

Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region

Deliverable 6 (2016): MOES training plan

REPORT TITLE - Deliverable 6 (2016): MOES training plan

PROJECT - Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region

| Deliverable 6 (2016): MOES training plan | | | Date |
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| Prepared by | Juan Fernandez | Signature | 30/09/2016 |
| Checked by | | Signature | |
| Approved by | | Signature | |

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1. Introduction

The objective of this document is to present a training plan for MOES in order to ensure that the central Early Warning System implemented within the framework of the “Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region” is properly maintained and updated.

2. Background

Within the framework of this project, the implementation of several flood Community-Based Early Warning Systems (CBEWSs) was proposed. As it has been described previously in several deliverables by this consultant, the implementation of a flood CBEWS do require the implementation of a full (National or Central) Flood Forecasting Early Warning System (FFEWS). This is due to the local characteristics of the catchments in the study area, with very short lead times.

The implementation of a national FFEWS does require a significant operational and maintenance effort from the Ministry of Emergency Situations (MOES), and therefore a training plan has been devised in this respect.

3. Flood Forecasting System

The proposed system was described in detail in Deliverable 1 (Terms of Reference for a full FFEWS in the Pilot Catchments, 2014). The flood forecasting framework can be observed in Figure 1. All the different components and its relationship and link will be detailed below.

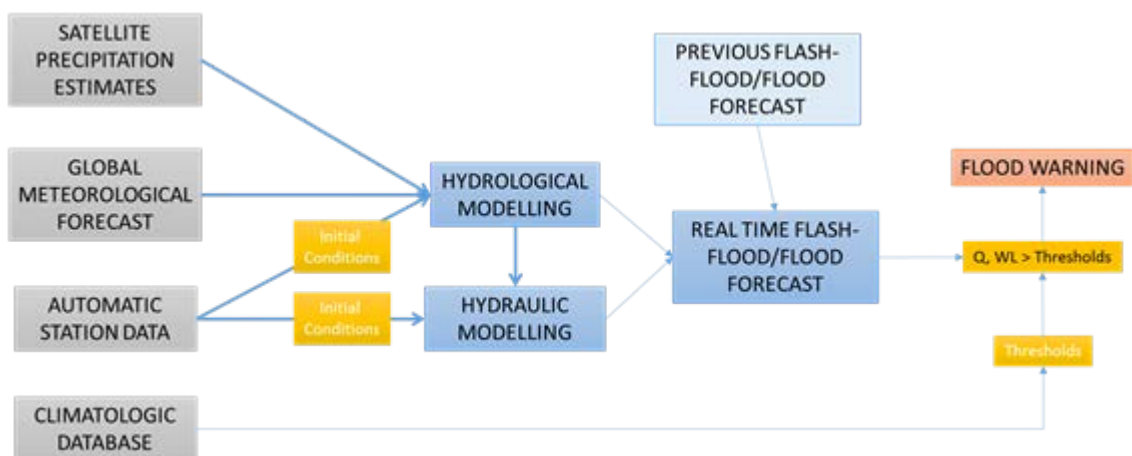


Figure 1 – FFEWS Structure

The forecasting platform selected for this implementation is DELFT-FEWS. The structure of this platform will be described below in detail.

3.1. FFEWS components

The different components of the FFEWS are briefly outlined below.

3.1.1. Meteorological Inputs

Several meteorological inputs are considered in the FFEWS.

Automatic Stations

Information from weather and hydrological automatic stations and posts is being imported into the system.

Meteorological Forecasting (GFS and ACCESS)

At this stage, global forecasting models are being used. The Global Forecasting System by NOAA (National Oceanic and Atmospheric Administration of the USA) is the main forecasting input. Also, the global Australian Community Climate and Earth-System Simulator (ACCESS) weather model is also being imported into the platform.

Satellite Precipitation Estimates

Satellite precipitation estimates (TRMM/GPM) are available. At this stage TRMM estimates are being imported automatically into the FFEWS.

All the different precipitation and temperature data sources are analysed and combined within the forecasting platform to be used in the hydrological model.

3.1.2. Hydrological Modelling

A hydrological model (HEC-HMS) has been implemented for the FFEWS. This hydrological model is using the precipitation and temperature information from the meteorological inputs in order to calculate flow at pre-specified locations.

3.1.3. Hydraulic Modelling

A hydraulic model (HEC-RAS) has been implemented for the FFEWS. This hydraulic model is routing the flows generated by the hydrological model and providing discharge and water level information.

3.1.4. Forecasting Platform

A forecasting platform (Delft-Fews) has been deployed in order to collect all the data, analyse all the data and provide the necessary means for model launching.

4. Training Requirements

The training plan for MOES staff will cover the different aspects required within the different typical components of a FFEWS.

4.1. Risk Knowledge Component

Within the Risk Knowledge component, the following training is recommended:

- Training in flood modelling and risk assessments: at this stage, there is no formal flood modelling and risk assessment being undertaken in any of the relevant authorities. This is a requirement specific to the State Water Agency and the Hydro-Meteorological institute. Relevant activities and initiatives on this topic has been listed in detail in previous deliverables. It is considered that this capacity should be enhanced considerably in order to provide these agencies the necessary means to undertake risk assessments themselves. At this stage, within the framework of this project, a flood modelling exercise and a flood risk assessment has been undertaken. Even if this exercise is being undertaken by an external party, capacity building activities has been planned within this exercise in order to facilitate capacity building activities within the relevant organisations. It should be added, however, that flood modelling and risk assessments are skills that required a significant level of expertise, and therefore it is expected that this sole activity would not be sufficient to ensure a proper capacity within the State Water Agency and the Hydro-Meteorological Institute. It is advised that more capacity building activities on this topic are organised within the framework of this project.
- Training in Hydrometric Databases: within the framework of this project a database has been implemented. This database, however, is being implemented by external consultants. It is recommended that capacity building activities are being undertaken on this regard with staff from the State Water Agency. Capacity building activities should focus on both the implementation and the maintenance of such a system.

4.2. Monitoring and Warning

Within the Monitoring and Warning component the following training is recommended:

- Training in FFEWS, development of flood forecasting procedures: the implementation of a FFEWS and of the associated flood forecasting procedures is a very complicated task. This task would be undertaken in close collaboration between the FFEWS expert and the relevant national organisations. However, extensive training is recommended on these topics in order to ensure that the relevant organisations have the necessary skills in order to upgrade, operate and maintain the final system.

4.3. Communication and Dissemination

Within the Communication and Dissemination component the following training is recommended:

- Training in warning procedures: it is recommended that relevant organisations receive suitable training in warning procedures in order to enhance the successfulness of the system operation and to ensure its sustainability. It is recommended that all the relevant parties participate in this training and that this is undertaken by relevant international organisations with wide experience in this matter.

4.4. Response Component

Within the Response component the following training is recommended:

- Training in response procedures: this is considered very critical by the consultant. This should include training to the different volunteers. Training for Civil Protection Brigades (MOES) on how to efficiently respond to floods is considered paramount. At this stage, there are various initiatives worth noting:
 - o IPA Floods Programme: this programme is intended to increase Beneficiaries' capacity to ensure proper flood risk management at national, regional and EU levels.
 - o The European Commission's Humanitarian Aid and Civil Protection department (ECHO). ECHO has two relevant programmes on this matter, the Civil Protection Exercises programme and the Exchange of Experts Programme.

5. Training Plan

The training described above can be associated to different challenges and recommendations, as described in Table 1. A suggested timeline for this training is also stated. It should be added that MOES staff has received training on some of these topics during the project

implementation period. However, learning flood modelling or forecasting procedures, for instance, it is not an easy task, and therefore it is recommended that this knowledge is improved.

| Component | Challenge and Recommendations | Training | Suggested Timeline |
|---------------------------------|--|--|---------------------------|
| Risk Knowledge | Technical capabilities to improve capabilities to produce flood and risk maps | Training in flood modelling and risk assessments | June 2017 |
| | Technical capabilities to improve the meteorological and hydrological database. | Training in Hydrometric Databases | June 2017 |
| Monitoring and Warning | Technical capabilities to improve flood forecasting | Training in FFEWS, development of flood forecasting procedures | July 2017 |
| Communication and Dissemination | Technical capabilities to improve communication capabilities for message dissemination | Training in warning procedures | October 2017 |
| Response | Technical capabilities to Improve response skills | Training in response procedures | October 2017 |

Table 1 – Training Plan