Country	**Republic of North Macedonia**
Request ID#	
Title	*Forest fire information system enhancement project in North Macedonia*
NDE	*Please add name, position, organization, email and address*
Proponent	*Please add name, position, organization, email and address*

Summary of the CTCN technical assistance

The Republic of North Macedonia (hereafter North Macedonia) has been feeling the negative impacts of climate change, most notably in the increased occurrence of forest fires over the past decade. According to statistics compiled by the Republic of North Macedonia State Statistical Office, damage caused by forest fires increased by 10 times from 11.5 sq. km in 2014 to 114.2 sq. km in 2021[1]. In August 2021, the country declared a state of emergency in response to a wildfire, which had been raging for 16 days at the time when the declaration was issued[2].

The increasing occurrence of forest fires have been linked to the progression of climate change, as evidenced by lengthening wildfire seasons, fire intensity, and burned area[3]. The United Nations Environment Programme (UNEP) projects that the frequency of forest fires would rise 50% by 2100[4]. The UNEP emphasized the need for countries to shift policy from reaction and response to prevention and preparedness.

North Macedonia has been strengthening its preparedness to such events by developing digital systems to forecast fire pathways and damages. This technical assistance will augment the system by adding a fire information module to better plan countermeasures to forest fires.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

National Designated Entity to the UNFCCC Technology Mechanism
Name: Dr. Teodora O. Grncharovska
Title: State Counselor on Climate Change UNFCCC Focal Point\Ministry of Environment and Physical Planning, Republic of North Macedonia
Date:
Signature:

Proponent (signature of the Proponent is optional)
Name: Dr. Stevko Stefanoski,
Title: Head of Department for Analysis, Assessment and Strategic Planning, Crisis Management Center, North Macedonia

Date:
Signature:

[1] Republic of North Macedonia State Statistical Office. (2022).
[2] IFRC. (2021).
[3] Environment Protection Agency. (2021). Climate Change Indicators: Wildfires.
[4] United Nations Environment Programme. (2022). Number of wildfires to rise by 50% by 2100 and governments are not prepared, experts warn

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Dr. Rose Mwebaza
Title: CTCN Director
Date:
Signature:

1. Background and context

The Republic of North Macedonia (North Macedonia) is a country on the Balkan Peninsula bordered by Kosovo, Bulgaria, Albania, and Greece and extending across 25,710 sq. km, of which 39.7% is covered by forests[5]. Recently, these forests have come under severe threat of forest fires caused by higher temperatures and drier weathers brought about by climate change. The burnt area resulting from forest fires has increased by 10 times from 11.5 sq. km in 2014 to 114.2 sq. km in 2021[6]. The wildfires that raged in the country in the summer of 2021 prompted the declaration of a state of emergency for 30 days[7].

The occurrence of forest fires is increasing globally with fires burning longer and more intensely. Changing weather patterns and climate are contributing to longer, warmer summers resulting in drier soil and vegetation that provide additional fuel[8]. The UNEP projects that forest fire events would increase globally by 14% by 2030 and as much as 50% by 2100. It therefore recommends in its latest report that countries must shift from reactive policies to strengthening their preparedness and prevention capacities[9].

One system that North Macedonia developed in 2014 to counter forest fires is the Macedonian Forest Fire Information System (MKFFIS)[10], supported by the Japan International Cooperation Agency (JICA). The MKFFIS utilizes a web-GIS system for fire prevention and early warning, providing crucial information on hotspots, vegetation, and topography. It ensures the availability and exchange of data relating to Risk: Hazard, Exposure, Vulnerability and Resilience/Capacity and connects all relevant institutions that share responsibilities in forest fire risk management. However, the existing system requires additional modules to reinforce its ability to assess fire damages, map fire hazards, and evaluate the existence of combustible materials. Therefore, this technical assistance envisions the development of an information module to be installed into the MKFFIS that would further strengthen North Macedonia's capacity to prepare for forest fires.

2. Problem statement

The key issues that the TA aims to address are as follows:

- **Climate change is threatening North Macedonia's forests by creating conditions that are conducive to more intense forest fires that burn for longer periods of time.**
- **North Macedonia has been severely impacted by forest fires over the past decade;** burnt areas are increasing and fires are becoming much more difficult to fight and contain.
- **North Macedonia is strengthening its capacity to prepare for forest fires risk management.** It has already made progress by introducing the MKFFIS.
- **The MKFFIS requires additional information modules to be more effective in**

[5] The World Bank. (2022). World Bank Data. Forest area (sq. km) - North Macedonia
[6] Republic of Montenegro State Statistical Office. (2022).
[7] IFRC. (2021).
[8] Environment Protection Agency. (2021). Climate Change Indicators: Wildfires.
[9] United Nations Environment Programme. (2022). Number of wildfires to rise by 50% by 2100 and governments are not prepared, experts warn
[10] http://mkffis.cuk.gov.mk/broshura/MKFFIS-en.pdf

mapping fire hazards and assessing damages.

Based on the above, the technical assistance will aim to develop an additional information module to be incorporated into the MKFFIS to bolster the existing system's ability to forecast fires and thus inform the development of appropriate countermeasures. The assistance would also include components of capacity building and training to ensure that the officials using the system are familiar with the added functions of the module and are better able to interpret outputs. The proposed project does not overlap or conflict with parallel projects, such as the IPA Floods and Fires[11].

[11] IPAFF. (2022). About the Program. https://www.ipaff.eu/about/

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
***Objective**: As a (forest) fire countermeasure, add information (module) that the existing forest fire information system does not provide, and use it for forest fire countermeasures. Consider and establish an implementing process for fire countermeasures, including training on systems*												
Outcome: • [Outcome 1] Development of implementation planning and communication documents • [Outcome 2] Demonstrate potential modules and specify useful information • [Outcome 3] Modules development on MKFFIS including equipment procurement • [Outcome 4] Capacity building on software usage to the local agencies • [Outcome 5] Consider DRR measures and establish decision making process • [Outcome 6] Analyze gaps in developing a larger climate change adaptation project leveraging GCF												
Output 1: Development of implementation planning and communication documents												
Activity 1: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* i) A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan; ii) Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan); iii) A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided); iv) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).												

Deliverable 1: i) Detailed work plan ii) Monitoring and evaluation plan iii) CTCN Impact Description iv) Closure and Data Collection report												
Output 2: Demonstrate potential modules and specify useful information												
Activity 2.1: *Assess Forest fire risk and evaluate current adaptation measures* A study will be performed to assess the current state of forest fire risks and adaptation measures in place. This activity will entail analyzing existing policy documents and national adaptation strategies to form a baseline from which the following activities and outputs will be built upon.												
Activity 2.2: *Identify useful information to be added onto the existing system* A study will be conducted to consider the information to be incorporated into the MKFFIS. The study would include a review of the existing system to identify components that should be developed further to enhance its capability to forecast and mitigate fire damages, such as through the analysis of combustible materials on the forest floor.												
Activity 2.3: *Demonstrate potential modules* Based on the study, several modules will be selected for demonstration to ensure their efficacy in addressing forest fire hazards as well as their compatibility with the existing system. The module(s) will be demonstrated upon discussion with key stakeholders. Outline of modules to be demonstrated: 1. Fire danger forecast - Establish the danger rating indexes for the next 1-3 days - Indexes will enable modelling and creation of scenarios to develop measures against fire. 2. Establish the danger rating indexes for the next 1-3 days - Establish a module for rapid determination of burned areas and their zoning - Burnt area data is developed by analyzing MODIS daily images at 250 m spatial resolution. - Consider higher resolution data produce by using other satellite - Assess the damage and impact using other layers (forest vegetation and other) 3. Evaluation of surface combustible material - Determine ground combustible material in pilot area through filed survey												

- Ground combustible materials are dependence on forest species and waste material (dry trees, branches, leaves, etc.) that have accumulated on the surface over the years - Field survey will be implemented in different region, forest type, topography and etc. A selection report, including findings from Activity 2.1 will be developed to conclude the Activity.		■	■									
Deliverable 2:												
1) MKFFIS review and selection report			X									
Output 3: Modules development on MKFFIS including equipment procurement												
Activity 3.1: *Procure necessary equipment and install on site* Based on the findings and selection from Activity 2, the equipment needed to develop the module(s) will be procured. The equipment will be sourced on a competitive basis.			■	■	■	■	■					
Activity 3.2: Develop the module(s) and install on the system Based on the findings and assessments from Output 2, develop the module(s). These module(s) will be installed on the existing system.			■	■	■	■	■					
Activity 3.3: *Benchmark, design and implement a fire prediction model and software* Relevant fire prediction models and software will be benchmarked and designed for installation onto the existing module. These models and software will constitute a core component of the fire risk reduction mechanism that would be materialized through the operationalization of the module.				■	■	■	■					
Activity 3.4: *Test module and assess efficacy* The installed module will be tested to ensure that data is obtained according to designed parameters. The parameters include the module's capability in measuring forest floor dryness and tracing the path and scale of past fires. The module's user interface will also be tested to ascertain that all features function as designed. Information collected from this activity will then be used to organize the two trainings to follow.							■	■				
Deliverables 3:												
1) Equipment installation report							X					
2) Test result report								X				
Output 4: Capacity building on software usage to the local agencies												
Activity 4.1: *Develop operation manual*									■			

An operation manual on the additional modules will be created for use by local officials. This will be done with input from key stakeholders at necessary stages of its development.												
Activity 4.2: *Organize trainings and seminar for capacity building* Training will be organized to selected Regional Crisis Management Center(CMC) as Trainer of Training (TOT). This will be done through lectures at a central location as well as OJT. Then trainer will train other Regional CMC officer. A seminar will be organized to make certain that officials, including those from the Ministry of Environment and Physical Planning, the Crisis Management Centre(CMC), Regional CMC, forestry sector and JICA, will be well-equipped in operationalizing the additional modules. Participants will be requested to fill out questionnaires to assess their level of understanding and to evaluate the efficacy of the workshop in achieving its purpose.												
Deliverables 4:												
1) Operation manual									X			
2) Seminar and OJT report, including feedback from participants										X		
Output 5: Consider DRR measures, including implications for women and vulnerable groups, and consider additional improvements to be made												
Activity 5.1: *Considerations for DRR measures and how to incorporate findings into national risk assessment and planning document* A discussion will be held to assess how the information obtained from the MKFFIS and the additional module may be used to inform policymaking. Participants will primarily consist of policymakers at various levels of government, particularly from ministries that are immediately involved in forest fire management. Discussion points include how best to incorporate findings into national policy, how best to communicate the policy to the public, and challenges and bottlenecks to achieving them.												
Activity 5.2: *Considerations for vulnerable groups, particularly women* This activity will focus on ensuring the perspectives of women and other vulnerable groups are included in the discussions for DRR communication. This will be done primarily through stakeholder surveys targeting either households or NGOs that represent the interests of vulnerable groups. Since the interviews will take time to implement, the activity will take place sooner than other activities under Output 5.												
Deliverables 5:												
1) Minutes of the discussion										X		

2) Survey results										X			
Output 6: Analyze gaps in developing a larger, cross-border climate change adaptation project													
Activity 6.1: *Identify potential for further improvement* This activity entails assessing the MKFFFIS for additional improvements that may be made. This will build on the test results from Output 3, the feedback from the workshop from Output 4, and the discussions done in Output 5 to assess what additions would be conducive to enhancing the MKFFIS's capability to forecast forest fires.													
Activity 6.2: *Assess potential for deployment in neighboring countries and opportunities for cross-border cooperation* Since forest fires impact regardless of national borders, the team will also assess the possibility of expanding the module for deployment in neighboring countries. The team will also approach the NDE, other relevant ministries, and NGOs to identify the potential for the cross-border exchange of information utilizing the MKFFIS module. The assessment will not only concern identifying opportunities but also possible challenges and bottlenecks to the expansion.													
Deliverables 6:													
1) Final report													X

4. Resources required and itemized budget:

Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 1% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

Activities and Outputs	**Input: Human Resources** *(Title, role, estimated number of days)*	**Input: Travel** *(Purpose, national vs. international, number of days)*	**Inputs: Meetings/events** *(Meeting title, number of participants, number of days)*	**Input: Equipment/Material** *(Item, purpose, buy/rent, quantity)*	**Estimated cost** *Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan*	
					Minimum (USD)	**Maximum (USD)**
Output 1: Development of implementation planning and communication documents	I1: 2 days I2: 1 day I3: 1 day L1: 2 days L2: 2 days G1: 1 day				**4,350**	**4,850**
Output 2: Demonstrate potential modules and specify useful information	I1: 15 days I2: 21 days I3: 20 days L1: 15 days L2: 21 days G1: 6 days	**5,160**	**4,000**		**63,310**	**63,810**
Output 3: Modules	I1: 10 days I2: 23 days	**11,360**			**51,680**	**52,810**

development on MKFFIS including equipment procurement environmental conditions	I3: 10 days L1: 23 days L2: 4 days G1: 3 days					
Output 4: Capacity building on software usage to the local agencies	I1: 11 days I2: 14 days I3: 13 days L1: 11 days L2: 13 days G1: 4 days	**19,300**	**4,000**		**58,650**	**59,150**
Output 5: Consider DRR measures and establish decision making process	I1: 10 days I2: 10 days I3: 10 days L1: 10 days L2: 10 days G1: 6 days	**2,000**	**4,000**		**36,200**	**36,700**
Output 6: Analyze gaps in developing a larger climate change adaptation project leveraging GCF	I1: 8 days I2: 4 days I3: 4 days L1: 4 days L2: 8 days G1: 3 days	**5,810**			**22,200**	**22,700**
Estimated range of costing for the entire Response Plan					**236,390**	**239,390**

5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.

Experts required	Brief description of required profile
Project Manager (I1)	The project manager shall have the following expertise and experience: ● Master's degree or above (or equivalent experience) in climate change, disaster risk reduction/management, forestry, fire management, GIS/Remote sensing, social sciences, or other relevant field of study. ● International experience in leading and managing a project and a team of experts from different cultural backgrounds and fields of expertise ● At least 10 years of international experience of working with various countries' national and local governments, local stakeholders and authorities on climate change issues or technologies relating to disaster risk reduction ● International project experience with a focus on technology transfer, project management, high-level negotiations ● Previous experience working with web-GIS system for fire management and forestry or civil/forest engineering for disaster risk reduction will be valued. ● Previous experience in Northern Macedonia or Western Balkans will be valued. ● Excellent written and communication skills in English are required.
International expert in Information Technology (I2)	The international expert in information technology shall have the following expertise and experience: ● Master's degree or above (or equivalent experience) in information technology, GIS/Remote sensing, science in geography, system engineering, programming, or other relevant field of study. ● At least 10 years of experience in information technology or system engineering is required. ● Previous experience working with GIS/Remote sensing for forestry will be valued. ● Excellent written and communication skills in English are required.
International expert in disaster risk reduction/management (I3)	The international expert in disaster risk reduction/management shall have the following expertise and experience: ● Bachelor's degree or above (or equivalent experience) in disaster risk reduction, civil engineering, environment engineering, urban engineering, forestry, agroforestry, civil engineering, urban engineering, or other relevant field of study. ● At least 5 years of experience in disaster risk reduction is required. Relevant experience in fire risk mitigation and prevention will be valued. ● Previous experience in North Macedonia or Western Balkans will be valued. ● Excellent written and communication skills in English are required.

Local expert in Information Technology (L1)	The local expert in information technology shall have the following expertise and experience: ● Master's degree or above (or equivalent experience) in information technology, GIS/Remote sensing, system engineering, programming, or other relevant field of study. ● At least 10 years of experience in information technology or system engineering is required. ● Previous experience working with GIS system development and operation will be valued. ● Previous experience in North Macedonia or Western Balkans will be valued. Excellent written and communication skills in English are required.
Local expert in disaster risk reduction/management (L2)	The local expert in disaster risk reduction/management shall have the following expertise and experience ● Master's degree or above (or equivalent experience) in information technology, system engineering, programming, or other relevant field of study. ● At least 7 years of experience in forestry, forest management, or related field is required. ● Previous experience in working with local government, stakeholders, and communities in North Macedonia is an asset. ● Excellent written and communication skills in English are required. ● It is expected that the expert will be based in North Macedonia
Local Advisor on Gender (G1)	The local adviser on gender shall have the following expertise and experience: ● Bachelor's degree or above (or equivalent experience) in gender studies or other discipline with focus on the field of gender issues in a developing country context. ● At least 5 years of experience in gender mainstreaming in climate change adaptation and mitigation. ● Preference given for experience in gender studies in North Macedonia or Western Balkans. ● Experience in stakeholder engagement processes ● Excellent written and communication skills in English are required. ● It is expected that the local advisor will be based in North Macedonia.

6. Intended contribution to impact over time

Since the TA's purpose is to augment the MKFFIS, there are two expected impacts over time: 1. Strengthening the country's ability to collect more precise data on forests and 2. Enhancing its capacity to preventing forest fires and providing early warning should a fire occur.

The additional module to the MKFFIS would firstly allow for improved data to be collected on forests that would help identify risks and vulnerabilities that could lead to forest fires. For instance, the module would include features that help to identify the dryness of forest floors as well as fallen foliage that may provide additional fuel that would be conducive to fires growing out of control. It would also feature weather maps and fire history maps to identify the factors that have contributed to forest fires and help inform future decisions.

The additional information gathered thusly may be then used to inform policy to prevent such fires from occurring. Populations living close to high-risk forests may be warned with ample time before factors such as weather conducive to fires arrive in the area. Moreover, improved identification of fire risk areas would allow for a swifter response to fire hazards should one occur.

7. Relevance to NDCs and other national priorities

Forest fire management is a priority area for North Macedonia and is mentioned in several national documents. Firstly, the enhanced Nationally Determined Contributions (NDC) submitted in 2021. Building on the NDC submitted previously in 2015, the updated NDC strengthens policies and actions to be taken by identifying 63 mitigation policies and measures, among which are priorities that address Land Use, Land Use Change and Forestry (LULUCF)[12]. Furthermore, the NDC states that the country intends to develop a National Action Plan (NAP) which would include actions in sectors such as forestry and disaster risk reduction.

The Long-term Strategy on Climate Action and Action Plan refers to wildfires and in particular the need for a forest management system to better monitor forest fires. According to the Plan, North Macedonia will establish an integrated forest management system to reduce average burned forest area by 6,000 hectares[13]. The plan for integrated forest management is also mentioned in the NDC Implementation Roadmap[14]. Activities to develop management capabilities include the introduction of fire response vehicles and specialized training for firefighters.

The 3rd National Communication submitted in 2014 mentions the MKFFIS and is directly relevant to the module to be installed through this technical assistance. The Communication notes that the increased occurrence of forest fires would have multi-faceted impact, such as damage to infrastructure, increased GHG emissions, reduced wood supply, and increased frequency of insects and disease outbreaks[15]. In response, North Macedonia has developed the

[12] Republic of North Macedonia. (2021). Enhanced Nationally Determined Contribution
[13] Republic of North Macedonia. (2021). Long-term Strategy on Climate Action and Action Plan
[14] Republic of North Macedonia. (2021). NDC Implementation Roadmap for North Macedonia 2020-2030
[15] Republic of North Macedonia. (2014). 3rd National Communication

MKFFIS, an early warning system within the framework of the JICA/UNDP/CMC project entitled ""Development of Integrated System for Prevention and Early Warning of Forest Fires". The system is intended to strengthen the forestry sector by enabling the implementation of prevention and pre-suppression measures, thus leading to decreased forest fires and burned area.

8. Linkages to relevant parallel on-going activities:

The European Union is currently funding a programme in the West Balkans and Turkey called the IPAS Floods and Fires. This is a programme intended to foster cooperation and knowledge sharing among countries, including Montenegro, for the exchange of good practices to combat natural disasters.

While not a parallel activity, the proposed TA builds on the project "Development of Integrated System for Prevention and Early Warning of Forest Fires", which culminated in the development and deployment of the MKFFIS [16]. Taking place between May 2011 and May 2014, the project successfully implemented a national system for forest fire risk assessment and reinforced national coordination for forest fire information sharing and early warning. The Project on Capacity Building for Ecosystem Based Disaster Risk Reduction also has been implemented with the assistance of JICA and the most recent capacity building project is undergoing till the end of 2023[17].

North Macedonia also has projects being developed that entail the promotion of biodiversity and sustainable land management. For example, the country has applied and received approval for a project concerning sustainable land management (SLM) utilizing the Green Environment Fund[18]. Its main objective is to reduce the effects of land degradation and land use pressures on natural resources in the mountain landscapes. It is comprised of three key activities: Strengthened legal and institutional framework and capacity building for SLM and Sustainable Forest Management (SFM), implementation of sustainable land and forest management practices for reducing the effects of land degradation in three pilot sites, and building knowledge
management and public awareness.

9. Anticipated follow up activities after this technical assistance is completed:

Two main activities are envisioned as follow up to the technical assistance. Firstly, the team will consider how the MKFFIS may be improved by considering other modules that may be incorporated into the system. Secondly, they will consider the possibility of promoting the uptake of the system among the neighbouring countries.

The first follow-up activity would be to consider how the system may be improved further.

[16] JICA. Activities in Republic of North Macedonia
[17] JICA. The Project on Capacity Building for Ecosystem Based Disaster Risk Reduction through Sustainable Forest Management in Macedonia.
https://www.jica.go.jp/project/english/north_macedonia/001/index.html
[18] GEF. (2022). Promoting Sustainable Land Management (SLM) Through Strengthening Legal and Institutional Framework, Capacity Building and Restoration of Most Vulnerable Mountain Landscapes

Although the MKFFIS is operational and the module to be added through this TA will reinforce its capacity to monitor forest fires, the system still has the potential to be improved. However, identifying what improvements should be added to the system requires a review of the system post-module incorporation. In other words, the team will conduct an analysis to not only identify how the TA has improved the MKFFIS but also to identify gaps in the type of information that would be required to make the system more effective in achieving its design.

Another crucial follow-up activity would be to consider the upscaling of the TA to promote the implementation of a system like the MKFFIS among neighbouring countries such as Kosovo, Montenegro, Bosnia and Herzegovina, Albania and Serbia. Cooperation with Greece and Bulgaria of their national existing system will be considered. Due to the higher summer temperatures recorded in the region, both Albania and Greece experienced numerous fires in July 2022[19]. The team will therefore assess the possibility of expanding the system, including how effective it would be in monitoring and simulating forest fires. The uptake of similar systems across the region may also be conducive to encouraging cross-border cooperation in combating forest fires, especially since forest fires have massive impact beyond national borders. The team will also take this into consideration and assess the potential for using the system to promote the cross-border exchange of information on forest fires, including approaching the North Macedonian NDE and relevant ministries for their input.

10. Gender and co-benefits:

Imbedded in design of the activities:	The TA will ensure the equal representation of women and men as well as participation of gender focal points and associations that promote gender equality and empowerment of women and other vulnerable groups throughout the process. There will also be an emphasis on gender balance on the actual training sessions and meetings. In this regard, a gender expert will be consulted throughout the implementation of the TA to mainstream gender in each activity.
Gender and co-benefits intended as result of the activities:	The Republic of North Macedonia identifies several vulnerable groups, including refugees, Roma people, women, and children. In particular, the country stresses the importance of providing support to single mothers and women who are over 65 years old and are living alone. In the 2021 Rapid Socio-Economic Assessment of the Macedonian Enhanced NDC Targets/Measures, single mothers and women over 65 years old were mentioned to be particularly vulnerable resulting from a combination of low income and marital status[20]. While forest fires indiscriminately damage life, property, and landscape, the different social vulnerability would affect some groups more than others. For instance, the wildfires that raged in the summer of 2021 burnt over 100 square kilometres of forest and crops as well as houses and social facilities. Since the area affected was primarily dependent on

[19] Exit News. (2022). Wildfires Rage Across Albania with Temperatures Set to Rise
[20] Republic of Macedonia. (2021). Rapid Socio-Economic Assessment of the Macedonian Enhanced NDC Targets/Measures

	agriculture for their income, the people not only lost their homes but also a means of sustaining themselves. The situation would have been much more dire for single mothers and elderly women living alone, with lack of access to finance and appropriate facilities to see them through the disaster. The additional module of the MKFFIS is intended to provide better insight into forest fires, including the ability to project areas that are prone to fires. The module would also allow for the deployment of an Early Warning System to minimize the damage to the population. The heightened ability to prepare and combat fires and to develop relevant policies would be conducive to supporting single mothers and elderly women in preparing for the hazards to come and managing through the disaster.

11. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
Ministry of Environment and Physical Planning	The Ministry of Environment and Physical Planning oversees all matters relating to environment and spatial planning in the Republic of North Macedonia. It is also the national focal point to the United Nations Framework Convention for Climate Change (UNFCCC) and thus would be a central actor in developing and organizing the TA proposal.
The Ministry of Agriculture, Forestry, and Water Economy (MAFWE)	The Ministry of Agriculture, Forestry, and Water Economy oversees all agricultural and forestry matters, including collecting data on forest fires in the country. It will be involved in the TA to inform and guide activities by providing relevant information on wildfires.
Ministry of Health (MOH)	The Ministry of Health is tasked with developing and managing national policies pertaining to North Macedonia public health. It will be involved in the TA to inform activities from the perspective of wildfire-related health hazards.
Crisis Management Center (CMC)	The Crisis Management Centre was established in 2005 and is tasked with conducting risk assessment on disasters, including forest fires. It is also responsible for conducting training, providing early warning, and coordinating international assistance efforts once a disaster strikes. The CMC will be involved particularly in the module development portion of the activities to ensure that risk assessment perspectives are incorporating into the activities undertaken.
Macedonian Women's Lobby (MWL)	Founded in 2001, the Macedonian Women's Lobby advocates gender equality in all dimensions of social and public spheres. They will be approached for input when conducting the interviews to incorporate perspectives of women into policymaking.

CNVP (NGO)	CNVP is a Dutch NGO operating in the West Balkans and are engaged in areas such as sustainable resource management, climate change, and rural development. They will be approached for input when conducting the interview to include the perspectives of vulnerable groups.

12. SDG Contributions:

*Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.*

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	
3	Ensure healthy lives and promote well-being for all at all ages	Improved early warning and fire prevention to protect lives and health
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	
	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive and sustainable	

	economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	The TA will introduce an improved fire prevention system that would enhance fire prediction and early warning.
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	*All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).*
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	The TA would strengthen North Macedonia's capability in predicting and preventing forest fires, which are expected to occur more frequently as a result of climate change.
	13.2 - Integrate climate change measures into national policies, strategies and planning	The TA would strengthen North Macedonia's climate change priorities on forest fire prevention by allowing for more precise and readily available data.
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity	The TA is intended to bolster forestry management by allowing for more precise data to be collected on forests, thus strengthening the

	loss	country's capacity to take action in preventing forest fires or to provide early warning should one occur.
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

Please tick off the relevant boxes below	*Primary*	*Secondary*
☑ 1. Decision-making tools and/or information provision	☑	☐
☑ 2. Sectoral roadmaps and strategies	☐	☑
☑ 3. Recommendations for law, policy and regulations	☐	☑
☑ 4. Financing facilitation	☐	☑
☐ 5. Private sector engagement and market creation	☐	☐
☑ 6. Research and development of technologies	☑	☐
☑ 7. Feasibility of technology options	☑	☐
☑ 8. Piloting and deployment of technologies in local conditions	☑	☐
☐ 9. Technology identification and prioritisation	☐	☐

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance; and (iii) the CTCN Director about timeliness and appropriateness of the delivery of the activities and outputs.

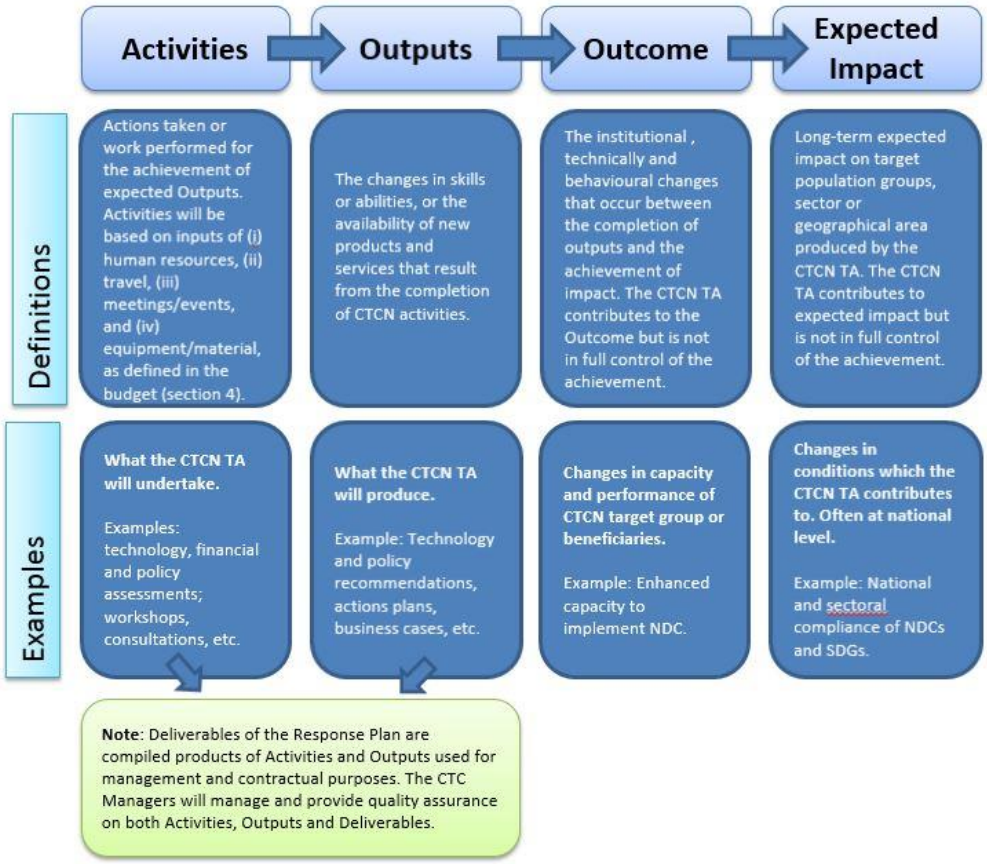
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

1. Objective of the Response Plan

The Response Plan is developed by CTCN specialists in response to a country request for technical assistance. It constitutes the Terms of Reference of the CTCN technical assistance that will be provided to the country and it provides the formulation of and subsequent basis for the monitoring and evaluation of the Response Plan implementation, as well as its expected outcomes and anticipated impacts.

2. Results chain and Logical Framework Approach to be defined in the CTCN Response Plan

The result chain is the causal sequence that stipulates the necessary flow of actions and processes to achieve desired objectives and results – beginning with inputs, moving through activities and outputs, and culminating in individual outcomes. The outcome will contribute to the desired impact in the society. The Logical Framework Approach is an analytical process used to support objectives-oriented project planning and management. It provides a set of pre-defined concepts which are used as part of an iterative process to aid structured and systematic analysis and management of the CTCN technical assistance.



3. Role of the Response Planning Design Team

The Response Planning Design Team is selected by the Climate Technology Centre (CTC). The composition of the team depends on each particular request but may include the National Designated Entity (NDE), the request Proponent, Climate Technology Manager of the CTCN, experts from the CTCN Consortium, UNIDO and UNEP experts from regional offices and other experts as needed.

The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager of the CTCN will provide quality assurance of timeliness and appropriateness of the Response Plan.

The Response Planning Design Team will draft all sections of the Response Plan template building on the information contained in the CTCN Request, based on expertise on the given topic and potentially further data collection, as required. This will be done by the CTCN Consortium Experts in consultation with the NDE, request Proponent and relevant stakeholders. The Response Plan has to be agreed to and approved by the NDE and the CTCN Director. This Response Plan will serve as the basis to identify, select and engage an expert institution from the Climate Technology Network or Consortium to lead the implementation of the CTCN Response Plan in the requesting country.

To the extent possible, staff from UNEP and UNIDO Regional, Sub-Regional and/or National Offices should be involve in all stages of formulation of the Response Plan to maximize synergies and avoid overlap with ongoing initiatives, as well as ensure relevance to regional and national context.

4. Process for designing the Response Plan

The Response Planning process should be completed over a period of up to 60 working days (12 weeks). Indicative steps and related timelines are laid out below:

5. Design Considerations

In order to maximize the impact of the technical assistance provided by the CTCN and provide an effective M&E process, the Response Plan should integrate as much as possible the considerations below:

Climate Technology focus: The Response Plan should have a clear focus on climate technologies, and identify activities that enable the identification, development, deployment or diffusion of one or several specific technologies (including equipment, techniques, knowledge and skills).

Barrier removal / Problem solving: The activities should contribute to address the specific problem statement identified in the Request. The barriers identified should be those hampering the identification, development, deployment or diffusion of one or several climate technologies or climate actions. Therefore, it may be necessary to limit the CTCN Response Plan to a set of activities for technical assistance commonly agreed with the NDE (and Proponent when needed) compared to the original request submitted. The CTCN will liaise with NDEs and Proponent in case the scope of the technical assistance deviates from the original request.

Use of the CTCN assistance by stakeholders: The Response Plan should identify clearly how the products of the CTCN assistance will be used in the short term once support is delivered, by who and when, to ensure it will lead to specific impacts in the country. The activities should engage the stakeholders that will use the concrete results of the assistance to deploy the technologies, including from the private sector, the public sector, research institutions, etc.

Within the scope of CTCN resources: The cost of the technical assistance provided by the CTCN cannot exceed USD 250,000 per Response Plan. Therefore, it may be necessary to prioritize activities and limit the CTCN Response Plan to a set of priority activities commonly agreed with the Proponent and the NDE to remain under this value. Under section 4 of the Response Plan template, an indicative activity based budget should be presented. The proposed budget is indicative and should present an estimated costing range per activity, output as well as a total costing range for the delivery of the Response Plan. Once the Response Plan is finalised and published for tendering, interested parties will provide competitive offer against the indicative budget.

CTCN activities and outputs should be linkable to monitoring and evaluation indicators: All proposed activities and outputs must be linkable to monitoring and evaluation indicators that are specific, measurable, achievable, relevant, and time-bound. The monitoring and evaluation process and corresponding indicators will be developed by the Lead Implementer as part of the work plan and will allow the CTCN technology Manager to monitor the timeliness and appropriateness of the implementation.

Synergies with existing efforts: The Response Plan should focus on activities that are not already being fully supported or that are in the process of being fully supported by another national, regional or international organization. Synergies and complementarity also require that the CTCN assistance is not duplicating past activities. It is possible in the Response Plan to indicate co-financing from the government, the Proponent or another stakeholder, that will maximize the effectiveness of the CTCN assistance.

Gender mainstreaming: The CTCN mission is to build or strengthen developing countries' capacities to identify technology needs, to facilitate the preparation and implementation of technology projects and strategies taking into account gender considerations. The Response Plan must therefore describe how gender considerations will be included and monitored within the proposed activities, and any gender co-benefits that will be gained as a result of implementing the CTCN technical assistance.