Research policy and the perspective for collaborative action

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SUMMARY - Research is a way to strengthen links between countries. The CEC created different research programmes to implement stronger research activities in Developing Countries. After the UNCED Conference in June 1992, it was recognised that the challenge for the entire scientific community in Sustainable Development. The common framework created in the Rio conference is based on the eradication of poverty as a pre-requisite for every action concerning the environment. This will oblige all the researchers to reformulate their own activities in a new context. In a meeting organized by the CEC research programme "Life Science and Technologies for Developing Countries" (STD3) in Rennes (France), a group of soil scientists has identified a new dimension for soil science in DC's: a holistic approach. This new role should be implemented in different eco-regions, including the mediterranean one.

Key words: Normal science, sustainable development, holistic approach.

RESUME - La recherche est un moyen de renforcer les liens entre pays. La CEE a créé différents programmes de recherche pour mettre en oeuvre des activités de recherche plus solides dans les Pays Développés. Après la conférence de l'UNCED en juin 1992, il a été reconnu que le défi pour toute la communauté scientifique est le Développement Durable. Le cadre de travail commun créé lors de la conférence de Rio est basé sur l'éradication de la pauvreté comme première exigence avant chaque action concernant l'environnement. Ceci va obliger tous les chercheurs à reformuler leurs propres activités dans un nouveau contexte. Lors d'une réunion organisée par le programme de recherche de la CEC "Life Science and Technologies for Developing Countries" (STD3) à Rennes (France), un groupe de pédologistes a identifié une nouvelle dimension pour la science su sol dans les Pays Développés : une approche hollistique. Ce nouveau rôle devrait être mis en oeuvre dans différentes régions écologiques, y compris dans la région méditerranéenne.

***Mots-clés**: Science normale, développement durable, approche hollistique.*

Introduction

Many scientific words "created" for specific purposes have influenced mass media and people. This is the case of "sustainability". We must recognize that this word has allowed such a large discussion that researches and decisions makers were forced to change the way in which they operate. In Brazil, after the Rio Conference, for example a computerized network was created with the sole objective of defining, through the exchange of experiences, what "sustainable development" is.

From a scientific point of view, researches are more and more aware that they are confronted by problems so wide that the "normal" way of carrying out research is no longer adequate (Funtowicz and Ravetz, 1990). Science cannot always discover well founded and experimented principles for planning human intervention in using and preserving natural resources. We need to identify mechanisms ruling

the environment and the natural resources through: large inter/multi disciplinary research activities, with a reduced research time; taking into account that the human being is at the centre of the development action, but he is only a part of a more complex system. This is even more valid for the so called "Developing Countries" (DCs), where the complexity of knowledge needed for immediate scientific solutions to development problems requires urgent activities in policy research.

The UNCED Conference of Rio de Janeiro in June 1992 has promoted the emergence of a common framework, indicating where development and research should move together, but also underlining that eradication of poverty is an indispensable requirement for sustainable development. In this optic the researcher must be able to dialogue also with the end users of his activities. This implies that he must operate more and more in synergy with researchers from other disciplines but with a common perspective.

As researchers interested in world natural resources, we must also be aware that the development model of industrialized countries isn't valid for tropical areas and for DCs. This model is based on the principle that natural resources as water, soil, trees, air, etc. are inexhaustible. It is not the case especially for the tropical and sub-tropical areas, where the natural resources are extremely fragile and limited. Not only, we must remind ourselves that the last oasis of world biodiversity are in the developing world. It is our common interest to work together to preserve them and as researchers we must recognize that primitive cultures have problem solving mechanisms of their own, and it's far better working with than against them. "Indigenous people and their communities have a vital role in environmental management and development because of their knowledge and traditional practices" (United Nations, 1992) and also because they are potentially their immediate beneficiaries.

The Mediterranean eco-region and sustainable development

The short analysis conducted in the introduction is actual and valid for the Mediterranean eco-region that remains a system at risk. Soils scientists are aware of desertification, erosion, loss of fertility, salinization. But there is a new dimension that researchers are requested to define: the risk of reductions in food production and security linked to major concentrations of population in urban areas, the development of industrial activities and a more intense pressure on natural resources due to tourism.

As illustrated in this meeting, the development trends for Mediterranean areas in the next years have a growing pressure on fragile areas as coastlines and oasis. This implies a food demand differentiation and a land use modification near the specific sites and in remote rural areas. We need then an appropriate economic and development policies tools able to integrate all the aspects of the Mediterranean ecosystem.

In New Delhi (Rodale Institute Research Centre, 1991) some researchers have identified a "Systems Framework" (Fig. 1) that is easily understandable and applicable to each eco-region. By touching one element of the figure automatically we modify many other interrelated factors. By studying the Mediterranean soil automatically we are related to household, urban market, aquatic and marine ecosystem, etc.

For instance if we, as researchers, consider the impact of Aswan dam, we may conclude that is has had environmentally negative consequences beyond the development of agricultural production and energy production. But what are our conclusions on the hundreds of small hilly lakes and/or small dams that we are creating in the upper part of Mediterranean lands? Are they the positive answer to environmental degradation? Do they modify positively the ecosystem? It is easy to use this System Framework model *a posteriori*, because it shows all our lacks; it is more difficult to use it *a priori*, because we are obliged to change our approach and to have a different mentality as above mentioned.

Mediterranean soil research

Talking about Mediterranean soil research normally elicits only a partial reaction. Soil is one of the most important factors in maintaining the global balance in the biosphere and so in the sustainable development.

But it must be considered in its complexity, including not only its physical, chemical and biological aspects, but also the environmental, economic, social and legal ones.

An efficient and sustainable soil use is not independent from the level of inputs brought to that soil, nor of the technology used in managing it. A differently structured approach for research priorities should try to identify the response in term of crop yield over the medium/long term future, to get improvements in soil status (texture, structure, biotic content) when compared to the baseline represented by a traditional system. This implies knowing how much labour and costs are involved in improving soils and the expected returns on this investment, to the farmer and to society. Account needs also to be taken of the role of external inputs in increasing crop productivity and its impact on labour productivity; of the impact of lack of conservation practices on other resources; and of the role of Science and Technology in generating knowledge needed for the recovery of degraded soils.

This new approach was discussed of a specific brainstorming meeting in Rennes in March '92 by a group of soil scientists coming from DCs and Europe (ENSA, 1992). The result was the identification of preliminary guidelines to formulate "soil" research projects using a "Holistic Approach" illustrated in appendix. It is evident that this exercise should allow a critical constructive discussion between soil researchers and other interested scientists.

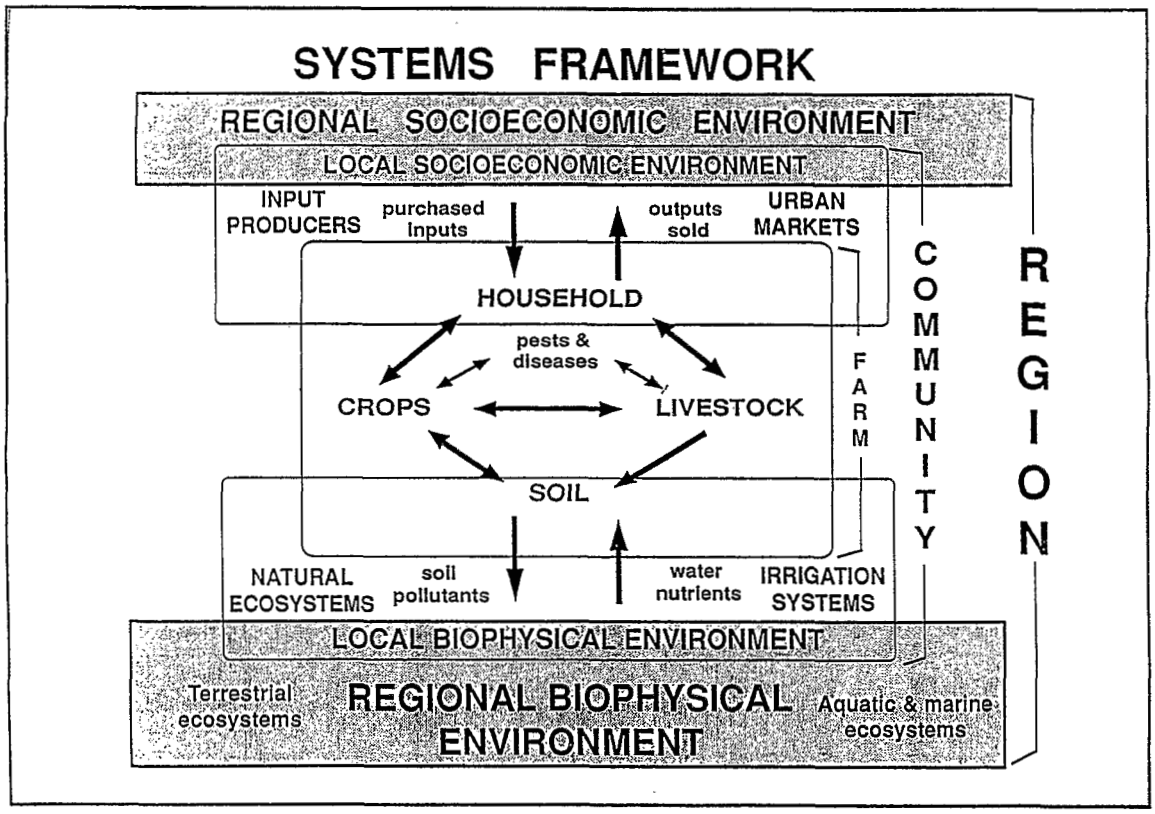

Fig. 1. Systems framework (Rodale Institute Research Centre, 1991).

The Commission of European Community (CEC) role

Various actions of the European Community address the Mediterranean area and it is not necessary to remind their acronyms and objectives. It is important to stress that many european institutions are more and more aware of the historical links that joint the populations of both side of the sea. There is a growing interest in promoting a better and strengthened effort of mutual comprehension. For instance, some Magreb countries have asked to use and adapt the software developed in the framework of the CEC Corine programme regarding the environment. It is obvious that these and other Mediterranean countries may ask to be incorporated in the activities of the future European Environment Agency.

The effort done for the environment and for economic cooperation between South and North Mediterranean has an equivalent one also in research and for many years the CEC research programmes related to DCs have worked to increase and strengthen the research capacity of Mediterranean areas.

The basic aim is to encourage cooperation between research teams and the main tool is joint research project, where scientists of DCs and CEC are "obliged" to pool their research potentiality.

Clearly there are different levels of research capacity, but all Mediterranean countries have skilled scientific teams and well equipped research institutions. The synergy in collaborating on common research activities allows for scientific complementarity technical exchanges and a better comprehension from a scientific and cultural point of view.

We must stress that this is not a new disguised way to create economic or technical dependence. These research actions have been created to stimulate the researchers to concentrate their effort on common problems of general and mutual interest. They are not "donations", on the contrary they represent a challenge posed to all researchers. For this reason they are offered on an internationally competitive base and all research projects are subject to a hard evaluation/selection procedure. Only projects considered scientifically original of the highest quality and better responding to the criteria of team integration will be funded, according to the financial resource available.

For the Mediterranean Region two "historical" community research programmes exist: "International Scientific Cooperation" (ISC) and "Life Sciences and Technologies for Developing Countries" (STD3); and a new one called Avicenne was created in 1992.

ISC tries to answer to research needs identified bilaterally by the CEC and individual countries belonging to Asia, Latin America or South Mediterranean.

STD is a thematic research programme, whose aims are to improve living and health conditions in all DCs including North Africa (CEC/DG XII, 1992).

Avicenne was created to build up a scientific effort specifically addressed to the Mediterranean areas and in the common interest of North Africa and Europe.

Joint research projects are the main instrument to stimulate the scientific cooperation. Other accompanying measures are possible; for example meetings of coordinators or promotion of research activities in fields considered particularly sensible for the research programme. This was the case of the Rennes above mentioned meeting.

Perspectives for scientific collaboration

It is relatively easy to ask for a strengthening of the already existing historical links between research institutions of South and North Mediterranean. But it becomes even more important being able to establish strong links between West and East Mediterranean too. The CEC research programme can

play a "bridging" role to allow the scientific community to cooperate despite all political and social differentiations.

Some european researchers concerned by environment problems would like to create a permanent structure of environmental monitoring/research related to natural resources. To implement it each country should create some kind of "benchmark site" where concentrate the activity of national and international researchers for a long time span (centuries?). The idea is to create a net of environmental data sites similar to those already existing for climatological data stations. This implies the involvement of each country in selecting their representative sites and to allow a permanent data collection and treatment. The reflection on this matter has already begun.

It is imperative to focus the researcher's attention not only on the current research action, but always more on the causes limiting the development and capacity of the Mediterranean environment to support human life and activities. For this reason the major request of CEC to Mediterranean researchers is to participate to the international effort of creating a common scientific knowledge able to reduce the risk of uncertainty on using the natural resources in a sustainable context.

In order to accept this challenge, the Mediterranean researcher needs to identify his own role in the international context, in agreement with their availability of personnel and scientific structures and their links with other scientific national and international institutions working on common thematics.

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Appendix

The holistic approach

Schematically these are the suggested basic considerations in formulating a holistic approach:

i. Research needs to be identified by involving the local beneficiaries.

ii. Several disciplines must be identified that together can try to solve the location-specific problems, while allowing scientists involved to do specific research when appropriate.

iii. A balance between human needs and conservation of natural resources should be anticipated when identifying research needs.

iv. Quality of research needs to be maintained.

v. Adequate availability of research facilities must be ascertained.

vi. Resource information availability needs to be adequate.

vii. Financial resources and infrastructural facilities must be ascertained, including the need for adequate mobility.

viii. Strengthening of national research capabilities may be needed in order to ensure the continuity of research after project termination.

ix. Training opportunities, especially on-the-spot training at all levels should be included.

x. Research activities should not only lead to an improvement in the local environmental conditions but also to improved standards of living of the local community.

xi. Research results should be made available in a user-friendly manner, and should lead to policy-making and development planning at all levels.

xii. Research results should be made available to the widest possible audience and, where applicable, be reported in scientific journals.

xiii. A cost-benefit analysis should be made, in order to provide for an efficient use of both internal and external resources.

xiv. Consideration should be given to the expatriation and transferability of research results not only to others areas, but also to other local workers.

xv. Research should build upon indigenous empirical know-how, as one of the means to better conservation of natural resources (principle of comparative advantage).