

Scientific Report to COST

Action ES1104

Training School 2; 18-24 September 2013

“Semi-Arid Land Management for Crop Production and Restoration in man-made Soils”

Valenzano, Bari, Italy

Organized and led by Pandi Zdruli

MC substitute member of Action ES1104, Mediterranean Agronomic Institute of Bari

Description, participants of TS and the trainers

The Apulia region in south-eastern Italy is famous for the production of table grapes, olive oil, fruits, vegetables and cereals. The Provinces of Bari and Brindisi in particular have the largest extension of grape and olive grove plantations in the region, due to the particular soil qualities dominated by shallow soils often less than 25 cm deep overlaying soft and by large hard limestones. To be able to expand cultivation on such “difficult” soils, Apulian farmers have invented an unique land reclamation technique, locally called “frantumazione” that could be described as the mixing of rocks with the topsoil through mechanical operations conducted by heavy tractors and machines and thus increasing soil depth up 70-80 cm. Only in the Province of Bari is estimated that an area of about 20,000 ha has been converted from natural pastures or rock outcrops areas into table grape plantations. Up to twenty years ago such processes expanded also on gently undulating slopes for the cultivation of cereals followed by adverse environmental problems such rill erosion and destruction of soil organic matter. Similar interventions in rocky areas are reported also in Sicily and Tuscany regions of Italy even though with less extension in sporadic occasions in Spain as well.

Sixteen trainees were selected to attend the TS Bari out of 45 applications. All applications were checked if meeting the eligibility standards and finally applicants from 14 COST countries and eligible candidates from non COST countries but residing in the EU were accepted. They included nationals from Nepal (MS student in Belgium), Iran (PhD student in Germany), and Pakistan (PD student in Italy) that were accepted. Unfortunately the Pakistani candidate did not attend the TS since she had delays in receiving the Visa entry to Italy. This brought the number of attending trainees to 15 with representatives from Italy, Spain, Portugal, France, Germany, Greece, Latvia, Bulgaria, Israel, and Belgium. In addition three other trainees, two from Italy and one from Tunisia attended the TS at their own expense bringing the total number of participants at eighteen. The background of trainees was were vast from soils, to eco-physiology, water management, remote sensing and GIS, agronomy, environmental science, forestry and geology.

Eight professors offered lectures describing the Apulian experience in management of man-made rocky soils (Zdruli), WOCAT mapping methodology of land degradation and sustainable land management (Schwilch), effects of rock fragmentation and/or deep tillage practices on soil skeletal material and chemical properties (Ferrara/Brunetti), effects of rock/soil grinding on above-ground biodiversity loss (Calabrese), evaluation of afforestation interventions carried out on shallow Mediterranean soils (Zucca), anthropogenic impacts on transformation of marly-limestone environments of the Mediterranean and means for remediation (Dazzi), factors influencing soil organic matter content in human-disturbed soils (Costantini), and suggestions for a correct environmental management of rock fragments during the reclamation of rocky soils (Corti).

Field technical training

The TS started with a technical visit in the Province of Brindisi in the town of Ostuni where the trainees met with the representatives of the Local Action Group of Alto Salento, an active farmer group operating in the context of a LEADER+ project that deals with the preservation of millenary olives and agricultural landscapes. The visit was followed by a meeting with the stakeholders of Parco Agrario delle Dune Costiere at Torre Guaceto that are implementing action on-the-ground to improve soil fertility under olive groves and recover native plants in reserved areas of the Park. Finally an important improved wetland area serving as repository for the migratory birds was visited.

Other technical training included:

- ❖ Soil survey of natural and man-made soils under grape and cereal cultivation using standard procedures of survey
- ❖ Botanical survey of natural and man-made soils under grape cultivation using standard procedures of survey

One full day of training was devoted to afforestation and reforestation actions undertaken by the Corpo Forestale dello Stato in the Province of Foggia. In particular trainees were acquainted with production of nurseries of native species that are latter transplanted into the open fields. An interesting visit was made at Monte Sant'Angelo where ancient terraces dating back since the 6th century AD were established and still remaining functional thanks to preservations actions. Monte Sant'Angelo has one of the largest distribution of ancient terraces throughout the Mediterranean, a great cultural heritage that is being protected and restored.

One important event was the meeting of IAMB MS students with COST trainees. Training was conducted at the Soil Hydrology Laboratory of the Institute to measure soil moisture content at various depths (TDR) and an overview of salt distribution patterns at transect scale in soils irrigated with saline water and measured with electromagnetic induction in field experiments was made. Other training included preparation of organic composts derived from organic and urban waste for use in agriculture.

Linkages for the future

The Mediterranean Agronomic Institute of Bari (IAMB) is the perfect place for the people throughout the Mediterranean and beyond to meet and share knowledge. As expressed by the Israeli COST trainee *“the atmosphere was excellent with an amazing international mixture of cultures and fields of interests that managed to have great time together and seem to establish academic connections for many years to come. In this respect, for me, as an Israeli participant, it was a special opportunity to meet Mediterranean colleagues from states like Iran, Tunisia and Iraq, which unfortunately are not accessible for me in any other framework; as I'm about to finish my PhD studies and move toward public service in policy of environmental issues – this week was a good blend of science and policy and I'm confident that the knowledge and connections that I gained will help me in my future endeavors”*

Valenzano, Bari, Italy 1 October 2013