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Research approaches on landscape pattern dynamics in European rural areas. Unesco MAB programme

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SUMMARY - Research approaches concerning ecological consequences of land use changes in Europe are facing a variety of situations, the causes of which are diverse and multiple: changes in crop production, land abandonment, intensification or extensification may cause ecological disruptions impinging on the human environment. The outlines of a Unesco MAB programme are presented in this note, and general sketch lines for a comparative study are discussed. The objectives are to understand the transformations underway, their origins, the present situations and ongoing or foreseeable future transformation of rural landscapes and to contribute to strategies for sustainable development which allow the long term preservation of the environment.

Key words: Ecology, land use changes, landscape pattern dynamics, Unesco MAB comparative study, Europe.

RESUME - "Approches de la recherche sur la dynamique de modèles de paysage dans les zones rurales européennes". Les approches concernant la recherche sur les conséquences écologiques des modifications de l'utilisation des terres en Europe se trouvent face à un grand nombre de situations, dont les causes sont diverses et multiples : les changements de productions agricoles, abandon des terres, intensification ou extensification peuvent causer des bouleversements écologiques ayant des répercussions sur le milieu humain. Les grandes lignes du programme MAB de l'Unesco sont présentées ici, et une ébauche générale pour une étude comparative est discutée. Les objectifs doivent envisager les transformations en cours, leur origine, la situation présente et les transformations futures qui se sont déjà amorcées ou qui sont prévisibles, des paysages ruraux, et également contribuer à des stratégies pour un développement à l'intérieur de limites qui permettent la conservation à long terme de l'environnement.

Mots-clés : Ecologie, changements de l'utilisation des terres, dynamique de modèles de paysage, étude comparative MAB de l'Unesco, Europe.

This presentation is based upon the conclusions of meetings organized within the framework of the MAB Programme by the MAB National Committee of the Federal Republic of Germany at the University of Osnabrueck, Arbeitsgruppe Systemforschung, 2-5 November 1987 (Lieth, 1988), and by Unesco, Paris on 24-25 March 1988 ("Land-use Changes in Rural Areas of the Mid-latitude Temperate Zone: Economic and Social Perspectives of Releasing Land from Agriculture"), and on 4 November 1988 ("Agricultural Land-use Changes in Europe"), and on the Second Meeting of European MAB National Committees held at Trebon, Czechoslovakia, on 22-27 May 1989.

Research on the environment is now faced with changes in and alterations to that environment for which the causes seem to be far more diversified than in past decades.

The example of land abandonment and more generally of the changes in land uses particularly illustrates this evolution in research on the environment. One can observe today a recomposition of the rural landscape, a reappropriation of land, modifications in land uses and land tenure, the forms and trends of which being different from that which has been considered as unchanging, immutable. Meyer (1984) points out the assimilation of rural landscape to cultural landscape: "Our European landscapes are not 'natural landscapes', but 'Cultural landscapes' issued from a permanent and constant action of man on the environment. Different land-use practices are coexisting within a given space and their diversity and also diversity in agricultural production cannot be explained only by natural conditions. Decision-making processes are important at the scale of the farm unit for establishing the conditions of re-affectation of land to different uses" (Capillon, 1984).

Changes in land uses are shaped and determined by multiple factors. When speaking of land abandonment, references to land environmental constraints (i.e. marginal lands) are not sufficient for explaining the transformation of the landscape as well as references to agricultural practices (i.e. intensification of agriculture). Both references show their limits when dealing with future trends of landscape evolution.

Land abandonment needs to be placed within the context of a number of changes affecting European agriculture which respond to main trends: increased production per hectare resulting in large surpluses and a consequent excess of agricultural land, greater development of diversified income sources for farmers and a move towards a non-agricultural use of land.

At the same time labour input is being minimized through better work organization, an improvement of the quality and the quantity of the work involved, and an enforced rationalization and biotechnological development and industrialization of agriculture: land abandonment and rural landscape evolution are now usually related to particular cases that exist or are foreseeable at a regional level:

- the vertical integration of food production and the corresponding market structures;
- the development of an agriculture based on biotechnology and on the progress of bioengineering and ecological understanding;
- the development of non-food production and other service activities with the aim of a multiple use of land and resources.

Regional differentiations

These development processes differ from one region to another and especially in the most southern part of Europe. The issue is rather an intention to move from a state of relatively extensive land-use towards a higher degree of intensification. The present points towards a future system of differentiation in Europe (Commission of European Communities, FAST Report, 1984). The industrialization of agriculture may thus directly affect the regions of Europe by leading to the concentration of production in certain regions: this is the case in dairy production, fruit production, green-house horticulture, etc. The conditions mentioned show genuine differences and different development trends in different regions of Europe. North-South and East-West have distinct properties, each region expecting similar ecological problems for its future development. The changing land-use pattern may cause disruptions in social structure, economic

wealth and along with such changes each region will experience significant ecological disruptions impinging upon the human environment. This in turn will lead to administrative and even juridical activities of the society in an attempt to remedy or at least minimize negative effects of the changes. All these changes are of such importance that the expression "continuity, deterioration or rupture in agricultural landscape in Europe" was the title of the IFLA Conference in Rotterdam (Meenns *et al.*, 1988).

Background

As a matter of fact, studies on present and foreseeable land-use changes and their impact on the environment are currently being shared by various groups such as the institutions in charge of the Common Agricultural Policy, national political institutions, local communities, producers' associations, as well as associations or non-governmental organizations dealing with environmental issues. The Commission of the European Communities, in particular through its contributions to the FAST report dedicated to the integrated development of renewable natural resources, has published a number of basic documents which were used as background material for this text. Two calls for research proposals are currently being diffused concerning environment and agricultural land use consequences. The FAO, the Council of Europe, OECD and IIASA have all produced converging analyses. From sifting the objectives and results of all activities mentioned it appears that the collaborative programme within MAB which was proposed at the Trebon meeting of European MAB National Committees can provide a useful contribution to solving problems generated by the expected development scenarios.

Research carried out within the framework of Unesco's Man and the Biosphere Programme aims at integrating environmental problems and the understanding of ecosystems into national agricultural, industrial and economic development policies. This integration is an explicit objective in several European MAB programmes. The results of their research and the conclusions drawn at several meetings held under the auspices of the MAB Programme form the basis of the present note. Particularly, the work which has been done within the framework of the Swiss MAB Programme (Messerli, 1987, and Elsasser and Messerli, 1983) provides a number of recommendations and experiences on research programme for action to resolve the Alpine Dilemma: changing in Alpine Environment based on the original trilogy, landscape, mountain population and agriculture, within economic, social and environmental dynamics.

Approaches for research on land-use changes

1. Overall objectives

Conclusions from these different sources emphasize the fact that research on land-use changes and environmental consequences should be conducted in order to answer questions dealing with the origin, the present situation and on-going or foreseeable future transformations of the rural landscape in Europe. Induced or spontaneous land-use changes should be identified and their transcription on the landscape pattern analyzed. Hypotheses should be established on the redistribution of land-appropriation and the evolution of the landscape. The consequences for the environment of these different hypotheses should be formulated and the observed changes put back within the general trends of European agriculture (Conrad, 1987).

Tested hypotheses should take account of foreseeable technological progresses, both on an environmental level and on an agricultural and rural land-use level and comparative research should involve not only the twelve member states of the European Community but also neighbouring European countries undergoing a similar dynamic evolution of their rural space.

The research will be carried out within the general framework of the dynamics of European agriculture and should provide the elements necessary for bringing together agricultural and environmental policies. It is of major importance that research should initially highlight current agricultural and environmental policies on a national/ regional as well as on a European level: regulations within the Community, investments and regional financial aid. Research proposals should also concentrate on regions for which recent statistical data are available.

The overall objectives for research programme on landscape pattern dynamics can be summarized as follows:

(a) The ecological, administrative, juridical, social and cultural conditions of each particular region studied will be compared. The emergence of ecological patterns and legal measures are of high importance.

(b) The intent of the comparison is to demonstrate the consequence of these individual components for a sustainable potential future land use.

(c) The key level of the comparison is the region but the comparison needs to be based on a site or farm level. Landscape pattern dynamics analysis will link the two levels. This approach enables the comparison of the different regions in Europe.

(d) The conflict between different types of use of the same land surface will be addressed.

(e) The time frame of the individual studies must be such that the experience of the recent history can be evaluated and a simulation of trends for the near future is possible. Future scenarios should include the possibility of climate changes.

The objective should be to identify at the level of an agricultural region those farming and land-use systems that are relatively stable or in a position to assume change in response to decisions taken at the European level as well as to technological innovations related to improved productivity or industrialization. Their stability will be determined on the basis of the reproducible or non-reproducible nature of certain land-use practices and their consequences, particularly on genetic impoverishment, pollution of the water-table, soil erosion and more generally on the landscape and its perception by different users (rural, agricultural and urban populations). The consequences for biotopes and the space arrangement between cultivated and non-cultivated areas should also be covered.

2. Design principles

The research programme should provide answers to the following questions:

(a) to identify the diversity of land-use management systems;

(b) to identify the modes of production and types of land-use adapted to different physical, social and economic environments;

(c) to define the conditions of emergence and settlement of land-use systems studied;

(d) to explain the progressive adaptation and indirect changes of systems in response to internal and external constraints;

(e) to analyze the rhythm of structural changes in relation to decisions and expected results;

(f) to identify the impact and the ways of the application of new technologies;

(g) to analyze the role of land ownership regulations on the observed dynamics of land allotment;

(h) to achieve a better understanding of the different types of exploitation based on the nature of their response to changing factors, and on their capacity to adapt without damaging the environment; the incomplete or negative nature of current changes should be evaluated;

(i) to express the results or trends of the measured or simulated changes in terms of their contribution to strategies for sustainable development allowing for the long-term preservation of the environment.

Conclusions: Geographical scope and emphasis

The approach chosen is deliberately oriented towards the dynamics of the rural landscape in Europe and extends beyond the scope of site studies limited to an analysis of the flora and fauna or the level of pollutants. The scale of research -at the level of an agricultural region- allows it to take account of general trends in European agriculture. The study of spatial organization and the multiple determinants governing it should lead to a better understanding of the transformations under way.

Of special importance in this respect will be the comparison of options available for different economic systems, different environmental constraints and different resources.

The debate, therefore, should not be summarized in research on alternatives such as extensification or intensification at the farm level, but should be applied to the situation at the level of the specific agricultural region which is relevant for defining the research project to be undertaken. Once defined, a region can be described in terms of the number and structure of its farming concerns and their relations with the network of firms up and down the agricultural production chain, by the ratio of non- agricultural land to land under agricultural production, by the economic importance of non-agricultural land use (town, tourism, industry, other activities), and by a number of physical, geological and climatic conditions. Such a region may coincide more or less with an autonomous administrative unit or it may have an established authority which can take decisions or make proposals concerning agriculture and its environment. The classification of farming systems elaborated by the CEC can serve for instance as a starting point and its application should allow for a useful comparison of results when analyzing land-use changes.

The objective of MAB Programme "Comparative Research on Landscape Pattern Dynamics in European Rural Areas" is to address the problems of changes in rural areas in two dimensions: ecological, as well as socio-economic, and to improve methodological research in order to handle the problem of conceiving and analyzing the complex interaction between Man and the

Biosphere at the regional level, and its environmental implications; the comparison of different situations under a wide range of conditions in Europe being the way to explain changes and propose adequate solutions.

References

- CAPILLON, M. *et al.*, (1984): Une typologie d'exploitations, préalable à la recherche de références techniques régionales. C.R. Acad. Agri. de France 70 (3): 344-353.
- COMMISSION DES COMMUNAUTÉS EUROPÉENNES (1988): Le développement intégré des ressources naturelles renouvelables. Direction générale de la Science, de la Recherche et du Développement, Synthèse des résultats. 183 pp. annexe.
- COMMISSION DES COMMUNAUTÉS EUROPÉENNES (1989): Appui de propositions pour le programme spécifique de recherche et développement technologique dans le domaine de la compétitivité de l'agriculture et de la gestion des ressources agricoles. J.O.C. 89/C269/03.
- CONRAD, J. (1987): Alternative land use options in the European Community on Land use policy. 229-214. Butterworth and Co. (publishers) Ltd.
- CZECHOSLOVAK NATIONAL COMMITTEE. Second European Conference of MAB National Committees-Final Report. Trébon. Czechoslovakia. May 1989.
- ELSASSER, H. and MESSERLI, P. (1983): The concept of stability and instability of mountain ecosystems derived from the Swiss MAB 6 Project studies of the Aletsh area.
- LIETH, H. *et al.* (ed.), (1988): Problems with future land-use changes in rural areas. Deutsches National MAB Komitee, MAB Mitteilungen 28.
- MEENNS, J., PLOEG, J.D. v.d. and WIJERMANS, M. (1988): Changing agricultural landscapes in Europe. Continuity, Deterioration or Rupture? IFLA conference, Rotterdam.
- MESSERLI, P. (1987): The development of tourism in the Swiss mountains - economic, societal and environmental effects. Experience and recommendation from the Swiss MAB Programme, Mountain research and development 7: 13-24.
- MEYER, H. von. (1984): PAC et Politique d'environnement dans la Communauté européenne. *in*: Politique agricole commune et construction communautaire (Raux, J., ed.). Commission pour l'étude des Communautés européennes (CEDECE) et ECONOMICA.
- TIREL, J.C. (1989): La nouvelle donnée démographique, la déprise des terres, l'extensification. Courrier de la cellule environnementale. INRA, 7: 1-29.