SASPARM
Support Action for Strengthening Palestinian-administrated Areas capabilities for seismic Risk Mitigation

EC GA no: 295122

Deliverable 1.1

SASPARM Work plan

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1. General information about the project

The Proposal full title is “Support Action for Strengthening Palestinian-administrated Areas capabilities for seismic Risk Mitigation” (SASPARM).

The type of funding scheme is Coordination and support actions (Supporting).

The Work programme topics addressed is INCO.2011-6.2 Mediterranean Countries: Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Palestinian-administrated Areas, Lebanon, Syria.

The EC contract number is 295122.

The participants involved in the project are listed below:

1. An-Najah National University, Palestinian-administrated Areas;
2. Centro europeo di formazione e ricerca in ingegneria sismica (Eucentre), Italy;
3. Istituto Universitario di Studi Superiori (IUSS) di Pavia, Italy.

The Project Coordinator is Prof. Jalal Al-Dabbeek of the An-Najah National University.

The beginning date of the project is October 1, 2012. The end of the project is scheduled for September 30, 2014 since the duration of the total project is 24 months.

2. Contest and objectives

SASPARM project aims to reinforce the cooperation with Europe’s neighbours in the context of the European Research Area. The An-Najah National University (NNU) in the Palestinian-administered Areas (PS) coordinates the project, supported by the European Centre for Training and Research in Earthquake Engineering (Eucentre) and the Institute for Advanced Study of Pavia (IUSS), Italy. The supporting action of Eucentre will lead NNU to become a globally competitive and experienced research centre in the field of seismic risk mitigation and disaster management. Eucentre collaborates with NNU to devise a research strategy capable of increasing the scope and visibility of NNU at the national and international levels. The supporting action of IUSS is fundamental for the training activities for students and young researchers. The long experience of IUSS in the field of earthquake engineering and engineering seismology post-graduate courses represents a distinguishing feature of the international vocation of the SASPARM activities.

By developing a comprehensive research strategy, the significant strengthening of NNU role will be fundamental in meeting the national socio-economic challenges and regional and international research activities.

3. Expected results and outcomes

Improved competitiveness of NNU, creation of networks of research centres, promote initiatives of general public awareness are some of the expected results of SASPARM. The project objectives and the expected results are fully described in the Part B of the Description of the Work (DoW).

4. Activities

The project activities are identified with the goal of creating a research infrastructure and developing as well as enhancing the international cooperation with Palestinian-administrated Areas in the field of scientific technology and capacity building, i.e. human resources, research policy, networks of researchers and research institutes. In an international framework, the proposed activities will lead NNU to a fruitful cooperation with EU.

At national level, an enhancement of capability will ensure Palestinian-administrated Areas to gain a centre prepared to respond to earthquake engineering needs of the local community. The latter target will be pursued by enhancing the capability of NNU for training activity in the field of earthquake engineering. Furthermore, a higher visibility of NNU will encourage researchers to compete internationally in terms of scientific excellence (e.g., acquiring and participating in EU Framework projects related to seismic risk reductions) and increase their incentives to continue their research activities in Palestinian-administrated Areas.

The activities are scheduled according to the DoW (i.e. the work packages and the Part B of the proposal) approved by the European Commission.

5. Overall strategy of the work plan

The SASPARM project is coordinated by NNU with the supporting action of two European partners - EUCENTRE, whose highly qualified competences in the field of seismic risk mitigation and training activities are recognised at international level; IUSS, a higher educational institution that offers, among others, international advanced postgraduate programmes (Master and Doctorate) in the fields of earthquake engineering, engineering seismology and risk and emergency management. However, the supporting action of the three partners is fundamental to follow through the activities of the proposal. The list of the Work Packages (WPs) is reported in Table 1.

Table 1 Work package list

WP Number	WP title	Type of activity
WP1	Project coordination and management	MGT
WP2	Collection of existing research data	SUPP
WP3	Training and knowledge exchange	SUPP
WP4	Enhancement of NNU's laboratory capability for experimental-based training	SUPP
WP5	Networking and dissemination	SUPP
WP6	Exploitation of the project results	SUPP

In order to strengthen research capacities of NNU, the state-of-the-art of the research capacities of the centre has to be analysed in depth. These capacities depend on the available human resources, research activities and publications, training modules and educational courses, teaching (mentoring), experimental tests, management, services and partnerships. Analytical indicators will be defined in order to evaluate the mentioned capacities in a qualitative and quantitative manner. The comparison with the research

capacities of EUCENTRE and the training activities of IUSS will be fundamental for the definition of these indicators.

Knowing the state-of-art of NNU, the two partners are planning activities in order to improve NNU's human resources both qualitatively and quantitatively. This entails the capacity building of human resources employed at present through training modules, short study visits, etc, as well as increasing the number of staff including technicians, engineers and experts in the field of seismic risk mitigation. In particular, researchers familiar with modern modelling and experimental techniques are specifically needed.

In addition, the activities of the work plan include the preparation of training courses for engineers in the private sector, as well as for nongovernmental organisations and governmental institutions. NNU is supported by EUCENTRE to raise awareness of seismic issues and increase the capacity to prepare for and respond to seismic disasters.

Thanks to the work plan activities, NNU will build a management structure able to liaise and collaborate with the community, municipalities, governors, and national ministries, like e.g. the Ministry of Housing and Land Use Planning, in order to disseminate information, resources and know-how to be used for seismic risk mitigation, preparedness and prevention.

Finally, the overall strategy of the work plan is driven by the ambitious idea of strengthening NNU's relationships with European institutions as well as establishing new partnerships in Europe and in the Mediterranean region.

The deliverables and the milestones of the work plan are defined in order to guarantee the sustainability and long-lasting positive effects of the proposal through a comprehensive development strategy of NNU. This will significantly strengthen its capacity to respond to the national needs in the field of seismic risk prevention and mitigation, as well as its role in regional and international research activities.

The timing of the 6 Work Packages and their components is shown in the Gantt chart in Figure 5.1, according to the Part B of the Proposal. The scheduled Consortium Project meetings (PM) are also shown in the diagram. The deliverables and milestones are listed in the Tables of the DoW.

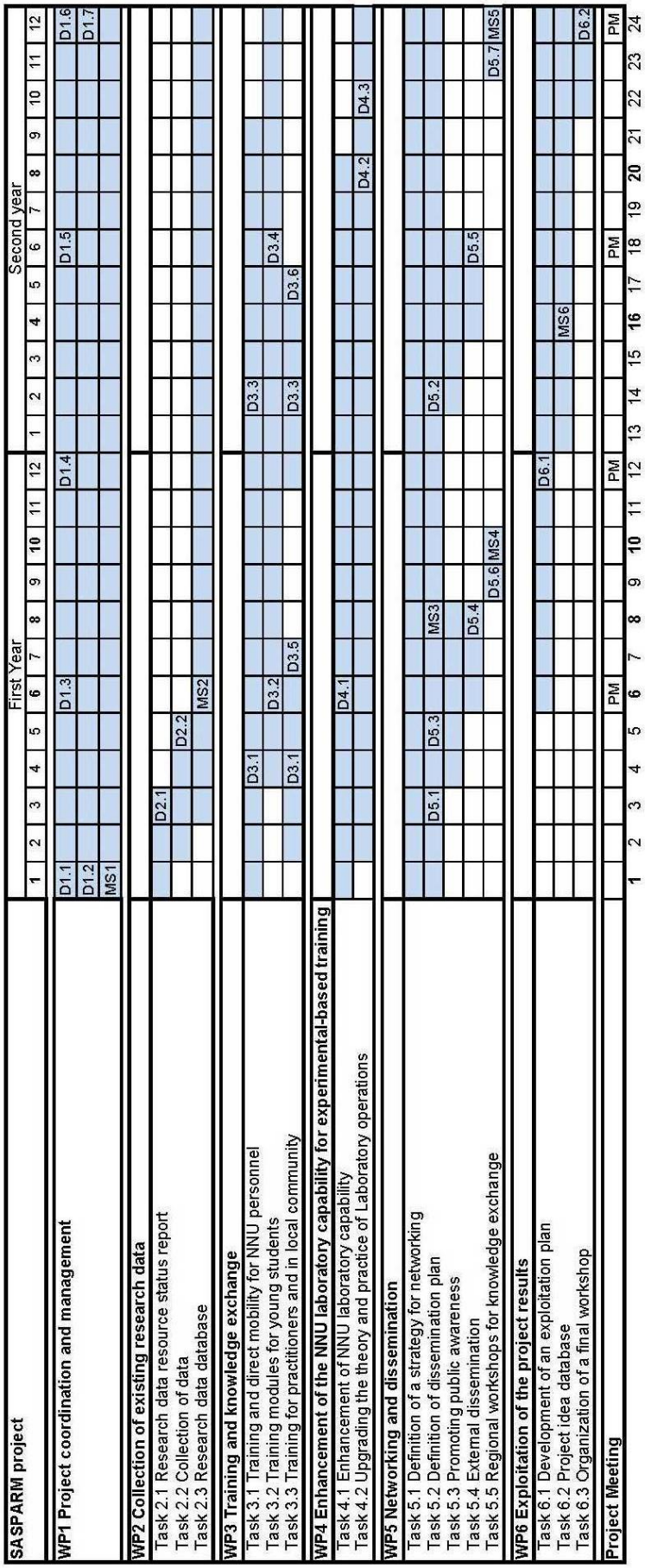

Figure 5.1 Timing schedule of the SASPARM activities

6. Project start-up

The beginning of the project is established by the date of the signature of the Grant Agreement by the European Commission. This corresponds to October 1, 2012. According to the deliverable lists and the Gantt Chart (Figure 5.1), the first deliverables to be finalised are D1.1 “SASPARM Work Plan” (this document) and D1.2 “SASPARM Consortium agreement”. In addition, the first milestone (MS1) of the project is the “Project startup meeting” scheduled on month 1. In the following sections, the description of the activities carried out is given.

6.1 Consortium Agreement

The management of SASPARM is focused on organisation, time and budget, process, communication and information, quality and risks. All these aspects are included in the Part B of the Description of the Work and in the Consortium Agreement. The CA has to be signed by all participants together with the Contract, in accordance with the Community Rules. Therefore, the Project Coordinator, Dr. Jalal Al-Dabbeek, prepared the first draft of the document, in collaboration with the Project Manager, Dr. Barbara Borzi (EUCENTRE) immediately after the signature of the Contract by the EC.

It includes all financial, administrative and coordination provisions not covered by the Contract, and regulates the inter-relation between the different activities. The discussion on planning and reporting mechanisms, exchange of information, organization of general meetings and activity meetings, review and general reporting, supporting administrative action and all other administrative issues, has been planned among the three beneficiaries and described in the CA. All the roles already established in the DoW have been confirmed. In addition to what specified in the DoW, the Project Coordinator and the Management Committee appointed Dr. Paola Ceresa (IUSS) as Deputy Coordinator of SASPARM.

Four drafts of the CA have been exchanged among the beneficiaries. The last version (V.1.4) of the CA has been signed on January 23, 2013.

6.2 Project start-up meeting and first activities carried out

The Project Coordinator proposed to the Partners the possibility of organising the Project start-up meeting in relation to an international event that could be extremely important to the activities and the expected results of SASPARM. The event was related to the visit of the UN Secretary-General’s Special Representative for Disaster Risk Reduction, Margareta Wahlström, to Nablus in order to welcome the city’s commitment to become the first Palestinian city to join UNISDR’s Making Cities Resilient Campaign. For this reason, the delivery date of the Project start-up meeting was scheduled for November or December, 2012, according to the agenda of Ms. Wahlström. However, due to the hard situations that happened in Palestine (e.g., the war on Gaza) during the month of November 2012, EU countries asked their citizens not to visit the Palestinian territories; therefore it was not possible to hold the meeting as scheduled. As a result, the meeting was postponed by all the parties (NNU, EUCENTRE and IUSS) to take place on the 20th and 21st of December, 2012, in the EUCENTRE, in Italy.

The new dates of the Project start-up meeting were scheduled in relation to a large experimental campaign to be carried out in the Laboratory of Eucentre - 4-storey building (scale 1:2), with a mixed reinforced concrete–unreinforced masonry wall structure to be tested on the powerful shaking table of Eucentre (December 20, 2012).

The participation of the Project Coordinator to the experimental test was considered as a fruitful exchange of experiences and knowledge among the Consortium Institutions. Furthermore, the possibility for the Project Coordinator of visiting the Laboratory and having a look to the shaking tables used by EUCENTRE researches for performing tests even for training purposes represents an activity strictly related to the SASPARM project. For that reason, the SASPARM start-up meeting between the participants was planned for the day after the experimental test (December 21, 2012).

During the period between October and December 2012, the communications between the partners was done via Skype conferences and emails. Through this period many activities related to the project work packages were discussed. The Urban Planning and Disaster Risk Reduction Center (UPDRRC) at NNU in coordination with the partners EUCENTRE and IUSS proceeded with the collection of the research results implemented by NNU in the field of Earthquake Risk Mitigation such as: seismic hazard, seismic vulnerability of buildings and the capacity of the governmental and nongovernmental institutions in the field of disaster management and emergency response. This is referred to in the project work plan as WP2.

NNU represented by the UPDRRC called for price quotations for making the website for the project in English and Arabic according to the applicable laws at NNU. Three quotations were received, analyzed and one of them was accepted. During the drafting of the primary structure ideas of the web site, some of these ideas were discussed with the partners by email and it was agreed to have a wider discussion of the structure of the site during the meeting which was planned to be held in Italy in the EUCENTRE during the period 20 – 21 /12/2012.

Based on the project work plan and documents and as a preparation for the implementation of the project work packages, during November and December 2012, UPDRRC held several meetings with many Palestinian governmental and nongovernmental institutions (such as Engineers Association, and the Ministry of Local Government, the Ministry of Public Works and Housing, and the Ministry of Education, etc) to explain the main goals and objectives of the project. During these meetings and lectures, all the documents and the slides were tagged with the FP7 logo, the European Union flag in addition to the logos and names of all partners.

The minutes of the project start-up meeting have been written by the Project Coordinator, sent the participants and revised by the partners.

During the project start-up meeting, the training modules and the research visits of the NNU staff have been planned.

There are two types of courses: i) courses for practitioners and ii) courses for young researchers and students. The courses scheduled for young researchers and students are also open to selected practitioners.

The suitable dates of the training courses were discussed. The courses for practitioners will be subdivided in two modules of 20 hours each. The course notes for the first 20 hours will be prepared by EUCENTRE Staff but both modules will be taught in Arabic language by NNU personnel.

During the meeting, it was decided to move the training courses for practitioners, originally planned for month 4 and month 14, after the courses for researchers. The courses for researchers will be held in April, while the ones for practitioners (originally in month 4 and 14) will be strarting from May and within the end of September in three different locations. This decision represents a change with respect to the timing schedule of the SASPARM activities of Figure 5.1. However, the new timing schedule of these courses has been introduced in order to be more functional for practitioners interested in following the courses. Moreover a number of locations has been selected in order to avoid long journeys for the engineers that want to attend the course: Nablus city for practitioner engineers from northern part of West Bank, Ramallah city for the practitioner engineers from the middle West Bank and the third training course will be in Bethlehem or in Hebron city for the engineers in southern part.

The lecturers involved in the training activities are: Dr. Jalal Al-Dabbeek (NNU), Dr. Barbara Borzi (EUCENTRE), Prof. Carlo G. Lai (EUCENTRE and University of Pavia), Dr. Simone Peloso (EUCENTRE), Dr. Paola Ceresa (UME School, IUSS), Dr. Alessandro Dazio (UME School, IUSS), Dr. Maria-Daphne Mangriotis (EUCENTRE and Heriot-Watt University).

In the following sub-sections, the time tables of the organised modules and the preliminary program of the research visits of the NNU staff are presented.

6.2.1 Modules for Practitioners

MODULE 1 Fundamentals of seismic analysis and seismic design
Lecturer Dr. Barbara Borzi

_ Day 1
09.00-10.30 Fundamentals of seismology
10.30-11.00 *Coffee break*
11.00-12.30 Seismic hazard in Palestine
12.30-14.30 *Lunch break*
14.30-16.00 Single Degree of Freedom System (SDOF)
16.00-16.30 *Coffee break*
16.30-18.00 Elastic Response Spectrum – Site effects EC8
_ Day 2
09.00-10.30 Fundamentals of ductility and Inelastic Response Spectra
10.30-11.00 *Coffee break*
11.00-12.30 Conceptual seismic design
12.30-14.30 *Lunch break*
14.30-16.00 Seismic Analysis
16.00-16.30 *Coffee break*
16.30-18.00 Capacity Design of Buildings
_ Day 3
09.00-10.30 Assignment 1
10.30-11.00 *Coffee break*
11.00-13.00 Assignment 2

MODULE 2 Seismic design according to codes used in Palestine (UBC97, Jordanian Seismic Building Code)
Lecturer Dr. Jalal Al-Dabbeek

_ Day 1
09.00-10.30 Seismic hazard according to code regulations
10.30-11.00 *Coffee break*
11.00-12.30 Seismic site effect according to code regulations
12.30-14.30 *Lunch break*
14.30-16.00 Seismic forces and building codes. Equivalent lateral forcemethod according to code regulations
16.00-16.30 *Coffee break*
16.30-18.00 General note about geotechnical and foundation, seismic design considerations
_ Day 2
09.00-10.30 The influence of architectural and structural configuration on seismic performance of buildings
10.30-11.00 *Coffee break*
11.00-12.30 Application on the seismic vulnerability of Palestinian common buildings
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 1
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 2
_ Day 3
09.00-10.30 Assignment 3
10.30-11.00 *Coffee break*
11.00-12.30 Assignment 4
12.30-14.30 *Lunch break*
14.30-16.00 Structural details
16.00-16.30 *Coffee break*
16.30-18.00 Special topics on earthquake engineering (seismic retrofit and upgrading fundamentals,..etc)

6.2.2 Modules for young researchers and students

MODULE 1 Fundamentals of seismic vulnerability and seismic risk
Lecturers Dr. Jalal Al-Dabbeek, Dr. Barbara Borzi, Dr. Paola Ceresa

_ Day 1
09.00-10.30 Concepts of vulnerability
10.30-11.30 Mathematical definitions of vulnerability and risk
11.30-14.30 Application 1, Application 2, Application 3, Application 4, and Application 5

MODULE 2 Fundamentals of structural dynamics
Lecturer Dr. Alessandro Dazio

_ Day 1
09.00-10.30 Introduction. SDoF systems: Equation of motion and modelling
10.30-11.00 *Coffee break*
11.00-12.30 Free vibrations
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 1
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 1
_ Day 2
09.00-10.30 Harmonic excitation
10.30-11.00 *Coffee break*
11.00-12.30 Transfer functions
12.30-14.30 *Lunch break*

14.30-16.00 Forced vibrations
16.00-16.30 *Coffee break*
16.30-18.00 Forced vibrations
_ **Day 3**
09.00-10.30 Seismic excitation (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Seismic excitation (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 2
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 2
_ **Day 4**
09.00-10.30 MDoF systems: Equation of motion
10.30-11.00 *Coffee break*
11.00-12.30 Free vibrations
12.30-14.30 *Lunch break*
14.30-16.00 Damping
16.00-16.30 *Coffee break*
16.30-18.00 Forced vibrations
_ **Day 5**
09.00-10.30 Seismic excitation (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Seismic excitation (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 3
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 3

MODULE 3 Ground response analyses and near-surface site characterization
Lecturers Prof. Carlo G. Lai and Dr. Maria-Daphne Mangriotis

_ **Day 1**
09.00-10.30 Fundamentals of wave propagation (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Fundamentals of wave propagation (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Ground response analyses (Part 1)
16.00-16.30 *Coffee break*
16.30-18.30 Case study and exercising
_ **Day 2**
09.00-10.30 Ground response analyses (Part 2)
10.30-11.00 *Coffee break*
11.00-12.30 Near-surface site characterization using seismic methods (invasive techniques)
12.30-14.30 *Lunch break*
14.30-16.00 Near-surface site characterization using seismic methods (noninvasive techniques)
16.00-16.30 *Coffee break*
16.30-18.30 Review of Fourier analysis and discrete inverse theory
_ **Day 3**
09.00-10.30 Seismic prospecting using active SASW/MASW techniques (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Seismic prospecting using active SASW/MASW techniques (Part 2)
12.30-14.30 *Lunch break*
14.30-15.30 Seismic prospecting using passive MASW, ReMi and H/V techniques
15.30-16.45 Case study using real and synthetic geophysical seismic data

MODULE 4 Basic of signal processing, design of a specimen, system acquisition
Lecturer Dr. Simone Peloso

_ Day 1
09.00-10.30 Basic of Sensor and Transducers (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Basic of Sensor and Transducers (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Description of Actuation Systems (Part 1)
16.00-16.30 *Coffee break*
16.30-18.00 Description of Actuation Systems (Part 2)
_ Day 2
09.00-10.30 Description of Actuation Systems (Part 3)
10.30-11.00 *Coffee break*
11.00-12.30 Analysis of Signal (Part 1)
12.30-14.30 *Lunch break*
14.30-16.00 Analysis of Signal (Part 2)
16.00-16.30 *Coffee break*
16.30-18.00 Analysis of Signal (Part 3)
_ Day 3
09.00-10.30 Scaling Strategy (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Scaling Strategy (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Testing Strategy (Part 1)
16.00-16.30 *Coffee break*
16.30-18.00 Testing Strategy (Part 2)

The researchers of NNU with the support of Eucentre and IUSS will train students, also with the support of the new laboratory equipment, to understand the dynamic of structures. A comparison of experimental response of a specimen prepared by NNU personnel will be compared with the analytical responses computed, for example, with Matlab.

6.2.3 Program of NNU researchers visiting EUCENTRE/IUSS

Researcher 1 (visit between month 6 and 10):
The researcher has to be one of the participants of the courses for researchers in NNU (planned for month 6). The researcher will come to be trained on how to use experimental equipment. Effort will be pay to learn how to plan experimental tests using the shaking table that Eucentre will provide to NNU. The researcher will be trained also in the field of geophysics investigations. Hence, this person will come also to take advantages of training courses run in Eucentre.

Researcher 2 (visit between month 11 and 14):
The researcher 2 is a technician will be trained by the technicians of Eucentre laboratory.

Researcher 3 (visit between month 19 and 22):
A senior researcher will come to learn about the organization of master/post graduate courses taking advantage from IUSS and EUCENTRE experience in organizing MSc and PhD programmes as the ones of the UME School of IUSS. In addition, new joined master and doctoral Programmes will be discussed and organised.

6.3 Election of the Advisory Board Members

During the Project Startup Meeting, the appointment of the Members of the Advisory Board has been discussed among the partners. The important rule of the AB in relation to the scope and the expected results of the project is described in the DoW.

After a discussion of the list of names, the following experts have been elected during the project start-up meeting on the basis of their knowledge and their involvement in different international projects:

1) Ahmed Y. Elghazouli,
   Professor of Structural Engineering
   Head of Structures Section
   Department of Civil & Environmental Engineering
   Imperial College London

2) Hanan Al-Nimry
   Assistant Professor,
   Department of Civil Engineering
   Jordan University of Science and Technology
   Irbid 22110,Jordan

3) Rasheed A. Jaradat
   Assistant Professor
   Department of Earth and Environmental Sciences
   Yarmouk University
   Irbid 21163, Jordan

6.4 Regional workshop and activities in progress

According to the DoW of SASPARM, it was supposed to conduct a regional workshop on the 9th or the 10th month of the project period, i.e. in June or July 2013, where tens of concerned governmental and non-governmental organizations in Palestine could participate.

The preparations for this workshop started through meetings conducted by the Project Coordinator with these organizations in January and February, 2013. The purpose of these meetings was to introduce SASPARM. It was clear that these organizations were very much concerned and interested in participating in the future activities of the project.

As mentioned above, it was planned to conduct the workshop according to the project work plan, but since the occasion of the visit of Special Representative of the Secretary-General (SRSG) for Disaster Risk Reduction Ms. Margareta Wahlström, to Palestine on February 26, 2013 (http://www.unisdr.org/archive/31454), it was agreed between all parties to conduct the workshop as a conference during which SASPARM project activities has been launched. Furthermore, all parties agreed that the anticipation of the workshop with regard to the original time schedule was proficient for the project, given the opportunity to the governmental and non-governmental Palestinian organizations to get involved since the beginning.

The activities of the six WPs of the projects are going on. The partners are working in strict collaboration for the preparation of the SASPARM deliverables and milestones.

A comprehensive and up-to-date overview of the SASPARM activities can be found in the project website: www.sasparm.ps.