

Terms of reference (ToR) for the procurement of services below the EU threshold

CONFIDENTIAL

International Consultancy for hydrological monitoring networks and flood & (hydrological) drought EWS for the future Albanian NMHS	Project number/ cost centre: G-011947-001 29%; G-011947-003 71%
ALBAdapt - Programme for Climate Resilient Urban Development in Albania	Tender number 10045741 OSR Code: 0101 -91% 0201 – 9% IO numbers: 11947010000 – 91% 11947020000 – 9%

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0. List of abbreviations

AE	Accredited Entity
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
CIEWS	Climate Information and Early Warning System
C3S	Copernicus Climate Change Service
CIC	GCF Climate Investment Committee
CIS	Climate Information Services
CN	Concept Note
CV	Curriculum Vitae
DRR	Disaster Risk Reduction
EEA	European Environmental Agency
EU	European Union
EbA	Ecosystem Based Adaptation
GCF	Green Climate Fund
GHG	Green House Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GoA	Government of Albania
MHEWS	Multi-Hazard Early Warning System
NAP	National Adaptation Plan
NCCS	National Climate Change Strategy
NDA	National Designated Authority
NDCs	Nationally Determined Contributions
NFCS	National Framework for Climate Services
NMHS	National Meteorological and Hydrological Service
ToC	Table of Content
TORs	Terms of Reference
SAP	Simplified Application Process
SDC	Swiss Development Cooperation
SECO	Swiss State Secretariat for Economic Affairs
UNFCCC	United Nation Convention on Climate Change

1. Context

The Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) is a federal enterprise supporting the German Government in promoting international cooperation for sustainable development and international education work. In Germany, GIZ's main commissioner and client is the Federal Ministry for Economic Cooperation and Development (BMZ). GIZ's international commissioners and clients include the European Union (EU), bilateral and private sector donors, and multilateral development finance institutions including the Green Climate Fund (GCF).

The GCF aims to support developing countries to adapt to climate change impacts while striving to limit and reduce their Greenhouse Gas (GHG) emissions. The overarching goal of the GCF is to serve the Paris Agreement in limiting global average temperature change below the 2°C mark. GIZ is currently expanding its GCF project portfolio and sourcing new ideas. In this context, GIZ Albania together with its local partners identified a project idea in Albania, developed a concept note (CN) endorsed by GCF Climate Investment Committee 2 (CIC-2) on 13th of April 2023 prepared a simplified funding proposal (SAP) submitted to the GCF in February 2024 which got approved on 18th of July 2021¹.

The ALBAdapt – Programme for Climate Resilient Urban Development in Albania is jointly financed by BMZ, GCF, Swiss Development Cooperation (SDC) and Swiss State Secretariat for Economic Affairs (SECO).

Country Context

Albania is facing a high level of damage caused by natural disasters, mainly from high exposure to climate change and a lack of adaptive capacity. Albania is prone to various extreme weather events, which have substantially increased their frequency in the last 30 years. Besides being at high risk from geophysical hazards, Albania is systematically endangered by floods, droughts and heatwaves. Recent analyses by the European Environment Agency (EEA) and the Copernicus Climate Change Service (C3S) emphasize that Albania's vulnerability continues to outpace the European average. Urban land within recognised flood-prone zones has risen to 26.9%, the highest proportion in the Western Balkans, while mean summer temperatures in the coastal areas have warmed by 1.4 °C since the 1981–2010 baseline. Additionally, 5 heatwave episodes, two storms, and respectively one landslide and drought occurred per year. An estimated US\$ 30 million, has been accounted yearly, for the damage caused from climate-induced extreme weather events, with the majority of damages being disproportionally registered in the last 30-40 years. Albania is ranked 82 (out of 191 countries) – and number 1 in Europe – on the World Risk Index of natural disasters and climate change and 80 on the ND-GAIN Index of climate vulnerability, making it the most climate-vulnerable country in Europe. Between 1980 and 2021, 35 natural disasters are estimated to have caused approximately US\$ 800 million of damage, with each natural disaster causing average damage of 1.3% of GDP, double the EU average. It is estimated that, on average, 50,000 Albanians are affected by floods every year.

The institutional and technical capability to produce science-based information and to translate it into comprehensive climate risk management in high-risk areas is very limited, and

¹ SAP041: ALBAdapt – Climate Services for a Resilient Albania | Green Climate Fund

communities in the coastal lowlands remain vulnerable to the adverse short- and long-term effects of extreme events and a changing climate. Like in many countries, there is neither a formal nor a functioning national regulatory and institutional framework for climate services that engages all relevant stakeholders and provides a space for co-production and facilitation of better climate risk informed decisions. According to Albania's Third National Communication to the UNFCCC, the socio-economic vulnerability to climate change is centred upon the sectors of agriculture, water, tourism and population.

To respond to the needs of the country in this regard, building upon the know-how and lessons learned from the GIZ experience in Albania, a project idea on climate information and climate services (named ALBAdapt – Programme for climate resilient urban development in Albania) was conceptualised in order to support vulnerable Albanian communities to be more resilient to climate change impacts, to be able to take early action, and to be able to take climate-informed investment decisions.

Economic exposure remains concentrated in climate-sensitive sectors: agriculture, energy and tourism together generate more than half of national GDP. Drought-induced hydropower shortfalls in 2022 forced Albania to import 35 % of its electricity needs, and storm-surge flooding in 2024 caused direct damages of about EUR 12 million. Rapid coastal urbanisation (three-quarters of the population now live within 100 km of the coastline) combines with labour migration to constrain the fiscal means for adaptation. These factors confirm that Albania remains Europe's most climate-vulnerable nation and justify the project's focus on robust climate-information services, people-centred early warnings and localised adaptation planning.

Programme Overview

"ALBAdapt- Programme for Climate Resilient Urban Development in Albania"

The programme aims to increase the adaptive capacity and climate resilience of Albania, particularly of its coastal zone and of selected basins, through generation, coordination, and effective use of climate information and services. It seeks to transform the entire climate services value chain: from the establishment of a National Framework for Climate Services (NFCS) to the building of a multi-hazard impact-based early warning system (MHEWS) for early action and mobilization of financial resources for adaptation measures. To reduce the impacts of climate-induced hydrometeorological hazards, timely access to Climate Information Early Warning System (CIEWS) and delivery of targeted measures and investments will be significantly enhanced through the project. As a result, the Albanian vulnerable communities and decision-makers will be able to take early action, make informed climate financial decisions and be more resilient to climate change impacts, particularly those resulting from water related hazards in the coastal areas.

The programme has 3 components and subsequent outcomes as following:

Component 1 - Weather, hydrological and climate information services

Outcome 1: *Albania has an enhanced National Meteorological and Hydrological Service (NMHS) and a National Framework for Climate Services (NFCS) capable of providing weather, hydrological and climate information services in support of policies, plans and priority sectors.*

Component 2 - Multi-hazard early warning system and early action

Outcome 2: *Albania establishes a widely-available early warning system and targeted early action services – saving lives, livelihoods and reducing climate disaster risks.*

Component 3 - Climate informed investments decisions

Outcome 3: *Improved climate-informed decisions for adaptation measures*

The programme idea follows the three paradigm-shifting pathways of the Climate Information and Early Warning Systems GCF sectoral guide², namely (i) Strengthening climate information services, (ii) Promoting impact based MHEWS and early action and (iii) Improving CIEWS for investment and financial decisions. It will contribute to the GCF results framework by enabling increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions, as well as by increasing resilience of green infrastructure, the built environment, ecosystems and their services to climate change threats (GCF fund-level impacts).

More details on the programme concept can be obtained from the Funding Proposal ALBAdapt to be found on the GCF website under the SAP041 project.

The consultancy will focus on Component 1, specifically Activity 1.1.1 “Strengthening the NMHS”, and Component 2, specifically Activity “Deploying a widely-available, fit-for-purpose MHEWS” of the ALBAdapt Programme.

Within the Component 1 of the programme as part of the Sub-activity 1.1.1.2 “Building the fundamental facilities and systems of the NMHS” the network design of the National Meteorological and Hydrological Service and the technical specifications of the stations are among the main tasks. The technical partner of ALBAdapt is MeteoSwiss, the Meteorological Service Institution of Switzerland. MeteoSwiss provides their extensive expertise regarding the meteorological network and the technical specifications of the Automatic Weather Stations. When it comes to the hydrological network and Automatic Hydrological Stations, there is a gap of expertise that needs to be filled. Another project that is operating in the same area is EU4Rivers, which is planning to procure around 20 AWS and 22 AHS, and is developing a hydrological network design based on Multi-criteria Analyses and GIS layers. Alignment between ALBAdapt Programme and EU4Rivers Project is important since the final aim is a National Hydro-Met Network, not a fragmented one.

Regarding Component 2, Sub-activity 2.1.1.2 “Co-creation of a people-centred MHEWS”, the consultancy will focus on the early warning system (EWS) for floods and (hydrological) droughts. Even in this case the meteorological counterpart, which will focus on the EWS for meteorological hazards, is MeteoSwiss. When it comes to the production of warnings, the consultancy must keep in mind that data scarcity is a big issue in Albania, as such practical strategies to overcome this challenge are necessary.

Throughout both components, the consultancy will work in close collaboration with MeteoSwiss and the ALBAdapt team, focusing on the hydrological dimension of the shared objective: a fully integrated National Hydro-Meteorological Network and a coherent, people-centred Multi-Hazard Early Warning System for Albania.

² <https://globalplatform.undrr.org/sites/default/files/2022-02/Sectoral%20guidelines%20for%20Climate%20Information%20and%20EWS.pdf>

2. Tasks to be performed by the contractor

- a. GIZ shall hire the contractor for the anticipated contract term, from 1. November 2026 to 30. November 2028

The consultancy shall focus on developing a technically sound, operationally sustainable and financially realistic hydrological monitoring system that supports flood forecasting, disaster risk reduction, climate services, water resources management and compliance with relevant EU and WMO requirements. MeteoSwiss is the technical partner of the ALBAdapt Programme that is working extensively for the meteorological network design and the technical specifications for the stations, among other things. This international consultancy will support the hydrological network design for Albania and the drafting of the technical specifications for the procurement of the hydrological automatic stations, as the main focus of the consultancy.

In parallel with the network design, a reform of the hydrometeorological sector of Albania is underway. The reform will regulate the sector with a law (which is missing at this stage) and establish a new hydrometeorological institution under the Ministry of Environment³. This consultancy will also aid in small specific tasks that address the hydrological component of the new institution.

Smooth collaboration with GIZ, MeteoSwiss and National institutions is required throughout the process. In more details, the international consultancy will:

1. **Inception Report and work plan:** as a first task, the expert shall provide a thorough inception report and a detailed work plan for the foreseen tasks and deliverables. Such report shall include:
 - a. Review all available ALBAdapt, MeteoSwiss, EU4Rivers, IGEO and national reform documentation relevant to hydrology.
 - b. Analyze WMO guidelines relevant to hydrological observations, stream gauging, flood forecasting, data quality management, and hydrological service operations. Review relevant EU legislation, directives and technical guidance applicable to hydrological monitoring, flood forecasting, water resources management and environmental data management, including the Floods Directive (2007/60/EC), Water Framework Directive (2000/60/EC) and INSPIRE Directive.
 - c. Clarify data availability, access constraints, counterpart roles, field mission logistics, and expected decision points.
 - d. Prepare a detailed workplan, including methodology, field assessment schedule, required inputs, risk log and deliverable calendar.
2. **Assess the existing hydrological network:** The assessment shall explicitly evaluate the suitability of stations for discharge measurement, rating-curve development, flood forecasting, drought monitoring, climate monitoring and water resources management.

³ The existing NMHS institution in Albania is IGEO, institute of GeoSciences. Due to a number of past reforms in the past, this institution was placed under the Polytechnic University of Tirana, dropping from 200 staff into 20 staff today. Now days it is seen mostly as a research institution rather than a service provider to the Albanian population. Hence, for this and other reasons, a new institution, directly under a ministry, with a clear mandate under the law, to focus solely on operations and service is necessary.

Particular attention shall be given to identifying stations of national strategic importance and stations required for compliance with international reporting and forecasting obligations.

At the moment there are 105 hydrological stations, operated by IGEO, where 22 are Automatic Hydrological Station (AHS) and 83 are Manual Hydrological Station (MHS)⁴. It is necessary to assess on the ground each AHS to fully understand their existing conditions (functionality, sensors, site location, operating system, needs for maintenance and calibration, etc) and give clear recommendations for the transfer to the new NMHS institution. For the 83 MHS only a sample should be assessed on the ground (around 5-10 stations) and suggest sound technical options for their handling⁵. In more detail, the expert shall follow the points below for this task:

- a. Compile and validate the inventory of existing hydrological stations, including automatic and manual stations, station metadata, coordinates, basin location, operational status, ownership, available measurements, power supply, telemetry, rating curve status, benchmarks, civil works, access, and maintenance history.
 - b. Assess the suitability of each station for discharge measurements, rating-curve development, flood forecasting, drought monitoring, climate monitoring and water balance applications.
 - c. Assess all automatic hydrological stations on site, subject to access and security constraints. The assessment shall cover sensor condition, data logger, telemetry, power supply, enclosure, staff gauge, benchmark/reference elevation, river cross-section stability, hydraulic suitability, access, safety, vandalism risk, and maintenance needs and lifecycle considerations.
 - d. Assess a representative sample of manual hydrological stations, tentatively 5 to 10 stations, in order to evaluate their possible role during the transition to a automatic network.
 - e. Classify stations into categories such as retain, upgrade, rehabilitate, relocate, replace, maintain as manual reference station, integrate from third party, or decommission.
 - f. Prepare station dossiers and a consolidated station assessment matrix with priority actions and indicative cost categories.
3. **Draft the methodology for the hydrological network design:** The methodology should be practical and easily applicable so that it can evolve long term by the new NMHS institution itself. EU4Rivers⁶, another project operating in Albania, has developed a GIS based methodology for the hydrological network design using a Multi-Criteria Analysis (MCA) approach. If the methodology developed by EU4Rivers and IGEO is sound from the technical perspective of this consultancy, the methodology shall be adopted, adjusted and developed further by this consultancy. If this is not the case, this consultancy shall build

⁴ This is a rough estimate based on the numbers provided by the institution (IGEO) and the inventory of the station conducted in 2023 during the preparation of the project proposal of ALBAdapt (the document will be provided when the work starts).

⁵ What happens to the manual network (both meteo and hydro) when transitioning towards an automatic network is still a question mark that needs to be answered. When answering this question there are certain factors that need to be considered, which will be discussed jointly when the work starts.

⁶ EU4Rivers is another project that targets the hydro-met sector in Albania. What is important to keep in mind is that they are planning to procure around 22 AHS and 20 AWS for IGEO. Also they have a rough outline of the methodology for the hydrological network design (GIS based) and are planning to pilot it in the basin of Vjosa (further information will be provided when the work starts).

the methodology from scratch in close collaboration with ALBAdapt team, MeteoSwiss experts and key partners. The methodology shall be aligned, to the extent possible, with WMO Hydrological Observing System recommendations, the EU Floods Directive (2007/60/EC), Water Framework Directive (2000/60/EC), and requirements related to climate adaptation and resilience planning. The main purpose of the network shall be flood risk management, DRR in general and water balance management. Another factor to be considered (requested by partners) is the incorporation of water quality monitoring sensors in the network design⁷. Beside the network operated by IGEO, hydropower plants are required by law to install an AHS for the water balance. This should also be taken into account for the network design. More details on this point will be discussed during the process. Below are some points to guide the work of the expert:

- a. Review the GIS-based multi-criteria network design methodology developed or proposed by EU4Rivers and IGEO.
 - b. Assess whether the methodology is technically sound, practical, transparent, and suitable for long-term application by the future, NMHS and national staff.
 - c. Refine the methodology where appropriate or propose an alternative if the existing methodology is not operationally applicable.
 - d. Ensure that the methodology considers flood risk management, disaster risk reduction, water balance management, basin representation, catchment response time, hydropower and reservoir influence, transboundary relevance, climate and drought monitoring needs, data continuity, station accessibility and maintenance feasibility.
 - e. Provide a practical GIS geo-package or other similar system/setup⁸ and scoring workflow that can be repeated and updated by national staff. Open-source tools such as QGIS, R or Python should be applied where possible.
4. **Implementation of the hydrological network design methodology:** The final network proposal shall distinguish between: (i) essential operational stations, (ii) stations supporting flood forecasting and early warning, (iii) climate and drought monitoring stations, and (iv) stations serving water resources and river basin management purposes. v) stations linked to irrigation and agriculture purposes: Through the application of the methodology the number of stations and the location of those stations for the Albanian context should be derived. Due to project limitations, a selection of the most critical sites, that are crucial for aiding efforts for flood risk management, disaster risk reduction in general and water balance management, is necessary. The sites selected by EU4Rivers project needs to be taken into account as well when prioritising sites. The tools and programs to be used are up to the consultancy, but open-source tool and programmes (i.e. RStudio, R, QGIS, etc) are preferred given that the methodology should be handed over to the new NMHS institution to use and apply on the long run. The work of the expert shall include the work below:
- a. Apply the agreed methodology to propose the optimal operational hydrological network for Albania.

⁷ This point shall be discussed further when the work starts. The technical input of the consultancy on this point (if it is possible or not to incorporate this) is crucial.

⁸ We do not want to constrain the expert regarding the tools, software or programme. We do want to stretch the fact that open-source tools, software, programmes are preferable due to the hand-over process. GIS tools are more common in the Albanian institutions than others.

- b. Define the minimum essential network, medium-term target network, and longer-term extended network, including station functions and implementation phases.
 - c. Identify priority stations needed for flood forecasting and warning support, disaster risk reduction, water balance assessment, river basin management, drought monitoring, climate services, and data continuity.
 - d. Take into account existing IGEO stations, planned EU4Rivers stations, relevant hydropower operator stations, major reservoirs and hydropower cascades, urban flood-risk areas, and national/international reporting needs.
 - e. Prepare maps, tables and technical rationale for the proposed network, including any recommended additions, upgrades, relocations or closures.
 - f. Prepare indicative investment and operational cost estimates (CAPEX and OPEX) for the proposed network scenarios, including station procurement, installation, calibration, maintenance, staffing and replacement cycles.
 - g. Provide recommendations regarding long-term sustainability of the network, including maintenance requirements, technical capacities, calibration arrangements and operational responsibilities.
5. **Draft the technical specifications for the AHS:** The technical specifications shall follow WMO guidelines as to meet the necessary requirements for site and station standards. They shall include elements such as data transmission, maintenance and calibration requirements, variables to be measured, sensors and so on. The consultancy shall also aid in the bid evaluation and the follow-up processes. Technical specifications shall prioritize standardization and interoperability across the national network, minimizing fragmentation of technologies and ensuring compatibility with future national databases, dashboards and data exchange platforms.
- The specifications shall support future integration with WIS 2.0, and WMO standardized database. The main points to be followed for this task are:
- a. Prepare technical specifications for automatic hydrological stations in line with WMO practices and the operational needs of Albania.
 - b. Define station classes or configurations, including minimum, standard and enhanced station packages as appropriate.
 - c. Specify water level sensors, staff gauges, benchmarks, data loggers, telemetry, local data storage, power supply, solar panels and batteries, cabinets/enclosures, lightning and surge protection, anti-vandalism measures, civil works, mounting structures, cable protection, metadata and documentation requirements.
 - d. Define data transmission intervals, event-mode logic, data format, time synchronization, failure alarms, backup storage, cybersecurity basics, and interoperability with national databases and dashboards.
 - e. Ensure compatibility with future national climate information systems, early warning systems and relevant WMO and EU data exchange requirements.
 - f. Define performance requirements, factory and site acceptance testing, commissioning procedures, warranties, spare parts, maintenance tools, and training requirements from suppliers.
6. **Bid Evaluation and Procurement Follow-up Support⁹:** Following the finalization of the technical specifications for automatic hydrological stations (Task 5), the expert shall provide technical support during the procurement process launched by GIZ for the supply,

⁹ This task is event-triggered, not calendar-driven. It will start once the procurement process begins and the bids come in.

installation and commissioning of AHS equipment. Given that procurement processes may extend over 12-18 months, this support shall be provided on an as-needed basis, triggered by the procurement timeline rather than running continuously. The expert shall ensure that the technical intent and standardization principles embedded in the specifications (Task 5) are preserved throughout the bid evaluation and contracting process. The main points to be followed for this task are:

- a. Support the procurement entity in clarifying technical queries raised by bidders during the tendering process, ensuring consistent interpretation of the technical specifications.
- b. Participate in the technical evaluation of bids received, assessing compliance of proposed equipment and configurations against the approved technical specifications, including station classes, sensor packages, telemetry, data transmission and interoperability requirements.
- c. Identify technical risks, non-compliances, equivalences or deviations proposed by bidders, and provide a clear technical recommendation to the procurement entity/evaluation committee to support the award decision.
- d. Document the technical evaluation criteria applied, findings per bidder, and final recommendations for institutional record-keeping and future reference by the new NMHS institution.

7. **Support in the development of the detailed design for the installation of hydrological stations:** In close collaboration with ALBAdapt team, MeteoSwiss and the national expert, the international hydrologist shall provide technical support for the development of the detailed design for the installation and/or rehabilitation of hydrological stations. The expert shall ensure that the detailed design is technically sound, consistent with the AHS technical specifications developed under Task 5 and aligned with the final network design established under Task 4. The main points to be followed for this task are:

- a. Support the national expert in developing detailed installation designs for hydrological stations, covering foundations, sensor mounting, staff gauge installation, access arrangements, protection works, benchmarks and reference levels, for different station types and site conditions.
- b. Define typical civil works and installation requirements per station type, ensuring consistency with the technical specifications developed under Task 5 and the station-specific requirements identified in Task 2.
- c. Review and provide technical quality assurance on detailed designs developed by the national expert, identifying gaps, inconsistencies or deviations from technical standards and WMO guidelines.
- d. Provide guidance for field supervision, inspection checklists, acceptance tests and documentation during installation and commissioning, to support the national expert in overseeing the installation process on the ground.

8. **Support for the hydrology department of the future NMHS:** This task aids the staffing efforts for the future NMHS institution and its hydrology department. The consultancy shall provide insights to the different hydro experts that are needed for such an institution and draft typical job descriptions for them. Also, the expert shall compile a list of WMO manuals, guidelines that address different operational aspects relevant for the hydrology department of the future NMHS. If needed, the experts shall draft manuals or SOPs for specific operational processes. This will aid the efforts of the future NMHS to build a functional library with international references. This shall be implemented in close collaboration with MeteoSwiss experts and ALBAdapt. This task shall be guided by the points below:

- a. Prepare operational guidance for the hydrology functions of the future NCA, including daily, weekly, monthly and event-based workflows.
- b. Propose hydrology staff profiles and job descriptions, including network operation, field hydrometry, data management, modelling, forecasting support, QA/QC, database management and service/product development.

- c. Define interfaces with IGEO, AMBU, civil protection authorities, hydropower operators, MeteoSwiss-supported processes, EU4Rivers, and other relevant users of hydrological data.
 - d. Prepare a practical hydrology operations manual or core SOP package suitable for adoption or further development by the future NMHS.
 - e. Develop a practical hydrological QA/QC framework for real-time and validated data, including automatic checks and manual review procedures.
 - f. Define procedures for range checks, rate-of-change checks, persistence checks, missing data treatment, cross-station consistency, time stamp control, outlier flagging, provisional and validated data status, and correction logs.
 - g. Develop a strategy for the long-term storage of hydrological records and collaborate with MeteoSwiss to assess the viability of combining hydro and meteo records into a unique climate database such as SURFACE CDMS or Climsoft.
 - h. Develop procedures for field visits, benchmark/reference checks, sensor verification, discharge measurements, rating curve development and updating, and post-flood validation.
 - i. Develop a manual for discharge measurements and rating-curve management, including prioritisation of gauging locations, measurements.
 - j. Define maintenance schedules, spare parts, emergency repair logic, calibration responsibilities, documentation forms, and performance indicators for station reliability.
 - k. Prepare templates for field inspection reports, rating curve logs, maintenance records, incident reports, and data correction reports.
9. **Insights and guidance regarding hydrological/hydraulic models needed for the Albanian context:** The guidance shall focus on operational feasibility, sustainability, required capacities and long-term maintainability rather than on developing new models. The consultancy shall provide a roadmap for operational hydrological forecasting and modelling in Albania, identifying realistic short-, medium- and long-term development pathways.: Albania has 7 main basins and, according to IGEO¹⁰, almost all of them have hydrological models even though different ones (Pantha-Rei, HEcrass, etc.). At the moment they are not operational or are being used sporadically. If possible¹¹, the consultancy shall assess the existing models and give a comprehensive overview on their functionality and application. This should be a useful a practical guideline for the existing models to be handed over to the new institution. If this option is not doable, the consultancy shall screen existing regional or global hydrological models that can be applied to the Albanian context (for each basin). Open-source options are always preferable. After compiling this extensive list, the consultancy shall also provide a practical guideline on how to access those models and how to tailor them for the Albanian context. In other words, this guideline should include practical technical recommendations for building a running hydrological model for Albania to aid in flood nowcasting, DRR in general and water balance management. The work shall be guided by the points below:
- a. Review available information on existing hydrological and hydraulic models for the seven main river basins of Albania, subject to data access.

¹⁰ This information is not 100% reliable, and access to those models is difficult. The approach for this point will be discussed further when the time comes.

¹¹ Depending on whether or not we can get access to those models from the institution.

- b. Assess whether existing models can be used, upgraded, transferred, documented, or should be replaced by more maintainable tools.
- c. Screen appropriate hydrological and hydraulic modelling options for Albania, including threshold-based alert systems, rainfall-runoff models, routing models, hydraulic models and real-time forecasting workflows.
- d. Prefer maintainable and transferable tools, including open-source options where feasible; however, the final recommendation should be based on operational robustness and staff capacity.
- e. Define a practical modelling roadmap for Albania, including short-term achievable products and medium-term improvements.
- f. Where feasible, prepare a demonstrator workflow for one priority basin or priority use-case, such as flood nowcasting, threshold exceedance monitoring, water balance reporting or hydrological bulletin preparation.

10. Technical architecture of flood and (hydrological) drought early warning systems:

Building on the hydrological network design (Tasks 3 and 4), the AHS technical specifications (Task 5) and in anticipation of the modelling roadmap (Task 9), the expert shall define the technical architecture underpinning the hydrological component of both the flood and (hydrological) drought Early Warning Systems, as foreseen under Component 2 of the ALBAdapt programme. The architecture shall describe the full data and operational chain for both hazards — from real-time and near-real-time AHS data acquisition through to alert issuance — and shall be designed following WMO standards (CAP, MeteoAlarma) to feed into the AlbaMet Alert¹² platform. Given that flood and drought EWS share significant common infrastructure, the architecture for both hazards shall be addressed in a single integrated framework, clearly identifying shared components and the points at which flood and drought monitoring diverge in terms of data requirements, update frequencies and warning timescales. The work shall be implemented in close collaboration with MeteoSwiss, the ALBAdapt team and the future NMHS, ensuring full compatibility with the broader MHEWS institutional and ICT architecture being developed in parallel, with the support of NCPA, under ALBAdapt Component 2. It is important to note that MHEWS governance, institutional design and AlbaMet Alert platform development are outside the scope of this consultancy and are being addressed separately. The consultancy shall focus exclusively on the hydrological technical content feeding into those systems. The approach and scope shall be discussed jointly with the ALBAdapt team and MeteoSwiss at the appropriate stage of implementation. The work shall be guided by the points below:

- a. Define the integrated technical architecture of the hydrological EWS component for both flood and drought, describing the end-to-end data and operational chain from real-time AHS data acquisition, processing and quality control through to alert trigger and handover to the AlbaMet Alert platform (NCPA).
- b. Identify and describe shared infrastructure components across flood and drought EWS (e.g. AHS network, data transmission, QC pipeline, AlbaMet Alert/CAP interface) and clearly distinguish where the two systems diverge in terms of data sources, monitoring frequency, indicator types and warning, alert timescales.
- c. Define data flow diagrams and system interface specifications, describing how hydrological data from the AHS network is ingested, processed, checked and translated into alert-ready outputs for the flood and drought EWS respectively.

¹² AlbaMet Alert (or ALBAAlert) is the platform that will be developed for MHEWS for the National Civil Protection Agency (NCPA), under the framework of ALBAdapt Programme.

- d. Assess integration requirements with European and regional monitoring systems relevant to both hazards, including the European Flood Awareness System (EFAS), Copernicus Emergency Management Service (EMS) and European Drought Observatory (EDO), with particular attention to transboundary basins (Drin-Buna, Vjosa/Aoos) and associated international data-sharing obligations.
- e. Identify technical and institutional gaps that would limit the operationalization of the flood and drought EWS architecture in the short term and propose a prioritized action plan to address them progressively as the AHS network is expanded and the future NMHS hydrology department becomes operational.
- f. Ensure that the proposed architecture is realistic, sustainable and operable by national staff of the future NMHS hydrology department, taking into account current and projected institutional capacity, available tools and long-term maintenance feasibility.

11. Threshold methodology for flood and drought early warning system: Building directly on the technical architecture defined in Task 10, the hydrological network design (Tasks 3 and 4) and the modelling roadmap (Task 9), the expert shall develop a methodology for defining hydrological thresholds for both flood and drought early warning across Albania's main river basins. Given that flood and drought thresholds are derived from the same hydrological records, rating curves and station baseline data, they shall be addressed within a single unified methodological framework, ensuring consistency in reference data, historical analysis periods and station classification across both hazards¹³. The threshold methodology shall be practical, transparent and reproducible by national staff of the future NMHS hydrology department and shall be calibrated to the extent possible against historical flood events, damage records and drought episodes in Albania. It is acknowledged that data availability and quality may constrain the level of precision achievable for certain basins or stations, and the methodology shall explicitly address how to handle data-scarce situations. The approach shall be discussed jointly with the ALBAdapt team, MeteoSwiss and relevant institutions at the appropriate stage of implementation, particularly regarding access to historical hydrological records. The work shall be guided by the points below:

- a. Review available historical hydrological records, flood event data, damage records and drought episode documentation across Albania's seven main river basins, assessing data length, quality and suitability for threshold derivation.
- b. Develop a methodology for deriving flood thresholds (water level and/or discharge) per priority station, linked to impact levels rather than purely statistical or meteorological criteria, and define corresponding flood alert levels (e.g. watch, warning, emergency) with their associated hydrological threshold values.
- c. Develop a methodology for selecting and deriving hydrological drought indicators appropriate for the Albanian context (e.g. streamflow drought indices, low-flow thresholds, reservoir storage levels) and define corresponding drought alert levels (e.g. advisory, watch, warning) with associated threshold values per basin and per use-case (water supply, agriculture/irrigation, hydropower, environmental flows).
- d. Ensure methodological consistency, together with MeteoSwiss, between flood and drought threshold derivation, particularly at stations serving both monitoring

¹³ Having said that, the consultancy should be aware that data scarcity is a big issue in Albania and should take into account measures to overcome this difficulty as best as possible. ALBAdapt team will assist on this when it comes to access to relevant institutions.

- purposes, by applying a unified hydrological reference framework (same baseline data, same historical period, same station classification).
- e. Define procedures for threshold review and updating over time, including triggers for revision (e.g. new rating curves, extended data records, post-event analysis) and responsibilities within the future NMHS hydrology department.
 - f. Address data-scarce situations explicitly, proposing interim or proxy approaches for basins or stations where historical records are insufficient for robust threshold derivation, and identifying priority data collection needs to improve threshold quality over time.
 - g. Prepare a practical threshold register for priority stations, documenting derived thresholds, methodology applied, data sources used, confidence level and recommended review frequency, in a format suitable for operational use and future updating by national staff.
 - h. Prepare a step-by-step guideline on how to build a threshold methodology for hazards, which can be transferable to other institutions that handle other hazard types.
- 12. CAP and SOPs for flood and drought early warning system:** Building on the technical architecture (Task 10) and threshold methodology (Task 11), the expert shall define the warning communication standards and operational protocols governing the flood and drought EWS hydrological component. This task addresses the operational layer of the EWS — how alerts are structured, communicated and acted upon — ensuring full alignment with WMO CAP standards, MeteoAlarm protocols and the AlbaMet Alert framework being developed under ALBAdapt Component 2. Given that Task 9 defines what the system looks like and Task 11 defines when alerts are triggered, this task defines how those alerts are communicated in a standardized, institutionally agreed manner and what procedures the future NMHS hydrology department follows operationally. The work shall be implemented in close collaboration with MeteoSwiss, the ALBAdapt team and other relevant national institutions, and shall be explicitly coordinated with the broader CAP and alerting international framework, to ensure consistency across hazard types. It is important that the communication standards and SOPs developed under this task are realistic and adoptable by the future NMHS hydrology department from day one of its operations, taking into account current capacity constraints and the gradual build-up of institutional expertise. The work shall be guided by the points below:
- a. Define the CAP message structure for hydrological flood and drought warnings and alerts, including required data fields, hazard classification, alert levels, spatial coverage, valid time periods and update frequency, ensuring full alignment with WMO CAP standards and the MeteoAlarm protocol framework.
 - b. Give technical advice on the integration of the CAP into the AlbaMet Alert platform.
 - c. Prepare Standard Operating Procedures (SOPs) for the NMHS hydrology department's operational role in the flood EWS chain, covering real-time data monitoring, threshold checking, warning-alert decision-making, internal escalation, communication with NCPA, and post-event review procedures.
 - d. Prepare SOPs for the NMHS hydrology department's operational role in the drought EWS chain, covering routine monitoring, indicator updating, drought bulletin preparation, warning-alert issuance, communication with relevant sectoral authorities (water management, agriculture, energy) and drought episode closure procedures.
 - e. Define roles and responsibilities within the NMHS hydrology department for EWS operations, including on-call arrangements, escalation logic, back-up procedures and interfaces with the meteorology department, NCPA and other relevant institutions.
 - f. Prepare a practical EWS operations reference guide suitable for use by hydrology department staff from the outset of NMHS operations, consolidating the CAP

standards, warning-alert level definitions, threshold values (from Task 11) and SOPs into a single operational reference document.

13. **Providing in-depth insights for international bodies with high relevance for hydrology (regional and global):** Assess and provide recommendations on Albania's future engagement with relevant regional and international hydrological initiatives, networks and data-sharing platforms, including WMO Hydrology, EFAS, Copernicus Emergency Management Services, transboundary river basin mechanisms and EU reporting obligations. MeteoSwiss has provided a comprehensive outlook into the most relevant international bodies when it comes to meteorology, such as WMO, EUMETNET, EUMETSAT, Copernicus, ECMWF and so on. Their work provides useful insights into membership benefits, services provided, membership fees, usefulness and so on, which is key for guiding decision-making process for the new institution. Some of the aforementioned international bodies covers hydrology as well. If there are other such bodies, specific to hydrology, that should be taken under consideration from the new NMHS, the consultancy shall provide a similar outlook of such bodies like MeteoSwiss has done. Since hydrology is a more localized element than meteorology, regional bodies (usually on basin level) should also be taken into consideration. And lastly, given the fact that Albania is in the process of EU accession, the perspective of an EU member state should be considered as well.
 - a. Map and assess relevant international, European, regional, and basin-level hydrological organizations, initiatives, and cooperation mechanisms of potential relevance to the future NMHS.
 - b. Review Albania's current participation in hydrological networks and identify opportunities, gaps, and future engagement needs.
 - c. Analyze the benefits, services, requirements, costs, and obligations associated with participation in the identified organizations and initiatives.
 - d. Assess implications arising from Albania's EU accession process, including relevant reporting, data-sharing, and cooperation requirements.
 - e. Develop recommendations and a prioritized roadmap for the future NMHS regarding engagement with international and regional hydrological bodies and initiatives.
14. **Hand-over process to the future NMHS of Albania:** The hand-over process of the products to the new institution shall occur in person, providing a clear walkthrough of each product, their usefulness and practical applicability. The in-person hand-over provides the opportunity for more in-depth peer-to-peer exchanges between experts. This shall be structured into in-person sessions where all the hydrology department staff can participate and listen. This way the expert has the opportunity to share with its peers also the challenges faced and steps that need further improvement by the staff of hydrology in the future. The hand-over process shall include dedicated sessions on:
 - a. inventarisation of the hydrological stations – methodology, content, importance, the process overall, difficulties and challenges and other relevant factors pertinent to task 2.
 - b. Hydrological Network Design – methodology, tools used, application, results, estimated cost and other relevant factors pertinent to task 3 and 4.
 - c. Procurement package and technical specifications for AHS – references used from WMO, core specifications, specific specifications, evaluations of bids process and other relevant factors pertinent to task 5 and 6.
 - d. Installation phase of the stations – civil works, factors to be accounted for, supervision process and relevant factors pertinent to task 7.
 - e. SOP and WMO library – relevance of each document, applicability and relevant factors pertinent to task 8.
 - f. Roadmap and guidelines regarding hydrological/hydraulic models for Albania - relevant factors pertinent to task 9.

- g. Technical architecture of the EWS for floods and (hydrological) droughts – everything pertinent to task 10.
- h. Threshold methodology for floods and droughts - everything pertinent to task 11.
- i. CAP and SOPs for EWS - everything pertinent to task 12.
- j. Overview of the hydrological international/regional bodies that are relevant for Albania - relevant factors pertinent to task 13.

Due to unexpected requests or needs from partner institutions of the Programme ww would like the consultancy to account for a few flexible working days (max. 5 working days). The requests or needs might refer to de-brief meetings with partners, brief presentations, technical inputs, and so on, regarding topics related to hydrology.

For key milestones, interim deliverables and an online de-brief might be considered, creating an iterative learning cycle that keeps institutions, GIZ, MeteoSwiss and international experts fully aligned. The working methodology will blend desk research (Previous work done by the local entities, inventory of the stations, MeteoSwiss assessments or working documents that align with the deliverable that the consultancy is trying to develop, especially in ongoing ALBAdapt activities that might feed the development of the network design and future NMHS support) with exchange and information revision stemming from institutions, and provision of expertise that integrates international standards to the Albanian narrative.

The consultant shall provide the deliverables according to the timeframe as presented in the table below. All deliverables shall be submitted in English language via e-mail . The contact details will be provided after the award. The products shall follow GCF-GIZ Corporate Design rules and regulations.

The contractor is responsible for providing the following services and the table below provides the overview of the tasks, deliverables and expected timeline/ deliverables:

Activities	Deliverable	Key content	Format /deadline
Task 1. Inception Report and work plan	1.1 Inception Report 1.2 Work Plan <i>(All deliverables to be provided in one package/document)</i>	- Online kick-off session, agreement on the timeline, first steps and meeting sessions' cycle - The report must contain the necessary review and analyses as stated in the task description. - Practical conclusions, recommendations and next steps for the work ahead. - Field mission logistics arrangements. - Detailed work plan, including a calendar of the field missions and logistics.	MS Word + Excel/ <i>(The format will be agreed when the time comes)</i> 1 st Month
Task 2. Assess the existing hydrological network	2.1 Hydrological Network Assessment Report	- This deliverable shall be guided by the points listed in the task description - A comprehensive report that includes every point listed in the task description above - Some annexes of the report might be Station Inventory Database, Station Dossiers, Station Assessment Matrix, etc. - Methodology applied for desk review, suitability assessment, on-site evaluation and classification - Findings on suitability of stations for discharge measurement, rating-curve development, flood	MS Word/ Excel/ Shapefile <i>(The format will be agreed when the time comes)</i>

Activities	Deliverable	Key content	Format /deadline
		forecasting, drought monitoring, climate monitoring and water resources management • Identification of stations of national strategic importance and stations required for international reporting/forecasting obligations • Summary findings from on-site assessment of all 22 AHS (sensor condition, data logger, telemetry, power supply, enclosure, staff gauge, benchmark/reference elevation, cross-section stability, hydraulic suitability, access, safety, vandalism risk, maintenance/lifecycle needs) and recommendations for transfer to the new NMHS institution • Summary findings from on-site assessment of sampled MHS (5-10 stations) and technical options for their role in transition to an automatic network • Station classification (retain, upgrade, rehabilitate, relocate, replace, maintain as manual reference station, integrate from third party, decommission), with justification per category • Priority actions and indicative cost categories per station <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	5 th Month
Task 3. Draft the methodology for the hydrological network design	3.1 Hydrological Network Design Methodology Report	• This deliverable shall be guided by the points listed in the task description • Review and assessment of the EU4Rivers/IGEO GIS-based multi-criteria network design methodology, evaluating technical soundness, practicality, transparency, and suitability for long-term application by NMHS/national staff • Description of the proposed/refined methodology, demonstrating alignment, to the extent possible, with WMO Hydrological Observing System recommendations, the EU Floods Directive (2007/60/EC) and Water Framework Directive (2000/60/EC) • Technical assessment and recommendation on the feasibility of incorporating water quality monitoring sensors into the network design (to be discussed) • Description of the multi-criteria scoring workflow, criteria weighing logic, and how it can be updated/repeated by national staff over time • List and justification of software/tools used, with preference for open-source solutions (e.g., QGIS, R, Python) to support institutional hand-over • Annexes may include GIS Geo-package / Scoring Tool, User Guide for the GIS/Scoring Tool	MS Word/ Excel/ GIS Geo-package <i>(The format will be agreed when the time comes)</i> 7th Month

Activities	Deliverable	Key content	Format /deadline
		<i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	
Task 4. Final definition of the national hydrological network	4.1. National Hydrological Network Design Report	• This deliverable shall be guided by the points listed in the task description • Application of the agreed methodology (from Task 3) to derive the proposed network for the Albanian context, with technical rationale • Definition of minimum essential network, medium-term target network, and longer-term extended network, including station functions per phase and implementation sequencing • Classification of stations by function: (i) essential operational, (ii) flood forecasting/early warning, (iii) climate and drought monitoring, (iv) water resources/river basin management, (v) irrigation and agriculture • Identification of priority stations for flood forecasting/warning, DRR, water balance, river basin management, drought monitoring, climate services and data continuity • Recommended additions, upgrades, relocations or closures, with justification • Indicative CAPEX and OPEX cost estimates per network scenario (procurement, installation, calibration, maintenance, staffing, replacement cycles) • Recommendations on long-term sustainability: maintenance requirements, technical capacity needs, calibration arrangements, and institutional/operational responsibilities. • The annexes of the report shall include Network Maps, Station Network Database/Table, Cost Estimate (CAPEX/OPEX). <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	MS Word/ Excel/ GIS Geo-package <i>(The format will be agreed when the time comes)</i> 10 th Month
Task 5. Draft the technical specifications for the AHS	5.1. AHS Technical Specifications Document	• This deliverable shall be guided by the points listed in the task description. • Definition of station classes/configurations, with rationale for each • Detailed equipment specifications: water level sensors, staff gauges, benchmarks, data loggers, telemetry, local data storage, power supply (solar panels, batteries), cabinets/enclosures, lightning and surge protection, anti-vandalism measures, civil works, mounting structures, cable protection • Metadata and documentation requirements per station	MS Word/ Excel/ <i>(The format will be agreed</i>

Activities	Deliverable	Key content	Format /deadline
		- Data transmission intervals, event-mode logic, data format, time synchronization, failure alarms, backup storage, basic cybersecurity requirements - Interoperability requirements with national databases, dashboards, and future national climate information/early warning systems - Alignment with WMO and EU data exchange requirements, including support for future integration with WIS 2.0 and WMO standardized databases - Performance requirements, factory acceptance testing (FAT) and site acceptance testing (SAT) procedures, commissioning procedures - Warranty terms, spare parts requirements, maintenance tools, and supplier training requirements - Standardization/interoperability rationale across the national network to minimize technology fragmentation <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	<i>when the time comes)</i> 6th Month
Task 6. Bid Evaluation and Procurement Follow-up Support	6.1. Bid Evaluation Technical Report	- This deliverable shall be guided by the points listed in the task description - Technical evaluation of bids received, assessing compliance of proposed equipment/configurations against approved specifications (station classes, sensors, telemetry, data transmission, interoperability) - Identification of technical risks, non-compliances, equivalences or deviations proposed by bidders - Clear technical recommendations to the evaluation committee to support the award decision - Documentation of evaluation criteria applied, findings per bidder, and final recommendation, for institutional record-keeping <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	MS Word/ Excel/ <i>(The format will be agreed when the time comes)</i> On-call / mobilized upon bid opening — estimated 12-15 Month
Task 7. Support in the development of the detailed design for the installation of	7.1. Detailed Installation Design Technical Note	- This deliverable shall be guided by the points listed in the task description - Definition of typical civil works and installation requirements per station type, ensuring consistency with AHS technical specifications (Task 5) and station-specific requirements identified during the network assessment (Task 2) - Technical quality assurance review of detailed designs developed by the national expert,	MS Word/ Other <i>(The format will be agreed when the time comes)</i>

Activities	Deliverable	Key content	Format /deadline
hydrological stations		identifying gaps, inconsistencies or deviations from technical standards and WMO guidelines Guidance for field supervision, inspection checklists, acceptance tests and documentation procedures during installation and commissioning, to support the national expert in overseeing the installation process on the ground, with supporting technical drawings/sketches and checklists as annexes <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	12 th Month
Task 8. Support for the hydrology department of the future NMHS	8.1. Hydrology Department Operations and Institutional Support Package	- This deliverable shall be guided by the points listed in the task description. - Proposed hydrology staff profiles: network operation, field hydrometry, data management, modelling, forecasting support, QA/QC, database management, service/product development - Draft job descriptions per profile - Definition of interfaces with IGEO, AMBU, civil protection authorities, hydropower operators, MeteoSwiss-supported processes, EU4Rivers and other relevant data users - Compiled list of relevant WMO manuals and guidelines - Strategy for long-term storage of hydrological records, including viability assessment (with MeteoSwiss) of a unified hydro-meteo climate database <i>Open/discretionary content (to be jointly scoped with the expert):</i> - Operational guidance for hydrology functions (daily/weekly/monthly/event-based workflows) - Hydrology operations manual or core SOP package - QA/QC framework for real-time and validated data - Procedures for field visits, discharge measurements, rating-curve development/ updating, post-flood validation - Maintenance schedules, calibration responsibilities, performance indicators - Operational templates (field inspection, rating curve log, maintenance record, incident report, data correction report) <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on</i>	MS Word/ Excel/ <i>(The format will be agreed when the time comes)</i> 9th Month

Activities	Deliverable	Key content	Format /deadline
		<i>the needs, it will also be discussed with institutional partners.)</i>	
Task 9. Insights and guidance regarding hydrological/hydraulic models needed for the Albanian context	9.1. Hydrological and Hydraulic Modelling Roadmap Report	• This deliverable shall be guided by the points listed in the task description. • Review of available information on existing hydrological and hydraulic models across Albania's seven main basins, subject to data access • Assessment of existing models (Panthia-Rei, HEcrass, and others) on their functionality, current operational status, documentation quality, transferability and applicability — with practical handover guidance for the future NMHS institution where models are deemed usable • Where access to existing models is not possible, screening of appropriate regional/global hydrological and hydraulic modelling options applicable to the Albanian context, including threshold-based alert systems, rainfall-runoff models, routing models, hydraulic models and real-time forecasting workflows • Technical recommendations for building and running a hydrological model for Albania to support flood nowcasting, DRR and water balance management • Preference for open-source, maintainable and transferable tools, with final recommendations based on operational robustness and national staff capacity • Practical modelling roadmap defining short-term achievable products and medium-term improvements, including realistic development pathways aligned with NMHS institutional capacity • Identification of capacity building needs and minimum staffing/technical requirements for operational modelling • Annexes may include Model Assessment/ Screening Matrix, Demonstrator Workflow (where feasible) <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	MS Word/ Excel/ <i>(The format will be agreed when the time comes)</i> 14 th Month
Task 10. Technical architecture of flood and (hydrological) drought early warning system	10.1. Flood and Drought EWS Technical Architecture Report	• This deliverable shall be guided by the points listed in the task description • Integrated technical architecture of the hydrological EWS component for both flood and drought, covering the end-to-end data and operational chain from AHS data acquisition through to warning-alert trigger and connection to AlbaMet Alert/ MeteoAlarm	MS Word/ Excel/ <i>(The format will be agreed when the time comes)</i>

Activities	Deliverable	Key content	Format /deadline
		- Description of shared infrastructure components across flood and drought EWS and clear delineation of where the two systems diverge (data sources, monitoring frequency, indicator types, warning timescales) - Assessment of integration requirements with EFAS, Copernicus EMS and EDO, with particular attention to transboundary basins (Drin-Buna, Vjosa/Aoos) and international data-sharing obligations - Assessment of technical and institutional gaps limiting short-term operationalization, with prioritized action plan - Evaluation of architectural sustainability and operability by future NMHS national staff - Some of the annexes may include Data Flow Diagrams, System Interface Specifications, Gap Analysis and Prioritized Action Plan. <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	16 th Month
Task 11. Threshold methodology for flood and drought early warning system	11.1. Flood and Drought EWS Threshold Methodology Report	- This deliverable shall be guided by the points listed in the task description - Review and assessment of available historical hydrological records, flood event data, damage records and drought episode documentation across Albania's seven main basins - Flood threshold derivation methodology per priority station, linked to impact levels, with corresponding warning-alert levels (watch, warning, emergency) and associated threshold values - Drought indicator selection methodology and derivation of hydrological drought thresholds per basin and per use-case (water supply, agriculture/irrigation, hydropower, environmental flows), with corresponding warning-alert levels (advisory, watch, warning) - Unified methodological framework ensuring consistency between flood and drought threshold derivation, developed in coordination with MeteoSwiss - Procedures for threshold review and updating overtime (triggers, responsibilities, revision cycles) - Explicit treatment of data-scarce situations: interim/proxy approaches and priority data collection needs - Some annexes may include Threshold Register, Transferable Threshold Methodology Guideline. <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on</i>	MS Word/ Excel/ other format like Script <i>(The format will be agreed when the time comes)</i> 18 th Month

Activities	Deliverable	Key content	Format /deadline
		<i>the needs, it will also be discussed with institutional partners.)</i>	
Task 12. CAP and SOPs for Flood and Drought Early Warning System	12.1. Flood and Drought EWS Warning Communication Standards and Operational Protocols Package	• This deliverable shall be guided by the points listed in the task description • Define the CAP message structure for hydrological flood and drought warnings and alerts, including required data fields, hazard classification, alert levels, spatial coverage, valid time periods and update frequency, ensuring full alignment with WMO CAP standards and the MeteoAlarm protocol framework. • Give technical advice on the integration of the CAP into the AlbaMet Alert platform. • Prepare Standard Operating Procedures (SOPs) for the future NMHS hydrology department's operational role in the flood EWS chain, covering real-time data monitoring, threshold checking, warning-alert decision-making, internal escalation, communication with NCPA, and post-event review procedures. • Prepare SOPs for the future NMHS hydrology department's operational role in the drought EWS chain, covering routine monitoring, indicator updating, drought bulletin preparation, warning-alert issuance, communication with relevant sectoral authorities (water management, agriculture, energy) and drought episode closure procedures. • Define roles and responsibilities within the future NMHS hydrology department for EWS operations, including on-call arrangements, escalation logic, back-up procedures and interfaces with the meteorology department, NCPA and other relevant institutions. • Prepare a practical EWS operations reference guide suitable for use by hydrology department staff from the outset of NMHS operations, consolidating the CAP standards, warning-alert level definitions, threshold values (from Task 11) and SOPs into a single operational reference document. • Some annexes may include CAP Message Specifications, Flood EWS SOPs, Drought EWS SOPs, EWS Operations Reference Guide, etc. <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	MS Word/ Excel/ other format like Script (XML template) 20 th Month

Activities	Deliverable	Key content	Format /deadline
Task 13. Providing in-depth insights for international bodies with high relevance for hydrology (regional and global)	13.1. International Hydrological Engagement Report	- This deliverable shall be guided by the points listed in the task description. - Review of Albania's current participation in hydrological networks, identifying gaps, opportunities and future engagement needs - Analysis of benefits, services, requirements, costs and obligations associated with participation in each identified organization/initiative, structured in a comparable format to the MeteoSwiss meteorological bodies outlook - Assessment of implications arising from Albania's EU accession process, including relevant hydrological reporting, data-sharing and cooperation requirements expected of EU member states - Consideration of the localized/basin-level nature of hydrological cooperation, with particular attention to transboundary river basin mechanisms relevant to Albania - Prioritized roadmap and recommendations for the future NMHS on engagement with international and regional hydrological bodies, including sequencing of memberships/ accessions, estimated costs and expected benefits per engagement, with a summary comparison matrix structured to mirror the MeteoSwiss meteorological bodies outlook for ease of cross-reference <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	MS Word/ Excel/ <i>(The format will be agreed when the time comes)</i> 21st Month
Task 14. Hand-over process to the future NMHS of Albania	14.1. Hand-over Package	- This deliverable shall be guided by the points listed in the task description - Inventarisation of the hydrological stations – methodology, content, importance, the process overall, difficulties and challenges and other relevant factors pertinent to task 2. - Hydrological Network Design – methodology, tools used, application, results, estimated cost and other relevant factors pertinent to task 3 and 4. - Procurement package and technical specifications for AHS – references used from WMO, core specifications, specific specifications, evaluations of bids process and other relevant factors pertinent to task 5 and 6. - Installation phase of the stations – civil works, factors to be accounted for, supervision process and relevant factors pertinent to task 7. - SOP and WMO library – relevance of each document, applicability and relevant factors pertinent to task 8.	MS Word/ PowerPoint Presentation s/ Comprehensive folder of files 23rd Month

Activities	Deliverable	Key content	Format /deadline
		- Roadmap and guidelines regarding hydrological/hydraulic models for Albania - relevant factors pertinent to task 9. - Technical architecture of the EWS for floods and (hydrological) droughts – everything pertinent to task 10. - Threshold methodology for floods and droughts - everything pertinent to task 11. - CAP and SOPs for EWS - everything pertinent to task 12. - Overview of the hydrological international/regional bodies that are relevant for Albania - relevant factors pertinent to task 13 All products, tools, datasets, scripts and GIS files developed throughout the assignment formally compiled and handed over in accessible, open-source formats to the future NMHS. <i>(Everything will be discussed and agreed jointly with ALBAdapt team (GIZ) and MeteoSwiss. Depending on the needs, it will also be discussed with institutional partners.)</i>	

3. Concept

In the tender, the tenderer is required to show *how* the objectives defined in Chapter 2 (Tasks to be performed) are to be achieved, if applicable under consideration of further method-related requirements (technical-methodological concept). In addition, the tenderer must describe the project management system for service provision.

Note: The numbers in parentheses correspond to the lines of the technical assessment grid.

Technical-methodological concept

Strategy (1.1): The tenderer is required to consider the tasks to be performed with reference to the objectives of the services put out to tender (see Chapter 1 Context) (1.1.1). Following this, the tenderer presents and justifies the explicit strategy with which it intends to provide the services for which it is responsible (see Chapter 2 Tasks to be performed) (1.1.2).

The tenderer is required to present the actors relevant for the services for which it is responsible and describe the **cooperation (1.2)** with them.

The tenderer is required to describe the key **processes** for the services for which it is responsible and create an **operational plan** or schedule (1.4.1) that describes how the services according to Chapter 2 (Tasks to be performed by the contractor) are to be provided.

The tenderer is required to describe its contribution to knowledge management for the partner (1.5.1) and GIZ.

Project management of the contractor (1.6)

The tenderer is required to draw up a **personnel assignment plan** with explanatory notes that lists all the experts proposed in the tender; the plan includes information on assignment dates (duration and expert days) and locations of the individual members of the team complete with the allocation of work steps as set out in the schedule.

The tenderer is required to describe its backstopping concept. The following services are part of the standard backstopping package, which (like ancillary personnel costs) must be factored into the fee schedules of the staff listed in the tender in accordance with Section 3.1 of the GIZ AVB:

- Service-delivery control
- Managing adaptations to changing conditions
- Ensuring the flow of information between the tenderer and GIZ
- Assuming personnel responsibility for the contractor's experts
- Process-oriented steering for implementation of the commission
- Securing the administrative conclusion of the project

4. Personnel concept

The below specified qualifications represent the requirements to reach the maximum number of points in the technical assessment.

Key Expert 1

Senior Hydrologist — Infrastructure and Network Specialist

Tasks of Key Expert 1

- Overall responsibility for the delivery of all infrastructure-related technical outputs under this contract (Tasks 1-8, 13 and 14), including quality, accuracy and adherence to deadlines.
- Coordinating and ensuring communication with ALBAdapt (GIZ), MeteoSwiss, and other relevant partners and stakeholders involved in the infrastructure components of the assignment
- Planning and conducting field missions to hydrological stations across Albania's river basins, for the purposes of the network assessment (Task 2) and installation design support (Task 7)
- Providing technical leadership on hydrological network design, AHS technical specifications, procurement support and civil works installation design throughout the assignment.
- Ensuring coordination and consistency between infrastructure outputs and the EWS/systems outputs delivered by Key Expert 2, particularly regarding station specifications, network design and data availability
- Providing technical leadership and peer-to-peer knowledge transfer throughout the assignment, culminating in the in-person hand-over process to the future NMHS hydrology department (Task 14)
- Regular reporting in accordance with contractual deadlines

Qualifications of Key Expert 1

- Education/training (2.2.1): Master's Degree in Hydrology, Water Resources Engineering, Civil/Environmental Engineering, or a closely related academic discipline.
- Language (2.2.2): C2-level language proficiency in English.

- General professional experience (2.2.3): At least 7 years of professional experience in operational hydrology, hydrological monitoring, water resources management or a closely related field.
- Specific professional experience (2.2.4): At least 5 years of demonstrated experience in the following areas:
 - Design, assessment and/or rehabilitation of hydrological monitoring networks, including automatic and manual hydrological stations.
 - Hydrological station assessment, instrumentation and data quality management (QA/QC).
 - Application of WMO guidelines and standards in hydrological observations, stream gauging, flood forecasting and hydrological service operations.
 - Preparation of technical specifications for automatic hydrological stations, including sensors, telemetry, data loggers, power supply, civil works and site acceptance testing.
 - Multi-criteria analysis and GIS-based approaches for hydrological network design and station suitability assessment.
 - Working knowledge of relevant EU legislation applicable to hydrological monitoring and water resources management, including the Floods Directive (2007/60/EC), Water Framework Directive (2000/60/EC) and INSPIRE Directive.
 - Experience supporting procurement processes for hydrological equipment, including preparation of technical specifications and technical evaluation of bids.
- Leadership/management experience (2.2.5): At least 3 years of experience leading technical assignments or serving as key expert in hydrology or water resources projects.
- Regional experience (2.2.6): At least 2 years of experience in projects in the Western Balkans or Southeast Europe.
- Development cooperation (DC) experience (2.2.7): At least 2 years of experience in internationally funded development cooperation projects (GIZ, EU, World Bank, or equivalent).
- Other (2.2.8):
 - Demonstrated experience with GIS tools for hydrological network analysis or spatial data management; familiarity with open-source platforms (QGIS, R, Python) is an asset.
 - Experience supporting institutional capacity building and/or knowledge transfer to national hydrometeorological services (NMHS) or equivalent institutions is an asset.
 - Knowledge of Albanian or broader Adriatic-Ionian basin hydrological context is an asset but not a requirement.

Key Expert 2

Senior Hydrologist — EWS and Hydrological Systems Specialist

Tasks of Key Expert 2

- Overall responsibility for the delivery of all EWS and system-related technical outputs under this contract (Tasks 9, 10, 11 and 12), including quality, accuracy and adherence to deadlines.
- Coordinating and ensuring communication with ALBAadapt (GIZ), MeteoSwiss, and other relevant partners and stakeholders involved in the EWS and systems components of the assignment.

- Providing technical leadership on hydrological and hydraulic modelling, flood and drought EWS architecture, threshold methodology, CAP standards and operational SOPs throughout the assignment.
- Ensuring coordination and consistency between EWS/systems outputs and the infrastructure outputs delivered by Key Expert 1, particularly regarding AHS data availability, station network design and data transmission specifications that feed into the EWS architecture.
- Ensuring full alignment of hydrological EWS outputs with the broader MHEWS institutional and ICT architecture being developed under ALBAdapt Component 2, in collaboration with MeteoSwiss and NCPA. *(To be discussed further once the assignment starts)*
- Providing technical leadership and peer-to-peer knowledge transfer throughout the assignment, culminating in the in-person hand-over process to the future NMHS hydrology department (Task 14).
- Regular reporting in accordance with contractual deadlines.

Qualifications of Key Expert 2

- Education/training (2.3.1): Master's Degree in Hydrology, Water Resources Engineering, Environmental Engineering, or a closely related academic discipline, with a demonstrable specialization in hydrological forecasting, early warning systems or operational hydrology.
- Language (2.3.2): C2-level language proficiency in English.
- General professional experience (2.3.3): At least 7 years of professional experience in operational hydrology, hydrological forecasting, flood and/or drought early warning systems or a closely related field.
- Specific professional experience (2.3.4): At least 5 years of demonstrated experience in the following areas:
 - Design and/or implementation of flood and/or drought early warning systems, including end-to-end data and operational chain design from data acquisition through to alert issuance.
 - Development and application of hydrological and/or hydraulic models for flood forecasting, flood nowcasting, water balance or drought monitoring purposes, with preference for open-source tools (e.g. HEC-RAS, SWAT, GR4J, or equivalent).
 - Development of hydrological threshold methodologies for flood and/or drought early warning, including impact-based threshold derivation and calibration against historical events.
 - Working knowledge of WMO Common Alerting Protocol (CAP) standards and MeteoAlarm protocol framework, including CAP message structure and integration with alerting platforms.
 - Preparation of Standard Operating Procedures (SOPs) for operational hydrology and/or early warning system functions within national hydrometeorological services or equivalent institutions.
 - Familiarity with European and regional hydrological monitoring and early warning systems, including EFAS, Copernicus Emergency Management Service (EMS) and European Drought Observatory (EDO).
 - Working knowledge of relevant EU legislation applicable to flood forecasting and water resources management, including the Floods Directive (2007/60/EC) and Water Framework Directive (2000/60/EC).
- Leadership/management experience (2.3.5): At least 3 years of experience leading technical assignments or serving as key expert in hydrology, EWS or water resources projects.

- Regional experience (2.3.6): At least 2 years of experience in projects in the Western Balkans or Southeast Europe.
- Development cooperation (DC) experience (2.3.7): At least 2 years of experience in internationally funded development cooperation projects (GIZ, EU, World Bank, or equivalent).
- Other (2.3.8):
 - Demonstrated experience with open-source hydrological modelling and data processing tools (e.g. R, Python, QGIS) is an asset.
 - Experience with WMO Information System (WIS 2.0) and/or WMO Hydrological Observing System (WHOS) standards for hydrological data exchange is an asset.
 - Experience supporting institutional capacity building and/or knowledge transfer to national hydrometeorological services (NMHS) or equivalent institutions in the context of EWS operationalization is an asset.
 - Knowledge of Albanian or broader Adriatic-Ionian basin hydrological and flood risk context is an asset but not a requirement.

5. Costing requirements

Assignment of personnel and travel expenses

Per diem allowances are reimbursed as a lump sum up to the maximum amounts permissible under tax law for each country as set out in the country table in the circular from the German Federal Ministry of Finance on travel expense remuneration (downloadable from the https://www.bundesfinanzministerium.de/Content/DE/Downloads/BMF_Schreiben/Steuerarten/Lohnsteuer/2025-12-05-steuerliche-behandlung-reisekosten-2026.html).

Accommodation allowances are reimbursed as detailed in the specification of inputs below.

With special justification, additional Accommodation costs up to a reasonable amount can be reimbursed against evidence.

All business travel must be agreed in advance by the officer responsible for the project

Sustainability aspects for travel

GIZ has undertaken an obligation to reduce greenhouse gas emissions (CO₂ emissions) caused by travel. When preparing your tender, please incorporate options for reducing emissions, such as selecting the lowest-emission booking class (economy) and using means of transport, airlines and flight routes with a higher CO₂ efficiency. For short distances, travel by train (second class) or e-mobility should be the preferred option.

CO₂ emissions caused by air travel must be offset. GIZ specifies a budget for this, through which the carbon offsets can be settled against evidence.

There are many different providers in the market for emissions certificates, and they have different climate impact ambitions. The [Development and Climate Alliance \(German only\)](#) has published a [list of standards \(German only\)](#). GIZ recommends using the standards specified there.

Specification of inputs

Fee days	Number of experts	Number of days per expert	Total	Comments
Designation of Key Expert 1	1	95	95	For this consultancy, the total number of days envisioned is 180 working days, covering all the tasks listed in Chapter 2. An approximation of 95 working days for Key Expert 1 is foreseen, focusing on the hydrological network, technical specifications and assessment of existing network.
Designation of Key Expert 2	1	85	85	For this consultancy, the total number of days envisioned is 180 working days, covering all the tasks listed in Chapter 2. An approximation of 85 working days for Key Expert 2 is foreseen, focusing on the hydrological early warning system, covering hydrological modeling, CAP, system architecture, has been estimated.
Travel expenses	Quantity	Number per expert	Total	Comments
Per-diem allowance in country of assignment	22	17 days Key Expert 1, 5 days Key Expert 2	22	The consultants will spend 22 full working days in Albania during the service contract. On this note, the consultants will perform 2 missions in Albania, where In the first mission only the Key Expert 1 is expected to come while in the second mission both expert are expected to come in Albani. For unforeseen additional days, the flexible remuneration budget line will be used, in agreement with GIZ team.
Per-diem allowance for arrival day to Albania and departure day from Albania (8-24 hrs)	6	4 days key expert 1 and 2 days key expert 2	6	The consultants will spend 6 working days to travel to and from Albania during the service contract. On this note, the consultants will perform 2 missions in Albania, where In

				the first mission only the Key Expert 1 is expected to come while in the second mission both expert are expected to come in Albania
Overnight allowance in country of assignment	28	21 days Key Expert 1, 7 days Key Expert 2	28	The 3 trips will consist one of 14 days' stay (only Key Expert 1) and the other of 7 days (both experts). Note: Under the BMF travel expense regulations, overnight allowances not exceeding 100% of the lump sum amounts can be submitted for reimbursement against evidence. Up to 75% of the maximum rates specified in the travel expense regulations can be submitted for reimbursement on a lump-sum basis. Please indicate in the price schedule whether your offer is on a lump-sum basis or against evidence.
Transport	Quantity	Number per expert	Total	Comments
International flights	2	2	4	An estimate of 3 round trips to Tirana, Albania has been envisioned to complement the activities foreseen in the Terms of Reference of the consultancy. As specified in the ToRs, there are 2 missions in Albania. In the first mission only the Key Expert 1 is expected to come while in the second mission both experts are expected to come in Albania. Additionally, one extra trip has been allocated to account for unforeseen needs in the tasks, to be agreed on with GIZ team when the time comes.
CO₂ compensation for air travel Guidance for GIZ service providers on avoiding, reducing and offsetting GHG emissions (giz.de) (giz.de)	2	2	4	A fixed budget of EUR 400 is earmarked for settling carbon offsets against evidence.

Other costs	Number	Price	Total	Comments
Flexible remuneration	1	4.500	4.500	A budget of EUR 4,500 is foreseen for flexible remuneration. Please incorporate this budget into the price schedule. Use of the flexible remuneration item requires prior written approval from GIZ.

6. Inputs of GIZ or other actors

GIZ and/or other actors are expected to make the following available:

- Premises for field work: A briefing session will serve the purpose of understanding the exchange setup with the institutions, the envisioning of the calendar for the field trips, hand-over sessions based on exchanges with GIZ combined with further suggestions from the consultancy. Additionally, synergies with other activities of the programme will be evaluated to understand the potential for the activities of the consultancy to complement the additional ones of the programme.

7. Requirements on the format of the tender

The structure of the tender must correspond to the structure of the ToR. In particular, the detailed structure of the concept (Chapter 3) should be organized in accordance with the positively weighted criteria in the assessment grid (not with zero). The tender must be legible (font size 11 or larger) and clearly formulated. It must be drawn up in English (language).

The complete tender must not exceed 25 pages (excluding CVs). If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment. External content (e.g. links to websites) will also not be considered.

The CVs of the personnel proposed in accordance with Chapter 4 of the ToRs must be submitted using the format specified in the terms and conditions for application. The CVs shall not exceed 5 pages each. They must clearly show the position and job the proposed person held in the reference project and for how long. The CVs must also be submitted in English (language).

Please calculate your financial tender based exactly on the parameters specified in Chapter 5 Quantitative requirements. The contractor is not contractually entitled to use up the days, trips, workshops or budgets in full. The number of days, trips and workshops and the budgets will be contractually agreed as maximum limits. The specifications for pricing are defined in the price schedule.