

**HARMONIZATION OF SEISMIC HAZARD MAPS
FOR THE WESTERN BALKAN COUNTRIES
BSHAP**

(SfP Project Number 983054)

OCTOBER Progress Report - 2009

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1. LIST OF ABBREVIATIONS USED IN THE PROJECT PLAN

ARSO	Environmental Agency of The Republic of Slovenia
DTM	Digital Terrain Model
DEMA	Danish Emergency Management Association
EC	European Commission
GIS	Geographical Information System
GPS	Global Positioning System
IGEO	Institute of Geosciences, Tirana, Albania
IPR	Intellectual Property Right
IZIIS	Institute of Earthquake Engineering and Seismology at the University "Ss. Cyril and Methodius", Skopje, FYR Macedonia
METU	Middle East Technical University, Ankara, Turkey
MSO	Montenegro Seismological Observatory
MSK	Scale of Seismic Intensity (Medvedev-Sponhouer-Karnik)
PGA	Peak Ground Acceleration
GMP	Ground Motion Prediction
PSHA	Probabilistic Seismic Hazard Analysis

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3. BACKGROUND AND OBJECTIVES

During past centuries, the southern part of Europe has been devastated by a great number of large earthquakes, resulting in human victims and enormous material loss. Because of intensive building construction and increasing urban population density for the last two decades, the current consequential effects of such disastrous events would be even more drastic. It is therefore, of great importance to assess the seismic hazard properly, raise public awareness and improve disaster planning and management in the whole region.

Besides exceptional willingness and cooperation of the participating countries, in developing of this Project the most important role acted Disaster Preparedness and Prevention Initiative (DPPI) of the Stability Pact for South Eastern Europe. DPPI recognized possibility to, through launching of this Project, introduce necessary, basic steps towards the complex seismic risk management process in this region. DPPI organized four Project Working Group meetings (Macedonia, Albania, Montenegro and Serbia) for the purpose of elaboration, preparation of the Project Proposal Plan.

The main objective of the Project is the preparation of new seismic hazard maps of the region using modern scientific methodologies that will ensure harmonization within the region as well as with the European standards. The fact that current seismic provisions have been updated in early 1980-is (practically in all of participating countries) underlines an evident need to upgrade these technical norms. The foreseen logical step is harmonization with EU standards (EUROCODE 8), what impose the seismic hazard harmonization as the first step towards.

Another important objective of the Project is to improve scientific collaboration between the project partners. Enhancement of joint cooperation and coordination in the field of seismic hazard will provide an important step towards preparedness and prevention activities in disaster management. Through lecturing of invited experts in seismic hazard related topics introduction of the state of the art of methodology will be achieved as well as the training of young scientists. Also, the project deliverables will help achieving the deployment of new seismic instruments in the participating countries and foster real time data exchange between national seismic networks.

The end users of the Project results will be governmental disaster management agencies, ministries of environment or agencies responsible for environmental protection and sustainable development in the Balkan region. The civil protection agencies as well as the insurance companies, in all of the participating countries, may benefit from this Project results using it to estimate seismic risk at certain region/location. Consequently, civil protection agencies should risk prevention, preparedness and mitigation measures. Direct users of Project results should be structural engineers, earthquake engineers, and physical planers in the whole region.

4. PROJECT STRUCTURE AND ACTIVITIES

MILESTONES, DELIVERABLES AND SCHEDULE: SfP 983054

		1 st year				2 nd year				3 rd year			
Milestone:		1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12
Month no:		X-XII	I-III	IV-VI	VII-IX	X-XII	I-III	IV-VI	VII-IX	X-XII	I-III	IV-VI	VII-IX
Month:		X-XII	I-III	IV-VI	VII-IX	X-XII	I-III	IV-VI	VII-IX	X-XII	I-III	IV-VI	VII-IX
1.	Compilation of earthquake catalogue data												
	1.1. Earthquake catalogue completion												
	1.2. Unification of magnitude scale												
2.	Seismic source modeling												
	2.1. Seismotectonical elaboration												
	2.2. Recurrence of earthquakes inside the identified seismic sources												
	2.3. Modeling of seismic sources using smoothed seismicity approach												
3.	Determination of GMP models												
	3.1. Investigation of available GMP models												
	3.2. Comparison of results from different GMP models												
4.	Seismic hazard assessment												
	4.1. Preparation and testing of input database												
	4.2. Computation of hazard probabilities												
5.	GIS implementation												
	5.1. Preparation of GIS background and thematic maps												
	5.2. Elaboration of hazard GIS maps												
6.	Equipment purchase and deployment												
7.	Software purchase												
	7.1. Accelerogram analysis software												
	7.2. GIS software												
	7.3. Alternative hazard computation software with limited license												
8.	Project coordination activities, issuing information and results in the Project												
	8.1 Web site preparation												
	8.2 Web maintenance, Workshops, coord. and dissemination of the results												
	8.3. Presentation and dissemination of the final hazard results												
9.	Training of young scientists												
Deliverable		Web site of Project			Depl. instruments & Completed Earthq. catalogue	Determined GMP		Determined alternat. source models		GIS background maps		Seismic hazard maps in GIS form	
Reporting	<div style="display: flex; align-items: center; gap: 10px;"> <div style="width: 20px; height: 15px; background-color: #800040; border: 1px solid black;"></div> as planned </div> <div style="display: flex; align-items: center; gap: 10px; margin-top: 5px;"> <div style="width: 20px; height: 15px; background-color: #e0ffff; border: 1px solid black;"></div> progress </div>		1st Progress Report		2nd Progress Report		3rd Progress report		4th Progress Report		5th Progress Report		Final Report

5. TECHNICAL PROGRESS

A) MONTENEGRO

A.1 Major Accomplishments

On October 2nd 2007, for the purpose of bringing the Project objectives to the public attention, Montenegro Seismological Observatory in coordination with NATO SfP Office successfully organized the Project Kick-off Meeting in Podgorica, Montenegro. As the leading project partner, MSO, coordinates Project activities, prepares workshop agendas, Minutes of the meetings and finalizes the Six-month reports.

At the very beginning of the Project realization, MSO established a dedicated Web presentation (www.wbseismicmaps.org). The web is continually maintained and updated with all project-relevant information and documents.

Representatives and involved personnel of MSO actively participated to all project workshops: Ig, Skopje, Dubrovnik and Budva. The major activities realized through and besides these workshops have been as follows:

Compilation of national earthquake catalogue (earthquakes occurred on the territory of Montenegro and surroundings) with threshold magnitude 3.0. Later on the national catalogue has been reexamined and filled in with additional catalogue data got through collaboration with NEREIS project.

All relevant data on seismotectonics related to the Montenegro territory and surrounding area have been investigated and presented.

Preliminary results of seismic hazard using OHAZ software had been presented at Skopje workshop. As the input data MSO national catalogue, solely, has been used. Output results have been graphically presented and the influence of catalogue filtering and involvement of seismotectonic file in the hazard calculation was discussed.

According to gained experience and agreement with other partner institutions the GIS software *MapInfo Professional 9.5* has been purchased along with supplementary software *Vertical Mapper*. Previously, the four trainees attended the GIS training arranged for the Project participants by Seismological Survey (Divcibare, April 2009).

The major part of activities realized in previous six month period was related to testing and deployment of procured equipment. The equipment was delivered by the beginning of May of current year.

- *Broad band seismometers, sensor type KS2000M, Geotech Instruments:* One of the broad band instruments is placed on the newly (April, 2009) constructed station Dracevica, municipality of Bar. All land property right, as well as the station electricity and communication issues were resolved prior to the instrument deployment. Another broad band seismometer is placed in previously existing station Bratogost. The third broad band instrument malfunctioned, showing low frequency instrumental noise: - that instrument is returned to manufacturer to be repaired.
- *Strong motion recorders, sensor type SMART-24A:* The strong motion sensors (3 peaces) were placed on existing weak-motion stations Niksic and Herceg Novi while the third one is equipping the Dracevica station.
- *Digitizers model SMART-24D:* The purchazed digitizers (two peaces) are equipping existing stations of Bratogost and Plav, while *micro wave wireless links* are placed on Dracevica station and repeater Sjenica.



Dracevica seismic and geodynamic station: fully equipped weak, strong motion and geodynamical station with professional microwave wireless link

- As the donation of DEMA the purchase of one permanent GPS station was realized. For the purpose of observation and measuring of earth crust deformations two permanent GPS station were placed (one financed as national contribution). *Geodynamical stations:* Martinicko Gostilje, municipality of Danilovgrad and Dracevica, municipality of Bar (national contribution) are operating, now.

All of deployed instruments become operable starting from June / July, 2009.



Martinicko Gostilje geodynamic station

In the frame NATO SfP Project No. 983054 all involved institutions, wishing to establish cooperative mutual relations, signed:

- *The Protocol on Multilateral cooperation in seismic Data Exchange.* According to suggestions and agreements made on Dubrovnik WS, The Protocol document was prepared by MSO. For the purpose of protocol realization the IT capacities of the MSO have been broadened so to make possible real-time seismic data exchange.
- Also, the *Protocol on multilateral cooperation in further developing the OHAZ software* was signed among MSO (on behalf of the BSHAP Project) and *Institute of Geosciences of Polytechnic University of Tirana, Albania and Environmental Agency of Republic of Slovenia, Ministry for Environment and Spatial Planning,*

Slovenia (as the owners of source code of OHAZ software). The cooperation in implementation of new PGM formula between ARSO, IGEO and MSO is intensive.

A.2 Actions to insure the implementation of results

Within the previous period, the Cooperation with *The Real Estate Agency of Montenegro* is established through the *Agreement on permanent GPS observation data exchange*. The outcome of agreement is availability of additional eight permanent GPS stations (operated by this Agency) measurements data.

The major objectives of The NATO SfP 983054 and its importance for the tailoring of EUROCODE 8 are nowadays well recognized in community. Since the Montenegro is striving towards European and NATO integrations - on the national level there is an intensive ongoing mission on compliance with EU legislations.

In domain of construction provisions the introduction of *EURO CODES* is of primary importance and several national projects are in preparation. Through the conclusion of recently organized Meeting "*Euro codes in Montenegrin Legislation*", organized by Engineering Chamber (Podgorica, October 2, 2009), *significance of NATO SfP 983054 is emphasized as well as expected implementation of its results in preparation of Euro code 8 Annexes: Nationally Determined Parameters for the Montenegro*. Also, the implementation of Project results is expected within the IPA Twinning project proposed in cooperation of *Ministry of Spatial Planning and Environment of Montenegro* and *Technical Assistance Exchange Instrument*.

A.3 Milestones for the next six months

Within the next months the final deployment of purchased instruments should be realized (upon the repairment of one broad band seismic sensor).

The first results of analysis of Earth crust kinematic monitoring data obtained by permanent GPS stations Martinicko Gostilje and Dracevica will be presented.

The compiled earthquake catalogue should be formally adopted by all parties on scheduled Banja Luka Meeting (25-27 october,2009). The compiled seismotectonical model should be adopted (Montenegrin seismotectonical file is already prepared).

The adopted compiled earthquake catalogue should be presented as the thematic, GIS layer, as well as seismotectonic layer, and leyers of seismic zone delineated for the purpose of OHAZ implementation. In addition, the output hazard computation data using OHAZ software will be used for hazard map layer.

Upon on final decision reached in following WS in Banja Luka, the EZ FRISK program for seismic hazard computation will be purchased so to familiarize with the main features of software and format input data accordingly.

A.4 Involvement of young scientists

In the time period from the beginning of the project three young scientists were involved in the realization of the project activities.

Ms. Ljiljana Vucic, Mathematician assistant researcher, has prepared the Web presentation for the Project, and maintains it as the permanent task. With respect to *the Protocol on Multilateral cooperation in seismic Data Exchange* Ms Vucic is the nominated MSO liaison officers in charge of coordinating the activities listed in the areas of cooperation. Nowadays, new connections and collaboration in this field has been established with: MEDNET, Italy, Slovenia, Croatia, Macedonia, Bosnia and Herzegovina, Bulgaria and Greece.

Ms. Jadranka Mihaljevic, civil engineer, has participated on all Workshops dedicated to the Project. In the second workshop in Skopje she presented the first results of OHAZ software implementation to the seismic hazard assessment for the territory of Montenegro. The resulting differences of output hazard, depending on earthquake

catalogue filtering, have been emphasized. The appropriate format of seismotectonic model for Montenegro was also presented. The model itself was developed using neighboring Albanian seismotectonic model (presented in Ig Workshop) as well as already known geological, seismic and seismotectonic data. On behalf of the Montenegro as the Project leading country, Ms. Mihaljevic presented the current state of the Project realization on XV DPPI SEE Regional Meeting in Zagreb, 2008. Also, in the role of the invited key-speaker she participated on “*Seminar for Experts and Senior Managers on NATO Standards and Project Evaluation Procedures, focusing on Hydro-Meteorological aspects*” that was organized by DPPI. Ms. Mihaljevic is the person in charge for the coordination and preparation of Six month reports.

Six day training of young scientists Ljiljana Vucic and Natasa Kaludjerovic of the introductory course into Bernese GPS Software, including lectures on Global Navigation Satellite Systems, was realized in Bern, Switzerland in January 2009. The training was realized for the purpose of putting into practice permanent GPS data observations, analysis of obtained kinematical parameters and consequently, determination of geodynamic model of the region.

In coordination with local UNDP office, the GIS training of involved MSO personnel and young scientists (Mr. Gavranovic, Ms. Kaludjerovic, Ms. Mihaljevic, Ms. Vucic) has been conducted in November 2008, what fits to Project plan. Additionally all young scientists attended the GIS *MapInfo Professional 9.5 & Vertical Mapper* training arranged by Seismological Survey (Divcibare, April 2009).

A.5 Major travel

Major travels were related to participation to Project related workshops: Ig, Slovenia (7-9 November 2007) and Skopje, Macedonia (17-18 December 2007) and Dubrovnik (26-27 March 2008) Also, in the role of project leading country, MSO representatives traveled to Zagreb, Croatia (20-22 February) (“*Seminar for Experts and Senior Managers on NATO Standards and Project Evaluation Procedures, focusing on Hydro- Meteorological aspects*”) as well as to Brussels to NATO Forum on Environmental Security. In April 2009, the four trainees traveled to Divcibare, Serbia for GIS training workshop.

PPD Prof Branislav Glavatovic and Ms. Vucic use Project funds (Conference attendance) to participate on International Workshop on Real Time Seismology held in Italy, Erice.

By the beginning of September technician Marin Cavelis went to study stay in Geotech Dallas TX. The purpose of the stay was to familiarize with the equipment maintenance as well as to clear up the evidences of malfunction of purchased instrument.

A number of domestic travels were realized for the purpose of site investigation for the placement of new seismic stations, as well as the workshop organized in Budva.

A.6 Visit by experts/advisors and NATO consultant

As the guest expert from Slovenia, Agency for Environment, Mr. Mladen Zivcic has been invited to Podgorica for the occasion of Official Launching of the Project.

A.7 Visibility of SfP project

For the purpose of visibility of the Project, the Web site: www.wbseismicmaps.org was dedicated to the Project following the NATO SfP existing recommendations. Besides ongoing and planned activities related to the Project, important document on outcomes, all necessary links to participating institutions, as well as to NATO SfP

Programme are available. Web presentation is developed and hosted by Montenegro Seismological Observatory.

The event of Official Launching of The Project was held in Podgorica on October 2nd 2007, (<http://www.wbseismicmaps.org/Events.htm>) with the participation of distinguished guests from NATO SfP Programme, DPPI, diplomatic chore, as well as Montenegro Government representatives and ministries. The event itself was preceded by reports of all major national media: newspapers and TV.

A special March addition Security of daily news *Vijesti*, which is financed by the British Council, was dedicated to the objectives and significance of the Project.

The importance of collaboration within the NATO SfP Project No 983054 is emphasized on several occasions as the good example of streaming of Montenegro towards Euro-Atlantic integrations.

The main features of *NATO Science for Peace Programme* as well as the Project progress were presented on Workshop (Ulcinj, May 29,2009), organized for the NGO ecology sector by *Alfa mreza* , aimed to public debate European integration process and its influence to issues of ecology and environment issues.

The Project objectives and progress was also presented on occasion of 30th anniversary of destructive 1979 Montenegro earthquake.

A.8 Technical and administrative difficulties

All technical and administrative difficulties related to establishing of dedicated banking account and tax-free exoneration was successfully resolved. One of the purchased weak seismic motion sensor malfunctioned. Thus, the final 10% payment for the purchased equipment from Geotech Instruments, LLC, TX is still waiting.

A.9 Changes in personnel

Ms Natasa Kaludjerovic, BS of Physics, employee of MSO, has been involved as the Project participant.

A.10 Changes in project plan

A special attention was paid to procurement and selection of necessary seismic equipment. Having in mind the significant improvements of acquisition system that MSO undertook during the summer of 2007 and at the beginning of the current year, specific needs to improve capacity and performance of MSO seismic network were more precisely defined. In that sense, the final decision regarding the purchase of seismic instruments was, as it has been stated in the justification of procurement.

B) ALBANIA

In the period April-October 2009, the Albanian team of the project, was focused on the following issues:

- Compiling of a unified earthquake catalog in terms of moment magnitude, M_w .
- Preparing of the seismotectonic data for Albanian territory.
- Statistical analysis of the earthquake catalog (data completeness with time, declustering the earthquake catalog, estimation of recurrence parameters and the maximum possible magnitude for every seismotectonic zone).

- Compilation of the topographic database and the relevant Digital Terrain Model (DTM) for Albania, which will be used as GIS layers.
- Further development and improving of OHAZ software, for probabilistic seismic hazard calculation.

B.1 Major Accomplishments

Two catalogues of Albanian earthquakes have been previously prepared by the Albanian working team:

1. Catalogue of Albanian earthquakes with $M_s \geq 4.5$, for the time period 58BC-2006, sent on November 28, 2007. This catalogue includes earthquakes occurred within the area with geographical coordinates 39.00-43.00N and 18.50-21.50E. Part of this catalogue, covering the period 58BC-1964, includes earthquakes occurred within the area with coordinates 38.50-43.00N; 18.50-22.50E. The catalogue includes in total 667 earthquakes, from which 450 are main shocks assigned the code 1, and 117 earthquakes are for/aftershocks assigned the code 0. The catalogue sources, reported magnitudes and its completeness are given too.

2. Catalogue of the Albanian earthquakes with $M_L \geq 3.0$, for the time period 1964-2000, sent on December 10, 2007. The catalogue contains 19453 events; from which 14818 events has computed magnitudes based on Albanian Seismological Network (ASN) data. Events occurred within the area with geographical coordinates [38.028-43.854N; 18.024-22.00E]. Reported magnitudes and references are given for this earthquake catalogue.

A new catalogue of the Albanian earthquakes for the period January 2000–December 2008 was prepared also in terms of $M_L \geq 3.0$. This catalogue comprises events occurred within the area with geographic coordinates 38.50-43.00N; 18.50-22.50E.

It is evident, that compilation of a homogeneous earthquake catalog, by expressing the size of the earthquakes in a unified magnitude scale is the first step in the PSHA. Because most of PGM models proposed recently (Akkar & Bommer 2007, NGA models 2008, etc.) use the moment magnitude, M_W , it is indispensable to have a unified catalogue in terms of M_W . That is why regression analysis is carried out to estimate the correlation between moment magnitude M_W , and M_L magnitudes reported by the seismological agencies of the region (Tirana, Podgorica, Zagreb, Belgrade, Skopje and Thessaloniki). The values of M_W corresponding to the events used in the relevant datasets are taken from Harvard CMT catalog and RCMT catalogs compiled by INGV (Rome) and ETHZ (Zurich). The derived relations can be used to convert the local magnitudes M_L reported by seismological networks in the region, to the moment magnitude, M_W .

Because, some new updated PGM models proposed the last years for the European region use surface wave magnitude, M_S (Berge-Thierry et al, 2003: Journal of Earthquake Engineering, Vol. 7, No. 2, 2003, pp. 193-222), or the magnitude M_{SP} defined by Sabetta-Pugliese (Bindi et al., 2009, Bull. Earthquake Eng: Towards a new reference ground motion prediction equation for Italy - update of the Sabetta-Pugliese (1996), published online 10 March 2009), it would be very useful that the homogenous catalogue compiled for Western Balkan to be also in terms of M_s and M_{SP} , aside from M_L and M_W .

For the earthquakes occurred within Albanian territory we have compiled the unified catalog in terms of M_W , M_S and M_{SP} for events with $M_W \geq 3.5$. This unified catalog is used in further analysis and in our preliminary hazard calculations. Some refinements of the catalog are planned to be carried out within this year.

During this period, a digital map with the main active faults on the territory of Albania has been compiled. The relevant database, with the required fault parameters, as decided to be used for the BSHAP project, is now completed. Actually, we are

working to prepare the seismotectonic data for the Albanian territory, according to the seismotectonic model used in OHAZ software (identification and characterization of the seismotectonic zones with homogenous seismotectonic characteristics, determination of predominant tectonic structures, their orientation and corresponding weights for every zone).

Statistical analysis of the earthquake catalog, such as data completeness with time, declustering the earthquake catalog, estimation of recurrence parameters as well as the maximum possible magnitude for every seismotectonic zone are already accomplished. However, a further refinement is necessary, and will be carried out before hazard calculation.

During this six-month period, training of a young scientist (Dr. Enkela Begu) for the common GIS software selected for the BSHAP project needs (MapInfo Professional 9.5 and MapInfo Vertical Mapper) was completed in Divçibare (Belgrade). The software is delivered and installed. Dr. E. Begu, in concert with another young GIS specialist (Mrs. Irena Ymeti) involved in the project, are now working to complete the GIS layers for the seismic hazard maps (compilation of the topographic database in the scale 1:200 000, and the relevant Digital Terrain Model (DTM) for Albania).

Further development and improving of OHAZ software, accordingly to the project needs, has been also an important issue for us. As it is already known, IGEO (Albania) and ARSO (Environmental Agency of Republic of Slovenia, Slovenia), as co-owners of the source code of OHAZ software, agreed to make it available for the other partners of the BSHAP project, and signed the Protocol on multilateral cooperation in further developing the OHAZ software with MSO on behalf of the BSHAP Project. Besides, during this period Prof. Neki Kuka in close collaboration with Dr. Barbara Šket Motnikar (ARSO, Slovenia), attained some important improvements in OHAZ:

-It was implemented a maximum-likelihood procedure to account for unequal observational time periods (completeness periods of the earthquake catalogs).

-An improved procedure to estimate the recurrence relationships (incremental and cumulative), including estimation of related uncertainties, is also integrated in OHAZ.

-The approximate function that calculates the distance site-source, is replaced with a more accurate geodetic procedure.

-The database of Predictive Ground-Motion Models (PGMM) is extended with the following models, which in our opinion are very appropriate for PSHA in our region:

- Berge-Thierry et al. (2003).

It seems, this model fully replace the Ambraseys et al. 1996. It is based on the updated European strong motion database, and use also MS magnitude scale. The only change from the model of Ambraseys et al. 1996, is that the Berge-Thierry et al. model use hypocentral distance instead of the fault distance.

- Bindi et al (2009), which is based on a revised Italian strong motion records, and is an update of the Sabetta-Pugliese 1996 PGM model.
- Akkar & Bommer 2007.

This could be used instead of Ambraseys et al. 2005, which it seems to be not appropriate for PSHA (Muson 2009).

- Boore & Atkinson 2008.

This model is derived in the framework of NGA project in USA (EERI, 2008), and it is based in a very large strong motion database. It is considered very appropriate to be used in the European region (Bommer et al., 2007).

-Some other important features (especially combining hazard curves in the framework of a logic-tree approach) need to be developed in the near future.

In the framework of NATO SfP BSHAP Project 983054, and taking into account the mutual interest for seismic data exchange between partners (improvement of epicenter determination in the border regions), IGEO has signed The Protocol on Multilateral cooperation in seismic Data Exchange. In order to fulfill its obligations undertaken in the context of this protocol, in the period November 2009 – December 2009, IGEO capacities have been broadened so to make possible real-time seismic data exchange. The new monitoring center in the central building of the Institute has been equipped with a number of PC and servers, all dedicated to the acquisition and processing of seismic data. IGEO has established the real-time seismic data exchange with INGV (Rome) and Thessaloniki University, which run the same data acquisition system (Nanometrics). IGEO has contacted the GEOFON team in order to install the SeisComP software also. A contract between us is undersigned, but up to now GEOFON has not provided their software. We are waiting for their help, because it seems SeisComP is the only available tool to exchange seismic data with the Institutions involved in the BSHAP project. A particular contribution to the data exchange between neighboring countries resulted also from the EU project (CoSEESNet, A Collaborative South East Europe Seismic Network: “Towards Early Warning System and Real Time Seismic Monitoring in South East Europe”).

The strong motion instruments are delivered by Guralp Systems Ltd., consisting of 8 CMG-5T strong motion sensors and 10 CMG-5TD Strong Motion Sensor Systems consisting of CMG-5 accelerometer and CMG-DM24 modules, at the total cost of \$ 64,967.50. IGEO successfully finished the process of equipment purchase, but IGEO has administrative problems related to tax-free exoneration not yet resolved. IGEO has developed an extensive correspondence with the NATO and Albanian Custom authorities in order to resolve this question, and we hope to resolve it within this year.

B.2 Actions to insure the implementation of results

The probabilistic seismic hazard map, that is the major objective of the project, shall be adopted by the Albanian authorities as National Annex for the new design standard conform Eurocode 8. IGEO staff is working with the relevant Directorate in the Ministry of Construction for the formulation of the necessary actions that will comprise the relevant Albanian Institutions for the EC8 implementation in our country.

B.3 Milestones for the next six months

Within the next months the deployments of the strong motion instruments should be performed. The process of tax-free exoneration shall be concluded and some other actions related to the land property rights, measurements and selection of sites and houses (structures) shall be concluded.

Statistical data analysis of the unified earthquake catalog and compilation of the seismotectonic data file accordingly to the OHAZ specifications have to be completed. Also, it is necessary to be finished the GIS layers which will be used as reference for the seismic hazard maps. It is indispensable to begin with hazard calculation, at least at the beginning of 2010.

B.4. Involvement of young scientists

Two young researchers, Dr. Enkela Begu - GIS specialist, and Msc. Irena Ymeti - Remote Sensing specialist, have been involved in the project. The two above mentioned specialists will take part in the GIS training course (MapInfo) in Serbia, and later on they will be involved in the activities for project results visualization. Furthermore, Dr. Begu was involved in the preparation of the presentation in the framework of the “Week of technological, scientific and University cooperation Italy-

Albania” entitled “Monitoring infrastructure of the Institute of Geosciences” (Tirana, November, 2008).

B.5 Major travels

Major travels were related to participation to the Project related workshops: Ig, Slovenia (7-9 November 2007), Skopje, Macedonia (December, 2007), Dubrovnik, Croatia (26-27 March 2008) and Budva, Montenegro (16-17 December 2008).

B.7 Visibility of SfP project

A paper dedicated to the NATO Science for Peace and Security Project No 983054 “Harmonization of Seismic Hazard Maps for the Western Balkan Countries”, and entitled “The NATO and Albanian Seismology” was published by Prof. Shyqyri Aliaj in Albanian Newspaper “Albania”, February 27, 2008 (in Albanian).

B.8 Technical and administrative difficulties

Administrative difficulties have been encountered regarding to the tax-free exoneration of the seismological equipments delivered by the NATO SfP 983054 project. The administration of IGEO is making intensive efforts to resolve the question.

The other technical and administrative difficulties, related to the bank account transfer from the former Co-Director Prof. Aliaj to the new Co-Director, were successfully resolved.

B.9. Changes in personnel

On 1/01/2008, a new research institute – Institute of Geosciences (IGEO), started its activity based on a decision of the Albanian Government (VKM No. 561, date 22/08/2007). IGEO includes the former Institute of Seismology of the Albanian Academy of Sciences and some research units of Albanian Geological Survey (geology, geophysics, geoinformation technologies). The Institute of Geosciences is a national research unit that operates under the umbrella of the Polytechnic University of Tirana. According to the above mentioned decision, all the assets and activities of the former Institute of Seismology, including projects and bilateral contractual agreements, are now transferred to the new Institute of Geosciences.

After retirement of the former Albanian Co-director, Prof. Shyqyri Aliaj, and his resign from the Co-Director function for the Albanian partner, the new Director of the IGEO, Prof. Ismail Hoxha, expressed his interest to take over the Co-Director function for the Albanian partner into the NATO SfP 983054 project, and also his engagement to fulfill all the agreements that comply the project objectives. The necessary documents were sent to the NATO SfP project authorities, and we received their official approval. The Albanian Project team was reorganized, in order to fulfill the related BSHAP project activities. Prof. Neki Kuka, Head of Department of Geoinformation Technologies in IGEO, was involved in the BSHAP project.

C) BOSNIA AND HERZEGOVINA

C.1 Major Accomplishments

In the past two years period (October 2007 to October 2009), Seismological Survey of Bosnia and Herzegovina conducted tasks consistent to the methodology, project structure and activities of the approved Project Plan.

In last 12 months we conducted our best efforts in fulfillment planned tasks and activities, but we were significantly obstructed by the long delay in seismic equipment delivery from a vendor Geotech. Additionally, a part of equipment was delivered with "manufactory mistake" and resolving this issue becomes to be main priority to Seismological Survey of Bosnia and Herzegovina.

Activities on resolving this problem were conducted along with Seismological Survey of Montenegro, as our partner in Project and as Seismological Survey which also choose Geotech, as a vendor.

This situation was a reason for small initial stagnation on the level of planned testing and deployment of the equipment.

Even Seismological Survey of Bosnia and Herzegovina is strongly affected by recession, all this activities were conducted inside of Seismological institutions of Bosnia and Herzegovina and as far there were no additional costs and requests from the Budget for Bosnia and Herzegovina.

Also, for this equipment NATO paid 50 % advance (52244 \$) in mid of May of 2008. Additional payment will be done in much worse finance situation for us, regarding a much worse EURO – US dollar co-relation, and that might be a cause of additional (finance) problems.

This fact, also, may have significant influent on the Project on the other way forsing us to cover deployment of the equipment with cost planned for the training and education of young experts (MapInfo software providing and training) as well as other planned activities on the Project such are payment of stipends. Also fulfillment of some other financial issues might be postponed.

The main objectives of the Project for this past two years period were as follows:

- Equipment purchase and deployment.
- completion of the National earthquake catalogue consisting of verified data as one of the most important steps in seismic hazard assessment.
- Further work on unique earthquake catalogue and training of scientists to use sophisticate software for this purpose.
- Strengthening of co-ordination and work on Project of two seismic institutions
- Creating pre-conditions for unique seismic network (with two centers)
- Strengthening of professional capacities of (two) seismic institutions in B&H

To fulfill this goal we organized several meetings among representatives of both seismic institutions, and established principles of common work (of both institutions) on the national earthquake catalogue consisting of verified data, data exchange (among institutions) and joint efforts on developing a future unique seismic network with two (main) centers, as described in Project DIRECTE, to be developed.

Within the working package (section 7 of the Project Plan), the participants from Bosnia and Herzegovina finished following tasks: survey of available catalogues of both seismic institutions; unifying of catalogues of both seismic institutions, re-assessment of historical earthquakes and fulfillment of missing data; investigation of the national catalogue completeness according to $M_{min} = 2.5$ and magnitude scales; investigation of possibilities for an unification of magnitude type.

Improvement of an existing seismic station network in the region and real time data exchange is another important objective of the Project.

One of the (major) achievements in a first six months was a meeting with donators (to be) from the Slovak Republic. Under mediations and facilitation of our Serbian hosts in Belgrade (in December 2007-th) was organized a meeting, in order to provide donation of Slovak Aid for both participating seismological institutions from Bosnia and Herzegovina. On that meeting are defined main goals of the future Project (DIRECTE): those are development of infrastructure for rapid earthquake data collection and exchange in the Bosnia and Herzegovina composed of the eight new seismic stations network. It was agreed that the Project within Slovak Aid plan will be prepared by the Slovak partner and that the Project proposal should be complementary to the activities of the NATO Project SfP – 983054.

C.2 Actions to insure the implementation of results

Providing a consistent background is one of the main objectives of the Project. For that purpose we undertake activities on involving Federal Geological Institute - Sarajevo in Project. This institution developed most recent and most updated Map of Hazard, based on (it's own) Geological survey and catalogue of earthquake of seismic institution of Federation of B&H.

Mr. Hazim Horvatovic, Head of Federal Geological Institute – Sarajevo expressed a wish to his institution participate in the Project.

We also, provide all necessary back up, from Ministry of Civil Affairs and Council of Ministers of B&H, aiming to fulfill all obligations of Bosnia and Herzegovina, regarding administrative, finance and other kinds of support to the this Project.

C.3 Milestones for the next six months

According to the Project Plan, in the next six months period, following tasks should be achieved:

- Testing and deployment of the equipment
- Networking; (among institutions and other partners in Project)
- Further activity in additional founding and institutional contribution to the Project.
- Investigation of the existing geological, neo tectonic, remote sensing and other relevant data in the Bosnia and Herzegovina and surrounding regions for the purpose of seismic source determination (in co-operation with Federal Geological Institute – Sarajevo)
- Education and training of the young experts

C.5 Major travel

Four participants from Bosnia and Herzegovina attended the first workshop on November 2007 in Ig, Slovenia. Benefits of first workshop were in terms of presentation of different experiences in preparation of input earthquake catalogue data, treatment of historical earthquakes, as well as presentation of participating

countries reports, and in to the training in OHAZ software as an appropriate tool for the fast seismic hazard assessment. The software was tested on preliminary prepared national catalogues.

Mr. Amer Zoranic traveled in Belgrade (December 2007) on a meeting with possible Slovak donors, in order to provide donation of Slovak Aid for both participating seismological institutions from Bosnia and Herzegovina inside of the future Project (DIRECTE). (All travel costs were covered by Ministry of Civil Affairs of BiH).

One participant attended the second workshop on December 2007 in Skopje, Macedonia. First day session offered an opportunity to find out about state of the art in seismological investigation of Bulgarian and Romanian institutions. Some preliminary conversation has been negotiated with Bulgarian colleagues about possible future cooperation. Also, we have learned valuable information from Prof. Akkar about most recent researches related to strong motion records and prediction formulas. Second day session participants heard more about OHAZ software form Slovenian colleagues. It was further discussed about instrument minimum requirements and bid details; technical suggestions concerning earthquake catalogue contents and policy suggestions concerning usage and modalities of publishing of the final catalogue.

Tree participants attended the Workshop in Dubrovnik March 26-27-th. The workshop was dedicated to analysis of seismic instrument bid.

Four participants attended the Workshop in Budva (Becici) in Montenegro, on 15-18-th December 2008. A question of long delay in seismic equipment delivery of a vendor Geotech was issued, but main activities were tightly connected with further work on Project, as planed.

Tree participants attended the Workshop in Divicibare, Serbia, April 20-24-th.

On this workshop young scientist were trained how to use MapInfo software for seismic survey needs, and how to work on earthquake catalogue using this sophisticate software as one of the elements for harmonization of seismic hazard maps.

C.8 Technical and administrative difficulties

During this two years period of time many of technical and administrative difficulties occurred, mostly because of different administrative and financial procedures between NATO and Bosnia and Herzegovina.

However, most of (if not ALL) this administrative and financial difficulties were successfully resolved and created conditions for a further successful work on Project of all participants.

C.9 Changies in personel

As far it was no changes in personnel, but we are creating additional possibilities for involvement of new personnel and young researchers in the Project.

C.10 Changes in Project plan

No significant changes in the Project plan were undertaken. Our intention to use all available money (for this purpose) in order to provide as much as possible of seismic equipment is in accordance with Project plan.

D) CROATIA

D.1 Major Accomplishments

Main activities of Croatian participation in the project in this period were mostly related to site preparation for five new seismological stations in Croatia (A.1.1) as well as completing the Croatian earthquake catalogue (A.1.2).

D.1.1 Site preparations for new seismological stations

Five new Guralp seismographs that were purchased within the Project will be installed on the islands Brijuni, Dugi otok, Žirje, Lastovo nad Palagruža. In the order to determine appropriate micro locations for seismographs, the number of microseismic noise field measurements was performed. Parallel to those activities, the administrative issues concerning different licenses and permissions from different state ministries were obtained. Considering the data transmission from new stations to the central observatory in Zagreb, the new satellite equipment was bought in Germany, as well as satellite bandwidth for six months period.

D.1.2 Verification and completing of Croatian earthquake catalogue

The main activities concerning the verification and completing of Croatian earthquake catalogue were related to the harmonization of the earthquake catalogue regarding to the magnitudes. The completing as well as digitalization of the macroseismic catalogue was also important task in previous period.

D.1.3 Process of compiling the regional catalogues

So far submitted available catalogues are as follows (Fig. 1):

- Albanian catalogue, containing earthquakes from year 58-2000, and no magnitude threshold
- Bosnia and Hercegovina's catalogue, containing earthquakes from 306-2006, and magnitude threshold 3.5
- Croatian, containing earthquakes from 373 BC – 2008 and no magnitude threshold
- Macedonian catalogue, containing earthquakes from 479 BC – 2005 and magnitude threshold 2.9
- Montenegrin catalogue, containing earthquakes from 1444 – 2008 and magnitude threshold 3.0
- Declustered Serbian catalogues with threshold magnitude 3.6
- Romanian catalogue, containing earthquakes from 984 – 2006 and no magnitude threshold.

Additional catalogues that were used are ANSS Catalogue, Shebalin et al. (also known as 'Leydecker catalogue'). The completion of catalogues continued by adding the last year's national catalogues and final catalogue will be presented and should be adopted on scheduled Banja Luka Workshop by the end of October.

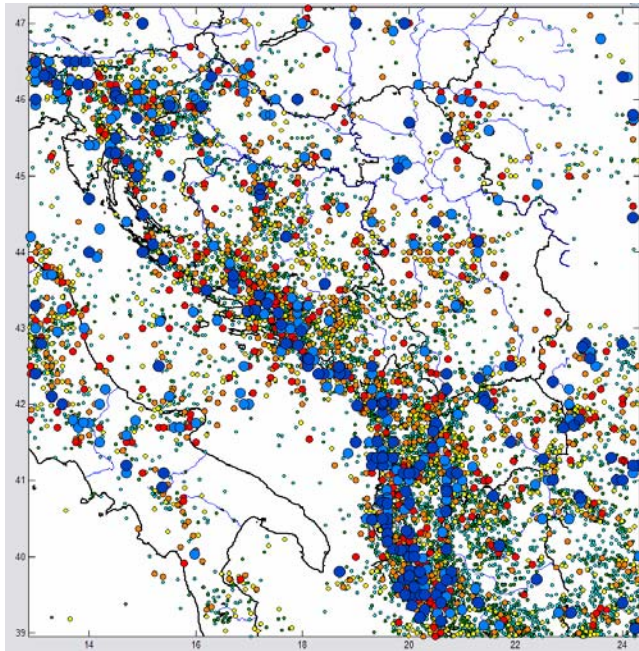


Figure1. Unified Regional Main-shock Catalogue

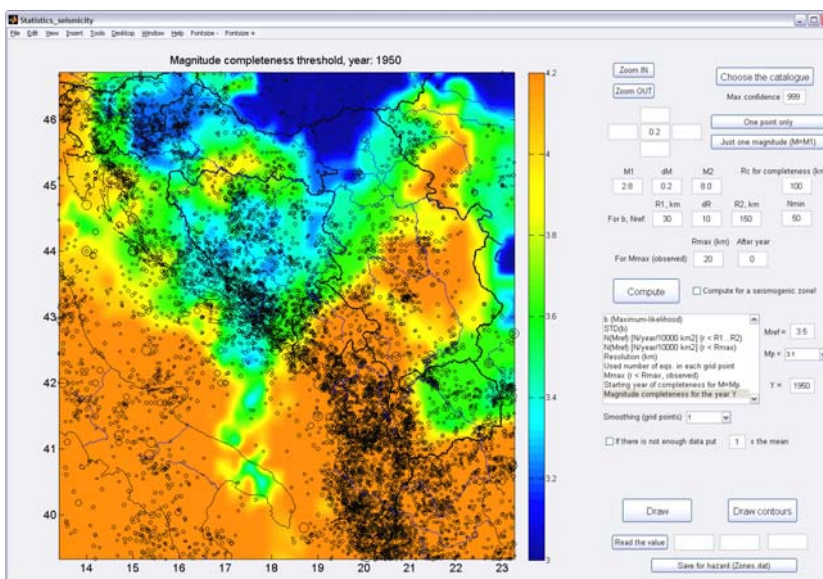
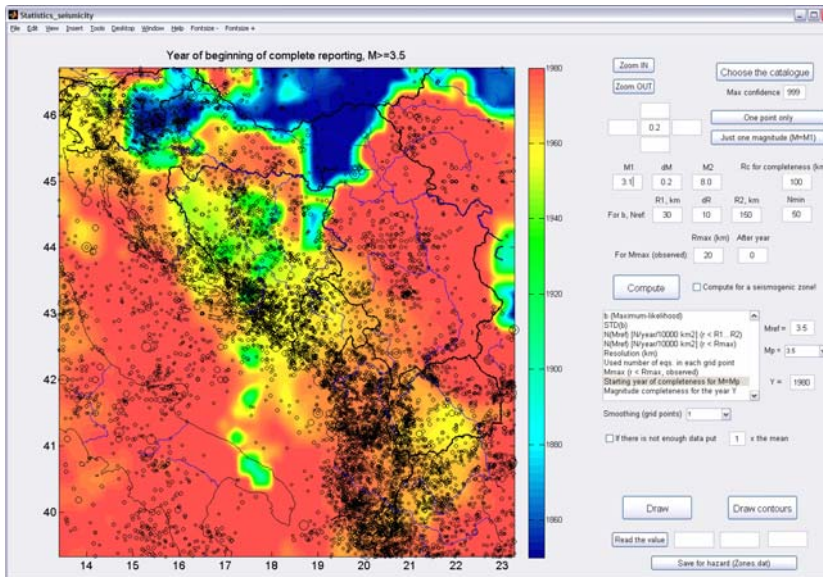


Figure2. Year of the beginning of complete reporting for $M \geq 3.5$ (top), and magnitude completeness threshold for the year 1950 (bottom).

D.2 Actions to insure the implementation of results

One of the very important project roles is the collaboration between project members in the frame of the real time data exchange. Croatia will continue that cooperation mostly by exchanging real time data with neighboring and other close countries.

D.3 Milestones for the next six months

In the next six months of project realization, the main activities in Croatia will be oriented towards installing new equipment and putting it into network.

D.4 Involvement of young scientists

Two young scientists (Krešimir Kuk and Josip Stipčević) were involved in realization of project from its beginning. Another two young researchers (T. Fiket and S. Prevolnik), employed after starting the project, were also included immediately in all project activities. Mr. S. Prevolnik is at present participating one month seismological seminar in Potsdam, in Germany.

D.5 Major travel

The travels were related to the project First GIS software training (Divcibare, Serbia, April 21-23, 2009). Two representatives (Mrs. S. Markušić and Mrs. I. Ivančić) from Croatia attended that training.

D.7 Visibility of SfP project

All international activities of Croatian team, as well as presentations, are permanently being announced and updated on the official web site of the University of Zagreb. The project and ongoing activities were also several times mentioned in national news and television by Croatian project Co-Director Mr Vlado Kuk.

D.8 Technical and administrative difficulties

There were many technical difficulties regarding Guralp equipment in project realization. Major problems rose after temporary site measurements. Instruments were not able to extract recorded data. After several weeks, Guralp technical department prepared the plugin which solves the problem, but each instrument had to be taken back to main data center, linked into network and firmwared from Guralp.

D.9 Changes in personnel

New young researcher (Mr. Snježan Prevolnik, B.Sc.) was employed at Geophysical Department. He joined the project immediately.

D.10 Changes in project plan

There were no changes in project realization regarding the project plan.

E) MACEDONIA

In the period March 2009 - October 2009, the Institute of Earthquake Engineering and Engineering Seismology (IZIIS-Skopje) in cooperation with Seismological Observatory, Faculty of Natural Sciences (SO/PMF) conducted tasks compliant to methodology, project structure and activities of the adopted Project Plan, i.e., along activities to fulfill Milestone requirements as declared in the October 2008 - March 2009 six months report, i.e.:

1. Re-compilation of Macedonian earthquake catalogue;
2. Testing of selected SMA models against parameters of regional SM data; and,
3. Procurement of the SM instruments, selection of station sites and assurance of additional budget for construction of facilities to accommodate SM instruments.

E.1 Major Accomplishments

All activities related to re-compilation of Macedonian earthquake catalogue have been completed. The final catalogue to be adopted at 5th SfP 983054 Workshop, to be organised in conjunction with International conference "Banja Luka Earthquake – 40 Years of Engineering Experience", 25-28 October, 2009, Banja Luka, Bosnia and Herzegovina

Testing of selected SMA models against parameters of regional SM data has been completed. As acceptable attenuation relation for implementation proposed is: Akkar & Bommer (2007) ground motion attenuation (GMA) models that, based on 532 accelerograms from the strong-motion databank from Europe and the Middle East, in consistent way provide attenuation models for PGA and Spectral displacements. In addition, the proposed models are later enhanced by (Akkar & Bommer /2007/) by PGV model derived from the same data set. Irrespectively of the proposal, IZIIS study does not limit application of any other GMA model if consensuses by all participants.

Procurement of SM instruments (12) is completed. Thanks to the courtesy of Guralp LTD, instead 12, received are 13 last generation accelerograph units together with generous offer that Guralp engineers assist in installation. Selection of station sites is completed, and presently locations are under negotiation with relevant authorities.

All assessments of seismic hazard of Macedonia are completed, including tectonic, neotectonic and relevant seismic data.

E.2 Milestones for the next six months

In the next six months of the project performance the following tasks shall be completed:

1. Definition of seismic zones following smoothed seismicity approach,
2. Analytical studies of seismic hazard using OHAZ, EZ-FRISK, other software
3. Ground noise and geophysical measurements at defined accelerograph sites, completion of installation of 13 strong motion accelerograph stations,
4. Development and GIS mapping and analysis capability and elaboration of needed GIS layers,

5. Participation at International conference “Banja Luka Earthquake – 40 Years of Engineering Experience”, agenda: (1) Promotion of NATO SfP 983054 achievements, and (2) participation at 5th SfP 983054 Workshop, 25-28 October, 2009, Banja Luka, Bosnia and Herzegovina
6. Obligations undertaken at 5th SfP 983054 Workshop.

E.3 Involvement of young scientists

From the beginning of the project, two young scientists (Ms. Radmila Salic, MSc. and Ms. Irena Gjorgjeska) were involved in realization of project activities.

Ms. Radmila Salic, assistant in IZIIS-Skopje, is well progressing with her PhD. Thesis: "Advanced Approach to Seismic Hazard Assessment of Republic of Macedonia (Working Title)".

Her formal administrative application for commencement of the elaboration of Doctoral Thesis works in accordance with the Statute of the University “Ss. Cyril and Methodius” http://www.ukim.edu.mk/dokumenti_m/23_Statut-UKiM.pdf was submitted in July 2009.

On its session held on 17.07.2009, the Scientific Council of UKIM-IZIIS nominated Committee for Evaluation of the Compliance of Doctoral Thesis and the Capability of the Candidate:

- Prof. Dr. Snezana Stamatovska, president
- Prof. Dr. Zoran Milutinovic, mentor, member
- Prof. Dr. Dragi Dojcinovski, member

mandated to, in accordance with the Article 237 of the UKIM Statute, evaluate the compliance and scope of the Doctoral Thesis proposed under the working title “Advanced Approach to Seismic Hazard Assessment for Republic of Macedonia” and the capability of the Candidate against requirements of the Article 237 of the UKIM Statute, as well as elaborate the report and publish it in the Bulletin of University “Ss. Cyril and Methodius” in Skopje.

The Report of the Committee for Evaluation of the Compliance of Doctoral Thesis and the Capability of the Candidate, is published in Bulletin of University “Ss. Cyril and Methodius” No. 969 of 1 September 2009 (Annex C), and accepted by UKIM-IZIIS Scientific Committee on its session held on 16.09.2009 year (Decision 09-1620/1 of 22.09.2009).

Ms. Radmila Salic is presently on her study training at GFZ German Research Centre for Geosciences, Helmholtz Centre Potsdam under the advisory of Prof. Dr. J. Zschau, Director of GFZ.

Ms. Irena Gjorgjeska, in September 2009, submitted the formal administrative application to the Scientific Council of UKIM-IZIIS for commencement of the elaboration of Master Thesis. It is expected that the Committee for Evaluation of the Compliance of Master Thesis and the Capability of the Candidate will be nominated on the next session of the UKIM-IZIIS Scientific Committee, scheduled to be held in October-November 2009.

E.4 Actions insuring implementation of results

The main objective of the project is producing the harmonized Seismic Hazard Map as National Annex that conforms to EU standards (i.e. Euro code 8) that shall be adopted by Macedonian structural design and construction legislation.

Along this line, IZIIS continue with collaboration with Macedonian Institute for Standardization (ISRM; <http://www.isrm.gov.mk>) established in 2007, in particular within the Working Group 8 (TC/WG8): Design of Structures for Earthquake Resistance.

E.5 Major travels

In the reporting period travels were dominantly related to training activities, i.e.:

1. GIS software training (Divčibare/Valjevo), Serbia, 21 – 23 April 2009, participated by Prof. Dr. Zoran Milutinovic, Ms. Radmila Salic, MSc. and Ms. Irena Gjorgjeska, student.
2. Training of Ms. Radmila Salic at GFZ German Research Centre for Geosciences, Helmholtz Centre Potsdam, 1.09. – 23.12, 2009.

E.6 Visibility of SfP project

The project and ongoing activities have several times been mentioned on national television by Macedonian project Co-Director Prof. Mihail Garevski and Prof. Zoran Milutinovic. A comprehensive article has been published in "PORTA" – Journal of Civil construction, Architecture and Ecology.

The Project was reported and promoted on the several meetings of EUR-OPA Major Hazard Agreement and the Annual Board of Directors of the Network of Specialized Euro-Mediterranean Centers of Councils' of Europe Major Hazard Agreement (EUR-OPA MHA).

Further promotion will be made on the Annual Meeting of the Permanent Correspondents of EUR-OPA MHA to be held in Dubrovnik, Croatia, period: October 16-18, 2009. It is hoped that promotion at this very particular meeting will be helpful for rising an additional budget of about 6,000€ for the year of 2010.

E.7 Technical and administrative difficulties

There were no technical and administrative difficulties in project realization.

E.8 Changes in personnel

No changes in this period

E.9 Changes in project plan

There were no changes in project realization regarding the project plan.

F) SERBIA

In the period April 2009/ September 2009, Seismological Survey of Serbia conducted the tasks in accordance with the Project structure and activities. The most important activities in the past six month period have been: a) final overlay and compilation of earthquake catalogue; b) seismic source investigation and determination; b) analysis of available ground motion prediction models, c) comparative seismic hazard assessment using different GMP models using OHAZ software, d) assigning stipend for the young researcher.

F.1 Major Accomplishments

Within Working Package 1 (WP 1.– Preparation and compilation of earthquake catalogue data), the participants from our institution finished national earthquake catalogue, which involved: survey of available catalogues; re-assessment of historical earthquakes and fulfillment of missing data; investigation of the national catalogue completeness according to accepted magnitude threshold and de-clustering of the catalogue.

Unification of magnitudes is mostly performed by conversion of M_s to M_w . According to the analysis of magnitudes published in ISC it was deduced that there are 180 earthquakes with M_s and m_b pair of magnitudes. Using published relations for a conversion magnitudes to M_w , based on M_s - m_b pairs, by the regression analysis L2 normalised, the relation for magnitude conversion is defined (presented in previous six month report).

Within WP 2 (Seismic source investigation and determination), seismic sources for the territory of Serbia and surroundings have been investigated. Preliminary source zones are determined and recurrences of earthquakes inside the identified seismic source zones have been defined.

Within WP 3.(Determination of ground motion prediction model), available GMP models have been tested: Sabetta, 1996; Ambraseys et al., 1996; vertical acceleration Ambraseys and Douglas, 2000. The result was significant difference in calculated acceleration. New attenuation relations will be derived and tested using isoseismal maps for the strongest earthquakes. Also, attenuation relations for two different regions will be attempted. The decision should be made which prediction model will be used.

Within WP 4 (Seismic hazard assessment), besides for several construction sites mentioned in previous report, tentative calculation of seismic hazard for the territory of Serbia has been performed, based on available data (Fig.1). Alternative software OHAZ 6.0 has been adapted.

Within WP 5 (Preparation of GIS background and thematic maps), the activities regarding seismotectonics elaboration continued. Digital map with the main tectonic faults on the territory of Serbia have been performed, in cooperation with the Department for Remote Sensing Geology from the Faculty for Mining and Geology at Belgrade University. All of the templates was processed and prepared up to the level suitable for the interpretation. Seismic data were compared with tectonics, morphology and geological map. It has been concluded that the resulting rupture model should be supplemented and templates readjusted with digital elevation model in the same referent system.

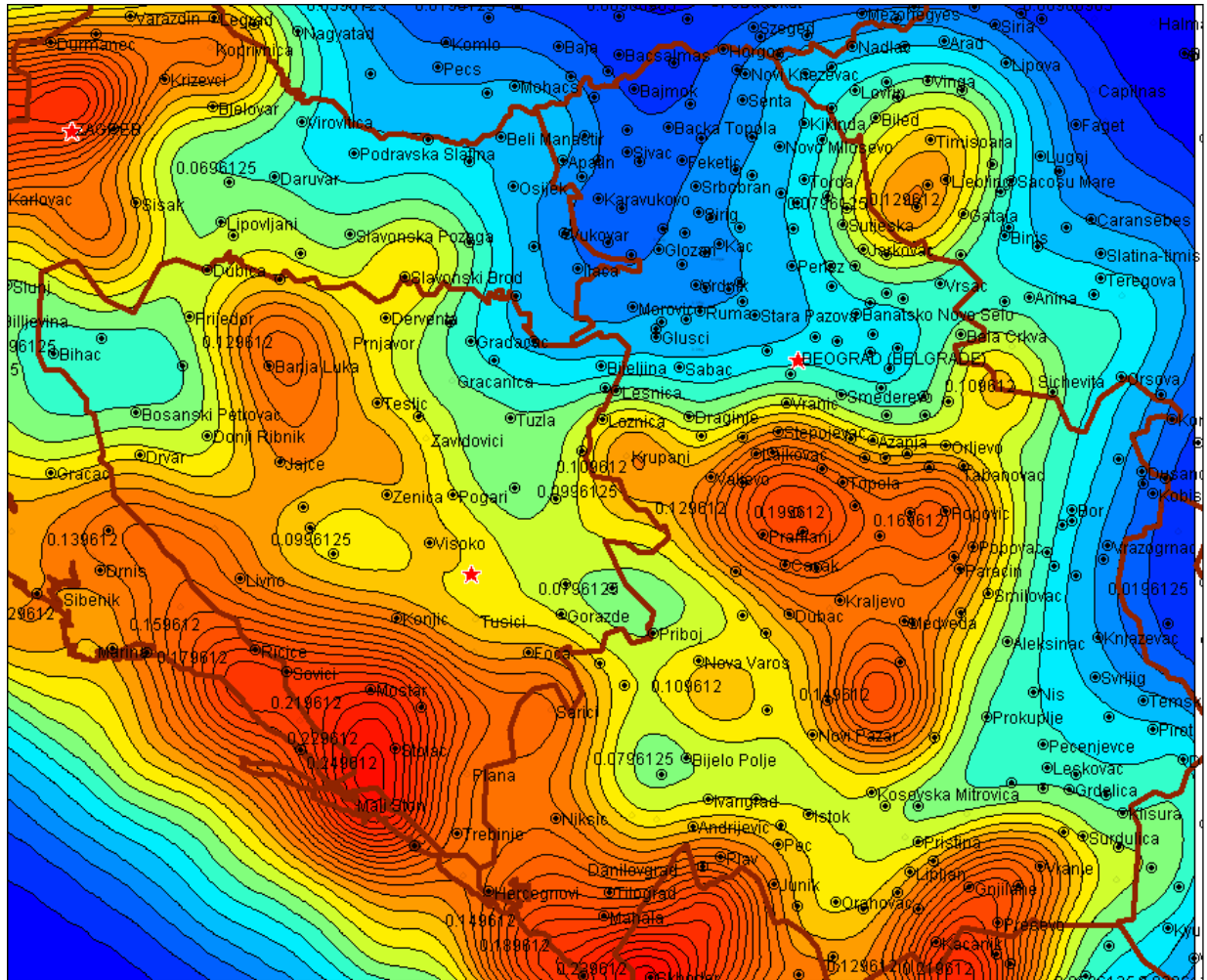


Fig. 1 - Seismic Hazard Map of the Serbia and surroundings; isolines and colors represent peak horizontal ground accelerations in g units

Within WP 6 (Equipment purchase and deployment), Seismological Survey of Serbia received twelve (12) units of strong motion instruments; model ETNA on August 11, 2008. Since all of the units have been successfully deployed, the remaining activity which should be achieved by the end of next six month period is investigation of instrument site characteristics. This task shall be carried out in cooperation with choosed geophysical institution. Constant field monitoring of recording accuracy and coping of recorded data are conducted.

We take for an important achievement the Project of modernization of Bosnia and Herzegovina in seismic equipment which is approved in July 2009 by the Slovakian government. The Project is approved after the initiative which have began two years ago in Belgrade when the specification is defined considering the present seismic sensors in B&H and expert opinion of Slovakian colleagues. Those preparatory activities resulted in acceptance of 8 digitizers, type Wave and 2 acquisition computers for two seismological centers. In cooperation with RHMZ from Banja Luka, preparation of seismic sensors (modification and calibration) was initiated. In addition, we have installed shared seismic station in Doboju, Republic Srpska and in Serbia at Fruska Gora, conjoint equipment is installed at seismic station. Also, we initiated a selection of internet provider for conjoint equipment.

Within WP 7 (Software purchase), "MapInfo +Vertical Mapper" GIS software has been acquired and is already in use. Software for analysis of strong motion data has been received with strong motion instruments and the recorded data have been

analyzed using this software. OHAZ 6.0 software is already used for the assessment as it was mentioned earlier.

Within WP 8 (Project coordination activities), participants have communicated in order to make agreement on next workshop.

Within WP 9.(Training of young scientists), according to the previous agreement, we have organized joint training course on GIS software application. The training was held at Divcibare, on April 21-23, 2009. Participants from all institutions successfully took part in training activities.

F.2 Actions to insure the implementation of results

All the relevant results derived from the Project activities are implemented in seismic hazard assessment for the regional spatial plans and for the design of earthquake resistant structures within the scope of the projects of local civil engineering companies.

F.3 Milestones for the next six months

In the next six months of project realization, the following tasks should be accomplished: investigation of instrument site characteristic, purchasing of licensed software for seismic hazard assessment such as EZ FRISK; further identification of seismic source zones and analysis of earthquake recurrence inside identified seismic source zones; investigation of available GMP models and the comparison of the results.

F.4 Involvement of young scientists

Young researcher, Natasha Kotur, B.S. in geophysics, has been involved in Project activities since February 2009. In the next six month period the young researcher will participate in Project tasks.

Young researcher Srdjan Kostic, student (9. semester) at the Faculty of Mining and Geology at Belgrade University, have been selected to be a stipendiary. The Contract for the stipend assigning has been made and signed by both sides. Stipendiary will be involved in Project activities in next one year period.

Two young researchers, Goran Kronic and Stepa Petrovic-Cacic were participants of training course on GIS software application.

F.5 Major travels

Participants traveled to workshops in Podgorica, Ljubljana, Skopje and Budva since the start of the Project. There were no major travels in the past six month period.

F.6 Visibility of SfP project

All activities of the Seismological Survey of Serbia are being announced and updated on the official web site, in national media and through cooperation with civil engineers in seismic hazard assessment at the construction sites. The journalists from local newspaper were present during the training course in April at Divcibare and they reported important facts concerning Project activities.

F.7 Technical and administrative difficulties

There were no technical and administrative difficulties in Project realization.

F.8 Changes in personnel

There were no changes in personnel.

F.9 Changes in project plan

There were no changes in Project plan.

G) TURKEY

During the 4th 6-month period, the NPD, Prof. Akkar, continued to undertake the administrative responsibilities of the project together with the PPD, Prof. Glavatovic. He presented the overall progress of the project in Zurich during the kick-off meeting of the SHARE (Seismic Harmonization of Europe) project. He also invited a representative of the BSHAP project to participate in the 2nd Euro-Mediterranean Accelerometric Data Exchange and Archiving Workshop that will be held in his institution during November 10-12 2009. This way the objectives and achievements of the project can be spread to the seismological community in Europe.

Prof. Akkar is still awaiting for the unanimous decision of all participating countries for conducting a course on strong-motion data processing that has been under discussion for the last two periods of the project.

FINANCIAL STATUS

6.1 Annex 4a: SfP NATO BUDGET TABLES

A) MONTENEGRO

Project number: SfP - 983054	Project short title: SfP - BSAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2009	Duration of the Project ¹ :	1.10.09. 2007 – 1.10. 2010 / 3 years
Project Co-Director: Prof Branislav Glavatovic, Podgorica, Montenegro		

Detailed Budget Breakdown <i>(to be completed in EUR³)</i>	ACTUAL EXPENDITURES		FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 31.03. current year	(2) for the following six months	(3) for the following period until project's		
(a) Equipment					
(A1) Three integrated weak and strong motion instr.	44,418	4,999			
(A2) Installation	780	1,803			10% on hold calculated according to currency rate US\$=0.68055 EUR.
Subtotal "Equipment"	45,198	6,802			
(b) Computers - Software					
(B1) PC laptop and Printer	1,574	1,081			
(B2) Norton fire wall and antivirus, avira AntiVir premium software	65				
(B3) PC monitor	750				
(B4) EZ FRISK licence		2,000	500		
(B5) GIS licence"MapInfo Professional 9.5"+DMT	1,890				
(B6) GIS licence"Vertical Mapper"	1,840				
Subtotal "Computers - Software"	6,119	3,081	500		
(c) Training					
(C1) Training of three younger researchers	5,098	3,000	902		3000 Eur not spent in 1 st year redirected to 2 and 3 year
Subtotal "Training "	5,098	3,000	902		
(d1) Books and Journals (global figure)	420	80			
(d2) Publications (global figure)					
Subtotal "Books - Publications"	420	80			
(e) Experts - Advisors					
(E1) Mr. Mladen Zivcic from ARSO, Slovenia to Project Official Launching	769		1,231		231 Eur not spent in 1 st year redirected to following period
Subtotal "Experts - Advisors "	769		1,231		
(f) Travel					
(F1) Meetings	4,675	1,825	2,500		
(F2) Conferences	2,140	1,860			
Subtotal "Travel"	6,815	3,685	2,500		
(g) Consumables - Spare parts:	1,010	490	500		
Subtotal "Consumables - Spare parts"	1,010	490	500		
(h) Other costs and (i) stipends (specify)					
(H1)Web:design, domain registration and one year lease	1301	199			
(H2) Mailing costs- DHL service etc.	452	148	150		
(H3)Missellaneous	1,790	960	1,000		
(I1)Stypends for Ms Ljiljana Vucic	3,750	900	750		
(I2)Stypends for Ms Jadranka Mihaljevic	3,750	900	750		
Subtotal "Other costs"	11,043	3,107	2,650		
TOTAL (1), (2), (3):	76,472	20,245	8,283		
CURRENT COST OUTLOOK =(1)+(2)+(3)			105,000		

B) ALBANIA

Project number: SFP - 983054	Project short title: SFP - BSHAP	Harmonization of Seismic Hazard Maps for West. Balkan Countries
Report date: 01 October 2009.	Duration of the Project ¹ :	1.10.09. 2007 – 1.10.2010 / 3 years
Project Co-Director: Prof. Ismail Hoxha, PhD in Geoinformatics, Albania		

Detailed Budget Breakdown <i>(to be completed in EUR³)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved Project Plan
	(1) from start until 31.08. / 31.03. (current year) ²	(2) for the following six months	(3) for the following period until project's end	
(a) Equipment				
(A1) <i>Guralp Systems CMG-5T Sensor & CMG-5TSM</i>	20845	22090		40%+10% o hold stated according to currency rate 1USD eq. 0.68EUR
(A2) <i>Installation</i>		2370		
Subtotal "Equipment"	20845	24460		
(b) Computers - Software				
(B1) <i>2 PC laptops</i>		2,000		
(B2) <i>2 printers</i>		1,000	1,000	
(B3) <i>1 computer code EZ- FRISK</i>		1,000	1,500	
(B4) <i>1 license for GIS software</i>	3730			
Subtotal "Computers - Software"	3730	4,000	2,500	
(c) Training				
(C1) <i>Training of three younger researchers</i>	986	2,000	5,500	
(C2) <i>Study tours for two younger researchers</i>			3,000	
Subtotal "Training "	986	2,000	8,500	
(d) Books and Journals				
(d1) <i>Books and Journals</i>		1,000	1,000	
Subtotal "Books - Publications"		1,000	1,000	
(e) Experts - Advisors				
(E1) <i>Invited</i>		1,000	1,000	
Subtotal "Experts - Advisors "		1,000	1,000	
(f) Travel				
(F1) <i>Meetings</i>	8429	750	3,200	
(F2) <i>Conferences</i>		1,000	2,000	
Subtotal "Travel"	8429	1,750	5,200	
(g) Consumables - Spare parts:		1,000	2300	
Subtotal "Consumables - Spare parts"		1,000	2300	
(h) Other costs and (i) stipends (specify)				
(I1) <i>Stypends for two young scientists</i>	2,100	2100	2100	
Subtotal "Other costs"	2,100	2100	2100	
TOTAL (1), (2), (3) :	36090	37310	22600	Total budget reduced for 1.800 Euros according to Grant Letter
CURRENT COST OUTLOOK = (1)+(2)+(3)		96,000		

C) BOSNIA AND HERZEGOVINA

Project number: SfP - 983054	Project short title: SfP - BSHAH	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2009	Duration of the Project ¹ :	1/10/2007 – 1/10/2010
Project Co-Director:	Mr. Amer Zoranic, Sarajevo, Bosnia and Herzegovina	
3 years		

Detailed Budget Breakdown <i>(to be completed in EUR²)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 31.03. current year	(2) for the following six months	(3) for the following period until project's	
(A) Equipment				
<i>(A1) Three seismograph stations for the national network & (A2) five strong-motion accelerograph for the national strong-motion network improvement</i>	63,191	7,309		<i>Equipment 10% payment calculated according to currency rate 1\$=0.68055 EUR</i>
Subtotal "Equipment"	63,191	7,309		
(B) Software				
<i>(B1) EZ-FRISK licence with two years extension</i>		2,500		
<i>(B2) GIS software-Mapinfo+Vertical Mapper</i>		5,100		
Subtotal "Computers - Software"		7,600		
(C) Training				
<i>(C1) Training of two young researches</i>		2,000	1,000	
Subtotal "Training "		2,000	1,000	
(E) Experts - Advisors			1,000	
Subtotal "Experts - Advisors "			1,000	
(f) Travel				
<i>(F1) Meetings</i>	3,989	1,511	2,500	
<i>(F2) Conferences</i>		1,500	1,000	
Subtotal "Travel"	3,989	3,011	3,500	
(h) Other costs and (i) stipends (specify)				
<i>(h) Other costs</i>		1,000	1,000	
<i>(i) stipends</i>	1,800	1,800	1,800	
Subtotal "Other costs"	1,800	2,800	2,800	
TOTAL (1), (2), (3) :	68,980	22,720	8,300	
CURRENT COST OUTLOOK =(1)+(2)+(3)	100,000			

D) CROATIA

Project number: SfP - 983054	Project short title: SfP -	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries (BSHAP)
Report date: 30.09.2009	Duration of the Project ¹ :	31.10.2007 – 31.10.2010 / 3 years
Project Co-Director: Vlado Kuk, Zagreb, Croatia		

Detailed Budget Breakdown <i>(to be completed in EUR²)</i>	ACTUAL EXPENDITURES		FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 31.03. current year	(2) for the following six months	(3) for the following period until project's		
(a) Equipment					<i>I. 1 USD = 0.68055 EUR . The over Equipment cost exceeded since the 40+10% payment risen over the \$/EUR currency rate change. II. Due to the State Budget reduction, the costs of the site preparation for new stations can not be covered from State Budget, as planed earlier</i>
(A1) Two integrated systems (weak / strong motion)	54,080	8,932.50			
(A2) Three weak motion seismographs					
(A3) Site preparation for seismological stations		1,067.50			
Subtotal "Equipment"	54,080	10,000			
(b) Computers - Software					
(B1) EZ FRISK licence		2,000	500		
(B2) GIS licence "Mapinfo Professional 9.5" + DMT	1,890				
(B3)GIS licence "Vertical Mapper"	1,840				
Subtotal "Computers - Software"	3,730	2,000	500		
(c) Training					
(C1) Training of one younger researchers		1,000			
Subtotal "Training "		1,000			
(f) Travel					
(F1) Meetings	8,137	1,000	2,603		
Subtotal "Travel"	8,137	1,000	2,603		
(h) Other costs and (i) stipends (specify)					
(I1)Stypends for Mr Kresimir Kuk	3,600	900	450		
(I2)Stypends for Mr Josip Stipcevic	3,600	900	450		
(I2)Stypends for Mr Tomislav Fiket	1,350	900	450		
(I3)Stypends for Mr Snjezan Prevolnik		900	450		
Subtotal "Other costs"	8,550	3,600	1,800		
TOTAL (1), (2), (3) :	74,497	17,600	4,903		
CURRENT COST OUTLOOK =(1)+(2)+(3)		97,000			

E) MACEDONIA

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2009.	Duration of the Project ¹ :	1.10.09. 2007 – 1.10. 2010 / 3 years
Project Co-Director: Prof. Mihail GAREVSKI, Skopje, Macedonia		

Detailed Budget Breakdown <small>(to be completed in EUR²)</small>	ACTUAL EXPENDITURES		FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 31.03. current year (current) year ²		(2) for the following six months	(3) for the following period until project's	
(a) Equipment					
(A1) Guralp System Ltd	18,726		17,383	4,346	<i>on hold summ estimated EUR/1USD=1.3425</i>
(A2) Instalation costs				8,545	
Subtotal "Equipment"	18,726		17,383	12,891	
(b) Computers - Software					
Dell Latitude E4300	2,160				
MapInfo&Vertical Mapper	3,730				
EZ FRISK SH software			2,500		
HP Designjet 510ps 42-in	3,599				
Network card for HP Designjet 510ps 42-in	425			386	
Subtotal "Computers - Software"	9,914		2,500	386	
(c) Training					
Dr. Z. Milutinovic, Ig, Slovenia	140.00				
MSc. R. Shalic, Ig, Slovenia	175.00				
Dr. L. Pekeski, Ig, Slovenia	182.20				
MSc. R. Salic, Ljubljana, Slovenia	168.00				
Ms. I. Gjorgjeska, Istanbul, Turkey	1,156.50				
Dr. Z. Milutinovic, Divchibare, Serbia	563.62				
MSc. R. Shalic, Divchibare, Serbia	426.06				
Ms. I. Gjorgjeska, Divchibare, Serbia	426.06				
MSc. R. Shalic, Potsdam, Germany			2,000		
Subtotal "Training "	3,237		2,000	7,763	
(f) Travel					
(F1) Meetings	4,520		3,084	3,9612	
(F2) Conferences	1,434				
Subtotal "Travel"	5,954		3,084	3,962	
(g) Consumables - spare parts					<i>Item Micheleneous redirected to Spare part and cut from 4,100 to 2,000. (rest redirected to Computers)</i>
(G2) Cartridges& paper			500.00	1,500	
Subtotal " Consumables - spare parts "			500.00	1,500	
(h) Other costs and (i) stipends (specify)					
(I1)Stypends for Ms Irena Gjorgjeska (24 months)	2,400		600	600	
(I2)Stypends for Mr Goran Jekic (24 months)	2,400		600	600	
Subtotal "Other costs"	4,800		1,200	1,200	
TOTAL (1), (2), (3) :	42,631		26,667	27,702	<i>Total budget reduced for 400 Euros according to Grant Letter</i>
CURRENT COST OUTLOOK =(1)+(2)+(3)				97,000	

F) SERBIA

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2009	Duration of the Project ¹ :	1.10. 2007 – 1.10.2010 / 3 years
Project Co-Director: Ms Svetlana Kovacevic, Belgrade, Serbia		

Detailed Budget Breakdown <i>(to be completed in EUR³)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 31.03. current year	(2) for the following six months	(3) for the following period until project's	
29200(a) Equipment				
(A1) Seven strong-motion accelerograph stations	43,000			
(A2) Accelerograph installation		7,000		
Subtotal "Equipment"	43,000	7,000		
(b) Computers - Software				
(B1) One data storage unit			1,000	
(B2) Software for creating and managing acc .data base		1,000		
(B3) Upgrade for Arc view 8.1 Gis software	4,448		52	
(B4) EZ FRISK licence			2,500	
Subtotal "Computers - Software"	4,448	1,000	3,552	
(c) Training				
(C1) Training of three younger researchers		3,000	6,000	
Subtotal "Training "		3,000	6,000	
(d1) Books and Journals (global figure)	542	1,000	1,458	
Subtotal "Books - Publications"	542	1,000	1,458	
(e) Experts - Advisors		700	1,300	
Subtotal "Experts - Advisors "		700	1,300	
(f) Travel				
(F1) Meetings	1,117	2,000	5,883	
(F2) Conferences		1000	2,500	
Subtotal "Travel"	1,117	3,000	8,383	
(h) Other costs and	289	1,000	2,211	
(i) stipends (specify)	4,500	1,500	3,000	
Subtotal "Other costs" and "Stipends"	4,789	2,500	5,211	
TOTAL (1), (2), (3) :	53,896	18,200	25,904	
CURRENT COST OUTLOOK =(1)+(2)+(3)			98,000	

G) TURKEY

Project number: SfP - 983054 Report date: 30.09.2009 Project NPD: Prof Sinan Akkar, Ankara, Turkey	Project short title: SfP - Duration of the Project ¹ :	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries 31.08 2007 – 31.08 2010 / 3 years
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Detailed Budget Breakdown <i>(to be completed in EUR³)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved Project Plan
	(1) from start until 30.04.09	(2) for the following six months	(3) for the following period until project's end	
(f) Travel				
(F1) Meetings	6,851	3,500	6,149	
(F2) Conferences	2,811	3,500	4,189	
Subtotal "Travel"	9,662	7,000	10,338	
(g) Consumables - Spare parts:	2,736	3,264	3,000	NATO-SfP office permitted to buy 2 mathematics software (SIGMAPLOT and SYSTAT) with the money allocated for this item.
Subtotal "Consumables - Spare parts"	2,736	3,264	3,000	
(h) Other costs and (i) stipends (specify)				
(H1) Contingency	561	439	500	
(H2) Administrative Costs		2,500	5,000	
Subtotal "Other costs"	561	2,939	5,500	
TOTAL (1), (2), (3) :	12,959	13,203	18,838	
CURRENT COST OUTLOOK =(1)+(2)+(3)				45,000

6.2 Annexes 4b: SfP NATO SUMMARY BUDGET TABLES

Project number: SfP -	983054	Project short title: SfP - BSHAP	Harmonization of Seismic Hazard Maps for The Western Balkan Countries
Report date:	30.09.2009	Duration of the Project ¹ :	1.10.09. 2007 – 1.10. 2010 / 3 years /
The Project is in the year (please indicate): 1 - 2 - <u>3</u>			

Breakdown per Project Co-Director			ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in financial planning compared to the approved Project Plan
	APPROVED BUDGET: Total year 1-5	CURRENT COST OUTLOOK:	since start until 31/03/ 2009 of current year ²	for the following 6 months	for the following period until project's end	
Prof Branislav Glavatovic, Podgorica, Montenegro	105,000	105,000	76,472	20,245	8,283	
Prof. Dr. Ismail Hoxha, Tirana, Albania	96,000	96,000	36,090	37,310	22,600	
Mr.Amer Zoranic, Sarajevo,B&H	100,000	100,000	68,980	22,720	8,300	
Vlado Kuk, Zagreb, Croatia	97,000	98,100	74,497	17,600	4,903	
Ms. Svetlana Kovacevic, Belgrade, Serbia	98,000	98,000	53,896	18,200	25,904	
Prof. Mihail GAREVSKI Prof. Zoran MILUTINOVIC,	97,000	97,000	42,631	26,667	27,702	
Prof. Sinan Akkar, Ankara,Turkey, PPD	45,000	45,000	12,959	13,203	18,838	
TOTAL	638,000	638,000	365,525	155,945	116,530	

Breakdown per item (to be completed in EUR ³)			ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in financial planning compared to the approved Project Plan
	APPROVED BUDGET: Total year 3	CURRENT COST OUTLOOK:	since start until 31.03. 2008 of current year ²	for the following 6 months	for the following period until project's end	
(a) Equipment.	306,000	330,885	245,040	72,954	12,891	<i>The overall sum of the purchased equipment overcame the approved figure. Additionally this item grew because of the EUR / \$ conversion rate change. Consequently the other costs have been changed so to fit the overall project sum.</i>
(b) Computers - Software	50,900	55,560	27,941	20,181	7,438	
(c) Training	61,000	46,486	9,321	13,000	24,165	
(d) Books - Publications	5,500	5,500	962	2,080	2,458	
(e) Experts - Advisors	12,000	7,000	769	1,700	4,531	
(f) Travel	104,700	103,119	44,103	22,530	36,486	
(g) Consumables - Spare parts:	19,000	16,300	3,746	5,254	7,300	
(h) Other costs and (i) stipends	78,900	73,150	33,643	18,246	21,261	
TOTAL :	638,000	638,000	365,525	155,945	116,530	638,000

6.3 Annexes 4c: Sfp NATO NATIONAL CONTRIBUTION TABLES

A) MONTENEGRO

Project number: Sfp - 983054
Project Co-Director: Prof. Branislav Glavatovic, Podgorica, Montenegro
Report date: October, 2009

A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1st year	2nd year	3rd year
(a) Salaries (Name and qualification of research and support personnel)			
1. Mr. Branislav Glavatovic, Prof, director	5,000	5,000	5,000
2. Ms. Jadranka Mihaljevic, consultant in eq. engineering, civil engineer	2,000	2,000	2,000
3. Ms. Ljiljan Vucic, applied mathematician	1,500	1,500	1,500
4. Mr. Marin Cavelish, electrical engineer	2,000	2,000	2,000
5. Ms. Velisa Supic, MS geologist, senior consultant in seismology	2,500	2,500	2,500
6. Ms. Natasa Kaludjerovic, applied physicist		2,000	2,000
7. Mr. Vladan Dubljevic, MS, director of Geological Institute	5,000	5,000	5,000
Subtotal "Salaries"	18,000	20,000	20,000
(b) Overhead Costs (specify: consumables, energy, local transportation)			
(B1) Energy, local transportation etc.	500	500	500
(B2) Consumables	500	500	500
Subtotal "Overhead"	1,000	1,000	1,000
(c) Equipment - Computers			
(C1) Equipment - Computers, scanners etc.	1,000	1,000	1,500
(C2) Office tolls: photocopiers, faxmachine etc.	800	800	1000
Subtotal "Equipment"	1,800	1,800	2,500
(d) Other costs			
(D1) Local experts and consultantss	1,500	1,500	1,500
(D2) National workshops	2,000	2,000	3,000
Subtotal "Other costs"	3,500	3,500	4,500
	24,300	26,300	28,000
TOTAL :		78,300	

Name of sponsoring institution	1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

B) ALBANIA

Project number: SFP - 983054
Project Co-Director: Prof. Dr. Shyqyri Aliaj ,Tirana, Albania
Report date: October, 2008

A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1st year	2nd year	3rd year
(a) Salaries (Name and qualification of research and support personnel)			
<i>Prof. Dr. Shyqyri Aliaj , Director</i>	3,000	After the formal nomination of Project Co-Director the new team will be appointed along with the expenditures for the 2 nd and 3 rd year	
<i>Prof.Dr. Eduard Sulstarova, Secretary General</i>	3,000		
<i>Mr. JaniSkrami, Head of Dep Eng. Seism.</i>	1,000		
<i>Mr. Rexhep Koci, Geologist, MS</i>	500		
<i>Mr. Edmond Dushi, Head of Dep. of Seismic Network, MS Cand.</i>	2,000		
<i>Mr. Ilir Shinko head of Electronic Laboratory, MS Cand.</i>	1,000		
<i>Mr. Llambro Duni, Eng. Seismologist,Ass. Prof., Dr.</i>	1,000		
<i>Ms. Albana Zotaj,Head of GIS and Remote SensingDepartment</i>	500		
<i>Ms. Anuela Prifti,Specialist in GIS, MS</i>	500		
Subtotal "Salaries"	12,500	app. 12,500	app. 12,500
(b) Overhead Costs (specify: consumables, energy, local transportation)			
<i>(B1)Energy, local transportation etc.</i>	500	500	500
<i>(B2) Consumables</i>	500	500	500
Subtotal "Overhead"	1,000	1,000	1,000
(c) Equipment - Computers			
<i>(C1) Equipment - Computers, scanners etc.</i>	1,000	1,000	1,000
<i>(C2) Office tolls: photocopiers, faxmachine etc.</i>	800	800	800
Subtotal "Equipment"	1,800	1,800	1,800
(d) Other costs			
<i>(D1) Local experts and consultantss</i>	1,500	1,500	1,500
<i>(D2) National workshops</i>	2,000	2,000	3,000
Subtotal "Other costs"	3,500	3,500	4,500
	18,800	18,800	19,800
TOTAL :		57,400	

Name of sponsoring institution	1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

C) BOSNIA AND HERZEGOVINA

Project number: SfP - 983054
Project Co-Director: Mr. Amer Zoranic, Sarjevo, Bosnia and Herzegovina
Report date: October, 2009

A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1st year	2nd year	3rd year
(a) Salaries (Name and qualification of research and support personnel)			
Mr. Amer Zoranic	5,000	5,000	5,000
Mr. Ivan Brlek, BS	5,000	5,000	5,000
Mr. Rusmir Gorusanin, BS	3,800	3,800	3,800
Dr. Drago Trkulja	5,000	5,000	5,000
Ms. Snjezana Cvijic, BS	4,000	4,000	4,000
Mr. Sveto Vrhovac, BS	4,000	4,000	4,000
Subtotal "Salaries"	26,800	26,800	26,800
(b) Overhead Costs (specify: consumables, energy, local transportation)			
(B1) Energy, local transportation etc.	1,000	1,000	1,000
(B2) Consumables	800	800	800
Subtotal "Overhead"	1,800	1,800	1,800
(c) Equipment - Computers			
(C1) Equipment - Computers, scanners etc.	2,000	2,000	2,000
(C2) Office tolls: photocopiers, faxmachine etc.	1,600	1,600	2,000
Subtotal "Equipment"	3,600	3,600	4,000
(d) Other costs			
(D1) Local experts and consultantss	1,500	1,500	2,500
(D2) National workshops	2,000	2,000	2,000
Subtotal "Other costs"	3,500	3,500	4,500
	35,700	35,700	37,100
TOTAL :	108,400		

Name of sponsoring institution	1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

D) CROATIA

Project number: SfP - 983054

Project Co-Director: Mr.Vlado Kuk, Zagreb, Croatia

Report date: October, 2009

A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1 st year	2nd year	3rd year
(a) Salaries (Name and qualification of research and support personnel)			
1. Mr. Vlado Kuk, Ms, director	4,000	4,000	4,000
2. Mr. Marijan Herak, prof.	4,000	4,000	4,000
3. Mrs. Davorka Herak, prof.	3,000	3,000	3,000
4. Mrs. Snjezana Markusic, dr.	2,500	2,500	2,500
5. Mr. Ivo Allegretti, M.S.	2,200	2,200	2,200
6. Mr. Kresimir Maric, M.S.	2,200	2,200	2,200
7. Mr. Ivica Sovic, M.S.	2,160	2,160	2,160
8. Mr. Kresimir Kuk, B.SC.	2,000	2,000	2,000
9. Mrs. Ines Ivancic, B.SC.	2,000	2,000	2,000
10. Mr. Josip Stipcevic, B.SC.	2,000	2,000	2,000
11. Mr. Vladimir David, dr.	2,500	2,500	2,500
Subtotal "Salaries"	28,560	28,560	28,560
(b) Overhead Costs (specify: consumables, energy, local transportation)			
(B1) Energy, local transportation etc.	1,000	1,000	1,000
(B2) Consumables	500	500	500
Subtotal "Overhead"	1,500	1,500	1,500
(c) Equipment - Computers			
(C1) Equipment - Computers, scanners etc.	1,000	1,000	1,500
(C2) Office tolls: photocopiers, faxmachine etc.	1,000	1,000	2,000
Subtotal "Equipment"	2,000	2,000	3,500
(d) Other costs			
(D1) Local experts and consultants	2,000	1,000	2,000
Subtotal "Other costs"	2,000	1,000	2,000
	34,060	34,060	35,560
TOTAL :		103,680	

Name of sponsoring institution	1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

E) MACEDONIA

Project number: SFP - 983054

Project Co-Director: Prof. Dr. Mihail Garevski, Skopje , Macedonia

Report date: October, 2009

A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1 st year	2nd year	3rd year
(a) Salaries (Name and qualification of research and support personnel)			
<i>Dr. Mihail Garevski</i>	7,000	7,000	7,000
<i>Dr. Zoran Milutinovic</i>	6,000	6,000	6,000
<i>Dr. Snezana Stamatovska</i>	6,000	6,000	6,000
<i>Dr. Dragi Dojcinovski</i>	6,000	6,000	6,000
<i>Slobodan Micajkov, BS</i>	3,000	3,000	2,000
<i>Dr. Lazo Pekevski</i>	6,000	6,000	6,000
<i>Ms Radmila Salic, MS</i>	3,500	3,000	3,000
<i>Mr Kemal Edip, MS</i>	3,500	3,000	3,000
<i>Ms Irena Gjorgjeska</i>	3,000	3,000	
<i>Mr Goran Jekic</i>	1,840	1,640	1,800
Subtotal "Salaries"	45,840	44,640	40,800
(b) Overhead Costs (specify: consumables, energy, local transportation)			
<i>(B1)Energy, local transporttion etc.</i>	500	500	500
<i>(B2) Consumables</i>	500	500	500
Subtotal "Overhead"	1,000	1,100	1,000
(c) Equipment - Computers			
<i>(C1) Equipment - Computers, scanners etc.</i>	1,500	1,500	1,500
<i>(C2) Office tolls: photocopiers, faxmachine etc.</i>	800	800	1000
Subtotal "Equipment"	2,300	2,300	2,500
(d) Other costs			
<i>(D1) Accelerograph installation, site preparation,</i>		4,000	
<i>(D2) Purchase of digital and other relevant national digital data</i>	5,000		
<i>(D3) Procurement of licensed software</i>	3,500	1,500	
<i>(D4) Local experts and consultants fees</i>	1,500	1,500	1,500
<i>(D4) Organization of national workshop</i>	2,000	2,000	3,000
<i>(D5) Miscellaneous</i>	1,000	1,000	1,000
Subtotal "Other costs"	13,000	10,000	5,500
	62,140	57,940	49,800
TOTAL :		169,880	

Name of sponsoring institution	1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

F) SERBIA

Project number: SFP - 983054

Project Co-Director: Ms. Svetlana Kovacevic, Belgrade, Serbia

Report date: October, 2009

A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1 st year	2nd year	3rd year
(a) Salaries (Name and qualification of research and support personnel)			
<i>SvetlanaKovacevic,MS</i>	2200	2200	2200
<i>SlavicaRadovanovic,MS</i>	2400	2400	2400
<i>BrankoDragicevic,BS</i>	1,500	1,500	1,500
<i>VladanKovacevic,B.Sci</i>	1,500	1,500	1,500
<i>MiodragPetrovic,PhD</i>	2400	2400	2400
<i>Vidosava Knezevic,B.Sci</i>	1,400	1,400	1,400
<i>BrankaVeselinovic,BS</i>	1,400	1,400	1,400
<i>StepaPetrovicCacic, BS</i>	1,400	1,400	1,400
<i>GoranKronic, BS</i>	1,400	1,000	
<i>Dejan Valcic,BS</i>	1,400	1,400	1,400
<i>Dr MiraPetronijevic</i>		2000	2400
<i>Dr RadmilaPavlovic</i>	2400		
Subtotal "Salaries"	19.400	18.600	18.000
(b) Overhead Costs (specify: consumables, energy, local transportation)			
<i>(B1)Energy, local transporttion etc.</i>	500	500	500
<i>(B2) Consumables</i>	500	500	500
Subtotal "Overhead"	1,000	1,000	1,000
(c) Equipment - Computers			
<i>(C1) Equipment - Computers, scanners etc.</i>	3000	3000	3000
<i>(C2) Office tolls: photocopiers, fax machine etc.</i>	500	500	500
Subtotal "Equipment"	3.500	3.500	3.500
(d) Other costs			
<i>(D1) Local experts and consultants</i>		3.000	3.000
<i>(D2) Organization of national workshop</i>		2.000	2.000
Subtotal "Other costs"		5,000	5,000
	23.900	28.100	27.500
TOTAL :		79.500	

Name of sponsoring institution	1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

6.4 SFP NATO REPORT ON CO-FUNDING

REPORT ON CO-FUNDING (SfP 983054)

Initiatives Undertaken and Results Obtained for Project Co-funding

Report by: prof Branislav Glavatovic, Project Co-Director Montenegro Seismological Observatory					
Date	Organization Contacted (Name & Full Address)	Name Person Contacted (incl. telephone number; e-mail)	Results and Comments	Co-Funding	
				Duration Period	Amount
September 26, 2008	XV DPPI SEE REGIONAL MEETING,	Mr. Miroslav Vujanic, DPPI Office, Srajevo	Reccomandation to contact national UNDP offices		
February 2008	Denish Emergency Managament Agency	Mr. Michael Elmquist, senior advisor, +45 45 906000 , +45 45 6060, elm@brs.dk	Co-funding realized through Bilateral Ageement between DEMA and Montenegrin Ministry of Internal affair	one year	35,000 Eur
Report by: Svetlana Kovacevic, Project Co-Director Seismological Survey of Serbia					
Date	Organization Contacted (Name & Full Address)	Name Person Contacted (incl. telephone number; e-mail)	Results and Comments	Co-Funding	
				Duration Period	Amount
December 14, 2007	Geophysical Institute, Slovak Academy of Sciences, Bratislava	Peter Labak	Agreement on preparation of Project plan for BiH	one year	8 seismic stations
Report by: Prof. Mihail GAREVSKI/Prof. Zoran MILUTINOVIC IZIIS, Skopje					
Date	Organization Contacted (Name & Full Address)	Name Person Contacted (incl. telephone number; e-mail)	Results and Comments	Co-Funding	
				Duration Period	Amount
31/03/2008	Council of Europe "European and Mediterranean Major Hazards Agreement" (EUR-OPA MHA), ECILS-Skopje	Eladio FERNANDEZ-GALIANO, Executive Secretary; Council of Europe F-67075 Strasbourg Cedex; Tel:+33.3.88.41.22.59 Fax.+33.3.88.41.27.87; e-mail : eladio.fernandez-galiano@coe.int;	ECILS Skopje on annual basis is obliged to apply for budgeting for a next year. 2007 application has been approved, and Euro 6,000 used to organize a Workshop by inviting all NATOSfP983054 countries. Application for 2008, amounting at Euro 6,000 and for the same purpose has already been submitted in February 2008 and results will be known by end of April 2008.	2007-2009	3 x 6,000 = 18,000

7. EQUIPMENT INVENTORY RECORDS

	Inventory Label No.	Property Item	Manufacturer	Model Number	Serial Number	Date of Purchase	Cost (EUR)	Location
MONTENEGRO	601	PC laptop	HP	Pavilion DV276EA	CNF7060M TD	21/09/2007	1,345 EUR	Podgorica - central station
	0603	Strong mot. Rec.	Teledyne Geotech	SMART 24A	1710	6/05/2008	10,410 \$	Dracevica
	0609	Strong mot. Rec.		SMART 24A	1698	6/05/2008	10,410 \$	Niksic
	0610	Strong mot. Rec.		SMART 24A	1714	6/05/2008	10,410 \$	Herceg Novi
	0604	Broadband seismometer KS2000M		KS2000M	630	6/05/2008	6,525 \$	Dracevica
	0607	Broadband seismometer		KS2000M	631	6/05/2008	6,525 \$	Bratogost
	0606	Broadband seismometer		KS2000M	629	6/05/2008	6,525 \$	returned to manufacturer
	0608	Digitizer		SMART 24D	1758	6/05/2008	7,690 \$	Bratogost
	0602	Digitizer		SMART 24D	1711	6/05/2008	7,690 \$	Plav
	0605	Wireless link		VIP24-110	N.N.	6/05/2008	2,320 \$	Dracevica
	0611	Wireless link		VIP24-110	N.N.	6/05/2008	2,320 \$	Sjenica
ALBANIA	0621	Strong motion sensor	GURALP SYSTEMS LIMITED	CMG-5T	T5K47	04/02/2009	1800 USD	Not yet
	0622	Strong motion sensor		CMG-5T	T5K48	04/02/2009	1800 USD	Not yet
	0623	Strong motion sensor		CMG-5T	T5K49	04/02/2009	1800 USD	Not yet
	0624	Strong motion sensor		CMG-5T	T5K50	04/02/2009	1800 USD	Not yet
	0625	Strong motion sensor		CMG-5T	T5K51	04/02/2009	1800 USD	Not yet
	0626	Strong motion sensor		CMG-5T	T5K52	04/02/2009	1800 USD	Not yet
	0627	Strong motion sensor		CMG-5T	T5K53	04/02/2009	1800 USD	Not yet
	0628	Strong motion sensor		CMG-5T	T5K54	04/02/2009	1800 USD	Not yet
	0629	accelerograph		CMG-5TD	T5L73/A127 0	04/02/2009	4880 USD	Not yet
	0630	accelerograph		CMG-5TD	T5L66/A1269	04/02/2009	4880 USD	Not yet
	0631	accelerograph		CMG-5TD	T5L51/B837	04/02/2009	4880 USD	Not yet
	0632	accelerograph		CMG-5TD	T5L72/A1272	04/02/2009	4880 USD	Not yet
	0633	accelerograph		CMG-5TD	T5L68/A1183	04/02/2009	4880 USD	Not yet
	0634	accelerograph		CMG-5TD	T5L52/B747	04/02/2009	4880 USD	Not yet
	0635	accelerograph		CMG-5TD	T5L71/A1007	04/02/2009	4880 USD	Not yet
	0636	accelerograph		CMG-5TD	T5L70/A1271	04/02/2009	4880 USD	Not yet
	0637	accelerograph		CMG-5TD	T5L67/A1348	04/02/2009	4880 USD	Not yet
	0638	accelerograph		CMG-5TD	T5L69/C082	04/02/2009	4880 USD	Not yet
SERBIA	0681	accelerograph	Kinematics Inc.	ETNA	6441	25.06.2008.	4,300	Valjevo
	0682	accelerograph	Kinematics Inc.	ETNA	6444	25.06.2008.	4,300	Gruza
	0683	accelerograph	Kinematics Inc.	ETNA	6438	25.06.2008.	4,300	Zajecar
	0684	accelerograph	Kinematics Inc.	ETNA	6439	25.06.2008.	4,300	Radoinja
	0685	accelerograph	Kinematics Inc.	ETNA	6443	25.06.2008.	4,300	Svilajnac
	0686	accelerograph	Kinematics Inc.	ETNA	6437	25.06.2008.	4,300	Banatski Dvor
	0687	accelerograph	Kinematics Inc.	ETNA	6440	25.06.2008.	4,300	Sjenica
	0688	accelerograph	Kinematics Inc.	ETNA	6433	25.06.2008.	4,300	Novi Pazar
	0689	accelerograph	Kinematics Inc.	ETNA	6434	25.06.2008.	4,300	Sabac
	0690	accelerograph	Kinematics Inc.	ETNA	6435	25.06.2008.	4,300	Zavoj
	0691	accelerograph	Kinematics Inc.	ETNA	6436	25.06.2008.	4,300	Jagodina
	0692	accelerograph	Kinematics Inc.	ETNA	6442	25.06.2008.	4,300	Gornjak

	Inventory Label No.	Property Item	Manufacturer	Model Number	Serial Number	Date of Purchase	Cost (EUR)	Inventory Label No.
CROATIA	0641	Data acquisition sys.	GURALP SYSTEMS LIMITED	CMG-DAS-000	2032/A1310	27/01/2009	3.260	Not yet permanently placed.
	0642	Data acquisition sys.		CMG-DAS-000	2035/A1312	27/01/2009	3.260	
	0643	Data acquisition sys.		CMG-DAS-000	2034/A1305	27/01/2009	3.260	
	0644	Data acquisition sys.		CMG-DAS-000	2031/A1311	27/01/2009	3.260	
	0645	Data acquisition sys.		CMG-DAS-000	2039/A1303	27/01/2009	3.260	
	0646	Data acquisition sys.		CMG-DAS-000	2037/A1307	27/01/2009	3.260	
	0647	Data acquisition sys.		CMG-DAS-000	2040/A1309	27/01/2009	3.260	
	0648	Data acquisition sys.		CMG-DAS-000	2036/A1324	27/01/2009	3.260	
	0649	Accelerometer		CMG-5	T5K32	27/01/2009	1.250	
	0650	Accelerometer		CMG-5	T5K33	27/01/2009	1.250	
	0651	Weak-motion seismometer		CMG-C3E-0008	T35740	27/01/2009	4.700	
	0652	Weak motion seismometer		CMG-C3E-0008	T35761	27/01/2009	4.700	
	0653	Weak motion seismometer		CMG-C3E-0008	T35741	27/01/2009	4.700	
	0654	Weak motion seismometer		CMG-C3E-0008	T35762	27/01/2009	4.700	
	0655	Weak motion seismometer		CMG-C3E-0008	T35742	27/01/2009	4.700	

MACEDONIA	Not assigned yet	accelerometer with 24-bit resolution digitizer	Guralp Systems	CMG - 5TD	T5L53/A1339 G 9895 N/A	February, 2009	€ 3,622 (4,862 USD)	Not Yet (Pehcevo)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L54/A1344 G 9896 N/A		€ 3,622 (4,862 USD)	Not Yet (Gevgelija)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L55/A1340 G 9897 N/A		€ 3,622 (4,862 USD)	Not Yet (Bitola)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L56/A1338 G 9898 N/A		€ 3,622 (4,862 USD)	Not Yet (Ohrid)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L57/C770 G 9899 N/A		€ 3,622 (4,862 USD)	Not Yet (Debar)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L58/A1341 G 9900 N/A		€ 3,622 (4,862 USD)	Not Yet (Tetovo)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L59/C771 G 9901 N/A		€ 3,622 (4,862 USD)	Not Yet (Valandovo)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L60/A1343 G 9902 N/A		€ 3,622 (4,862 USD)	Not Yet (Sk.-Gov. Building.)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L61/A1342 G 9903 N/A		€ 3,622 (4,862 USD)	Not Yet (Sko.-Parl.Buil.)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L62/A1347 G 9904 N/A		€ 3,622 (4,862 USD)	Not Yet (Skopje - President's Residence)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L63/A1345 G 9905 N/A		€ 3,622 (4,862 USD)	Not Yet (Airport Petrovec)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L64/A1346 G 9906 N/A		€ 3,622 (4,862 USD)	Not Yet (Strumica)			
		CMG-5T accelerometer with CMG-DM24 24-bit resolution digitizer			T5L65/A1184 G 9907 N/A		€ 3,622 (4,862 USD)	Not Yet (decided)			
		Dell Latitude E4300			DELL		E4300	02804-877GX-7Y16R-FY976-PVHBM	March, 2009	€ 2,160	ECILS/Skopje
		HP Designjet 510ps 42-in			HP		HP510ps	N/A	April, 2009	€ 3,600	ECILS/Skopje
Network card for HP Designjet 510ps 42-in	HP	J7961G HP Jet direct 635n IPv6/IPsec Gigabit	N/A	April, 2009	€ 425	ECILS/Skopje					

8. CRITERIA FOR SUCCESS TABLE

Project number: 983054	Project short title:
Report date: September 30, 2009.	Duration of the Project : 1.10.2008-1.10.2010 /3 years/
The Project is in the year : 1 - 2 - 3	

Criteria for Success as approved with the first Grant Letter on: 20-06-2007	%	Criteria for Success: Achievements as at 1.10. / 31.03. of current year ³ (changes should be reflected here)	%
1) Consistent GIS database of earthquake catalogue information for the participating countries	15	1) Earthquake catalogues of participating countries with threshold magnitude 3.0 collected; magnitude type unified	10
2) Unique seismotectonical regional GIS database	15	2) Presented all available seismotectonical data related to referred region	5
3) Hazard assessment applying unified methodological approach consistent to EU standards and GIS hazard maps	35	3) First preliminary hazard results from testing of OHAZ software for the territory of Montenegro and Serbia	4
4) Seismic instruments deployments and integration into national networks	30	4) The 50% of advance payed for the instruments for all the countries. Some of the countries already installed equipment.	20
5) Dissemination of the results	5	5) Web presentation operable and regularly updated	3
TOTAL :	100%	TOTAL :	42%

SUMMARY REPORT

SfP – BSHAP

SfP – 983054

Project Co-Directors: *Prof. Sinan Akkar, METU, Ankara, Turkey (NPD)*

Prof. Branislav Glavatic, MSO, Podgorica, Montenegro (PPD)

Prof. Ismail Hoxha, Institute of Geosciences, Tirana, Albania (PPD)

MS Vlado Kuk, Faculty of Sciences, Zagreb, Croatia (PPD)

Amer Zoranic, Ministry of Civil Affairs, Sarajevo, Bosnia and Herzegovina (PPD)

Prof. Mihail Garevski, IZIS, Skopje, FYR Macedonia (PPD)

MS Svetlana Kovacevic, Seismological Survey of Serbia, Belgrade, Serbia (PPD)

Approval Date: 20th July 2007 Effective Date: 1st October 2008

Duration: 3 years till 1st October 2010

NATO Budget: 638 000 EUR

Information about the SfP Project through Internet: www.wbseismicmaps.org

Abstract of Research

Seismic hazard maps for the territory of participating Western Balkan countries will be realized. In the methodological approach unified earthquake catalogues, seismotectonic data and a consistent ground motion prediction model will be implemented to the probabilistic seismic hazard analysis. The output ground-motion parameter(s) describing the seismic hazard in the region will be provided that is consistent with the EUROCODE 8 and the design regulations of the countries involved in the project. All seismic input and output results will be presented through a consistent GIS database. Future researches in this field will be enhanced by new data collected by seismic instruments that will be deployed within this project realization.

Major Objectives

- *Establishing complete and consistent GIS database for the regional earthquake catalogue, seismotectonics and seismic hazard.*
- *Methodological improvement and harmonization of seismic hazard maps of the participating countries to surmount the existing artificial differences in the cross-border seismic hazard levels.*
- *Improvement of existing seismic monitoring networks through the deployment of strong- and weak-motion stations in the participating countries.*
- *Providing a consistent background for tailoring the seismic provisions of the participating countries harmonized with EU standards (Eurocode 8).*
- *Establishing active scientific collaboration between the participating countries, and training of future-promising young scientists in earthquake-hazard related topics,*
- *Publishing the major project findings that include the improved seismic hazard maps to share the outcomes with the seismological and engineering community.*
- *Encouraging the implementation of harmonized and upgraded seismic hazard maps by the concerned civil authority of each participating country to improve the seismic safety and seismic risk management.*

Overview of Achievements since the Start of the Project until 30 September of current year

- *The complete earthquake catalogue information with threshold magnitude 3.0 was collected for the territory of involved countries; Agreements on providing earthquake catalogues have been reached with neighboring countries: Greece, Bulgaria, Romania,*
- *Magnitude scaling for the unified earthquake catalogue has been adopted,*
- *Unified earthquake catalogue was filtered from the dependant earthquake events (foreshocks and aftershocks),*
- *Training of last version of Software OHAZ 6.1 was realized during the Ig workshop, sponsored by ARSO, Slovenia. The essential elements about the calculation procedure, type and format of input data were explained; First results in computing seismic hazard for the territories of Montenegro and Serbia are assessed.*
- *Upon of the International bidding call procurement of the instruments is done; some of the instruments already installed; the site preparations are ongoing.*
- *Memorandum on real-time data exchange was signed, as well as Memorandum on further development of OHAZ software source code. The selected numbers of GMP formulas are implemented in OHAZ software.*
- *The GIS software licences are purchased; training in GIS is realized in coordination with project partner from Serbia. Compiled earthquake catalogues and the seismotectonic information will be implemented to the GIS software.*

Payments through NATO Funds: 372.211 EUR

Milestones for the Next Six Months

- *Compilation of unified earthquake catalogue will be adopted.*
- *Results of various GMP models applicability to the region will be presented.*
- *The zones of the region where sufficient information on seismotectonics are available will be delineated and accordingly defined.*
- *The thematic GIS maps of earthquake catalogue, sesimotronics etc to be integrated for the region.*
- *The preparation of sites for the deployment of seismic instruments will commence; the final installation should take place.*
- *The planned software for the seismic hazard will be purchased and tested.*
- *The above results will be published on regular basis on the project Web page.*

Implementation of Results

The Civil Engineering Faculties/Departments of the regional universities as well as the concerned Ministries and Engineering Chambers are the major civil entities that will make use of the outcomes of this project to upgrade the national seismic provisions for their further adoption to EUROCODE 8 standards.

Other Collaborating Institutions

- *Environmental Agency of Republic of Slovenia, Ljubljana, Slovenia*

Intellectual Property (IP) Rights: *Participating institutions made an agreement to exchange the earthquake catalogue information for the scientific purposes of the Project.*

Abbreviations:

ARSO	Environmental Agency of Republic of Slovenia
B&H	Bosnia and Herzegovina
IZIIS	Institute for Earthquake Engineering And Engineering Seismology of University of "St Cyril And Methodius", Skopje, Macedonia
GMP	Ground motion prediction
IGEO	Institute of Geosciences, Tirana, Albania
METU	Middle East Technical University, Ankara, Turkey
MSO	Montenegro Seismological Observatory