

**REHABILITATION OF SEVERELY ERODED AND INDURATED VOLCANIC
ASH SOILS IN MEXICO AND CHILE (REVOLSO)**
(Presentation of an ecological Research Project of the European Union)

Gerd WERNER¹ & Juan F. GALLARDO² *et alii*³.

¹ Center for International Development and Environmental Research (CIDER), Otto-
Behagel-Strasse 10D, Justus-Liebig-University of Giessen (JLU),
D-35394 Giessen, Germany. (REVOLSO project co-ordination), E-mail:
<Gerd.Werner@agr.uni-giessen.de> & <REVOLSO@prodigy.net.mx>

² Instituto de Recursos Naturales y Agrobiología de Salamanca (CSIC), Apdo. 257,
Salamanca 37071, Spain, E-mail: <jgallard@usal.es>

³ University of Concepción (UDEC), Chillán (Chile), CENAPROS, Colegio de Postgraduados
de Montecillo (CPM), Universities of Chapingo (UACH) and Tlaxcala (UAT), (Mexico),
I.R.D. (France), University of Pisa (Italy)

INTRODUCTION. The "REVOLSO" international-Project, here described, belongs to the INCO-DEV Program of the European Union (FP-5, E. U.) and the title of this Project is "Alternative agriculture for a sustainable REhabilitation of deteriorated VOLcanic SOils in Mexico and Chile" (Ref. ICA4-CT-2001-10052). The estimated duration is 4 years (2002-05). In this REVOLSO Project 9 Institutions, belonging to 6 countries, are participating, being co-ordinated by Dr. Gerd WERNER, from C.I.D.E.R., Justus-Liebig-University of Giessen (Germany).

OBJECTIVES. The general objective of this Project is to develop and implement a technological package tending to get a sustainable rehabilitation of the eroded and indurated volcanic-soils located in Central Mexico (*tepetates*) and Southern Chile (*trumaos*). Other objectives are: (1) To validate if the application of the organic agriculture, Agro-forestry, and crop rotations would drive on a sustainable management (in the double aspects: of soils and Agro-forestry), useful for stopping the soil erosion in these districts. (2) To achieve the integration of the results obtained, endeavouring to technological tools that permit both, to guarantee the erosion control, and to be accepted for local people because they offer economical attractions and stop the rural emigration. (3) To extend the results and experiences which would yield positive, local and international evidences, mainly in the Latin-American countries which have degraded volcanic soils.

Initial hypotheses are: (a) Soil organic matter (SOM) has strong impact on the improvement on soil physical-properties. (b) Traditional agriculture is mainly focused to satisfy the basic needs of the local communities, producing strong erosion, usually in an irreversible way. (c) Organic agriculture permits an increase of the SOM in a sustainable, permanent way, resulting in measurable, positive effects against the erosion. (d) It is possible to transform a volcanic, indurated material (as an eroded outcrop, named *tepetate*) and/or a degraded soil in a fertile soil, using the knowledge provided by the Soil Science and the nowadays technology. (e) Because the overgrazing is one of the main causes of the soil degradation, it is compulsory to include both the agriculture system and the influence of the cattle, useful for obtaining needed organic-manures. (f) Technological changes would be accepted by the local societies, being the women the best tool for getting the acceptance of the management changes.

DESCRIPTION OF THE PROJECT. The structure of the REVOLSO Project includes 5 working groups (WG) accordingly with the objectives: WG1 is implementing organic agriculture in comparison to traditional crop management, co-ordinated by the JLU, mainly in Mexico. WG2 is introducing forestry inside the Agrosystems, co-ordinated by the UDEC, mainly in Chile. WG3 is controlling the changes in soil fertility produced by the implementation of organic agriculture and agro-forestry, co-ordinated by the CPM. WG4 is

measuring the changes of soil erosion (erosivity and erodibility) produced by the implementation of organic agriculture and agro-forestry, co-ordinated by the IRD. WG5 is studying socio-economy aspects induced by the change of management, co-ordinated by the CPM and UACH, mainly concerning women. In sum, 1000 scientist-months are participating, being the net, economical support of the European Union about 1.500,000 euros; the estimated total-costs (including the economical contribution of the involved institutions) will be higher than 2.000,000 euros (without personal costs), or 4.000,000 euros (including all personal costs).

RESULTS. Ongoing results and new findings concerning the *REVOLSO* Project could be visualized visiting the WEB page <<http://www.ird.teledetection.fr/revolso>> of *REVOLSO*, which is frequently actualized. Preliminary results obtained up-to-day do not permit a deep discussion just to now, but inter-exchanges of information between scientists belonging to the different *REVOLSO* teams and from other Institutions outside this Project are being produced; additional comments and contributions are welcome. A complementary issue is the control and sequestration of C produced by the proposed, new soil-management.

Keywords: Soil erosion, Soil rehabilitation, Volcanic Soils, Mexico, Chile



International Association of Geomorphologists

Regional Geomorphology Conference Mexico 2003

Geomorphic hazards:
Towards the prevention of disasters

ABSTRACTS

Hosted by
Mexican Society of Geomorphology
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