Building Resilience to Disasters in Western Balkans and Turkey

On-the-job Training on Severe Weather Forecasting and Warnings

National Meteorological Administration, Bucharest, Romania

5-16 May 2014 (Fourth Phase)

Performance Evaluation Report

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Contents

I. Executive Summary

The fourth and final stage of the On-the-job Training Course on Severe Weather Forecasting and Warnings was conducted during 5–16 May 2014. It was organized as an intensive and highly interactive “hands-on” course based on thunderstorm forecasting and warning of severe weather events. With the aim to provide the participant with the nowcasting and severe weather warning competences.

It was attended by an expert from Albania, who found the training course to be very useful, especially its applicative part, where the knowledge is to be applied in operational forecasting activity.

However, a detailed Evaluation of the Implementation performance has been done using various evaluation methodologies, described in the Evaluation Section of the Report, which also reveals the major findings and gives, to the Project Steering Committee, recommendations to ensure the long-term sustainability of the outcomes and results achieved.

II. Introduction

II.1. Background

This On-the-job Training Course has been planned within the Sub-task 4.1.1 of the IPA Project 2012/290-552: “Building Resilience in Western Balkans and Turkey”, which aims at *Enhancement of the severe weather forecasting capabilities of IPA beneficiaries in support of Early Warning Systems: advanced training for meteorological forecasters required for 24/7 operations.*

The National Meteorological Administration of Romania has been chosen as the training venue due to the existence of excellent operational and technical facilities as well as the rich experience in dealing with severe weather forecasting and warnings. Romania was also considered as a suitable place for training due to the similar climate conditions as those in the project region, that would allow the trainees to use the knowledge and experience gained directly at their National Meteorological Services.

A Letter of Undertaking was concluded between the National Meteorological Administration of Romania and the World Meteorological Organization to specify the working arrangements.

The Course was scheduled to be conducted in several phases:

1) 3-21 September 2012,
2) 13-31 May 2013
3) 3-21 June 2013, and
4) 5-16 May 2014.

All phases were held in Bucharest, Romania, at the Romanian National Meteorological Administration under the auspices of the Operational Nowcasting Centre.

II.2. Objectives

The main objectives of the course were to transfer the knowledge on improving the forecast and evaluation of thunderstorm initiation, monitoring, forecasting, and warnings in case of severe weather events:

- through upgraded knowledge gained by participating at lectures of specialized trainers,
- through upgraded skills gained by performing operational, hands-on, nowcasting activity,
- through application of the gained expertise in developing a project.

The objectives of the training were well met (see Evaluation section).

II.3. Participants

One (1) participant attended the final stage of the training. The participant, namely Metodi Marku, represented the National Centre for Forecast and Monitoring of Natural Risks of the Institute of Geosciences, Energy, Water and Environment of Albania.

The participant met the requirements stated in the *Information Note (attached as Annex I)*. The participant had also a wide range of experience in other fields, this being an advantage for both the participant and the trainers. This advantage was materialized through adaptation of topics approached during the training. The presentations were well done, therefore the trainers and forecasters became familiar with the activities of the trainee. In summary, the presentations provided useful information on the national institution represented by the trainee, on his responsibilities and on the forecast process and tools used in this regard.

The trainee was very active during the training, and very interested in assimilating new knowledge on severe weather forecasting and warnings.

III. Description of the Training Activity

The course was scheduled in phases to enable the conduction of the training sessions in small groups. The final phase of the Training Course was conducted from 5 to 16 May 2014.

The training programme of the final phase was scheduled in a similar manner as the previous phases, and it has been designed to cover a 2-week period, during which various scientific activities were taking place. The participant attended the presentations on the principles of nowcasting and knowledge on severe thunderstorm forecasting and monitoring. Moreover, during the whole period, the trainee performed the “hands-on” operational activity. See attached the Course Schedule as Annex II.

The emphasis was on practical forecasting aspects with particular attention on the provision of timely products for disaster mitigation. These aspects include:

- Forecasting thunderstorm initiation
- Forecasting thunderstorm development
- Forecasting organised convection – single cell, multi-cell and super-cell storms
- Forecasting severe weather – flash floods, hail, damaging winds, lightning
- Detection and monitoring of thunderstorms – interpretation of radar, satellite, lightning, and observational data
- Developing conceptual models for particular areas

Especially during the second week, the trainee was performing operational activity by assisting the nowcasters. He became familiar with the tools needed and useful to provide severe weather forecasts and warn the severe thunderstorms. The trainee also witnessed a couple of severe weather events. The events consisted of severe thunderstorms developing over Romania, the associated phenomena being heavy convective rainfall, strong wind gusts and hail. Therefore, these severe weather events offered the trainee the occasion to observe and to actively participate in the process of forecasting, monitoring and issuing warnings on severe weather. Additional to these operational activities, several archived case studies were presented to the trainee in order to underline other important aspects of the nowcasting process.

Part of the time from last week of the training was dedicated to the project the trainee had to develop, which had to reflect his newly gained knowledge and the potential of developing and implementation of new techniques in his work. The trainee has been doing that very well, applying various methods and knowledge gained during the training.

The course was intensive but was also opportunistic and flexible, adjusting for the speed of learning and topics of interest or in which the participant had difficulties. In particular, the learning aspects were often demonstrated along the way. The course was very much “hands on”, being based around thunderstorm forecasting and severe weather warnings.

The participant commented appreciatively on the informal, friendly and supportive atmosphere during the training period.

The Training–related costs, including the trainees’ accommodation and travel, have been covered by the IPA Project budget.

IV. Evaluation of the Activity Implementation' Performance

The Course' Performance was evaluated in a number of ways, using the following evaluation methodologies:

- The self-completion questionnaire, i.e. the participant completed *The evaluation form* (attached as Annex III),
- Face–to-face interview, in form of evaluation session, also, provided the opportunity of getting the trainee's feedback and suggestions. While considering the ways forward, discussion of an Action Plan was required, stating what can be done to implement ideas from the course on return to the workplace. Various proposals were made on how the trainee would apply the gained knowledge and experience in their activity. Such proposals include the use of gained knowledge in forecasting thunderstorms, with emphasis on severe storms development, observing the thermodynamics and movements of severe storms, or considering certain NWP outputs.
- Observations, throughout the course period and during the informal exchanges.

The participant was uniformly positive and enthusiastic about the value of the course and the way it was run.

On the question on what did he wish to get from this course, the trainee answered that he wanted to learn more about nowcasting forecast and warning issuing process, to improve the skills on monitoring the severe weather events, to pay more attention to the meso-scale processes, and to apply all these in the work. Further, on the question "Did this course meet your expectations? If not, why not?" the participant stated that the course met its expectations and he has learned new & useful things. The participant would also recommend this course to others.

V. Conclusions & Recommandations

V.1. Conclusions:

1. The last workshop of the training was organized from 5 to 16 May 2014, under the auspices of the Operational Nowcasting Center of the National Meteorological Administration of Romania;

2. The requirements, related to the organization of the training, stipulated in the Letter of Undertaking signed with the World Meteorological Organization, were fulfilled;

3. One trainee participated in the final phase of the training, i.e. Metodi Marku from Albania;

4. The Trainee well appreciated the format, the content and the duration of the training course.

V.2: Recommendations for future stages:

1. Given the strong demand for such topics, it is recommended that this type of courses to be held regularly.
2. The style and the content of the course could be considered for future similar training actions.

3. Although the course extended over two weeks, the participant stated that it was not difficult to be attended.
4. As a means of consolidation and support of the further activity, it is recommended that the trainee should attend complementary courses.

VI. Annexes

The Report has three (3) annexes, as follows:

Annex I: Information Note for participants on the training arrangements

Annex II: Course Schedule

Annex III: Evaluation Form

Building Resilience to Disasters in Western Balkans and Turkey

IPA/2012/290-552 Project:
"Building resilience to disasters in Western Balkans and Turkey"
(funded by the European Commission DG Enlargement and implemented jointly by WMO and UNISDR)

On-the-job training on Severe Weather Forecasting and Warnings

May 2014
Bucharest, Romania

INFORMATION NOTE FOR PARTICIPANTS ON THE TRAINING ARRANGEMENTS

Background

The IPA/2012/290-552 Multi-beneficiary Project: "Building resilience to disasters in Western Balkans and Turkey" has been approved by the European Commission Directorate General for Enlargement for joint implementation by the UNISDR and the WMO, for a period of 24 months (May 2012 – May 2014).

The project is part of the EC DG Enlargement Instrument for Pre-accession Assistance (IPA) Programme for the Western Balkans and Turkey.

The overall objective of the project is to reduce vulnerability of IPA beneficiary countries to disasters caused by natural hazards in line with the Hyogo Framework for Action and increase their resilience to climate change. The direct beneficiaries are the national authorities in charge for the disaster risk reduction and disaster risk management and the National Meteorological and Hydrological Services of Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Kosovo (under UNSCR 1244/99), the former Yugoslav Republic of Macedonia and Turkey.

The project activities are grouped in eight Work Packages, out of which four are to be implemented under WMO management.

On-the-job training activity targets the forecasters from all IPA beneficiaries and is planned within the Sub-task 4.1 which aims at Enhancement of severe weather forecasting capabilities of IPA beneficiaries in support of Early Warning Systems: advanced training for meteorological forecasters required for 24/7 operations.

Dates and venue

5-16 May 2014 – National Meteorological Administration's headquarters – Bucharest, Romania

The training course will be hosted by the National Meteorological Administration of Romania due to the existence of excellent operational and technical facilities as well as the rich experience in dealing with severe weather forecasting and warnings. These conditions will allow the trainees to get hands-on experience with modern technology, utilization of state-of-the art forecasting and

nowcasting methods and learn about the operational procedures used in providing services for disaster risk management. Romania was also considered as a suitable place for the training due to the similar climate conditions as those in the project region, that would allow the trainees to use the knowledge and experience gained directly at their own Hydrometeorological Services.

The Training Format & the Training Coordinator / Focal Point

The training programme is scheduled over 2 week's period and various activities will take place.

The training will be led by **Dr Sorin Burcea**, Head of the Nowcasting Laboratory of the National Meteorological Administration of Romania

Ist week

During the first week the trainee will learn about the principles of Nowcasting based on remote sensing, obs. data and NWP. This will include the following topics:

- Synoptic and mesoscale meteorology
- Types of mesoscale circulations
- Cyclogenesis
- Atmospheric fronts
- Particular mesoscale circulations (e.g., sea breeze)
- Identification of mesoscale convective systems

- Severe convection
- Conceptual models used to forecast severe storms
- Doppler weather radar basic principles
- Benefits and limitations of radar measurements
- Weather radar data analysis
- Radar rainfall estimation
- Interpretation of Doppler velocity data
- Severe thunderstorm signature in radar and satellite data
- Use of NWP in the forecast process
- Use of meteorological satellite data in nowcasting
- Use of lightning information in nowcawsting

2nd week

During the second week, the trainees will assist the nowcasting forecasters within National Center of Forecasting. In this time, they will become familiar with the tools we use to forecast severe storms and with the process of issuing warnings.

During this activity, they will have the opportunity to apply some of the knowledge gathered during the "theory" classes.

Shortly, this week the trainees will perform real-time operational activity that will help them to develop nowcasting competencies.

At the end of the course, the trainee will carry out a final project. This can be a severe case study or a project in which he/she would adapt the procedures used in Romania to the reality of his/her own metservice.

Requirements to the trainees

The trainees are required:

- to have basic knowledge on synoptic and mesoscale meteorology, convection, radar and satellite meteorology,
- to prepare a presentation that will include general information on the NMS they represent, on the specific tasks and responsibilities they have at their working place, trainings they have had lately, if a nowcasting activity is included in the forecast process at their NMS, technical equipment used for forecasting, and other relevant information.

This information will act as an overview of the skills for radar and thunderstorm nowcasting.

Electricity connections:

220 V

Entry requirements

Entry visa is required for some countries. For more info please visit the website of the Romanian Ministry of Foreign Affairs: www.mae.ro.

Note: ***In case the trainee has a biometric or a diplomatic passport there will be NO need for visa obtaining.***

Hotel reservation

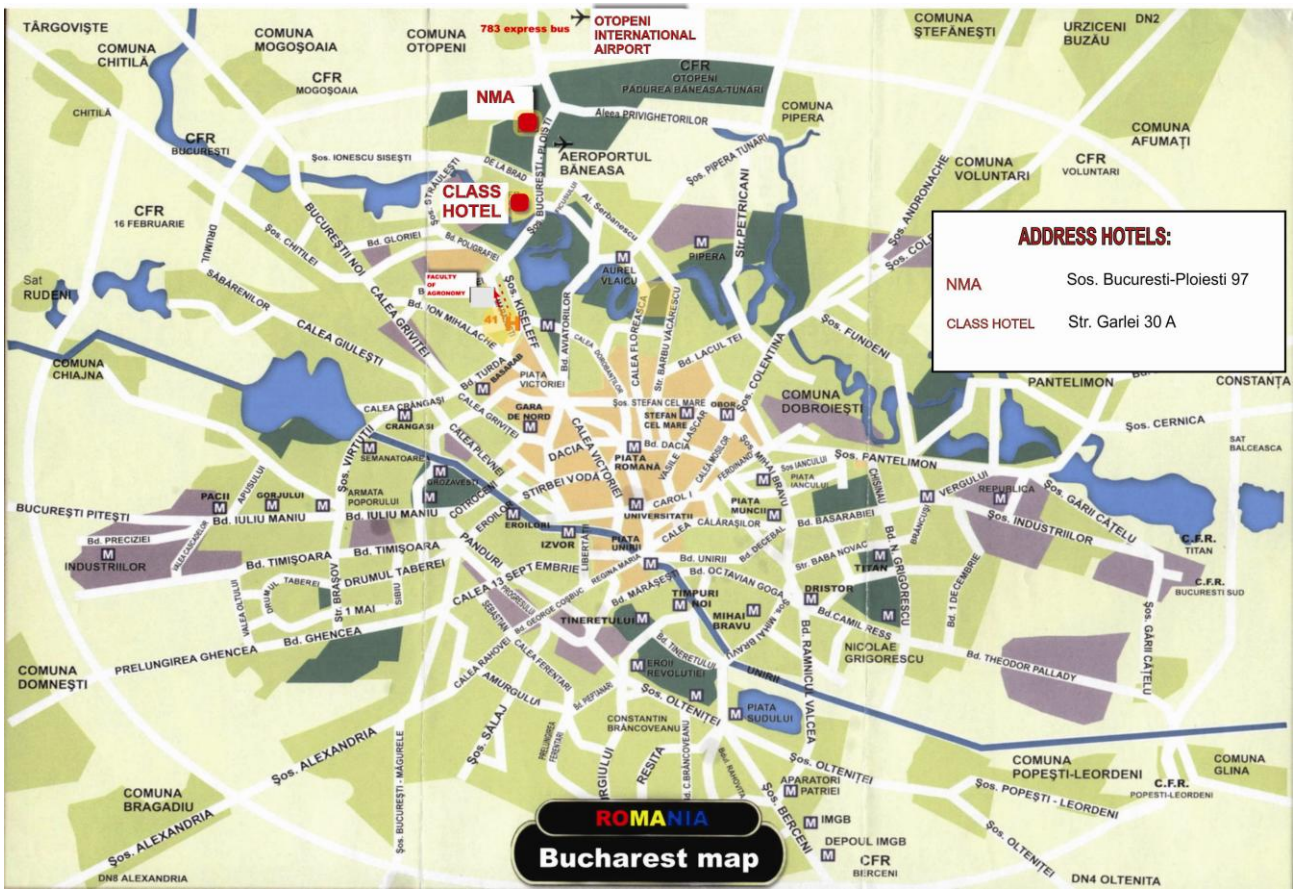
The National Meteorological Administration of Romania has made block reservation of single rooms, with breakfast included, in a hotel located not far from the training venue:

The Class Hotel
Str. Garlei, Nr. 30 A,
Sector 1, Bucharest
Phone: +40 21 233 28 13; + 40 21 233 28 14
Fax: + 40 21 233 28 86
Web: www.class-hotel.ro

Location: 10 minute walk to the nearest bus stop, close to the Herastrau Lake

Note: Upon request, NMA will make the reservations for the trainees after receiving their arrival/departure date/times (the trainees are kindly asked to announce cancellation 48 hrs prior the entry date)

* No credit card is requested to guarantee booking



Meals

The breakfasts will be available in the hotel, lunch can be served in the NMA's canteen and the dinners would be available in city restaurants.

– *close to the training venue:*

- Baneasa Shopping Centre

Local transportation

Public transportation in Bucharest is well organized by trams and buses:

Magnetic cards are for use in buses, trams, trolley buses, underground and 783 express bus. For buses, trams and trolley buses one trip is 1,30 lei, for the underground and the express bus, the price is a little bit higher (2 lei and 3,5, respectively) . These cards can be bought from dedicated kiosks ("RATB"), generally located near the main bus stops.

Note: *The hotel, lunches, as well as the bus tickets for the public transport during the training period will be paid directly through the National Meteorological Administration of Romania from the project budget. Also the transfer from the airport to the Class Hotel will be provided by the National Meteorological Administration*

Pocket money

The participants will receive from the project budget a lump sum to cover the dinner, lunches during the weekends or the days-off and other eventual costs, during the training period.

Currency

The Romanian currency is the LEU. The LEU underwent denomination on 1 July 2005, when four zeroes were cut from its former value. At present, the official exchange rate is around 4,50 Lei for 1 €. Private exchange offices operate slightly different rates.

At the airport, we advice you to exchange only a small amount of money (10 Euros or so), especially for local travel tickets. When you reach the exit hall of the airport, you will notice guiding panels, showing you the way to the exchange office.
There are also ATMs for currency exchange operations.

Info on local climate

Mean air temperature in Bucharest: 17,7^{o} C (May),
Maximum air temperature in Bucharest: 36,6^{o} C (May),)
Mean precipitation amounts in Bucharest: 70,1 l/m^{2} (May).

For any further local information, please contact:

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Building Resilience to Disasters in Western Balkans and Turkey

On-the-job training on Severe Weather Forecasting and Warnings

Fourth Phase [5–16 May 2014]

Course Schedule

Week 1 [5-9 May 2014]				
Interactive discussions and attendance to presentations that approached the topics described below Hands-on nowcasting operational activity within the National Center of Forecasting				
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
09:00-09:30 – Opening	09:00-10:30 – Mesoscale Meteorology	09:00-10:30 – Basic principles of Doppler weather radars	09:00-10:30 – Understanding severe storms signatures	09:00-10:30 – Nowcasting convective storms
09:30-10:30 – Introduction of the Project and Training Course	10:30-11:00 Coffee break	10:30-11:00 Coffee break	10:30-11:00 Coffee break	10:30-11:00 Coffee break
10:30-11:00 Coffee break	11:00-12:30 – Mesoscale Meteorology	11:00-12:30 – Basic understanding of storm evolution	11:00-12:30 – Radar rainfall estimation	11:00-12:30 – Nowcasting convective storms
11:00-12:30 – Synoptic Meteorology	12:30-14:00 – Lunch Break	12:30-13:30 – Lunch Break	12:30-13:30 – Lunch Break	12:30-13:30 – Lunch Break
12:30-14:00 – Lunch Break	14:00-16:00 – Presentation given by the trainee about his activity	13:30-15:00 – Severe convection and conceptual models	13:30-15:00 – Non-meteorological radar echoes	13:30-15:00 – Nowcasting convective storms
14: 0-16:00 – Synoptic Meteorology		15:00-15:30 – Coffee break	15:00-15:30 – Coffee break	15:00-15:30 – Coffee break
		15:30-16:30 – Diagnosing thunderstorms using radar information	15:30-16:30 – Use of lightning data in nowcasting	15:30-16:30 – Nowcasting convective storms
Week 2 [12-16 May 2014]				
Hands-on nowcasting operational activity within the National Center of Forecasting Discussions on the use of NWP, satellite, and observation data in operational Nowcasting Discussions and assistance on severe weather warnings issuing process Finalizing the project				

Evaluation
On-the-job Training on Severe Weather Forecasting and Warnings

5–16 May 2014

Completing this evaluation will let us know how you have experienced this course and will help us to improve future courses. Please be frank and honest as that will help us the most.

Name Metodi MARKU Country ALBANIA

What did you wish to get from this course?

The most important : end to end forecast process.

Did this course meet your expectations? If not, why not?

YES

What will you do differently in your job after this course?

We are going to get a radar (the first one) by the end of 2014. In using it, we are going to be in closer contact with romanian colleagues, too.

Would you recommend this course to others?

YES.

Overall

Interest in course	Bored					✓	Enthused
Understanding gained	Little/None					✓	Much
Content	Irrelevant					✓	Relevant
Scope	Too narrow			✓			Too wide
Emphasis	Too theoretical			✓			Too practical
Depth	Too detailed			✓			Superficial (shallow)
Presentation standard	Poor					✓	Excellent
English	Hard to understand					✓	Easy to follow
Standard	Difficult					✓	Easy
I would like	More lectures					✓	More activities
Learning and Action Guide	No use					✓	Very useful
Action plans	No use					✓	Very useful
Length of course	Too short			✓			Too long

Particular topics

	No Use				Very Useful
Learning nowcasting objectives/competences					✓
The forecast process					✓
Ingredients approach					✓
Composite analysis					✓
Instability, CAPE, CIN					✓
Conceptual models – local flows in your country					✓
Severe weather					✓
Case studies					✓
Radar conceptual model					✓
End to end forecast process					✓
Satellite RGB imagery					✓

Logistics

Transport	Unsatisfactory					✓	Satisfactory
Arrival - transfer	Unsatisfactory					✓	Well looked after
Accommodation	Unsatisfactory					✓	Comfortable
Meals	Unsatisfactory					✓	Delicious
Classroom	Unsatisfactory					✓	Excellent
Internet access	Unsatisfactory				✓		Excellent
Staff and trainer availability	Unavailable					✓	Accessible

Further comments and suggestions:

I would prefer wireless internet in the Forecasting Room (also skype access)

Thank you for taking the time to assist us with planning and improving our course.