The environmental impact of economic incentives for agricultural production: a comparative law study

FAO LEGISLATIVE STUDY

38

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

The environmental impact of economic incentives for agricultural production: a comparative law study

by
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FOREWORD

During the course of the past thirty years the international community has identified a number of factors that have contributed to environmental degradation, the foremost of which have been the economic factors. The search for profit at all cost, the desire for immediate short-term gain and the blind pursuit of economic benefit have been, and are, strongly criticized by those concerned about the long-term protection of natural resources and the environment. The economy has even at times been considered by certain ecological movements as the number one adversary. A more moderate stance, however, would still include an awareness of the impact of economic trends and decisions on the pace and quality of natural resource exploitation and protection. The economic measures are, therefore, vitally important for agricultural development and for the conservation of the requisite natural resources.

Ecology and the economy should not, however, be considered as two conflictive concepts. This would not only betray their etymology but would also indicate a misunderstanding of the absolute need for their complementarity for the general, and their respective, good. There is no denying that economic causes are partly responsible for the degradation of the environment and it will be generally agreed that these causes can also serve as a means of remedy. What is required, therefore, is homoeopathic action. Many countries have recognized this, and those which have made the most progress in recent years with regard to environmental protection, are precisely those which have been able to re-orient the economic processes and forces towards this protection.

Homoeopathy is, however, a difficult science. If the economic incentives are badly designed or poorly applied, the results may be diametrically opposed to those intended. Economic incentives for agricultural development have sometimes resulted in short-term development, with a subsequent deterioration of the resources required for long-term development. The present study will include instances of this.

This study sets out to provide a useful contribution to the understanding of the various economic incentive measures, thereby enhancing their employment and promoting healthy, balanced and environmentally sound agricultural development. This comparative law study is directed towards the jurists and therefore makes no attempt to further economic research. It is hoped that the interest aroused will revitalize an area of research that is of prime concern for the jurist, the agricultural policy-maker and development experts in general.

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Mohamed Ali Mekouar
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INTRODUCTION

A. STUDY OBJECTIVE

Nature and agriculture have always been closely tied. Since time immemorial they have acted together in partnership, interconnected and interdependent. For thousands of years the pair have been both inseparable and productive, generously providing mankind with its nourishment. Agriculture has skillfully acquired its resources from the environment and, in exchange, has often acted as its protective shield. By living off and within nature, the farmer is more keenly aware than any of its irreplaceable value; objectively, he is in principle its closest guardian. 1/ However, this cohabitation has not always been serene, for difficulties and antagonisms have periodically marked its long existence. The memory of past famines and the dramatic famines of today bear tragic witness to a relationship that is periodically in conflict. The relationship between agriculture and the environment has been, and continues to be, productive but antagonistic, to varying degrees that influence the precarious equilibrium sought between the growing needs of the one and the limited capacity of the other.

For a number of decades, the pressure of external factors - competitive occupation and degradation of the natural environment - as well as internal factors - more aggressive farming practices, less favourable ecological conditions - have meant that the development of the agriculture/environment tandem is a cause of concern rather than a reason for hope. The level of understanding has fallen, whilst the degree of misunderstanding has risen. Agriculture both acts upon, and is, in its turn, acted upon by the environment, 2/ and, similarly, is both the victim of pollution and the cause of multiple harm. It is a producer of food but also a consumer of resources and energy. It both gives and receives within a system of positive and negative exchange, but the balance now appears to have become distorted in many parts of the world to the dangerous detriment of the environment and the natural resources. This is threatening the very ecological base of agricultural production and, more generally, the foundations of economic development and social welfare. 3/

1/ Le monde rural gardien de la nature, Colloque international, Paris, 4-6 March 1970, Cahiers du CENACA, special issue, March 1970.

2/ FAO/Alhéritière D., Environmental Impact Assessment and Agricultural Development. A Comparative Law Study. FAO Environment Paper No.2, Rome, 1981, p. 6.

3/ FAO/Penn, R.J., Environmental Aspects of Natural Resources Management, Agriculture and Soils. Agriculture Services Bulletin 14, 1972, p. 1. Noirfalise A., Rapport de synthèse de la semaine: agriculture et environnement, Bulletin des recherches agronomiques de Gembloux, 1974, p. 762.

The risks of such a development are now clearly understood. The close correlation that necessarily exists between the quality of the environment and the development of agriculture is now so obvious that it would be superfluous to dwell on the matter at this stage. A number of publications have already dealt with the issue in the greatest of detail from the ecological, economic and legal perspectives. 4/

However, relatively little attention has so far been paid to the environmental impact of the legal measures for the economic promotion of agricultural production. To what extent can the financial or fiscal incentives that are directed towards increased agricultural production harm or enhance the environment? The agriculture/environment relationship does not appear to have been greatly considered from this limited perspective. The issue has not yet received sufficient attention within this precise context, at least not on the part of the jurists.

4/ By way of example : Agriculture and Pollution, Seventh Report of the Royal Commission on Environmental Pollution, London, 1979, 225 pages; Agriculture, Development and Environment, Mazingara, special issue, 1979, 97p, Agriculture et Environnement cinquième Colloque de la Société française pour le droit de l'environnement, Pau, 24-26 February 1981, Lyon, Publications périodiques spécialisées, 1981, 353 pages; European Environmental Bureau, The Common Agricultural Policy and the Natural Environment, Brussels, 1983, 23 pages; Cox G.W., Atlkins M.D., Agricultural Ecology. An Analysis of World Food Production Systems, San Francisco, W.H. Freeman and Company, 1979, 715 pages; FAO/Alhéritière D., supra (note 2); FAO/PENN R.J., supra (note 3); FAO, Food and Environment. Reconciling the demands of agriculture with global conservation, Rome, 1976, 44 pages; FAO, Natural Resources and the Human Environment for Food and Agriculture, Environmental Paper No. 1, Rome 1980, 67 pages; Fédération française des Sociétés de protection de la nature, Agriculture et Nature, Vichy, 31 May - 3 June 1984; Fédération internationale des mouvements d'agriculture biologique, Vers une agriculture viable, Aarau, Verlag Wirz AG, 1978, 243 pages; Fleury A., Mollard A., Agriculture, système social et environnement, Grenoble, Centre national d'études économiques et juridiques agricoles, 1976, 327 pages; Hawkes, J.G. (Editor), Conservation and Agriculture, London, Duckworth, 1978, 284 pages; Labeyrie V., Ecologie et agriculture, Conférence au Collège de France, Paris, 3.2.1981, 15 pages; Séminaire d'étude. Agriculture et environnement 2-6 September 1974, Bulletin des recherches agronomiques de Gembloux, 1974, 780 pages; Tolba M.K., Développer sans détruire. Pour un environnement vécu, Dakar, ENDA Tiers Monde, 1984, 195 pages, Despax M., Droit de l'environnement, Paris, Litec, 1980, 879 pages (particularly p. 243 and ff.: "Les aspects juridiques de la rupture des équilibres naturels en agriculture"); Richards P., Ecological Change and the Politics of African Land Use, African Studies Review, June 1983, pp. 1-59.

Yet the importance of the underlying problem should not normally have left the researchers indifferent to its examination, for there is a great deal at stake. Whilst food demand is continually increasing, the level of production is definitely marking time, sometimes alarmingly so, particularly in the poorer countries. This leads to a chronic food shortage which is laboriously confronted through a variety of agricultural development strategies. One of the measures adopted is that which is of particular concern to this study, namely economic incentives for agricultural production. There are two sides to this coin, however, for though these incentives can result in enhanced production, they can also, When applied unwisely, produce negative impacts on the environment. This, in turn, can cause a long-term decrease in agricultural production, whereas the original intention had been to bolster it. The gravity of the problem can be illustrated by recalling various estimated data in this regard.

Most projections of food requirements in the year 2000 agree that there will be a heavy increase in demand for agricultural commodities. It was observed in 1976 that "in the past 25 years world farm, forest and fisheries output has almost doubled. Over the next 25 years, if growing human demands are to be met, output must be almost tripled once more". 5/ More specifically, it was added, in 1977, that "merely to sustain the likely population of 6 300 million in the year 2000 at current levels of consumption would entail a further increase of almost 60% in agriculture, fisheries and forestry production in the quarter of a century from 1975. Allowing for the expected rise in incomes and effective demand might raise this figure to at least 80%". 6/

The achievement of such an increment in agricultural production will obviously largely depend on the efforts that the countries involved are willing to make. The requisite level of investment, to mention only the financial aspect, should not be underestimated. For example, according to a report produced by the International Food Policy Research Institute on 36 low-income and food deficit countries in Africa, Latin America and Asia, a total of US 98 700 million (1975 value) will have to be invested to cover

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5/ FAO, Food and Environment, Reconciling the demands of agriculture with global conservation, supra (note 4), p. 6.

6/ FAO, Natural Resources and the Human Environment for Food and Agriculture, supra (note 4), p. 1. More detailed projections are provided in a more recent FAO study entitled Agriculture: Towards 2000, Rome, 1981.

their food needs until 1990. 7/ In addition, "the past damage to natural resources and the greatly increased pressure on them that is to be expected in the future, especially in the developing countries", will have to be taken into account. 8/ Long-term projections can no longer disregard the consequences of the degradation of the natural environment which will increasingly burden agricultural development. It is, for example, estimated that some US $ 25 000 million will be required between now and the end of the century to halt the degradation of the world's farmlands. 9/ It is, therefore, clear that the future destiny of world food security largely depends on the level of investment that each country is prepared to make.

Agriculture, however, is often seriously short of funds, particularly in areas where these are most greatly needed. This is considered as a major handicap: "the lack of any real economic incentive for the average farmer to step up his production for the market" is seen by many as a major obstacle that inhibits "farmers in developing countries from producing up to the level of consumer demand". 10/ Whatever the actual effectiveness of economic incentives, there is no denying that in general they act positively on the promotion of agricultural production. But at what ecological cost? For it is not sufficient to bolster agriculture in the short term by providing economic incentives. The long-term consequences of such action should not be heavily detrimental to the quality of the environment and the conservation of natural

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7/ Oram, P., Zapata J., Alibahuro G., Roy Sh., Investment and Input Requirements for Accelerating Food Production in Low-Income Countries by 1990, Washington D.C., International Food Policy Research Institute, Research Report 10, September 1979, p. 15.

8/ FAO, Natural Resources and the Human Environment for Food and Agriculture, supra (note 6), p. 2.

9/ FAO, Protect and Produce, Soil Conservation for Development, Rome, 1983, p. 5.

10/ FAO, Incentives and Disincentives for Farmers in Developing Countries, Agricultural Planning Studies No. 8, Rome, p. 1.

resources. The economic factor should not outweigh the ecological aspect, 11/ given the increasing impact of agriculture on the ecology. 12/ Of course, the vast problem of how to design an agricultural system that is both economically and ecologically viable widely oversteps the framework of this study, though it does strongly influence its orientation. Though the study is mainly restricted to the legal domain, it is nevertheless conditioned by the notion that lasting agricultural development is closely tied to environmental protection and judicious resources management.

B. STUDY SCOPE

The environmental impact of the legal measures for the economic promotion of agricultural production is a complex and ramified issue, which could have merited a multidimensional analysis conducted on at least three fronts: economic, ecological and legal. From the economic perspective, it would be of interest to examine the relevance of existing incentives, to assess their relative merits, and to identify those with proven effectiveness. These could then be recommended for the purposes of an established agricultural policy. 13/ However, the economic dimension will not be directly covered as it lies outside the scope of this study. Similarly, with regard to the ecological aspect, the economic incentives to agricultural production could be usefully considered in terms of their positive or negative, intentional or incidental, impact on the environment. Though this study is obviously conditioned by the environmental impact, this is not the focal point of research. The purely ecological dimension will, therefore, also be excluded from in-depth analysis. However, a number of ecological digressions will at times have to be made if some of the issues that arise are to be fully understood. Finally, with regard to the legal aspect, it may be pertinent to review the legislative and regulatory texts that provide economic incentives for agricultural production, to determine whether these include specific provisions regarding the environmental impact. This will help to discern the overriding legal trends in this area and to identify the attitudes of the national legislators on this point, by assessing their respective concern for agricultural production and the conservation of nature. More importantly, it will also lead to a thorough understanding of the nature of legislation in this regard, thereby evaluating its capacity, or ineptitude, to favour agricultural development whilst at the same time respecting the environment. This essentially juridical dimension will be the central theme of the subsequent pages.

11/ Economy and ecology have, after all, the same etymology: eco, or home, dwelling, milieu, environment; how individuals manage their lives within their environment refers to the economy, whilst their relationship with the environment refers to the ecology. The two are therefore part and parcel of the same reality (Nature et agriculture, supra (note 4).

12/ Cox G., Atkins M.D., Agricultural Ecology. An Analysis of World Food Production Systems, supra (note 4), p. 5; Glico N., Estilos de Desarrollo, Modernización y Medio Ambiente en la Agricultura Latinoamericana. CEPAL, PNUMA-Naciones Unidas, Santiago, 1981, p. 118; Manning E.W., "The bread basket begins to run out", Mazingira, May 1984, p. 27.

13/ FAO, supra (note 10).

Having defined the scope of the study, attention should now be paid to its contents. To avoid any ambiguity, the first point to note is that the study will mainly focus on the impact of agriculture on the environment, and not vice versa, even though in recent years some countries have adopted environmental legislation that has been detrimental to agriculture. 14/ The study will thus focus on the economic incentives for agricultural production with regard to environmental conservation, and not on economic incentives for environmental conservation with regard to agricultural production. Incentives for environmental conservation will only be referred to when these are also geared towards agricultural production, such as measures to safeguard water and soil resources.

This study, therefore, is far from exhaustive. Rather than recording the countless legislative and regulatory texts that include economic incentives for agricultural production - which would have been a tedious and probably relatively unproductive undertaking - it was thought more pertinent to select some of the more important legal texts by way of illustration only. Besides, this is a relatively new area of research, so the study must not be expected to lead to clear-cut or definite conclusions. It is more a matter of laying the foundation stones for subsequent construction work.

Thus, the study will concentrate more on determining the current state of affairs than on putting forward solutions. It will concentrate more on drawing up a balance of the existing situation than envisaging perspectives of change, which is beyond its scope and which could feature as an area of future research.

Given the context of the study, priority will deliberately be placed on the laws of the developing countries. There are objective reasons for this: the lack of research on these countries, together with the extremely limited legal publications available - or their difficult access - obstruct the understanding of their problems and the devising of appropriate solutions. In contrast, the greater resources of the developed countries have enabled these to understand the problem more fully, thereby enhancing the level of control over their specific problems.

Finally, on the methodological level, the terminology used should be clearly defined, as should the approach adopted. In particular, the recurring terms employed in the title - "impact", "environment", "economic incentives" and "agricultural production" - should be clarified. Though these words are in common usage, their meaning here will be strictly defined.

14/ Critchley, Ph., "The Impact of Environmental Legislation upon Agriculture. The de jure Situation in the United Kingdom", in Duesenberg B., Girling B., The Impact of Environmental Legislation upon Agriculture, Centre for European Agricultural Studies, Ashford, Kent, 1984, p. 11: "We hear a great deal these days about the effects of agriculture on the countryside... Here the subject is the impact of environmental law on agriculture itself. I think it is very useful to look from this other end of the telescope and to remind ourselves -since it is often overlooked - the extent to which existing legislation does already impinge on farming".

Thus impact will not include effects of secondary importance, but will rather denote a "decisive influence, a major consequence". 15/ Thus, the impact of an economic incentive may be positive or negative, beneficial or detrimental to the environment. It does not present any problem if it is positive as it is doubly profitable, both to agriculture and to the environment. A problem does, however, arise if it is negative in the sense that it produces a conflict between the short-term agricultural needs and the long-term environmental objectives. Only the negative impact will be truly considered because of its corflictual nature. In addition, attention will only be drawn to the strictly ecological impact, with the exclusion of the political, economic and social effects. As for the notion of environment, this is more difficult to define than would appear. It has already been observed that the word corresponds to an idea that is relatively clear at the centre but definitely blurred at the periphery. 16/ In fact, the doctrinal definition of environment often appears uncertain and divided. 17/ There is, however, a common denominator to most of the approaches, with a usual agreement to distinguish between two environmental components: that provided by nature and that artificially created, in other words, the resources of nature and the work of mankind. Though the dividing line between the natural environment and the human environment is far from clear, this distinction will be implicitly accepted for the practical purposes of this study, despite its dubious theoretical validity. Given that the study will concentrate on the impacts of agricultural production, which is mainly (though not exclusively) a rural activity, the centre of attention will obviously be the natural environment, particularly the natural resources that serve as the basis of agricultural development. As for the economic incentives, these are so numerous and diversified that it would be hazardous, at this level, to suggest too broad a definition. Moreover, in addition to its complex character, the notion of economic incentives is vital for the overall comprehension of this work, which is why it was considered appropriate to dwell at greater length on its examination in the form of a preliminary chapter. Finally, agricultural production should not be understood in the limited sense of produce from the land, but should also encompass fishery and forestry production. In practice,

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15/ FAO/Alhéritière D., supra (note 2), p. 4.

16/ de Lanversin J., "Contribution du juge administratif au développement du droit de l'environnement", in Mélanges M. Waline, Paris,. Librairie générale de droit et de jurisprudence, 1974, tome II, p. 519.

17/ References for the doctrinal controversies and uncertainties : Caballero F., Essai sur la notion juridique de nuisance, Paris, Librairie générale de droit et de jurisprudence, 1981, pp. 4 and 345; Despax M., supra (note 4), p. XI; Lamarque J., Droit de la protection de la nature et de l'environnement, Paris, Librairie générale de droit et de jurisprudence, 1973, p. XIV; Machado P.A.L., Direito Ambiental Brasileiro, Sao Paulo, Editora Revista dos Tribunais, 1982, p. 2; de Malafosse J., Le droit de l'environnement, Le droit à la nature, Aménagement et protection, Paris, Montchrestien, 1973, p.1; Martin G., Le droit à l'environnement, De la responsabilité civile pour fait de pollution au droit à l'environnement, Lyon, Publications périodiques spécialisées, 1978, passim.

these three sectors are often closely associated and overlapping. Such a definition also corresponds to that of the FAO Constitution, where the word "agriculture" is used to include "fisheries, marine products, forestry and primary forestry products" (article I-1).

The final introductory observation concerns the approach to be followed. The methodological approach will be more analytical than general. The relative novelty of the subject matter and the exploratory nature of the study would appear to justify this pragmatic approach, which essentially sets out to clarify the issue, to isolate its component parts, to discern the problems, to underline the contradictions; in brief, to reveal the state of the law as it now stands on the matter. However, the conclusion could well include a general summary of the points that have been analysed, but this will only represent a secondary dimension of the research. The study will also be oriented towards comparative law as such an approach is always productive to the extent that the comparison of juridical systems is of mutual benefit to the national legislations. As environmental legislation is still flexible, the law is more receptive than it is in other areas to lessons learned abroad. 18/ The comparative approach is, therefore, all the more enlightening for legislators seeking inspiration from juridical systems that have already proved their worth abroad.

The study will be structured as follows : the preliminary chapter will present an overview of the economic incentives for agricultural production; the first chapter will consist of a selective outline of the environmental impact of legal measures for the economic promotion of agricultural production; these will then be analytically examined in the second chapter; and the study will conclude with a brief summary to take stock of the situation.

18/ Despax M., supra (note 4), p. 820.

PRELIMINARY CHAPTER

OVERVIEW OF ECONOMIC INCENTIVES FOR AGRICULTURAL PRODUCTION

As there is no comprehensive study of these incentives it was considered essential to provide a brief preliminary general outline. The first stage will determine the ambiguity of economic promotion and the second will provide a synoptic table of the principal economic incentives for agricultural production.

A. CONCEPT OF ECONOMIC INCENTIVES FOR AGRICULTURAL PRODUCTION

Whereas doctrine generally accepts that encouragement is preferable to constraint for the achievement of a set objective 19/, it is fairly divided on the manner of conceiving an economic incentive. From both the theoretical and the practical point of view, the interpretation of such a concept is far from unequivocal. It does not constitute a firmly established legal category nor does it correspond to a universally accepted economic concept. Most of the related juridical 20/ and economic 21/ published material is characterized by a somewhat confusing conceptual blur. As a consequence, economic incentives for agricultural production, or for any other purpose, prove under examination to be a concept that is both ambiguous and relative.

1. Concept Ambiguity

The economic incentives are usually accompanied by widely disparate and poorly defined legal notions. Though these incentives are as a rule essentially financial or fiscal in nature, they also often employ other stimulatory techniques which are not directly related to financial or fiscal encouragement. This disparity is, in itself, a source of confusion and ambiguity. In this regard, it can be said that an analysis of positive law

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19/ Prud'homme R., Le ménagement de la nature. Des politiques contre la pollution, Paris, Dunod, 1980, p. 134: "On peut penser que dans beaucoup de cas la manière douce, c'est-à-dire l'instrument incitatif, serait préférable à la manière forte, c'est-à-dire l'instrument contraignant."

20/ For example, FAO/Henderson J., Foreign Investment Laws and Agriculture. FAO Legislative Studies No. 9, Rome, 1970, 224 pages; FAO/Mylonas D., Agricultural Credit Legislation, Legislative Series No. 6, Rome, 1974, 135 pages; FAO/Gimeno Sanz J.M., Fundamentos teóricos para una legislación tributaria en el sector agropecuario, Estudio legislativo No. 11, 1975, 97 pages.

21/ For example, Barde J. Ph., Gerelli E., Economie et politique de l'environnement, Paris, Presses Universitaires de France, 1977, 210 pages; FAO, supra (note 10).

indicates the existence of a very large number of often poorly differentiated juridical categories, for which jurisprudence and doctrine have not been able to clear up all the uncertainties. 22/

And if uncertainty exists in the legal sphere, it is also present in the economic field, where the language is not always crystal clear either, and therefore at times also the source of misunderstandings. 23/

However, both the juridical and the economic sciences have a pertinent interest in economic incentives, which inevitably leads to some overlapping. This is obviously desirable for a complete understanding of the subject, but this is in practice difficult to achieve, as the concepts and categories employed by the respective disciplines do not always coincide. Such a situation produces misunderstandings not only of terminology but also of substance, as illustrated by the following:

"Each discipline attempts to apprehend the reality with its specific approach; but there are also concepts that are particular to the jurists, and others that belong to the economists. The former make clear distinctions between various categories such as tax, duty, remuneration, price ... . The latter, however, do not distinguish, for example, between tax and duty. Each discipline, therefore, has its own concepts. (....) it is certainly desirable that the jurists and the economists understand each other with regard to the basic notions, particularly as the concepts transmitted by the public finances are interdisciplinary". 24/

In the meantime, the notion of economic incentive should be more closely defined, particularly from the jurists' point of view. In a broad context the word incentive can apply to both the financial factors (economic stimulation in the strict sense), and to other factors (social advantages, training, education, research, etc). In a narrower context, however, the term "economic incentive" indicates a purely financial or fiscal character, as in the case of subsidies, grants, contributions, loans, cost refunds, tax concessions, etc. 25/ The latter context will be that mainly retained in this study, given that the qualifier "economic" generally evokes the essentially financial and fiscal instruments (subsidies, credit or taxation).

22/ Isaia H., Spindler J., "Droit fiscal et financier", Année de l'environnement, Vol. 1, 1980, p. 241.

23/ Barde J. Ph., "La fiscalité de l'environnement: pertinence économique et expérience pratique", in Fiscalité-Environnement, Paris, Presses Universitaires de France, 1984, pp. 355-407; OECD, Pollution Charges in Practice, Paris, 1980, 118 pages.

24/ Fiscalité-Environnement, supra (note 23), Presses Universitaires de France, 1984, pp. 110 and 112 (free translation).

25/ FAO/Bombín L.M., "Incentivos económicos forestales en América Latina", Coloquio, Lima, 1975 (FO:MAFP/75/4), 27 pages, p. 1.

The ambiguity of the concept goes further than this though. When we start to examine each economic incentive we soon realize that the conceptual divergences multiply. Not to dwell at too great a length on this point, let us look at one example only, that of taxation. There are countless definitions of this term, two of which are as follows: "taxes are financial resources instituted by a public power and exacted without any direct reciprocal exchange" 26/; taxes are also "those prestations in cash or in kind that the State exacts, in the exercise of its sovereign power, for the purpose of acquiring resources for the accomplishment of certain objectives". 27/ These two definitions can be seen to differ considerably, if only with regard to the nature and the allocation of fiscal resources. In practice, as the national contexts are heterogeneous on both the economic and juridical levels, it would be pointless to seek a uniform concept of taxation. Moreover, the uncertainties noted with regard to the notion of fiscal incentive can also be observed, at will, for most of the other economic incentives, but such is not the purpose of this study.

Two interesting illustrations of this arise in connection with soil conservation and forestry development. In the first case, an extremely detailed report produced on the basis of a field study conducted in Latin America reads : "an incentive to soil conservation and rational management of lands in the process of degradation may be defined as any stimulation given by the State to the peasant to allow him to absorb additional investments and make temporary substitutions for his income for the sake of the works he must carry out in his farm to replace traditional farming methods with techniques and other methods which will ensure the sustained yield of renewable natural resources within his farm and its area of influence and contribute to increasing production. In other words, from this point of view, incentives are basically a temporary substitution of income for a permanent increase in productivity." 28/ We can see that this definition is more concerned with the purpose of the incentive - productivity and soil conservation - than with the form, which may be financial or fiscal.

In contrast, the second example, regarding forestry, emphasizes the incentive itself : the economic incentives for forestry include "all the public financial allocations (direct or indirect) to persons exercising an immediate economic activity, whether these be private bodies or public entities managing enterprises along private-sector lines". 29/ The so-called "financial" allocations in this case include a wide range of public interventions: donations in kind (plantations) or capital, free technical assistance, contributions to infrastructure work, credit supply, tax concessions, etc. These examples by no means illustrate the full complexity and disparity of economic incentives for agricultural production, but they do provide an approximate idea of this notion which, whatever the circumstances, remains decidedly relative.

26/ Centre de Droit public de l'Université de Strasbourg III, Fiscalité et Environnement, Strasbourg, 1982, p. 3 (free translation).

27/ FAO/Gimeno Sanz J.M., supra (note 20), p. 3 (free translation).

28/ FAO, Report on the Study Tour FAO/SIDA/CIDIAT on Incentives for Community Involvement in Forestry and Conservation Programmes, (GCP/INT/347/SWE), Rome, 1980, 103 pages, p. 11.

29/ FAO/Bombin L.M., supra (note 25), p. 1 and ff. (free translation).

2. Concept Relativity

Economic stimulation is by no means a neutral intervention tool with intrinsic virtues and universal value. It merely constitutes an instrumental means of economic policy. The relevance, effectiveness, success, failure and, finally, selection of a particular economic incentive depend on a range of political, economic, social, cultural and juridical factors that are specific to each given situation. If the same economic incentive is applied in differing contexts, the results will vary, as will its degree of usefulness, depending on the interplay of these factors and the reality of the situation. The notion of economic stimulation is therefore extremely relative.

When evaluating the effect of an economic incentive, particular attention should, therefore, be paid to the specific nature of the given context. For example, the analysis would have to consider the social and economic development model, which is obviously an influential parameter. There is little need, in this connection, to recall the very different role that an economic incentive may be required to play in a market economy and in a planned economy. The same observation can be applied to the level of development, for the structural differences between the developed and developing countries are often so pronounced that the same criteria cannot reasonably be used to appraise the respective impacts of the economic incentives. As these incentives have been, or were originally, studied, conceptualized and developed in the industrialized market economy nations 30/, care should be taken with regard to imitation. The tax system, for example, is essentially an economic tool for a certain type of development. Therefore, with regard to economic incentives for agricultural production, it is hard to envisage how the taxation of one particular country can be safely exported to another country with totally different development orientations. 31/

These considerations regarding the relativity of the economic incentive notion can be corroborated by instances drawn from practical experience. In principle, an incentive serves to encourage, but this objective is not always achieved in practice - far from it. Often, an incentive not only misses its target but actually accomplishes the opposite of what it sets out to achieve: instead of stimulating growth, it actually slows it down. Encouragement, therefore, becomes discouragement. This phenomenon has been widely observed in most countries and in several agricultural sectors. For example, many countries provide economic incentives in favour of afforestation and reafforestation, generally through the provision of tax concessions. However, at the same time, there may be other economic incentive measures with a different objective, for example, that of land settlement for agricultural purposes. Such settlement involves massive land clearing and is therefore detrimental to the forest. Thus the increment in cropped area corresponds to a reduction in the forest cover, and the land settlement policy seriously damages or completely cancels the afforestation efforts. This has happened, for example, in Latin America, particularly in the Amazon region. 32/

30/ Cooper Ch., Economic Evaluation and the Environment. A Methodological Discussion with Special Reference to Developing Countries, London-Sydney-Auckland-Toronto, Holders and Stoughton, 1981, p. 5.

31/ Fiscalité-Environnement, supra (note 24), p. 106.

32/ FAO/Bombín L.M., supra (note 25) pp. 12 and 13.

Similar cases have taken place in other agricultural sectors. For well-known reasons, that do not need examining in this context 33/, certain countries have concentrated, and continue to concentrate, on cash crops for export at the expense of food crops for the domestic market. Setting aside the economic, social or ecological implications of such a policy, the results have not always been convincing even, with regard to the immediate objective, for when a number of countries encourage this form of extroversive agriculture 34/, the corresponding incentives may lead to a production surplus for one or several cash crops, which the international market is unable to absorb. This can lead to both a slump in international prices - the trend has been constant for some thirty years - and a wastage of the unsold surplus. The outcome, therefore, is the opposite of what was originally intended, and all the more unwelcome in that this phenomenon generally occurs in countries with serious food problems. 35/

It should be pointed out that though such a consequence is usually accidental and due to an appraisal error, it can also be intended, in which case the incentive is resolutely destimulatory, in the sense that instead of encouraging agricultural production it seeks to curtail the output of certain crops. The recent unilateral or concerted measures of the EEC Member States illustrate this process: farmers are provided with economic incentives to reduce their production of milk and wine, amongst other products. This form of "negative" incentive is, however, virtually exclusive to the rich countries with surplus agricultural production, and, though of undeniable interest, will be excluded from this study, which centres rather on the problems of the resource-poor, food-deficit countries.

Having broadly examined the economic incentives, it would seem appropriate to proceed with their classification and with the identifiction and closer analysis of those which are more commonly employed.

33/ Semiti G.A., "Cash Crops versus Food Crops and their Comparative Effects on the Human Environment", African Environment, Occasional Paper No. 76-8, July 1976, pp. 19-36.

34/ Dinham B., Hines C, "Exporter ou manger? Les projets agricoles à grande échelle ne sont pas la solution", Forum du développement. No. 102, September 1984, p. 7.

35/ FAO, supra (note 10), p. 11.

B. CLASSIFICATION OF ECONOMIC INCENTIVES FOR AGRICULTURAL PRODUCTION

The incentive measures for agricultural development that normally feature in most national legislations can be classified from two perspectives: according to their form and according to their purpose, though other differentiation criteria may also be considered. 36/

1. Distinction of Incentives According to their Form

Considered in terms of their form, the economic incentives for agricultural production may be sub-divided into a number of categories: financial or fiscal, direct or indirect, positive or negative. These categories, however, are not isolated one from the other: a financial incentive may take the form of a direct or positive incentive; an indirect incentive may also be a fiscal or negative incentive, depending on the perspective adopted and the objective in mind.

One of the most common distinctions employed in practice is the financial or fiscal form of the incentive, though the economic incentive policies may not express this distinction clearly or explicitly. Financial incentives are essentially interpreted as the provision of loans or the allocation of subsidies. Agricultural credit is in fact generally considered as a major instrument of agricultural development. A number of studies have revealed its specific and essential character: specific in the sense that the activity involved is different to the others, for agriculture follows the rhythm of the seasons, plants and animals, not the rhythm of monthly, quarterly or annual instalments. The farmers' incomes are generally lower, more insecure and less regular than those of the trade and industry sectors, whilst the levels of investment required are sometimes relatively high and their time-specific expenses (sowing, harvesting) cannot await the capital returns. 37/ The farmer is therefore all the more dependent on agricultural credit, particularly as the other financing channels, notably the banks, are only accessible with difficulty, if at all. 38/ This explains why many countries have set up agricultural credit agencies, which provide loans that are adapted, as far as possible, to agricultural activity: flexible payback periods to account for the farmers' repayment capacity; duration of credit calculated according to the type of work carried out; interest rates well below prevailing bank rates, etc. 39/ Loans are granted for a wide range of

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36/ For example, their impact over time (short, medium or long term) or their economic intention (investment, capitalization, subsistence, etc.)

37/ FAO/Mylonas D., supra (note 20), p. 34; FAO, supra (note 10), p. 33.

38/ FAO/Bochet J.J., Management of Upland Watersheds : Participation of the Mountain Communities, FAO Conservation Guide No. 8, Rome, 1983, pp. 44 and 45.

39/ FAO/Masrevery J., Agrarian Law and Judicial Systems, FAO Legislative Study No. 5, Rome, 1977, p. 32.

activities such as irrigation development, land reclamation, the procurement of farm equipment and implements, the use of fertilizers and pesticides, etc. 40/

In addition to agricultural credit, the financial incentives consist of a wide range of subsidies. In fact the loan itself is a form of undeclared subsidy, when accompanied by a low and, therefore, in real terms negative, level of interest. Another form of subsidy is the public support of commodity prices. The price policy can introduce a number of incentives to encourage the farmers to produce more. For example, inputs such as seeds, fertilizers and pesticides may be subsidized to increase their accessibility for underprivileged farmers, or the prices of staple foods may be supported to ensure a decent and stimulatory farmer income. In China, "extra production is particularly favored: grain sales above quota attract a premium of 50% over base prices". 41/

There are just as many diverse fiscal incentives as there are financial incentives, for taxation offers a wide range of interventionary action to bolster agricultural production. Farmer taxation may itself be oriented to this end. Recently, for example, the agriculture tax was suspended in Morocco, doubtless to revitalize the sluggish agricultural economy. Other countries employ less drastic fiscal measures to pursue a set objective. In Brazil, for example, "a rebate of up to 50% of tax is allowed on land newly brought under cultivation"; in Iraq, land made cultivable by desalinization is exempt from tax under certain conditions; whilst in Argentina, a "surcharge is levied on land capable of being improved but left unimproved". 42/

Also, given that agriculture requires significant levels of capital investment, which is often lacking, such investment is generally strongly encouraged. Many countries have issued codes related to agricultural investment. These apply to both foreign and national investors and include a variety of tax incentives amongst the benefits offered: varying periods of time with exemption from, or reduction of, income tax, tax on profits, land tax, import or export duties for certain commodities, etc. 43/ Similar incentives also exist in the industrial investment codes, for the promotion of agro-industries, 44/ and in the marine investment codes, for the promotion of fishery production. 45/

40/ Vinyo T.R., "Le financement de l'agriculture en République populaire du Bénin: objectifs et contraintes", in Le financement de l'agriculture, Colloque, Paris, 4-6 March 1982, Cahiers du CENECA, June 1982, p. 3/321. See also Aziz S., "The Role of Credit in Rural Development", in Report of a Meeting on Innovative Approaches to Rural Development, Rome, SID, 1983, p. 230 and ff.

41/ World Bank, World Development Report 1982, Washington D.C., 1982, p. 47; Schultz Th. W. (edited by), Distortions of Agricultural Incentives, Bloomington-London, Indiana University Press, 1978, p. 213.

42/ FAO, supra (note 10), p. 32.

43/ FAO/Henderson J., supra (note 20), p. 69 and ff.

44/ Ibn Abdeljalil N., Moneger J., Le Code marocain des investissements industriels (Etude analytique et guide pratique), Casablanca, Editions Maghrébines, 1984.

45/ Lahlou A., Le Maroc et le droit des pêches maritimes, Paris, Librairie générale de droit et de jurisprudence, 1983.

The second possible classification of economic incentives according to their form is the distinction between direct and indirect incentives. A direct incentive is one that directly benefits the farmer, without intermediary and is of immediate use for a specific work. An indirect incentive is one that only benefits the farmer through the intervention of a given economic policy, for the accomplishment of a task which may require a certain length of time. Thus, a study of the economic incentives for forestry and conservation 46/ indicates the following distinctions :

i) direct incentives are provided in cash or in kind. The former include: low-interest credit with a grace period, payment of daily wages for work on the farmer's own holding, for work on neighbouring farms or for government work, payment for work carried out or as agreed (cost sharing). The incentives in kind include: food for work, either daily or per operation, farm implements, hand tools, home improvements, small irrigation schemes, cattle sheds, fish ponds, etc.;

ii) the indirect incentives mentioned in the study relate to fiscal, social and service provisions. Fiscal incentives include tax exemptions on income and property, differential rates, price supports, bonuses and deductions, etc; social incentives include electricity supply, schools, commercial, religious, health and sports centres, youth clubs, etc.; the services include technical assistance, marketing, storage, road works, fellowships, loans and savings cooperatives, etc.

The third classification regarding the form of the economic incentives consists of the positive and negative distinction, which is in fact not specific to the agricultural sector as it was mainly devised for environmental management, with particular emphasis on pollution control. 47/

The so-called positive measures take the form of incentives supplied to the polluter, either as subsidies, loans or tax concessions to encourage him to adopt anti-pollution measures. As for the so-called negative measures, these are borne by the polluter, and take the form of pollution charges or penalties when the level of pollution exceeds a certain limit, in an effort to contain the pollution damage within acceptable boundaries. 48/ The incentives do in effect, therefore, act either positively or negatively, and both exist concurrently in a number of countries that abide by the principle that the polluter pays. 49/ The strict application of this principle, as it is generally understood, signifies that the polluter should be made to bear the cost of the measures introduced by the government authorities for the environment to be in an acceptable condition. In other words, the cost of these measures should be reflected in the cost of the goods and services that

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46/ FAO, supra (note 28), p. 12 and ff.

47/ Anderson F.R., Kneese A.V., Reed Ph.D., Stevenson R.B., Taylor S., Environmental Improvement Through Economic Incentives, Baltimore-London, Resources for the Future, 1977, p. 18 and ff.

48/ Delogu O.E., Soell H., Fiscal Measures for Environmental Protection. Two Divergent Views, Morges, 1978, p. 11 and ff.

49/ OECD, supra (note 23).

cause the pollution through their production and/or their consumption. Such measures should not generally be accompanied by subsidies that are likely to result in major distortions in international trade and investment. 50/

One of the functions of the pollution charges is to ensure the partial or total financing of collective pollution control installations, the polluter investments to control pollution, the various implementation costs and the payment of compensation for damages. 51/ The charges are used in areas which directly or indirectly concern agriculture, such as the elimination of solid wastes and the pollution of air and water. These have been mainly used with regard to water management, particularly within the framework of catchment basins, that is to say in an integrated area, thereby expressing the physical solidarity of the different water users located within the basin, where any change in the water regime or quality affects the users as a whole. 52/ Any polluter of the basin, whether industrial, agricultural or other, is normally liable to the financial cost of the pollution caused, which should encourage its reduction or elimination. 53/ Such an incentive can obviously be beneficial for agriculture, as it thus acquires enhanced water resources, both in terms of quantity and quality. The same condition of interdependency can be observed when examining the classification of economic incentives according to purpose.

2. Distinction of Incentives According to their Purpose

In terms of their purpose, the economic incentives for agricultural production can be sub-divided into three groups: those applying to agriculture as such; those regarding forestry; and those directed towards fisheries, though it should be noted that some may be multi-functional. For example, a measure for the protection of a watercourse or a woodland area could easily lead to a production increase in all three sectors.

Agricultural production, sensu stricto, is stimulated in a variety of ways. In general terms, it usually benefits from special taxation provisions that are normally geared towards farmer support. 54/ However, the incentive effect of such a fiscal policy is relatively modest as the taxes levied on

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50/ Point 4 of the guiding principles for the economic aspects of international-level environmental policies, in annex to the recommendation on the guiding principles for international-level environment policy aspects, adopted by the OECD Council on 26 May 1972 (in OECD, The Polluter Pays Principle, Paris, 1975, p. 11).

51/ OECD, supra (note 23), p. 12.

52/ Ibidem, p. 40.

53/ Despax M., supra (note 4) , p. 354.

54/ Le financement de l'agriculture, supra (note 40).

agricultural incomes are not high, so any tax relief granted is of limited consequence. 55/ This explains why agricultural production is stimulated through other factors that are more varied and better adapted to particular situations.

Subsidies, for example, may be provided for the execution of permanent improvements such as drainage or the drilling of tubewells, with varying proportions of the cost met by the farmer and by the State respectively. 56/ Provisions may also be introduced to encourage the procurement or manufacture of goods or machinery for agricultural production, through, for example, their exemption from import duties or subsidies for their manufacturers. 57/ Some countries make extensive use of a series of economic incentives to enhance agricultural yields, notably the promotion of fertilizer production and utilization 58/, chemical inputs 59/, improved seeds 60/, and plant protection. 61/ The selection of the incentives provided, which may vary considerably in form, is largely dependent on the nature of the targeted production factor.

Though forestry production benefits from a narrower range of economic incentives, it is nevertheless of equal concern to the government authorities, particularly where the forest cover represents an important source of income for the national economy or, conversely, where the forest cover is receding excessively and thereby jeopardizing national or local economic prosperity and ecological equilibrium; There is a growing awareness throughout the world that the forest is an important national - indeed international - heritage that needs to be safeguarded and developed through a rational management policy. 62/

55/ Passeron S., "Fiscalité agricole, fiscalité des espaces naturels et protection de l'environnement", in Fiscalité-Environnement, supra (note 24), p. 213; FAO/Masrévéry J., supra (note 39), p. 33: "The need to stimulate productivity and to promote reform has implied the further need to develop fiscal measures not so much to provide the State with a tax revenue as in order to bring pressure to bear by way of implementing a given policy and guiding agricultural activities along lines contemplated by it."

56/ FAO, supra (note 10), p. 4.

57/ Ibidem, p. 35 and ff.

58/ FAO/Gimeno Sanz J.M., supra (note 20), p. 5.

59/ FAO, supra (note 10), p. 35.

60/ FAO/Bombín L.M., Seed Legislation, Legislative Study No. 16, Rome, 1978, p. 9-10.

61/ FAO/Bombín L.M., Legislación fitosanitaria, Estudio legislativo No. 28, Rome, 1983, p. 30. The list of the stimulated means of production or agricultural branches is not restrictive; the incentives for agribusiness can also be mentioned.

62/ Prieur M. (under the direction of), Forêts et environnement en droit comparé et international, Paris, Presses Universitaires de France, 1984, p. 291.

Economic incentives play an important role in the implementation of such a policy, since forestry is a crucial economic activity and, therefore, generally requires relatively heavy levels of investment with returns that are far from immediate. 63/ Such investments are in fact long term given that the forest production cycle usually extends over a number of generations. 64/ Economic incentives are virtually indispensable if we also consider the uncertain and modest level of income generated by forestry. 65/ There has been a clear trend during recent years to promote community, and particularly village, forestry to implement reafforestation operations. A number of such programmes, based on a variety of incentive measures, have been set up with close farmer collaboration, for the major resource deficiencies are precisely at the village level. Thus in the Republic of Korea a village forestry development programme provides financial and technical assistance to the villages "in the form of subsidies and loans. Subsidies are mainly in kind and include seedlings, fertilizers, and transportation of such to planting sites. Loans are provided under the Forest Development Fund, established by the 1972 Forest Development Law." 66/ Similar operations have been conducted, with varying degrees of success, in various countries such as Indonesia, Honduras, Jamaica 67/ and Senegal. 68/

More generally, and apart from the social advantages and the assistance in kind that exists particularly for community forestry, the economic incentives are usually financial or fiscal: subsidies, loans and tax concessions exist in virtually every country. 69/ With regard to taxation, one particular feature needs to be highlighted, namely the existence in many countries of a special fund for forestry development. Though the term "forestry fund" is fairly common, it can in practice be widely interpreted. 70/ For example the French National Forestry Fund, which was created in 1946, is a special allocation account sustained by levies exacted on forestry production and timber imports. 71/ The tax revenue is then passed on to the farmers in the form of subsidies or concessionary long-term loans. Other countries have introduced a similar forestry fund, sometimes modelled on the French experience. 72/

63/ Passeron S., previously cited (note 55), p. 228.

64/ ECE/FAO, Incidences de la fiscalité sur la gestion des forêts et l'offre de bois rond, Geneva, December 1980, p. 1.

65/ Ibidem, p. 41.

66/ FAO/SIDA, Village Forestry Development in the Republic of Korea. A Case Study, Forestry for Local Community Development Programme (GCP/INT347/SWE), Rome, 1983, p. 57.

67/ FAO, supra (note 28), p. 45.

68/ Mekouar M.A., Wenger E., "Forêt et environnement en droit sénégalais", in Prieur M., supra (note 62), p. 170.

69/ ECE/FAO, supra (note 64), p. 3.

70/ du Saussay Ch., "La protection des forêts en droit africain, in Prieur M., supra (note 62), p. 158.

71/ Passeron S., supra (note 55), p. 229; see also Meyer F., Legislation et politique forestières, Paris, Berger-Levrault, 1968, p. 114.

72/ Such as Morocco, Senegal, Uruguay; see Prieur M., supra (note 62), pp. 194, 178 and 226 respectively.

With regard to fishery production, the governments have paid increasing attention to this sector during the past ten to twenty years, depending on the country. This has been partly due to the relative stagnation of recent catches, compared to the sharp increase in fishery production that had occurred since the Second World War. 73/ The FAO World Conference on Fisheries Management and Development, which was held in Rome in June-July 1984, was largely responsible for the greater focus on this sector. 74/ Attention should also be drawn, in this connection, to the major repercussions, particularly for the non-coastal states, of the virtually global extension of fishing limits to 200 nautical miles. 75/

These combined factors have encouraged those states wishing to increase their fishery production to introduce incentive measures for both inshore and deep-sea fishery industries. The member states of the OECD, for example, dispose of a wide range of economic incentives to promote the fishery industry. The Federal Republic of Germany grants loans and subsidies for the construction of trawlers and fishing vessels as well as for the surveying of new fishing grounds. 76/ In the State of Tasmania, in Australia, the Fisheries Development Authority and the State Agricultural Bank have established a system of financial assistance to enhance the exploitation of the fishery potential. 77/ In Greece, no tax is levied on fisheries, the importation of fishing equipment and nets is duty-free and fuel for fishing vessels is subsidized. 78/ The Italian Government concedes rebates for naval credit. 79/

These few examples illustrate the wide variety of economic incentives that are regularly provided to the fisheries sector: financial assistance or, more rarely, tax concessions, for the procurement of equipment or the promotion of exports.

Though the development of fisheries, and particularly deep-sea fishing, requires increasingly greater human, financial and technical resources, the industrialized countries and those with fishing traditions are not the only ones to have introduced incentives to bolster fisheries production. Numerous developing countries have also adopted similar provisions, as in the case of Morocco which has both a code for marine investment and a marine credit system. The former is directed towards the acquisition on the part of the fishing enterprises of medium and large vessels that employ modern methods and

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73/ FAO, supra (note 6), p. 31.

74/ FAO, Report of the FAO World Conference on Fisheries Management and Development, Rome, 27 June - 6 July 1984, Rome, FAO, 1984, 60 pages + annexes.

75/ FAO, supra (note 6), p. 33.

76/ OECD, Les aides financières aux industries de la pêche, Paris, 1980, p. 2 and ff.

77/ Ibidem, p. 13.

78/ Ibidem, p. 59 and ff.

79/ Ibidem, p. 74; the same publication provides information on the incentives granted to the fishery industry in the following states : Belgium, Canada, Denmark, Finland, France, Ireland, Iceland, Japan, Norway, Sweden, Turkey, United Kingdom, United States, Yugoslavia.

technology, thereby extending the operational range and hence enhancing catch quality, 80/ The latter provides an interest drawback for up to five years on loans granted to beneficiary vessel-owners. 81/ A further example is the case of El Salvador 82/, where one of the legislative provisions to support deep-sea fishing is that of exempting the related enterprises from customs and taxation.

The most notable features brought to light in this analysis of the national realities are, therefore, the fluidity of the concept of economic incentives for agricultural production and the diversity of their application. This observation partly explains the lack of uniformity in the juridical texts that support these incentives.

80/ Lahlou A., supra (note 45), p. 77.

81/ Ibidem, p. 79; Bahraoui O., "Financement des investissements maritimes", in Le Maroc et le droit de la mer, Revue juridique, politique et économique du Maroc, No. 6, 1979, p. 174 and ff.

82/ Decreto No. 97; Ley de fomento a la pesca marítima de altura y gran altura, 1.10.1970, D.O. No. 195, 26.10.1970, p. 12354.

CHAPTER ONE

SELECTIVE OUTLINE OF LEGAL MEASURES FOR THE ECONOMIC STIMULATION OF AGRICULTURAL PRODUCTION, WITH REGARD TO THEIR ENVIRONMENTAL IMPACT

The legal measures to encourage agricultural development will be presented selectively with the view to discerning the major ecological trends of incentive legislation. These measures will be examined from two perspectives: firstly, on the agricultural sector level, then on the agricultural resources level. 83/

A. LEGAL MEASURES DIRECTLY STIMULATING AGRICULTURAL PRODUCTION

National legislations generally tend to implement sectoral interventions to stimulate agricultural production, rather than to employ global actions. This sector-by-sector casuistic approach is currently adopted by numerous legislators, even though it is based on a piecemeal and partial conception of the issue, which is not without certain incoherences. 84/ This is revealed by an examination of comparative incentive law, which usually focuses on three sectors: the agricultural sector as such, the forestry sector and the fishery sector.

1. The Agricultural Sector Sensu Stricto

It is widely recognized that the agricultural sector can be promoted through a variety of ways: extension of cultivated land area, adoption of more appropriate technology, agricultural development (irrigation, drainage, land consolidation, etc.), agricultural mechanization, higher yields mainly through the use of fertilizers and selected seeds, the chemical and biological control of parasites and disease, the reduction of post-harvest losses, etc. As has already been observed, these, and other, factors of production are usually stimulated economically. These economic incentives are expressed legally through a mosaic of diverse national legislations. Their objective is the same - the development of agricultural production - but the paths differ as each legislator has to consider the particular needs and constraints of the social setting and the natural environment where his actions are to be applied. Thus, different legal strategies are employed to achieve the same goal.

83/ Though such a distinction is convenient, it is not absolute as the incentive effect may be mutual, and therefore beneficial to both the agricultural sectors (forestry, fisheries) and to the agricultural resources (water, soil).

84/ ECE, Environmental Aspects of Policies for the Conservation and Rational Utilization of Natural Resources, Senior Advisers to ECE Governments on Environmental Problems (ENV/R.136), 22 December 1981, p. 5.

For example, the law and its corresponding incentives often stimulate agricultural mechanization. Despite the fact that this is sometimes detrimental in the case of fragile soils 85/, it is nevertheless widely encouraged as, when properly employed and under favourable conditions 86/, it represents an important factor for increased agricultural production. Some legislators are all the more inclined to favour the use of agricultural machinery as the horizontal extension of the cultivated land area no longer seems possible, given the levelling off, and even reduction, of available arable land in many parts of the world. According to a fairly recent evaluation, some 60% of the world's cropped land area is still exploited through non-mechanical means. 87/ Certain legislators, therefore, believe that a major incentive effort should concentrate on the relatively large-scale manufacture, importation, procurement and utilization of agricultural machinery.

They have consequently adopted corresponding incentive juridical measures. Morocco, for example, issued a decree in 1969 88/ that introduced State financial assistance, in the form of a subsidy, to enable owner or tenant farmers to acquire new agricultural equipment, whether this be heavy machinery (tractors, seeders, fertilizer spreaders, pick-up balers, etc.) or farm implements (hand tools, harnesses, etc.). As the intention is to enhance agricultural development, article 3 of the decree specifies that agricultural equipment acquired through State assistance must be utilized at full capacity, maximum efficiency and kept in good order. More recently, in 1982, a ministerial order 89/ suspended the levying of duty and tax on the importation of certain agricultural equipment: engines, motor-driven pumps, sprayers, machinery and equipment for soil preparation, for cultivation and for harvesting, tractors and spare parts, etc. Thus exempt from customs duty, this equipment is more accessible for certain categories of farmer, thereby enabling them in theory to increase their output. In some countries, such as

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85/ Glico N., supra (note 12), p. 49 and ff.

86/ ECE, Rôle de la mécanisation agricole en ce qui concerne le maintien de l'environnement dans les zones de collines et de montagnes, Rapport AGRI/MECH No. 96 prepared by E. Kramer, United Nations, New York, 1982, p. 5.

87/ Cox G.W., Atkins M.D., Agricultural Ecology, supra (note 4), p. 2.

88/ Decree No. 2-69-313 of 25 July 1969 regulating State incentives for the acquisition of agricultural equipment (B.O., 29.7.1969, p. 808).

89/ Order of the Ministry of Finance suspending the levying of duty and tax on the importation of certain goods, 17 April 1982 (B.O., 19.5.1982, p. 297).

France 90/ and the Federal Republic of Germany 91/, the policy to encourage agricultural mechanization involves the subsidization or tax exemption of fuel.

Other forms of agricultural promotion have also been introduced by national legislations. Many focus, in one way or another, on the intensification of agricultural production, as for example, the legal measures enacted to stimulate the use of chemical inputs: pesticides, insecticides, herbicides, fungicides, etc. The encouragement to produce, import and use chemical anti-parasites can go as far as granting major financial and fiscal benefits to foreign enterprises so that they will set up national plants for local production. Thus certain Latin American and Asian States have welcomed the presence of chemical multinationals with the provision of subsidies and tax exemptions. 92/

At the same time, some developing country legislators have begun to modify their incentive legislation by adopting measures to protect the environment. In the case of Morocco, for example, whilst continuing to exempt the importation of certain chemical agricultural inputs from tax 93/, the legislation now includes provisions for their rational utilization. A ministerial order of 1984 (a) prohibited the importation, manufacture and marketing of certain pesticides, (b) introduced Government control of these operations for a second list of pesticides, and (c) specifically circumscribed the use of a third group of pesticides. 94/

Fertilizers represent an important chemical input for the intensification of agriculture. Some countries, therefore, have adopted legal measures to promote their utilization. A decree issued in 1969 in Morocco, for example 95/, prescribed such a measure within the framework of the

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90/ EEC, Agriculture de montagne dans la région alpine de la Communauté, II - France, Informations internes sur l'agriculture, Brussels, 1973, p. 89.

91/ EEC, Agriculture de montagne dans la région alpine de la Communauté, III - République fédérale d'Allemagne, Informations internes sur l'agriculture, Brussels, 1973, p. 141.

92/ Weir D., Shapiro M., Pesticides sans frontières, Geneva-Lausanne, CETIM, Déclaration de Berne, E3M, 13M, Magasins du Monde, 1982, p. 49.

93/ Ministerial Order, supra (note 89).

94/ Order of the Ministry of Agriculture and Agrarian Reform regulating the use of organochlorine pesticides (B.O., 18.4.1984, p. 158).

95/ Decree No. 2-69-316 of 25 July 1969 regulating State encouragement for the intensification of annual rain-fed crop production (B.O., 29.7.1969, p. 811).

so-called "Operation Fertilizer", directed mainly towards the intensification of wheat and fodder crop production. The decree provided for State assistance that comprised the provision of services and works, as well as the granting of subsidies for the acquisition of fertilizer and selected seeds. This assistance is subject to the farmers' application of, or commitment to apply, cropping practices that comply with the technical prescriptions of the related Ministry of Agriculture services (article 4). Such a provision enables the Administration to orient the action of the beneficiary farmers so that, above all, they do not damage the environment through an excessive or inappropriate use of fertilizers. This element of control, however, is not explicitly mentioned in the text of the decree. We can observe, therefore, that the environmental objectives are not clearly considered by the legislation governing the economic incentives for agricultural production. A similar observation can be made with regard to the forestry sector.

2. The Forestry Sector

Rational forest management presupposes an exploitation that is both economically viable and ecologically balanced. Though the need to establish an equilibrium between these two converging aims is increasingly being recognized, it is still not sufficiently reflected in the legal texts. The incentive legal measures for the forestry sector, particularly those establishing financial and fiscal provisions, continue to focus more on the productive aspect than on the environmental consequences. It is true that the latter feature in a large number of national legislations, but in practice the provisions for safeguarding forest resources often leave much to be desired.

In Uruguay, for example, the forestry law of 16 December 1968 set up a forest fund which, amongst its other purposes, served to provide loans for reafforestation, forest conservation, the acquisition of afforestation land and the increase of the national forest estate. 96/ The same law prescribes reafforestation obligations in certain production and protection forests (article 25). In practice, this legislation "has not proved effective with regard to natural woodlands. (...) the lack of adequate infrastructure and technical staff to ensure regular supervision of the declared forest areas, has enabled the owners to benefit from all the advantages whilst being free to exploit the resources to the point of exhaustion. As for the compulsory reafforestation, this has hardly taken place...". 97/

96/ Magarinos M., "Les forêts et l'environnement en Uruguay", in Prieur M., supra (note 62), p. 226.

97/ Ibidem, p. 235 (free translation).

A forestry fund has existed in Morocco since 1949, through the levying of a 10% tax on the price of forest products. 98/ Though the fund is mainly used for reafforestation operations, its input is not commensurate with the scale of reafforestation required. 99/ This is doubtless the reason for the adoption of a legislative reform in 1976, whereby resources from the forest sector are allocated to the territorial communities concerned rather than to the national treasury. 100/ Based on the observation that "forestry protection measures cannot be applied without some means of control that involve the users" 101/, the legislator has sought both to associate the local populations directly with the management of their forests and to interest them financially in the benefits of their exploitation. In return these are obliged to allocate at least 20% of the forestry income to community-oriented development: reafforestation, agro-forestry enhancement, the establishment of green spaces, etc. In this way the law makes a positive effort to encourage forest production whilst at the same time safeguarding the forest resources. This reform still does not appear, however, to have borne fruit with regard to the conservation of the forest cover, for the pace of reafforestation is well behind the increasing level of deforestation. 102/

The national legislators usually act generously towards the forest users who are prepared to carry out the development actions desired by the public authorities. Thus, in Spain, a regulation of 30 May 1941 provides for tax exemptions for forest lands on which reafforestation operations are to be effected in accordance with contracts established between the Administration and individuals. 103/ In Italy, landowners who decide to retimber, to establish woodlands, or to develop coppiced land into high forest land 104/ are exonerated from land, agricultural, local and related income taxes according to the provisions of a law of 14 December 1955. In Ghana, a law of 1980 105/ exempts the Commission in charge of the management and exploitation

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98/ Dahir of 12 September 1949 and order of 14 November 1949 concerning the forestry fund.

99/ Mekouar M.A., "Forêt et environnement en droit marocain", in Prieur M., supra (note 62), p. 194.

100/ Dahir of 20 September 1976 on the participation of the population in the development of the forestry economy.

101/ Comte M.C., "Making Social Forestry Work", Ceres, No. 74, (Vol. 13, No. 2), March-April 1980, p. 44.

102/ Mekouar M.A., supra (note 99), p. 184.

103/ Fernández S.G., "Les forêts et le droit de l'environnement en Espagne", in Prieur M., supra (note 62), p. 55.

104/ Caponera D.A., "Le régime juridique de la forêt en Italie" in Prieur M., supra (note 62), p. 101.

105/ The Ghana Forestry Commission Act No. 405 of 22 March 1980.

of forest resources from all income tax (article 19), and appoints it to monitor the conservation of national forest resources (article 7-v). In Colombia, the 1974 National Code for Renewable Natural Resources and Protection of the Environment 106/ envisages a variety of economic incentives in favour of reafforestation, to permit in particular the implementation of protective-productive forest plantation programmes (articles 229 and ff). In Niger, a 1974 law 107/ regarding the forestry regime encourages reafforestation by granting subsidies in kind or in cash to collective groups and individuals (article 25). In addition bare or degraded public lands can be allocated to beneficiaries for the purpose of reafforestation, subject to restrictions for the protection of sloping lands (article 24). Similarly, the 1965 Forestry Code of Senegal 108/ allows for the concession of forest land to collective groups and to public or private bodies for the purposes of reafforestation or the planting of quality forest species. Assistance is provided in the form of seedlings or cash, and when the operation is completed, the direct participants have the right to exploit the wooded land (article D.47). The State has also, for some years, been promoting the development of participatory forestry on the basis of article D.10 which permits the allocation of some of the forest resources to collectives and cooperatives for the purpose of forest development or reafforestation under the technical control of the administration. This has mainly consisted of reafforestation contracts with rural communities, which act as territorial bodies with juridical status and financial autonomy, for which the law recognizes a number of prerogatives with regard to local and community-based rural development. 109/ Though these incentives have produced notable results they have not managed to stem the marked reduction of the wooded land area. A forest taxation reform is therefore planned with the intention of revaluating lumber and rehabilitating the forest, with higher prices for wood products to minimize the pressure of exploitation. 110/ However, the higher price of wood may also produce certain negative consequences, given that wood is a basic

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106/ Decreto No. 2811 de 18.12.1974, por el cual se dicta el Código Nacional de Recursos Naturales Renovables y de Protección al Medio Ambiente (D.O., 27.1.1975, p. 145).

107/ Law No. 74-7 of 4 March 1974 establishing the forestry regime.

108/ Decree No. 65-078 of 10 February 1965 regarding the Forestry Code (regulations section).

109/ Mekouar M.A:, Wenger E., "Forêt et environnement en droit sénégalais", supra (note 68), p. 170.

110/ Ibidem, pp. 178-179.

necessity for a majority of the population. The higher price may lead to an increase in the already common practice of fraudulent tree felling which would be counter-productive for the forest resources.

In France, the forest sector benefits from a number of advantages, some encouraging investment, others aiming to safeguard its resources. 111/ One of the juridical measures of potential benefit for the environment is the land-clearing tax introduced in 1969. 112/ The law aims to control the level of land clearing by taxing corresponding operations, whilst at the same time a credit amounting to the equivalent of the tax revenue is allocated each year in the State budget for the purposes of afforestation, forest development or to finance the upgrading of national forest resources. 113/ The tax could therefore be thought to be of dual benefit to the forest as it discourages land clearing and encourages afforestation, but in practice its level is too low, and in any case out of proportion to the profits realized by "those who transform the forest area into property or industrial complexes ... and given the large number of waivers (some fifteen operation categories), the land-clearing tax is not considered to have achieved its objectives satisfactorily". 114/

These examples illustrate both the environmental benefits and limits of the legal measures regarding economic incentives for forestry production. The relatively modest contribution of the law in this matter is partly explained by the difficulty of ensuring a balanced management of the forest areas, particularly in consideration of the long forest production cycles: the forest in fact needs time to grow and the delay is more burdensome than that of other sectors. 115/ The legislator is also confronted with the problem of

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111/ Beltram P., "La Fiscalité de la forêt", Actualité juridique de droit administratif, No. 5, 1979, pp. 69-73; Gadant J., La forêt et le bois en France, Paris, La Documentation française, 1982, p. 175 and ff; Giraut Ph., "La Fiscalité et la conservation de la forêt", in L'environnement et la forêt, Aspects écologiques et juridiques, Lyon, Publications périodiques spécialisées, 1984, pp. 226-232.

112/ Article 11 of the law of 24 December 1969, subsequently article L.311 of the Forest Code.

113/ Schmitt Th., "Fiscalité forestière et protection de la forêt", in L'environnement et la forêt, supra (note 111), p. 218.

114/ Prieur M., "Les forêts et l'environnement en droit français, supra (note 62), p. 78 (free translation).

115/ Gizard M., La fiscalité forestière, thèse de Bordeaux I, 1983, p. 806.

harmoniously integrating the multiple forest uses: foresters, farmers, pastoralists, walkers, etc., each with different interests which need to be reconciled. Careful thought requires that all the forest functions be considered: the impact on the climate and on soil and water conservation, the safeguarding of the flora and the fauna, the supply of wood and other products both for industry and the population, in addition to the social and cultural aspects. 116/ The law is therefore faced with a particularly delicate task for it has to both regulate the forest uses and ensure its conservation. Its role is, in effect, to combine both the ecological and economic interests. 117/

3. The Fishery Sector

The recent World Conference on Fisheries emphasized the need to focus on the enormous potential offered by currently under-exploited, or totally neglected, fish species. It also called for less fishery resource wastage through an enhanced utilization of current catches. 118/

A number of national legislators had already sought to introduce legal measures for the economic promotion of fishery production, particularly with regard to under-exploited resources. In Colombia, the National Code for Renewable Natural Resources and Protection of the Environment of 1974 119/ provides for the creation of cooperatives and community enterprises which aim to improve the economic and social conditions of fishermen. It includes a number of incentives, particularly with regard to vocational training and technical assistance for the fishermen, as well as tax concessions for the fishing industry as, for example, the duty-free importation of fishing craft, materials and equipment (article 287 and ff.). In Niger a decree of 1974 120/ establishes a special taxation regime for fishing cooperatives, which are exonerated from fishing activity taxation: they are exempted from the payment of tax on profits, turnover, licences and permits, and on revenue from assets, etc. (article 19). In Syria, a decree of 1964 121/ grants wide permit tax

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116/ Prieur, Kiss "Conclusions générales du séminaire", in Prieur M., supra (note 62), p. 291.

117/ Ibidem.

118/ FAO, supra (note 74).

119/ Supra (note 106).

120/ Decree No. 74-284 of 15 November 1974 enacting Law No. 71-17 of 30 March 1971 establishing the fishery regime.

121/ Legislative Decree No. 30 on the protection of aquatic animals of 25 August 1964 (Food and Agricultural Legislation, FAO, Vol. XIV, No. 1, XVI/3).

exemptions to motorized fishing vessels equipped with automatic refrigeration and fish detection devices (articles 65-66). The fishing cooperatives also benefit from tax exemptions and rebates as well as vocational and technical guidance (article 67). In the Yemen Arab Republic, a law of 1980 122/ established a government agency for the development of fishery resources, responsible for promoting fishery resource exploitation and enhancing the status of fishermen. With this in mind, the agency analyses the investment requirements, formulates a credit policy for small-scale fisheries, encourages the formation of fishing cooperatives, etc. (article 4). A similar agency, the National Fisheries Board, was set up in Morocco in 1969 123/ to vitalize the fishery sector. The Board functions as a public body with legal status and financial independence, appointed to manage the national fishery resources. 124/

These legal measures, as a whole, set out to promote the quantitative and qualitative development of fishery production through a variety of means, but fail to make any specific reference to the possible ecological repercussions. Curiously, no mention is made of the need to limit the catches, to replenish the fish stock, to rationalize exploitation, etc. There are, however, exceptions to this tendency to ignore the environmental dimension, for some national legislators have considered the issue and included protective provisions in their incentive laws. In the Gambia, for example, a law of 1977 125/ stipulates a number of measures to ensure fisheries development: credit supply, appropriate infrastructures, technical assistance and vocational training, etc. (article 6). It also establishes a Fisheries Development Fund which is financed by part of the permit fees, by a percentage of the fines imposed by the law and through various subsidies (article 8). At the same time, the law is careful to point out that the development of commercial fishing should not be at the expense of the traditional sector. Appropriate methods are envisaged to this end, and different zones are reserved for each type of fishing (article 7). In addition, the Fisheries Development Fund subsidies should focus primarily on the promotion of small-scale fisheries and cooperative societies (article 8). Finally, the law includes general indications to ensure a rational management of the fishery resources, by avoiding over-exploitation and adopting appropriate conservation measures (article 4).

122/ Law No. 7 of 6 April 1980 establishing and organizing the governement fishery resource development agency (Official Gazette of 30 April 1980, pp. 6-11, in Arabic).

123/ Dahir No. 1-69 of 21 February 1969 establishing the National Fisheries Board (B.O. of 26.2.1969, p. 294).

124/ Chaguer A., L'Office national des pêches (ONP), Essai d'analyse du rôle de l'ONP dans le processus de développement des pêches maritimes au Maroc, Mémoire de Faculté de Droit de Casablanca, 150 pp. (without date).

125/ The Fisheries Act, No. 17 of 27 August 1977 (G.G. of 17.9.1977, Supp. C, p. 117).

Similar, though reduced, concern is also found in a law of El Salvador of 1970 126/ for the promotion of deep-sea fishing. This law prescribes the duty-free importation of vessels, materials, machinery, equipment, fuel, etc., to be used for deep-sea fishing; fishing enterprises are also exempted from paying tax on profits and on capital invested (article 5). These benefits are granted for a period of up to ten years (article 6). In exchange, the beneficiary enterprises must undertake to respect a number of obligations, including: a) the keeping of special records, which are subject to official inspection, with precise details regarding size and destination of catches; b) the setting aside of a fixed quota for domestic consumption to meet national food requirements (article 17). The regular monitoring of the catch levels provides forewarning of over-exploitation which can be reduced if necessary, whilst the fact that part of the catch is earmarked for the domestic market prevents massive exportation, which would be detrimental to the national population.

Despite its growing importance, aquaculture does not appear to have received sufficient attention from the legislators, at least from the perspective of this study. Incentive legal measures have of course been introduced in certain countries, but little consideration has been taken of the impact on the aquatic environment. For example, the Colombian Code for Renewable Natural Resources and the Protection of the Environment of 1974 127/ limits itself to defining aquaculture and urging its development (article 286), without mentioning its environmental impact. Similarly, the Syrian decree of 1964 128/ regarding the protection of aquatic species, encourages fish-farming to increase fishery production (article 23). The only requisite specified is that of obtaining permission to fish-farm (article 24) without any mention of the criteria for approval. The Gambian law of 1977 129/ is more specific on this point: incentives are provided for aquaculture (article 26) but this requires permission which is based on location, construction and operation criteria. Fish-farms are subject to health inspections and the fish to quality control so as to detect any disease that might arise (article 28).

B. LEGAL MEASURES TO PROMOTE THE CONSERVATION OF AGRICULTURAL RESOURCES

A Botswanan law of 1972 130/ regarding the conservation of agricultural resources defines these resources as: the soil, water, plants and products from the soil, animals and wildlife, together with any other agricultural resource declared as such (article 2): We could also include the air, the wind, the sea, sunrays, etc. However, the following pages will only deal with the three major agricultural resources, namely the water, soil and genetic resources.

126/ Decreto No. 97: Ley de fomento a la pesca marítima de altura y gran altura, supra (note 82).

127/ Supra (note 106).

128/ Supra (note 121).

129/ Supra (note 125).

130/ The Agricultural Resources Conservation Act No. 39 of 29 December 1972 (B.G. No. 1, Suppl. A, 5.1., 1973, p. A.247).

1. Water Resources

A rational exploitation of water resources that considers both the requisites of agricultural development and those of environmental conservation is a delicate undertaking, for the legislator has to attempt to reconcile opposing interests and constraints. One possible solution is to employ the polluter-pays principle which is considered "valid both for livestock production and other activities. The sum of the taxes and charges exacted for certain types of pollution are eventually directed towards agriculture in the form of improved methods which are less damaging to the environment and the community. The funds thereby collected can be used to subsidize the development of storage facilities for manure-based products, etc. The revenue earned from detrimental practices serves to promote improved practices". 131/ With these considerations in mind, a report on water pollution due to livestock production recommends the introduction of an economic incentive system that, amongst other features, provides grants and subsidies, low-interest loans, tax relief or that charges for the use of water and the discharge of effluents, in addition to imposing penalties and fines. 132/

A more wide-ranging report on the economic incentive strategy for ensuring the water supply and the controlled discharge of dirty water, including that of the agricultural sector, begins by underlining the fact that agricultural development (and that of other sectors) is accompanied by an ever-increasing need for water, which presents the acute problem of balancing the available resources with the higher demand, as well as that of increased water pollution. Consequently, the report goes on to emphasize that "new economic incentives can be established to encourage a more rational use of water resources and to protect these resources from pollution (...). These measures aim to encourage a more rational water utilization with the users modifying their production technology or economizing water in their own networks. They also set out to produce an income to finance new water resource development activities and to re-establish water purity". 133/ Three series of incentive measures are recommended to permit: a) enhanced protection against pollution (remuneration for services rendered, compensation

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131/ ECE, Rapport du Séminaire sur la pollution de l'eau imputable à la production animale, 29 September 1981 (SGRI. sem. 14/2, WATER/SEM.(8/2), p. 4 and ff. (free translation).

132/ Ibidem, Annex I, p. 2; similarly, ECE, The Use and Effectiveness of Economic Incentives for Prevention of Pollution at Source, 2 December 1971, p. 3 and ff.

133/ ECE, Principes et méthodes de stimulation économique pour l'approvisionnement en eau et l'évacuation des eaux usées, y compris la fixation des redevances (ECE/WATER/16), United Nations, New York, 1976, p. 2 (free translation).

for damages incurred, charges, taxes, tax rebates, etc.); a more rational utilization of water resources (charges for water offtake proportionate to the quantity taken, rates determined by the water quality, etc); c) the funding of investments in water resource management (irrigation canals, reservoirs, water supply plants, purifying stations, etc.).

Some of these measures, which have been used here as examples, do in fact exist in a number of national legislations. In Colombia, the National Code for Renewable Natural Resources and the Protection of the Environment of 1974 134/ specifically stipulates that the Government must establish economic incentives that promote the conservation, improvement and rehabilitation of these resources, and therefore of water (article 13). The Code also introduces so-called "remunerative taxes for environmental services" (tasas retributivas de servicios ambientales), to be charged to direct or indirect users of watercourses, lakes and underground water, who discharge agricultural waste, used water or noxious substances. These taxes should be employed to eliminate or reduce the detrimental consequences of polluting activities (article 18). In order to promote water economy, the Tunisian Water Code of 1975 135/ authorizes the Administration to grant financial and technical assistance for water-wastage reduction works, on condition that these are economically viable and technically feasible (article 96). The Code also encourages the control of water pollution through the provision of financial assistance, and if necessary technical help, from the State for the construction of waste-water treatment installations (article 130). Enterprises that agree to build these installations are also granted special amortization terms (article 131).

A comparable provision is included in a Botswanan law of 1972 136/; according to article 18, if the construction or undertaking of works is considered to be necessary to prevent the pollution of public water for agriculture, the cost may be covered by a special endowment specifically allocated by Parliament to this effect. Those benefitting from the works may however be called on to contribute to their financing. The USA law of 1977 on the conservation of soils and water resources is more complete and detailed in this respect. 137/ In view of the growing demand for water to meet current and future national needs (article 2), the legislator envisages the implementation of long-term conservation programmes to ensure water-resource availability in the future (article 4). Amongst its conservation policy features, the law prescribes that the water resources must be continuously assessed to ascertain, in particular, their quantity and quality, the impact of farming practices and irrigation techniques, and the general environmental

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134/ Supra (note 106).

135/ Law No. 75-16 of 31 March 1975 proclaiming the Water Code.

136/ Supra (note 130).

137/ Soils and Water Resources Conservation Act No. 95-192 of 18 November 1977.

situation (article 5). The conservation programmes must also establish alternatives for the protection and conservation of the water resources and must develop research into the treatment of agricultural waste (article 6). The overriding principle of these programmes must be that of maintaining an equilibrium between the economic and the environmental factors (article 7). The law also provides for the supply of credit to finance the programmes implemented (article 8). This law covers both the conservation of water resources and soil resources.

2. Soil Resources

As a result of the increasing soil degradation, the national legislators have introduced a wide range of incentive legal measures, which are geared both towards agricultural production and, to varying degrees, to the conservation of soil resources. These incentives generally involve the provision of financial and technical assistance or the concession of tax benefits. Technical assistance is, however, not often made available in practice because of the shortage of qualified staff to meet the individual farmers' needs. Financial support is provided in a variety of forms: subsidies, endowments, credit, equipment, etc. 138/

The tax incentives can be employed in particular to promote appropriate land use, in accordance with its physical qualities and productive capacity. The taxation tool may also serve as a more or less effective means of safeguarding agriculture and the environment from property development and land speculation. For example, the rampant, and indeed anarchic, urbanization taking place in most developing countries is often at the expense of fertile agricultural land, and is partly due to the fact that land taxation largely neglects the characteristics of the rural economy and the environmental issue. The impact of the land taxation system may, however, be positive if it accounts for these factors. In some states of the United States of America, some owners prefer to abandon the land rather than pay the high property taxes, which are calculated on the basis of the estimated land value, not on the much lower farmland value. To counter this dangerous trend for agriculture, two-thirds of the states, including the most urbanized, have introduced preferential or differential taxation for farmers (California, Ohio ...) and foresters to keep the land under cultivation:

- preferential: the land is declared at its agricultural value and not at the market value;

- differential: if the farmer sells a plot of land for urbanization, the tax levied is calculated on its market value, with four or five years of retroactivity. 139/

138/ FAO/Christy L.C., Legislative Principles of Soil Conservation, FAO Soils Bulletin 15, Rome, 1971, p. 26.

139/ Organisation et environnement, "Evaluation des mesures existantes et envisageables pour la protection des espaces naturels. Etude comparée de la situation dans quelques pays", in Groupe d'exploitation et de recherches multidisciplinaires sur l'environnement, Politiques de l'environnement comparées, 1981, p. 373.

It has been noted that the land juridical regime together with the property taxation system can, at times, be detrimental to the soil resources. This indicates the vital importance of land control not only with regard to agricultural development 140/ but also for the protection of soil resources. 141/ The legislator must, therefore, take extreme care when enacting incentive measures, which would appear to be rarely the case at present.

The other aspects of soil conservation for agricultural purposes have, in contrast, been largely included in the national legislations. In Tunisia, a decree of 1977 142/ provides for assistance (loans, subsidies, indemnities) to farmers to encourage them to undertake operations that tackle erosion and thereby enhance land productivity, and protect the urban areas and public works from flooding (article 1). When these actions involve checking a dangerous erosion process (article 3) all the costs are covered by the State. If necessary, should no agreement be reached with the owners involved, development can be declared to be in the public interest and undertaken with the provision of compensation for the loss of their right of enjoyment (article 3). This indicates, to some extent, the legislator's concern to give priority to the general interest in environmental conservation over an individual's potential interest in agricultural exploitation. The decree includes a further remarkable provision: State assistance is only envisaged for farmers who carry out soil conservation actions and grow shrubs and crops that exploit the land in accordance with its agricultural suitability (article 8). Assistance is not, therefore, granted indiscriminately, for the agricultural suitability of the land must be respected. This serves to encourage both production and conservation, which are considered to be interdependent and compatible.

A similar soil protection regime exists in Morocco, based on legislative and regulatory texts that mostly date from 1969. One of the notable measures receiving State support is the establishment of soil protection and rehabilitation areas of national interest, in cases where the erosion threatens the urban areas, public works or those of public utility, agricultural regions, or when development measures are essential within a whole catchment basin. 143/ The cost of the soil protection and rehabilitation work is shared between the farmers and the State. The latter is responsible for the erosion control infrastructure in addition to any

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140/ FAO, supra (note 10), p. 27-28: "...when land reform gives the tenant farmer or landless laborer the title to land of his own it becomes one of the greatest possible positive incentives."

141/ FAO/Christy L.C., supra (note 138), p. 11.

142/ Decree No. 77-195 of 17 February 1977 regulating State encouragement for soil and water conservation (J.O., 22.2.1977, p. 465).

143/ Article 6 of dahir No. 1-69-170 of 25 July 1969 on the protection and rehabilitation of soils (B.O., 29.7.1969, p. 802), completed by decree No. 2-69-311 of 25 July 1969, issued for the application of the dahir (B.O., 29.7.69, p. 807).

necessary protective afforestation. 144/ The cost of the bund networks (cereal, fruit, wooded), are partially borne by the State, which initially finances the operations then recovers the farmers' share of the cost from the income generated by the agricultural production from the bunds and the afforestation. 145/ The principle of this system appears to be particularly appropriate and stimulatory in many regards, for the farmer is encouraged, at no initial cost, to protect the soil by establishing bunds and to expand his level of output to reimburse his debt to the State. If the development of the bunds requires provisional enclosures, an annual loan may be obtained during the first six years after the completion of the works, thereby enabling the farmers to confront the conservation expenses. 146/ Finally, the owners of land used for the infrastructure work must be compensated for the losses incurred. 147/ In addition to the soil protection and rehabilitation areas of national interest, which are established and determined through the statutory process, the legislator has also envisaged state involvement through contractual agreement with collective groups or individuals. In this case, the State provides technical assistance (execution of works) and financial help (subsidies, loans), whilst the groups or the individuals undertake to implement the measures recommended by the Administration for the protection and rehabilitation of the soil 148/, these measures being similar to those effected in the statutory areas. The State may also provide support for rain-fed cultivation holdings outside these areas. 149/ To be eligible for State assistance (financial and technical), the landowners must carry out one or several of the following operations: land-clearing, subsoiling, trenching, stone-clearing, approximate levelling, establishing cereal or fruit bunds, preparing stone cordons, gully stabilization, etc., and generally all the works of a definite nature that permit the upgrading and conservation of the soils. 150/ Though the provisions of these legal texts and of others 151/

144/ Ibidem, article 9.

145/ Ibidem, article 10.

146/ Dahir of 1969, supra (note 143).

147/ Ibidem, article 12.

148/ Article 1 and ff. of the same dahir.

149/ Decree No. 2-69-310 of 25 July 1969 regulating State incentives for rain-fed cultivated land. (B.O., 29.7.1969, p. 806).

150/ Ibidem, article 2.

151/ For example, dahir No. 1-69-171 of 25 July 1969 regarding the establishment of pastoral improvement areas (B.O., 29.7.1969, p. 803).

may appear to be generally satisfactory, their practical application has fallen short of expectations as the means implemented have been considerably lower than the actual or potential needs, and in any case far from sufficient to effectively achieve the conservation objectives that the legislator had optimistically, and perhaps ambitiously, set in 1969. 152/

3. Genetic resources

Conservationists readily acknowledge that "the preservation of genetic diversity is both a matter of insurance and investment - necessary to sustain and improve agricultural, forestry and fisheries production, to keep open future options, as a buffer against harmful environmental change". 153/

It has, however, been established that, globally, the genetic resources are in constant decline despite the spectacular advances of genetic engineering, which does not appear to be capable of providing qualitative or quantitative compensation. The real dangers involved have not yet been adequately perceived by the jurists. Comparative law only makes cursory allusions to the need to sustain genetic diversity, but considerable hope is attached to the follow-up of the recent FAO-sponsored International Undertaking. 154/

The incentive legal measures in this matter are relatively rare and, when existent, do not dwell at any great length on the preservation of genetic wealth. Seed legislation, for example, rarely includes provisions to protect plant genetic resources. Regulations regarding importation, and therefore the introduction of exotic varieties, mainly deal with technical aspects such as the packaging, labelling, sealing or the control of conformity to national quality standards. However, some national legislations do consider the environmental impact of such importation: in Chile, for example, this is only authorized after the "agricultural value" of the variety has been appraised; in Finland, restrictions and prohibitions may be applied to the importation of seeds and seedlings "whenever these are unsuitable for cultivation in the country"; in Kenya, the Administration is empowered to "prohibit imports of seeds that may cause deterioration of domestic seed or is unsuitable for the climate of the country". 155/ When economic incentives are explicitly granted

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152/ For soil conservation in Morocco in general, see FAO/Alhéritière D., Downes R.G., Aspects institutionnels de la conservation des sols et de la lutte contre l'érosion dans le Royaume du Maroc, FAO/UNDP/78/015, Rome, 1981, 32 pages.

153/ IUCN/UNEP/WWF/FAO/Unesco, World conservation strategy, 1980 (Chapter 3, "Preservation of Genetic Diversity").

154/ FAO, Report of the Conference of FAO, Twenty-second Session, Rome, 5-23 November 1983, Resolutions 8/83 and 9/83, paragraphs 275 to 287.

155/ FAO/Bombín L.M., supra (note 60), p. 14.

by the legislators these are generally geared more towards promoting the production of improved seeds than preserving primitive cultivars. Such is the case in Spain 156/, Morocco 157/ and Rumania. 158/ The same observation applies to animal genetic resources in the sense that the law is generally more oriented towards improvement than protection. For example, a Moroccan decree of 1969 159/ grants subsidies for livestock breeders who wish to acquire pure-breed or selected-breed cattle, sheep and goats, though there is a stipulation that the animals must be suited to the conditions of the natural habitat and to those of the farm (articles 5 and 6). In addition, covering and insemination are provided freely at the breeding stations and artificial insemination centres (article 9).

In general, the legal measures for the economic promotion of genetic resource development are still largely inadequate. Not only are they usually lacking, but when they do exist they clearly tend towards production: the emphasis is mainly placed on manipulations and improvements that are likely to intensify agricultural production (animal and plant), whilst the genetic diversity and durability, the key to sustained agricultural development, is virtually ignored. Of course it could be argued that the preservation of genetic resources can be ensured through other legal provisions, particularly through forestry legislation or protected areas (parks, nature reserves), which, together with the forests, are important reservoirs of plant and animal genetic resources. Such partial and indirect protection, however would only apply to specifically safeguarded areas and would probably remain dependent upon the maintenance of certain particularly vulnerable habitats. It would, therefore, appear that we must concur in an opinion expressed in another context, which states that "it is a matter of the utmost urgency, then, that laws be drafted for the protection of genetic diversity". 160/

156/ Law No. 11 of 30 March 1971, regarding seeds and seedlings (B.O., 1.4.1971, p. 5300).

157/ Dahir No. 1-69-169 of 25 July 1969 regulating the production and the marketing of seeds and seedlings (B.O. 29.7.1969, p. 801).

158/ Law of 1974 concerning the production and utilization of seeds and seedlings and quality control (publication of the Foreign Trade Society).

159/ Decree No. 2-69-314 of 25 July 1969 regulating State incentives for the intensification of animal production (B.O., 29.7.1969, p. 809).

160/ FAO/Alhéritière D., Environmental Impact Assessment and Agricultural Development, supra (note 2), p. 33.

CHAPTER TWO

ANALYSIS OF THE ENVIRONMENTAL IMPACT OF LEGAL MEASURES FOR THE ECONOMIC PROMOTION OF AGRICULTURAL PRODUCTION

Without wishing to place the study on a purely theoretical level, this chapter nevertheless sets out to broadly analyse the major guiding principles underlying incentive legislation, as they seem to appear from the multitude of legal texts and the diversity of practices. 161/ The comparative law of the economic incentives for agricultural production appears to have two tendencies: on the one hand, the existence of incentive enactments with little regard for their environmental impact; and on the other, the growing adoption of legislation that is increasingly aware of this impact.

A. PREDOMINANT TREND OF INCENTIVE LAW: A LEGISLATIVE APPROACH MODERATELY ATTENTIVE TO THE ENVIRONMENTAL IMPACT

This is in fact the essential feature to emerge from an examination of the comparative law. Legislators tend to adopt the sectoral approach, more or less throughout the world and whatever the economic, social and cultural context, and enact piecemeal incentive measures, sometimes for specific agricultural activities (agricultural, forestry or fishery production), sometimes in favour of the major agricultural natural resources (water, soil or genetic resources etc.). This procedure lacks coherence and may even be conflictive: the lack of intersectoral agreement and coordination between the various juridical services dealing with agriculture and the environment, means that "the sectoral approach frequently gives rise to short-sighted, inconsistent and contradictory policy decisions, as multisectoral claims on the same land, water and air resources are not taken into account until limits of carrying capacity are exceeded". 162/

With the application of the sectoral method, the legislator only pays full attention to the regulated sector. The other sectors, which are no less important, are granted secondary status, when they are not totally disregarded. The law, therefore, only considers, at best, part of the environmental effects.

161/ Obviously such an analysis is in no way exclusive of particularisms and must therefore be accepted for what it is: an attempt to characterize the general comparative law situation and not an accurate description of prevailing positive law in any particular country.

162/ ECE, supra (note 84), p. 5.

It should be clearly understood that a sectoral law can easily be part of a global concept so long as it does not fail to establish all the interrelationships required for rational environmental management. In fact, there is nothing to prevent a global law from emerging from a sectoral concept, if it limits itself to juxtaposing the different sectors. This is where all the difference lies between the sector as a management unit and the sectoral approach, between an intersectoral structure and the simple multisectoral structure.

1. Limited Sectoral Law - Consideration of the Environmental Impact

There is no doubt that, in many cases, when the legislator introduces legal incentive measures, he tries to assess and control the ecological consequences by envisaging protective provisions. This concern to reconcile agricultural development and environmental conservation features relatively clearly in a number of sectoral concept laws. It can be noted, for example, in certain legislations related to forestry 163/, to fisheries 164/, to soil 165/ or water resources 166/, for which the laws have generally been conceived by adopting the intersectoral approach.

However, the legislator is not everywhere, far from it, nor is he totally aware of the environmental risks that accompany his laws, nor is he always willing to tackle them and to bear the consequences. At times he fails to recognize their scope, at other times he represses their repercussions. The result is virtually the same in either case: when he does not ignore them completely, the legislator only briefly considers the environmental impact of incentive legislation.

The attitude, therefore, to the ecological impact on genetic resources has been one of almost total indifference, particularly in developing country incentive legislation. 167/ Yet the universally recognized accelerated erosion of the world's genetic resources 168/ should have resulted in closer monitoring on the part of the governments. Some, perhaps, failed to provide this because of insufficient resources, which is why the authors of the World Conservation Strategy call for international funding within the framework of a global programme for the protection of genetic resources. 169/ Similarly, the FAO Member States are making efforts to strengthen international cooperation in this area. One of the objectives of the International Undertaking on Plant Genetic Resources, which was adopted in 1983 to this end, is that of promoting the adoption of appropriate legislative measures for the conservation and

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163/ The Ghana Forestry Commission Act No. 405 of 22 March 1980; Niger law No. 74-7 of 4 March 1975 establishing the forestry regime; Senegal decree No. 65-078 of 10 February 1965 regarding the Forestry Code (statutory section).

164/ For example: The Fisheries Act (Gambia) No. 17 of 27 August 1977.

165/ For example: Moroccan dahir No. 1-69-170 of 25 July 1969 on soil protection and rehabilitation.

166/ For example: Tunisian law No. 75-16 of 31.3.1975 regarding the Water Code.

167/ FAO/Bombín L.M., supra (notes 60 and 61).

168/ Westoby J., "Genetic Erosion - the other war", IUCN Bulletin, Vol. 16, No. 1-3, 1985, p. 18-19.

169/ IUCN/UNEP/WWF/FAO/Unesco, supra (note 153), Chapter 17. Such a global programme had already been envisaged by the United Nations Conference on the Environment in 1972 (Recommendation 39).

utilization of genetic material, as well as that of encouraging increased financial support for conservation operations. 170/ More recently, and in the same optic, the IUCN adopted a resolution on wild genetic resources, suggesting that the costs of conserving these resources should be shared and that the requisite financial resources should be made available by the international community. 171/ It is, therefore, becoming increasingly recognized that the genetic capital constitutes a global resource which should be safeguarded by every State, and that incentive measures should be adopted to this end.

The legislators should focus all the more on preserving the genetic capital in view of the recent rapid advances in genetic engineering. 172/ A number of countries are strongly encouraging research into plant biotechnology 173/, which many experts view as an extremely promising new scientific area. Its advocates estimate that it will be capable of sustaining the green revolution of tomorrow: genetic manipulation will lead to the development of crops with a greater resistance to insects and micro-organisms, which will be particularly beneficial to most developing countries given their increasing dependence on agriculture. Whilst producing positive environmental effects, biotechnology would enhance long-term agricultural development and open up interesting new perspectives for the expansion of agro-industries. On account, therefore, of its vast potential both for agriculture and the environment, biotechnology "has been acclaimed as the most fascinating discovery of the last decade". 174/ However, comparative law does not reflect this development and the national legislations virtually ignore the subject of genetic engineering. There would, therefore, appear to be a need for legislative intervention, and if measures are adopted to encourage biotechnology it should be remembered that one of the cardinal principles of rational and lasting environmental management is the preservation of genetic diversity. 175/

The various forms of intensification of agricultural production constitute a further area where the environmental objectives are not always clearly considered by economic incentive legislation. A number of countries have, admittedly, adopted laws on this matter, notably with regard to the control of pesticides, such as Egypt 176/, Kenya 177/, Malaysia 178/, Morocco 179/, the Philippines 180/ , El Salvador 181/, or Trinidad and

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170/ FAO, Report of the Conference of FAO. Twenty-second Session, Rome, 5-23 November 1983, C83/REP, paragraphs 275-287.

171/ IUCN, Resolutions, 16th Session of the General Assembly, Madrid, 5-14 November 1984, Resolution 16/24.

172/ Sasson A., Biotechnologies: Challenges and Promises, Paris, Unesco, 1984, 315 pages.

173/ Magnaval R., Les étapes du financement des biotechnologies aux Etats-Unis, Paris, Ministère des relations extérieures, Direction de la coopération scientifique et technique, 1984.

174/ Wardham H., "Plant Genetics - A new weapon against hunger", Mazingira, Vol. 8, No. 1, May-June 1984, p. 27.

175/ IUCN/UNEP/WWF/FAO/Unesco, supra (note 153): Denis-Lempereur R.J., "20 000 plantes auront bientôt quitté la terre", Science et Vie, No. 804, September 1984, p. 62 and ff., Ravachan P., "The Law of the Seed", IFDA Dossier No. 40, March-April 1984, p. 53-57.

176/ Law No. 509 regarding pesticides.

177/ The East Africa Community Control of Pesticides Act II of 1969.

178/ Pesticides Act No. 149 of 1974 (HMGC, 29.8.1974, No. 13).

179/ Decree of 19 March 1984 regulating organochlorine pesticides.

181/ Decreto No. 315, 4.5.1973; Ley sobre control de pesticidas, fertilizantes y productos para uso agropecuario (D.O. No. 85, 10.5.1973).

Tobago. 182/ However, though the use of chemical inputs in agriculture is generally encouraged by economic stimulants, there are no, or inadequate, accompanying regulations to protect the environment. This is the case, for example, with the international trade in pesticides. A survey conducted by the Ministry of Agriculture of the Federal Republic of Germany in 1982 revealed that out of 56 developing countries, 32 lacked the necessary legislative or statutory means of controlling pesticides. 183/ However, a more recent comparative study, carried out by the International Group of National Associations of Agro-Chemical Manufacturers (GIFAP), indicates that, since then, 17 of these countries now possess corresponding regulations and seven others employ a comparable administrative authorization regime. Several countries require that the pesticide be approved in the country of origin, or in other countries, before being eligible for importation. 184/ Nevertheless, 24 importing countries still do not possess an official approval procedure: 11 in Africa, 7 in Asia, 4 in Latin America and 2 in Europe. The study points out, however, that this does not mean that no legislative or administrative action has been taken to control pesticide importation. Many of the governments have a monopoly over imports and it is quite possible that their control is in fact stricter than in countries with official approval systems. Nor should the existing approval systems be necessarily considered as operational or actually implemented. 185/ At the same time the study underlines the fact that in a number of exporting countries, the pesticides are not subject to the producer country's environmental and security rules. 186/ To partly overcome the difficulties that result from these legislative and administrative disparities, UNEP has recently put forward guidelines for the exchange of information on potentially toxic chemicals that are traded internationally. 187/ One of the important provisions is that, with regard to the importation of potentially toxic chemicals, the States should take the necessary measures to provide the users with information, advice and assistance for the rational ecological management of these products (point 3-d). This dissemination of information could be invaluable for legislative bodies that wish to encourage agricultural production but that are also anxious to introduce a system to control agro-chemicals. A further considerable step forward is that accomplished by FAO which has developed an International Code of Conduct on the Distribution and Use of Pesticides. 188/

182/ Pesticides and Toxic Chemicals Act, No. 42 of 1979 (TTG No. 420, 31.12.1979, Suppl., p. 483).

183/ UNEP, Examen des programmes et des activités pour l'échange de renseignements sur les produits chimiques potentiellement nocifs (notamment les pesticides) entrant dans le commerce international, UNEP/WG. 96/3, 26 January 1984, Annex 1, p. 1.

184/ Ibidem.

185/ Ibidem, p. 2.

186/ Ibidem, Annex 2, p. 1.

187/ UNEP, Version révisée du Projet de lignes directrices applicables à l'échange de renseignements sur les produits chimiques potentiellement toxiques faisant l'objet du commerce international, UNEP/WG/112/3, 23.11.1984.

188/ This Code was adopted in November 1985 by the Twenty-third Session of the FAO Conference in Rome.

Similar observations can also be made with regard to agricultural mechanization, where the environmental impact is not always as clearly exposed as the merits are widely acclaimed. At times the negative consequences are even totally ignored and the only aspects considered are those which are beneficial to both agriculture and the environment: "Agricultural mechanization often produces positive environmental repercussions. Not only does mechanization serve to increase the production of foodstuffs, but it also helps to enhance the maintenance of recreation areas. Greater agricultural areas are cultivated and maintained. Plots are more easily accessible and can be exploited by machinery". 189/ This, and the conviction that mechanization can play a leading role in encouraging and sustaining cultivation, as well as cropping land that would otherwise have been left idle 190/, has induced a number of ECE States to strongly promote mechanization , principally through cultivated surface area bonuses, crop bonuses, differentiated price scales, subsidies and credit for the purchase of machinery, for agricultural and housing materials, as well as for improvement work. In addition, the incentive of subsidized or tax-exempted agricultural fuel is often found in comparative law. Such is the case in France with the finance law of 1971 (article 30), in Morocco with the decree of 25 July 1969 regulating State incentives for the purchase of agricultural machinery, and in the Federal Republic of Germany with the agricultural law of 5 September 1955.

The level of agricultural mechanization is due to increase in the near future. Thus, within the ECE geographical area, the expected trend towards the year 1990 confirms the current intensification of mechanization: the evolution of the already highly mechanized development in the regions will be characterized by the automation of processes, enhanced working conditions and the employment of modern management methods. Agriculture will increasingly influence the whole of society throughout the regions. Greater consideration will be taken of environmental protection, the maintenance of the land, the well-being of the animals and the quality of agricultural produce. 191/ Such development, however, will not be the same everywhere. The promotion of agricultural mechanization today varies according to the region. Manual labour co-existe with animal power, tractors, self-propelled machinery and automatic

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189/ ECE, supra (note 86), p. 5 (free translation).

190/ Ibidem, p. 3.

191/ ECE, Tendances actuelles et prévisibles de la mécanisation de l'agriculture (Horizon 1990), Rapport AGRI/MECH Nº 22 établi par F. Coolman et R.L. de Vries, New York, United Nations, 1981, p. 23.

processes. 192/ This gradual development of mechanization will obviously be accompanied by important changes at different levels. In particular it will have to take place at the expense of arable land which is presently employed as permanent pasture or which has natural plant cover; the tropical forests, the savannahs and prairies are amongst those tracts of land that are directly exposed to the risks of extensive mechanization. 193/ This form of agricultural land settlement through mechanization will certainly affect the natural habitat, with varying degrees of intensity. 194/ It is important that the legislator is fully aware of this, and that when enacting incentive measures for mechanization, he seeks to develop a system of encouragement that respects the farming structures, the peasant's dignity and the ecological equilibrium. In the final analysis, agricultural production can but gain from this.

The lack of consideration of the environmental effects of incentive legislation in developing countries is equally noticeable in the ever-expanding agribusiness sector. As this develops, so do the ensuing pollution problems. Thus the forestry industry, and in particular that of pulp and paper, can cause serious water and air pollution as the liquid affluents and the gases emitted are discharged without preliminary treatment in a large number of countries. 195/ Initially the legislator was more concerned with promoting agribusiness 196/ than tackling its detrimental ecological consequences, with the result that the various incentives offered "were not necessarily accompanied by measures designed to secure the protection of the environment". 197/ Some legislators reacted later by imposing anti-pollution measures on manufacturers of pulp and paper which resulted in a considerable abatement of the damage. In these countries today, with their modern factories, "a sizeable proportion of construction costs goes to environment

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192/ Ibidem, p. 9.

193/ Cox G.W., Atkins M.D., supra (note 4), p. 3.

194/ Glico, supra (note 12), p. 54; Caisse centrale de coopération économique, "La motorisation de l'agriculture en Afrique sahélienne et soudano-sahélienne et son financement", in "Le financement et l'agriculture", supra (note 40), p. 3/5210.

195/ FAO, supra (note 6), p. 49. There are other forestry industries that cause degrees of pollution, such as fibreboard and plywood plants, and sawmills, etc.

196/ FAO, Legislative and administrative measures taken to attract and regulate foreign private investment in agriculture, forestry, fisheries and related industries, FAO/Industry Cooperative Programme, Rome, 1967.

197/ FAO/Alhéritière D., supra (note 2), p. 23.

protection measures". Some countries such as Canada, the United States, Finland and Japan have prescribed "for these industries rules governing wastes disharged into the air or into water, and quality standards for the ambient air and the water environment. Other countries have preferred the formula of levying dues proportional to the degree of deleteriousness of the effluents. The dues may be paid into the general Budget, as in the Federal Republic of Germany and the Netherlands, or they serve to cover the cost of installing purifying plants, as in France". 198/ This development, however, has mainly occurred in the industrialized countries, whereas in most developing countries, with some noteworthy exceptions, as in the case of the Philippines 199/, the legislator has remained resolutely passive in this respect. This is perhaps mainly due to economic reasons: "The installation of pollution abatement systems is a heavy financial burden for the industry, and cannot be accomplished without affecting product prices. In some cases, it has not been financially possible to eliminate effluent disharge from old mills". 200/ This does not mean, however, that incentive legislation should remain oblivious to the ecological impact of the forestry industries.

Economic incentives also exist for other agribusiness activities and the pollution these cause is not always effectively taken into consideration. This is particularly the case for canning plants, tanneries and slaughterhouses, which produce environmental damage that the developing country legislator has only rarely confronted. An exception to this is a Philippine decree of 1972 which stipulates that slaughterhouses should be designed to avoid pollution and to enable the disposal of wastes under adequate health, hygiene and environmental conditions. 201/

Similar problems exist with regard to intensive off-land animal production, for the concentration and intensification of livestock raising gives rise to a number of difficulties: health problems and the emergence of diseases that are impervious to traditional remedies; environmental damage and the pollution of surface and ground water caused by liquid manure, excreta and wastes; increased dependence on imported concentrated feed; the poor welfare

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198/ Ibidem.

199/ National Environment Protection Council, Environmental Impact Statement Annotated Outline for Forestry, Forest Industries and Wildlife, Republic of Philippines, 1980.

200/ FAO, supra (note 6), p. 49.

201/ Presidential Decree No. 856 of 30.9.1972: Code of Sanitation (sections 34-36).

of animals condemned to enforced stalling, etc. 202/ Here again, the legislation of the developing countries generally neglects the issue, whilst a number of industrialized countries have adopted appropriate measures. In the United States, for example, three acts have been introduced to deal with the pollution caused by intensive livestock production units. 203/ In France, intensive animal production, as an agribusiness activity, is placed under the control provisions established by the law of 1976 regarding classified installations (considered as potentially damaging to the environment). 204/ The standard ministerial sanitary regulation 205/ also stipulates rules for the construction of livestock raising and fattening stalls, with particular emphasis on the prevention of water pollution and the protection of the neighbouring area (article 153). Finally, a decree of 1980 206/ prescribes the treatment required to prevent needless animal suffering. Regulatory measures are included for livestock production, enclosures, health care, transportation, slaughtering, etc. It should be noted that most of these aspects are covered by a convention on the protection of reared animals, adopted by the Council of Europe on 10 March 1976. The convention applies to the feeding, health care and living conditions of animals, with particular reference to the modern systems of intensive livestock production (article 1). It is important, therefore, that incentive legislation not only promotes the development of agro-industries, but that it also concentrates on the environmental aspects of the production process. Otherwise the concern for the environmental impact may only be partial.

2. Partial Sectoral Law - Consideration of the Environmental Impact

An initial illustration of this incomplete evaluation of the environmental effects can be found in the taxation of the environment and natural resources. The employment of taxation as an instrumental means of conserving and upgrading the natural habitat is a relatively unknown issue, which has not been examined in great detail. Recent studies, conducted mostly in the industrialized countries with conclusions that are not necessarily transferable to developing countries - as taxation systems are designed according to development choices - have, however, produced a number of general ideas on the possible relationship between taxation, agriculture and the environment.

202/ ECE, Les problèmes des grands élevages et des élevages intensifs, Comité des problèmes agricoles (AGRI/R.138), 9 February 1983, p. 3; FAO, Environmental Aspects of Natural Resources Management, Agriculture and Soils, Agricultural Services Bulletin 14, Rome, 1972, p. 14.

203/ Solid Waste Disposal Act of 1965; Resources Recovery Act of 1970; Federal Water Pollution Control Act of 1972.

204/ Law No. 76-663 of 19 July 1976 regarding classified installations for the protection of the environment.

205/ Annex to Ministry of Health circular of 9 August 1978.

206/ Decree No. 80-791 of 1 October 1980 for the application of article 276 of the Rural Code.

Thus, it is felt that under present conditions it is not realistic, nor even desirable, to institute a single tax to protect nature and the environment. There are a number of reasons for this, most of which are economic, technical and psychological. 207/ In any case most authors are extremely doubtful about the actual effectiveness of taxation in this regard. Some criticize the low level of revenue provided and its consequently modest contribution. 208/ Others question its environmental virtues and tend to consider it unsuitable for the protection of the natural habitat. 209/ Others go even further and consider that present taxation, by its very nature, is actually anti-ecological. 210/ Very few are in a position to affirm, without hesitation, that the fiscal incentive constitutes a truly appropriate means of stimulating agricultural production or of encouraging environmental conservation. On the contrary, uncertainty generally prevails for fiscal intervention is fundamentally ambiguous. 211/

This can be illustrated by considering the forestry sector which has been studied in greater depth and which has a longer experience of fiscal intervention. The previous chapter noted the environmental merits and limits of the incentive provisions developed in certain countries for forestry production. It was observed that, in general, these incentive policies have not, in practice, been particularly successful on the ecological level, and that, in the best of cases, the achievements have fallen considerably short of expectations. This relative failure is perhaps all the more true in the case of forestry taxation, which serves to stimulate both production and protection.

Very often, in fact, there is no certainty that a particular tax, or tax exemption, will contribute towards conserving the forest area or encourage its reduction, whatever the original intentions of the legislator. This is generally because the fiscal jungle is so thick and entangled that it is difficult to see clearly and control its development. There are a number of

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207/ Lamarque J., "Le droit fiscal et l'environnement", Revue juridique de l'environnement, No. 304, 1976, 164. The idea of conservation-oriented environmental taxation had previously been defended by Saint-Marc Ph., Socialisation de la nature, Paris, Stock 1971, p. 274 and ff.

208/ Passeron S., supra (note 55), p. 213.

209/ Isaia H., Spindler J., "Droit fiscal et financier", Année de l'environnement, Vol. 1, 1980, p. 253; Isaia H., Spindler J., Martin G.J., "Rapport introductif: essai d'approche interdisciplinaire", in Fiscalité-Environnement, supra (note 24), p. 28.

210/ Malafosse J. de, supra (note 17), p. 10; Sainteny G., "Pour une fiscalité écologique", Combat-Nature, No. 57, August 1983, p. 44.

211/ Harford J., Ogura S., "Pollution Taxes and Standards: A Continuum of Quasi-Optimal Solutions", Journal of Environmental Economics and Management, Vol. 10, No. 1, 1983, pp. 1-17.

cases to illustrate this. For example, a forestry taxation reform was introduced in 1976 in Morocco 212/ as the forest fund revenue 213/ was judged to be insufficient. Since then the financial resources from forest exploitation have been directly allocated to the villages involved, instead of being paid into the National Treasury. In exchange, these have to earmark at least 20% of the forest income for community-oriented operations, particularly those involving reafforestation. The underlying principle was therefore to stimulate forest production whilst safeguarding the forest resources. However, the original intention does not appear to have been fulfilled: as the level of forest earnings is proportionate to the number of trees felled, some communities tend to over-exploit their forest, thereby contributing to its decline. 214/ The uncertain consequences of fiscal intervention in this area can also be illustrated by an experience that occurred in Senegal where social forestry, which receives multiple encouragement 215/, was particularly active in the reafforestation efforts undertaken within the framework of a forest development plan. However, some of this development was counteracted by the taxation system for the commercial exploitation of wood. This is the reason why a forest taxation reform envisages the adoption of measures to revalue stumpage, in an effort to contain the pressures of forest exploitation. 216/

Along the same lines, a third example may be taken from French legislation which exempts woodlands and forests 217/ from inheritance and gift tax, as well as from taxation on up to three-quarters of the value of large fortunes. 218/ At first sight this tax concession would appear to favour the preservation of forest resources. However, as this remission is only granted if the owner undertakes to commit his property to exploitation for thirty years, one is inclined to believe that it will probaby lead to the triumph of economic logic: "the intensive exploitation of the forest which it risks causing, may, in the long term, take place at the expense of concern for the protection of nature". 219/ Similar pessimistic opinions have also been voiced, in France, on the subject of forest fiscal law as a whole. When

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212/ Dahir of 20 September 1976 on community participation in the development of the forest economy.

213/ Dahir of 12 September 1949 and decree of 14 November 1949.

214/ Comte M.C., supra (note 101); Mekouar M.A., supra (note 99).

215/ Decree No. 65-078 of 10 February 1965 related to the Forest Code.

216/ Mekouar M.A., Wenger E., supra (note 68).

217/ Article 793-2-2º and 1-3º of the General Tax Code.

218/ Article 9 of the law of 30 December 1981.

219/ Isaia H., Spendler J., "Droit fiscal et financier", Année de l'environnement, Vol. 2, 1981, pages 240-241 (free translation).

summarizing the ambiguities of forest taxation, one author wrote in this connection: "Does fiscal legislation protect the forest? (...) The forest is generally treated as a reserve of renewable raw materials, and worthy, as such, of attracting investments through tax incentives (...). Taxation, however, fails to consider the natural and social functions of the forest. The qualitative relationship of man with the forest area is ignored, if not penalized (involuntarily) by fiscal legislation (...). The shortcomings and incoherences of forest taxation are a perfect reflection of the priorities accorded to purely economic values by a merchant society little concerned about the management of its environment". 220/ Another, more guarded, author also draws attention to the ambiguous nature of forest, and more generally, agricultural taxation. Mainly on account of its moderate level, the taxation levied produces a contradictory impact on the environment: at times this is favourable, in that it permits an indirect financing of farms, thereby contributing to the maintenance of a rural presence without which there would be no question of preserving the environment; at other times it is detrimental in that it deprives the government of a fiscal instrument for controlling agricultural pollution. 221/

It is not particularly surprising, after all, that the environmental dimension should be so absent from fiscal legislation, and that, when included, there should be doubts as to its functions. A country's fiscal policy is influenced by its socio-economic policy and not vice-versa. Thus, the environment can only be developed and protected through taxation when it forms an integral part of economic and social planning, serving as an essential component of development, and recognized as a welfare indicator. Furthermore, a tax only makes sense when considered in its global context and in terms of its field of action. However, taxation systems are usually extremely complex, with a general structure and a series of special sector-specific taxes. Thus, in areas that are closely tied to the environment, we find taxation related to agriculture, forests, fishing, energy, town planning, etc. Each of these tax provisions has its own rationale, which may or may not coincide with concern for the protection of the environment. Any effort "to introduce greater environmental concern in these special taxations would result in their assuming unfamiliar objectives (...) with all the consequences that such a process could have for their internal functioning". 222/ We cannot reasonably expect the tax authorities to neglect their essential role of budget procurement by emphasizing environmental protection at all costs. We must also avoid overestimating the contribution of taxation to the conservation of the natural habitat. 223/

220/ Schmitt Th., supra (note 113), pp. 222-223 (free translation).

221/ Passeron S., supra (note 55), pp. 230-231.

222/ Bazex M., "Rapport de synthèse", in Fiscalité-Environnement, supra (note 24), p. 325 (free translation).

223/ On this matter, see also: Centre de Droit Public de l'Université de Strasbourg III, supra (note 26) and Delogu O., Soell H., supra (note 48).

The limited scope of tax incentives with regard to the environmental issue is partly due to the fact that these are specific measures that are poorly coordinated with social practices, the economic machinery and the legal rules. Because of the lack of intersectoral coordination, it is not uncommon for the same policy of economic incentives for agricultural production to pursue rival, and even, conflicting objectives, with the subsequent risk of failure on several fronts. Experience has shown that in several OECD countries agriculture has been seriously hampered by competition from non-agricultural activities, as the assistance to the farmers has not been sufficiently attractive to match benefits from elsewhere. As a whole, the agricultural incentives are considered to fall short of the very high prices offered by the non-agricultural sectors, which are always in a dominant position as land profitability is much higher in the case of non-agricultural use. 224/ This unequal situation is not only detrimental to agricultural development but also, at times, environmentally damaging, given that the non-agricultural use of farmland is often more harmful to the natural habitat than is agriculture itself. 225/

Competition can also be found within the same sector, between the various possible uses of a resource, or between different types of exploitation or cultivation. Thus, in a number of OECD countries, the tendency to expand the forest area at the expense of certain agricultural lands is sometimes accentuated - involuntarily - by the assistance that most governments provide for reafforestation. It is true, though, that this mainly affects marginal lands-with poor agricultural potential, and that it generally leads to enhanced protection of the habitat, particularly in the steeply sloping mountain areas. 226/

Similarly, the unintegrated management of water resources may produce undesired environmental effects. Excessive water sometimes constitutes a serious handicap for agricultural development, particularly in low-lying coastal, valley or marshy areas. A number of countries have employed the polder technique to reclaim this potentially fertile land area. This technique, which involves the development of vast waterlogged areas through the control of drainage and flooding, has proved extremely profitable to agriculture in such diverse countries as Bangladesh, Egypt, Japan, Thailand, Venezuela and, above all, the Netherlands. Yet, such land reclamation also raises significant ecological problems, for polder cropping requires land

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224/ OECD, L'agriculture face aux politiques d'utilisation du sol, Paris, 1976, pp. 34 and 90.

225/ Ibidem, p. 89; for an illustration of this with regard to Latin America, see: Glico N., supra (note 12), p. 74.

226/ OECD, supra (note 224), p. 38.

development that alters the physical and chemical composition of the soil. 227/ On a more general level, the polder technique upsets the ecological equilibrium of the ecosystems it affects, thereby causing in particular the degradation of coastal wetlands, the destruction of coral reefs, the disappearance of mangrove swamps and coconut groves, the salt-contamination of wells, the depletion of fish stocks, etc. 228/ Obviously the legislator will largely ignore these environmental effects if he adopts a narrow sectoral approach that prevents a global understanding of the issue.

The use of water for irrigation purposes is another example of an instrument that cuts two ways and that therefore needs to be handled with care. Because of its undeniable benefits, irrigation has been strongly encouraged more or less throughout the world, with notable results in terms of agricultural production. This positive contribution should not, however, conceal the fact that irrigation can be expensive, technically complex and ecologically harmful. The major ecosystem changes it can produce sometimes result in undesirable environmental consequences. 229/ These negative effects are not always confronted at the legal level, whether by specific irrigation legislation, which is mainly oriented towards agricultural development, or by general water legislation, which is traditionally neglectful of irrigation (this being considered as dependent on the infrastructure and capital works); with their excessive specialization, they both fail to consider an important aspect of the water issue which concerns them, namely the environmental impact of irrigation. In Morocco, for example, the 1969 code for Agricultural Investment 230/ stimulates irrigation but ignores its ecological consequences. 231/ Similarly, the Water Code of Tunisia 232/ fails to mention irrigation, though it is detailed and includes provisions on water pollution. These few examples testify to the need for the intersectoral harmonization of legislative and regulatory texts directed towards the promotion of agricultural production.

227/ Volker A., "Les polders : une méthode ancienne de mise en valeur des terres", Nature et Ressources, Vol. XVIII, No. 4, October-December 1982, pp. 2 and 7.

228/ IUCN/UNEP/WWF/FAO/Unesco, supra (note 152), Chapter 2.

229/ Johl S.S. (edited by), Irrigation and Agricultural Development, Pergamon Press, 1980, p. 85 and ff.

230/ Dahir No. 1-69-25 of 25 July 1969.

231/ Boudebala N., La question hydraulique, Rabat, tome I, 1984, p. 45 and ff.

232/ Law No. 75-16 of 31 March 1975 establishing the Water Code.

B. EMERGING TREND OF INCENTIVE LAW: A LEGISLATIVE APPROACH INCREASINGLY ATTENTIVE TO THE ENVIRONMENTAL IMPACT

The new trend in comparative law to emerge during recent years is that of broadening and extending the narrow horizon of the sectoral approach. The legislator is increasingly seeking to adopt a more integrated concept of the regulated sector, with a consequent gradual increase in intersectoral legislation and clearly enhanced concern for both the agricultural and the environmental dimension of the incentive measures.

1. Intersectoral Incentive Legislation

The emergence of an intersectoral or integrated legislative approach is gradually enhancing the awareness and consideration, on the part of national legislators, of the environmental aspects of agricultural development policies. The successes and disappointments of comparative law have served as a lesson. The traditional legislative approaches, which are mainly directed towards regulating the uses and resources, are gradually being foresaken, without being totally discarded. 233/ Multi-dimensional laws are replacing uni-dimensional laws. Fragmentation and isolation are giving way to coherence and integration; conflicts and contradictions are ceding to coordination and harmony. A number of relatively recent laws testify to this new orientation.

For example, the Rwandese law of 1982 related to soil protection, conservation and use 234/, illustrates the legislator's concern to regulate and reconcile three objectives concurrently, an undertaking that necessarily entails coordination work which the law entrusts to a specially appointed Commission (articles 6-7). Moreover, the law extends beyond the framework of soil resources by also applying to closely connected sectors, such as agricultural pollution (article 3), forestry policy (article 4), and bush fires (article 5). In effect, the law goes beyond its main intention by aiming at several objectives, organizing several uses and covering a number of sectors.

In the same light, a Swiss law of 1979 provides for contributions to the cultivation of the soil in adverse conditions. 235/ These contributions, which are paid by the State to landowners, constitute incentives both for the cultivation of topographically difficult agricultural land, as well as for the protection and maintenance of a fragile habitat (article 1). This assistance is coupled with the obligation, on the part of the owners, to tolerate the cultivation or maintenance of their land whilst lying fallow, and when land cultivation is considered by the legislator to be in the public interest to sustain agriculture or when the lack of maintenance is particularly detrimental to the environment (article 6). Thus the law places agricultural production and environmental conservation on the same level and considers both to be in the public interest. The law covers and stimulates both simultaneously through the same incentive measure.

233/ FAO, Environmental Law and Development, Legal Office, Rome, 17 May 1984, pp. 3 and 4.

234/ Law No. 11 of 30 March 1982 (O.G., 1 May 1982, p. 334).

235/ Law of 14 December 1979 (R.L.F., 24 June 1980, p. 679).

Sometimes a single bi-sectoral law may apply to two closely interdependent natural resources, particularly with regard to soil and water. An example of this is a United States law of 1977 related to the conservation of soils and water resources. 236/ As the utilization of these two resources is difficult to separate, the legislator has considered them jointly for the purpose of their rational management. Public funds are, therefore, allocated to finance coordinated programmes of soil and water assessment and protection (articles 8 and 2); the conservation policy must consider all the environmental factors, notably the impact of farming practices, irrigation techniques and agricultural pollution (articles 5-7).

In Tunisia, a decree of 1977 adopts the same approach for the regulation of State incentives for the conservation of soil and water resources. 237/ Various forms of assistance are granted to farmers to stimulate activities that are directed to both resources and that in principle benefit both agriculture and the environment. The farmers are encouraged to carry out work to contain erosion, to protect the urban areas and the infrastructure from flooding, to improve land productivity and to respect crop suitability (articles 1 and 8). Similar provisions also exist in a Moroccan decree of 1985 related to State incentives for hydro-agricultural development and the upgrading of agricultural property. 238/

Such bi-sectoral laws also exist for water and air, as in the case of a Philippine law of 1964 that creates the National Water and Air Pollution Control Commission. 239/ The law sets out to ensure the quality of these two resources by envisaging the establishment of water and air purity standards, with regard to their different uses, whether these be agricultural, industrial, domestic or others (article 1). One of the Commission's duties is to provide incentives for voluntary cooperation between the inhabitants, the municipalities, the associations, the manufacturers and the farmers, with the view to promoting the judicious utilization of water and the preservation of air purity (article 6-b-l).

The occurrence of acid rains has clearly illustrated the close relations that can exist between air pollution, on the one hand, and the contamination of water, the deterioration of the soil and the degradation of plant cover, on the other. 240/ The governments and the nature protection associations, in most of the industrialized countries faced with the problem of acid rains, are becoming increasingly concerned about the level of environmental damage being caused. In June 1985, an international conference drew attention to the fact

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236/ Supra (note 137).

237/ Supra (note 142).

238/ Decree No. 2-83-752 of 29 January 1985 (B.O. 20.2.1985, p. 111).

239/ Act No. 3931 of 18 June 1964 creating the National Water and Air Pollution Control Commission.

240/ The acid rains have resulted in a wealth of publications during recent years. For a clear and succinct presentation of the issue, see: Swedish Ministry of Agriculture, Acidification. A Boundless Threat to Our Environment, Stockholm, 1983, 40 pages.

that air pollution was leading to forest degradation. 241/ The final declaration of the conference called for the immediate and extensive introduction of an anti-pollution tax on the discharge of noxious gases, together with legislation enacting incentive measures for energy conservation and the decentralized production of "soft" energy resources. In addition to the forest areas, the acid rains can also affect the whole of the agricultural production sector. A warning of the Parliamentary Assembly of the Council of Europe states that important dry or wet acid deposits reduce the growth of numerous crops either directly, or by decreasing their resistance to disease, harmful organisms or frost damage. 242/

A number of countries have introduced legislation to deal with this problem. For example, the United States passed the Clean Air Act in 1970, which has considerably reduced the damage caused by air pollution. In addition, a 1980 law on energy resource security established a ten-year programme for the assessment of acid precipitation. It is estimated that acid rains cause US$ 5 000 million of damage each year in North America. However, the damage avoided by the 1970 Clean Air Act is evaluated at US$ 24 000 million. A study conducted in the United States concludes that air pollution has decreased by 60% since 1970, which has led, amongst other benefits, to the saving of some US$ 40 000 million in public health expenditure. Similar positive results have been obtained by the strict pollution control measures introduced in Japan. 243/

This example has encouraged several European countries to adopt similar measures, two of which have received particular attention: speed limits on roads and motorways, and the introduction of leadless fuel. Thus, in December 1984 the Council of Ministers of the European Economic Community set a deadline on 1 October 1989 for the introduction of leadless fuel. 244/ In France, two decrees of 12 and 13 July 1984 envisage the gradual reduction of motor-vehicle pollution. 245/ In Switzerland, in addition to the federal measures to limit the speed on roads and motorways, certain cantons subsidize public transport commuters to encourage the reduction of private vehicle use. 246/ In the Federal Republic of Germany, the Government has decided to

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241/ Subsequent to the first such conference held in September 1984 in Austria, the second International Conference for Action against Forest Decline and Air Pollution was held in Strasbourg, between 7-9 June 1985, on the initiative of the European nature protection NGOs.

242/ Council of Europe, Parliamentary Assembly, Avis sur les effets des pluies acides sur l'agriculture, la sylviculture et les pêches, Doc. 5118, Strasbourg, 19 September 1983, p. 16.

243/ Council of Europe, supra (note 242).

244/ Council of Europe, Faits nouveaux. Nature, No. 1, 1985, p. 1; the European Parliament adopted a similar measure at virtually the same time. A number of countries already provide leadless fuel, such as Belgium, Denmark, Luxembourg, the Federal Republic of Germany, Sweden and Switzerland.

245/ J.O., 17.8.1984.

246/ Département fédéral de l'intérieur, Dépérissement des forêts et pollution de l'air, Berne, 1984.

gradually convert the car fleet to leadless fuel. Vehicles will also have to be fitted with catalyzers : from 1 July 1985 purchasers of such vehicles will be granted tax concessions. This should lead to a 80-90% reduction in carbon monoxide, hydrocarbon and nitrogen oxide discharge. 247/

It is widely recognized that the acid rain issue is international in scope, and that the search for solutions must largely be carried out through inter-State cooperation. There is, in fact, an international instrument that deals, to some extent, with this matter: the Geneva Convention of 13 December 1979 on Long-Range Transboundary Air Pollution. The party States undertake to combat this form of pollution (article 2) through joint research and development activities to determine the effects of air pollution on human health and the environment, including agriculture, forestry and the aquatic ecosystems, with a view to establishing, on a scientific basis, the level/effect ratios for the protection of the habitat (article 7-d). In connection with this Convention, Recommendation 867 (1979) of the European Parliamentary Assembly invites the Member States to provide adequate financial resources to develop the technology needed to reduce air pollution and to ensure that the most advanced technologies are implemented. This should be accompanied by the introduction of tax benefits and the adoption of other incentive measures (rapid amortization and a national "quality label" for example) for industries respecting the improved standards. 248/

Besides transboundary air pollution, several other environmental areas are covered by regional or global international legal instruments, which represent a higher degree of integration of the agricultural and environmental aspects. For example, in Latin America the Cartagena Agreement Board decided in 1983 249/ to set up the Celestino Mutis Andean System regarding agriculture, food security and the conservation of the environment. 250/ Aware that agricultural production is highly vulnerable and dependent on natural resources, the contracting parties agree in the preamble on the need to harmonize the agricultural exploitation and the preservation of the environment, in view of its essential role for the future of mankind, and to conserve the potential of the renewable natural resources. To this end, they undertake to develop integrated agricultural plans oriented towards the enhanced production of staple foods, which are granted priority status in accordance with the nutritional needs of the population (article 6). At the same time, they undertake to establish programmes for environmental conservation, the rational management of natural resources and the control of pollution and harmful effects (article 15). These two types of action are to be equally encouraged through economic stimulants; sub-regional financing agencies will be responsible for channelling sufficient resources for the fulfilment of these objectives (article 13).

247/ Council of Europe, Faits nouveaux. Nature, No. 10, 1984, p. 2.

248/ Council of Europe, supra (note 242), pp. 23 and 25.

249/ Decision No. 182 of 25 July 1983 (R.O. del Ecuador, 1.11.1983, p. 10).

250/ The naturalist José Celestino Mutis had organized the first botanical expedition to Colombia in 1783.

A further regional strategy is that of the integrated Mediterranean programmes elaborated by the EEC Commission in a regulation proposal of 23 August 1983. 251/ As experience had revealed the limitations of an approach based on sectoral actions that were not incorporated, in a coordinated manner, in an integrated development operation (preamble), these programmes set out to promote such development in the rural areas of certain Mediterranean regions in France, Greece and Italy, by implementing both agricultural and environmental measures, coupled with various forms of highly stimulatory economic assistance. Similar examples exist in other geographical regions, such as Africa 252/ and the South Pacific. 253/

Such legal instruments also exist on the global level, as, for example, the Paris Convention of 23 November 1972 for the Protection of the World Cultural and Natural Heritage. This Convention is relevant to the agro-environmental dimension of this study, as one of its objectives is to ensure the conservation, for scientific, aesthetic and ecological purposes, of the natural monuments, the natural sites and the habitats of threatened animal and plant species which have outstanding universal value (article 2) and appear on the world heritage list (article 11). The contracting States are encouraged to apply the conservation measures included in the Convention through the financial assistance provided to this effect by the World Heritage Fund (article 15).

We could also mention an international instrument which is mainly commercial in character, but which greatly influences the agricultural and environmental situation: the International Tropical Timber Agreement, established in 1983, within the framework of UNCTAD. 254/ Truly universal in scope, as it involves consumer and producer countries which together account for over 90% of the world trade in tropical timber 255/, the agreement concentrates in particular on the environmental consequences of the commercial exploitation of tropical forests. Though promoting the expansion and diversification of the international trade in tropical timber (article 1-b), the agreement also acknowledges the need for the appropriate and effective preservation and development of the tropical forests to ensure optimal exploitation, whilst sustaining the ecological equilibrium of the regions concerned and of the biosphere (preamble). At the same time, the agreement encourages the elaboration of national policies for the sustained utilization and conservation of tropical forests and their genetic resources (article 1-h). There is also an incentive component, whereby projects based on these policies - for example a reafforestation programme - are entitled to loans issued from an account especially set up for this purpose (article 20-7).

251/ J.O. des CE. No. C 251 of 19 September 1983, p. 1.

252/ African Convention on the Conservation of Nature and Natural Resources, Algiers, 15 September 1968.

253/ Convention on the Conservation of Nature in the South Pacific, Apia, 12 June 1976.

254/ International Tropical Timber Agreement of 1983, United Nations, New York, TD/TIMBER/11/Rev.l, 1984, 20 pages.

255/ Johnson B., "The New International Tropical Timber Agreement. Chimera, or a real chance for conservation?", IUCN Bulletin, Vol. 15, Nos. 4-6, April-June 1984, p. 38.

In addition to the legal incentive provisions, which are in wide application more or less throughout the world, some countries have developed stimulatory contractual mechanisms, some of which follow an integrated approach. An example of these are the French nature-area management agreements that are drawn up between the Administation and individuals or corporate bodies, with the main objective of ensuring the environmental management of the natural habitat through the protection of the area, the respect of the natural sites and ecological equilibrium. Thus, the contractor may be called upon to undertake various development operations and activities that are favourable to, or compatible with, the protection of the environment. 256/ This formula is attractive for the contractor because of the accompanying benefits, which are mainly fiscal; it is also beneficial for the environment as it helps to prevent the over-exploitation of the protected areas. There is a further stimulatory agreement formula in French legislation, involving contracts for clean rivers, for which the implementation procedure is defined in a circular of 5 February 1981. In this case an agreement is established between the State and the department(s) associated with the river in question. The agreement covers both the recovery and the subsequent maintenance of water quality and also the development of the river: protection of the river bed and banks, the safeguarding of the fauna and flora, etc. In addition to the assistance provided by the State and the River Boards, the Ministry of the Environment allocates an additional subsidy amounting to 10% of the total cost of the work undertaken, which has acted as a significant incentive. 257/ Similar agreements exist in other countries, such as the management agreements in England which have been used in the forest sector for the creation of nature reserves and for the conservation of wildlife 258/, or the New Zealand management plans which focus on the development and protection of marginal areas. 259/

In certain juridical systems, the intersectoral legislative approach has been adopted more extensively, with a more global perspective, though not a total one, which would not be materially feasible. A number of laws introduced during the past decade have reflected this approach, as for example the Colombian Code for Renewable Natural Resources and Protection of the Environment. 260/ This Code sets out to "accomplish the preservation and rehabilitation of the environment together with the conservation, improvement and rational utilization of the renewable natural resources according to criteria of equity, that ensure the harmonious development of mankind and these resources, the permanent availability of the latter and the maximum social participation, for the benefit of the health and the welfare of the present and future inhabitants of the national territory". 261/ Various

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256/ Isaia H., Spindler J., "Fiscalité et conventions de gestion des espèces naturelles", Année de l'environnement, Vol. 1, 1980, p. 146.

257/ Ministère de l'environnement, Actualité Environnement, No. 82, 15 May 1985.

258/ Lloyd R.J., "Incentives in Conservation" in Davidson J., Lloyd R. (editors), Conservation and Agriculture, New York-Brisbane-Toronto, John Willey and Sons Ltd., 1977, p. 176.

259/ OECD, Environmental Policies in New Zealand, Paris, 1981, p. 54.

260/ Decree of 1974, supra (note 106). 261/ Article 2 (free translation).

economic incentive measures have been included in the Code for the attainment of its objectives: some are directed towards the general stimulation of resource and environmental conservation (articles 13, 18 and 25); others are geared to developing specific activities such as forestry (article 233) or fisheries and aquaculture (article 286). In this way agricultural production is encouraged at the same time as the protection of the habitat.

Another example of this kind of approach is that of a Hungarian law of 1976 on the protection of the environment, wherein article 12 states that agricultural activities, in particular, must be conducted with care to avoid damaging the quality of the soil. Similar precautions must be taken by farmers to avoid polluting the water (articles 16 and ff.) and the air (articles 23 and ff.).

The same approach was adopted in the Philippines when a decree, issued in 1977 262/ expressed the urgent need to establish an integrated programme for environmental protection (preamble). This programme is specifically included in the Philippine Environment Code 263/, which sets out to draw up a global programme of environmental management (preamble). In fact, the Code includes provisions that comprehensively relate to the quality of the air and water, land development, the conservation of natural resources (wildlife, forestry, fisheries, energy, etc.), the management of wastes, etc. Article 56 of the Code specifically covers economic incentives for the prevention and reduction of pollution. The stimulants envisaged are above all fiscal: antipollution installations and materials are granted a 50% import duty rebate; up to 50% of the costs of research projects for the local manufacture of these materials are tax deductible for individual and legal entities undertaking such projects; credit and financial assistance may also be provided, notably for the healthy management of waste products. 264/

The same legislative approach is sometimes, though more rarely, found in agricultural development laws. It is not common for all the agricultural issues to be regulated within one single code, but this does occur, as in the case of the Jordanian agricultural code of 1973 265/ which is particularly noteworthy for envisaging the environmental aspects of agricultural development. The code contains several detailed provisions for the conservation of virtually all the natural resources (animal, plant, forest, soil, fishery, genetic, etc.). It also provides for the controlled utilization of fertilizers and pesticides, and generally supports farming practices that are suitable for the land and not burdensome on the habitat. In fact, rather than establishing a simple agricultural code, the Jordanian legislator has sensibly produced a code that integrates the two inseparable dimensions of agricultural development and the protection of natural resources and the environment. In this connection, some authors have called for the design of comprehensive integrated laws, under the form of rural codes, that would deal with "water and soil use, forestry, livestock farming, etc., as

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262/ Decree No. 1151 of 6 June 1977: Philippine Environmental Policy.

263/ Decree No. 1152 of 6 June 1977: Philippine Environment Code.

264/ Guidelines on the Implementation of section 56 of the Philippine Environment Code re: tax incentives, in Philippine Environmental Law, Vol. II, p. 12.

265/ Law No. 20 of 24 April 1973 (O.G., 16.5.1973, p. 882).

well as the people living (in rural areas)". 266/ There is, however, one shortcoming to the Jordanian code, which is the failure to directly envisage and regulate the economic incentives for agricultural production, but given the agro-ecological inspiration of the code, it would be relatively easy to include these in a supplementary text in such a manner that accounted for their environmental impact.

2. Agro-Environmental Incentive Legislation

When the legislator is concerned about the combined interests of agricultural production and the protection of the environment, we can logically expect that he will devise economic incentives that reflect this concern. Such incentives do, in fact, exist in certain national legislations, some of the more outstanding features of which are presented below.

Legislators and policy-makers are paying increasing attention to energy conservation in agriculture, with varying degrees of success, as testified by the recent adoption of numerous legislative texts on the matter. Thus, in 1981, the Parliamentary Assembly of the Council of Europe issued a resolution, related to agriculture and energy 267/, that invited the Member States to encourage the agricultural sector to economize as much as possible on energy consumption, particularly with regard to fossil fuels, and to promote the use of alternative sources such as solar, géothermic, wind and tidal energy. Certain European legislators have been quick to introduce such measures: for example, Belgium issued a decree in 1981 which encouraged the conservation of fuel in the agricultural sector 268/; Italy adopted a law in 1982 for the conservation of energy resources, the development of new energy resources and the functioning of power stations using non-hydrocarbon fuels 269/; Spain had taken the lead in 1980 270/, with a decree that envisaged special measures for the modernization and utilization of alternative sources of energy for farming. In general, these legal provisions offer the farmers various forms of assistance (loans, subsidies, tax benefits) to encourage them to carry out the work and install the equipment needed for the development of soft energy sources, which are generally more abundant and less detrimental than fossil fuels 271/, but for which the development has been hampered by a number of factors (socio-economic pressures, insufficient credit, insufficient development of research, technical obstacles, etc.). It would seem, therefore, that incentive law should concentrate more on moderating the consumption of non-renewable energy resources and promoting the use of renewable ones, given that these (solar energy 272/ and its immediate derivatives (watercourses, winds, "biomass"), the tides, the sea swell and waves, and part of geothermic energy) will be available for millions of years. 273/

266/ FAO/Bochet J.J., Management of Upland Watersheds: Participation of the Mountain Communities, FAO Conservation Guide 8, Rome, 1983, p. 51.

267/ Resolution No. 744 of 28 January 1981 (in Agriculture and Environment, supra (note 4), p. 337).

268/ Decree of 30 July 1981 (M.B. 4.9.1981, p. 11035).

269/ Law No. 308 of 29 May 1982 (G.U., 7.6.1982, p. 4119).

270/ Decree No. 308 of 29 May 1982 (G.U., 7.6.1982, p. 4119).

271/ Prieur M., "L'énergie et la prise en compte de l'environnement", Revue juridique de l'environnement, 1982, p. 262 (Comparative table of energy pollution).

272/ Robert D.A., "Financing Solar Energy", Journal of Legislation (University of Notre-Dame Law School), Vol. 8, No. 1, 1981, pp. 46-61.

273/ Le pouvoir de vivre, numéro spécial de Ecologie, March 1981, 294 pages, p. 60; see also Lepinoy B., Economie et énergie. Quels avenirs pour le Tiers Monde?, Paris, Technip, 1985, 352 pages.

Legislation can act as an instigator or a deterrent in this respect, according to the level of attention paid to the conservation of natural resources and the reduction of pollution and harmful effects. 274/ Tax legislation, for example, is a case in point. The exemption from tax of petroleum products used for agriculture stimulates agricultural production, but can also cause indirect ecological harm: the increase in the power of agricultural machinery that it sometimes encourages leads to the employment of more aggressive tillage techniques, which have exacerbated soil degradation (in addition to wasting energy). 275/ On the other hand, the tax regulations may produce beneficial consequences, as in the case of a slaughterhouse equipped with a system for the fermentation of wet biomass to manufacture methane from the organic wastes. 276/ Though the consequent energy savings are lower than the cost of producing methane, the operation can be economically viable and financially balanced, for the biomass system considerably reduces the discharge of noxious effluents and decreases the water pollution dues 277/, which sometimes more than covers the initial outlay. The operation is also satisfactory on the environmental level as, besides lowering the pollution, it enables the wastes to be recycled and converted into energy. Energy policy and environmental policy therefore work in tandem, but this would appear to be more a fortunate coincidence than a deliberate intention, for it would be difficult to affirm generally, given the present situation, that energy taxation is fundamentally favourable to environmental protection. 278/

A further relatively little studied component of energy policy and its relations with agriculture and the environment is that of animal power, which already plays an important agricultural role, particularly in developing countries, and is expected to assume an even greater role in the future. It has been calculated that draught animals accounted for a quarter of the energy used in 1980 in 90 developing countries. Replacing DAP with machine power would cost some "$250 billion for capital equipment and $5 billion per year for petroleum consumption" 279/ , whilst the 10 million draught animals that exist in sub-Sahelian Africa, for example, could provide four times more energy for agriculture between now and the year 2000, if their yield were

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274/ Lambrechts Cl., "Droit des energies nouvelles", Revue juridique de l'Environnement, 1982, p. 284.

275/ Fiscalité-Environnement, supra (note 24), p. 310.

276/ Hertzog R., "La fiscalité de l'environnement, Notion et état du droit positif en France", in Fiscalité-Environnement, supra (note 24), p. 70.

277/ Ibidem.

278/ Labié, F., "Fiscalité de l'énergie et protection de l'environnement", in Fiscalité-Environnement, supra (note 24), p. 304; for a more optimistic appreciation, with particular regard to the taxation of solar energy, see Hertzog R., "Les incitations financières au développement de l'énergie solaire", Revue juridique de l'environnement, 1979, p. 277.

279/ FAO, Report of the FAO Expert Consultation on Appropriate Use of Animal Energy in Agriculture in Africa and in Asia, Rome, 1982, p. 2.

enhanced and their number increased. 280/ This would require, in particular, that the development of animal energy be accompanied by economic incentives, yet, though most of the agricultural inputs are subsidized, DAP is "neither subsidized nor supported by other infrastruetural help" 281/, which perhaps belittles its value in the farmer's eyes, especially in view of the credit facilities made available to him for mechanization.

A close examination of the energy-agriculture-environment relationship also raises the issue of natural resource and agricultural production wastage, with regard to the environmental impact and the solutions of comparative incentive law. Remedies are currently being sought for the problems of food losses and agricultural wastage, for it is essential that post-harvest losses be considerably reduced through a wide range of appropriate technologies and strategies. 282/ For its part, incentive legislation should assist the farmers in removing the main obstacles that confront loss-prevention measures, which are the lack of infrastructure and qualified personnel, and inadequate financial resources. 283/ In addition, agricultural development projects should include a preliminary appraisal of potential losses and envisage the means of preventing and reducing them.

As far as fishery resources are concerned, the World Conference on Fisheries Management and Development, held in 1984 under the auspices of FAO, approved an integral package of five programmes of action, one component being the promotion of the role of fisheries in improving nutrition. The aim, briefly, is to produce more and waste less. "Action will be taken to increase the availability of suitable raw materials by improving the handling and processing methods and thus reducing post-harvest losses". 284/ Various forms of assistance will be provided to this end.

With regard to agricultural waste, the development of low-damage agricultural practices will doubtless usually require economic incentives, which are far from adequately provided by incentive legislation. Already, on a general level, "environment and pollution abatement through improved production technology, or through post-treatment or recycling and waste recovery, continues to occupy a relatively secondary position" 285/ in national legislations. It is only to be expected, therefore, that related encouragement measures are neglected, if not totally disregarded, by incentive law. Consequently, a number of international meetings have recommended the

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280/ Spurgeon D., "Les tracteurs bovins", Le CRDI Explore, July 1983, p. 20.

281/ FAO, supra (note 279), p. C2.6.

282/ UNEP, "Agro-Industry and the Environment - Post-harvest loss reduction", Industry and Environment, special issue, 1981, January-February, p. 1.

283/ FAO, Prévention des pertes alimentaires après récolte, Notes d'information FAO, July 1979.

284/ Carroz J.E., "The Way Forward for Fisheries", Mazingira, May-June 1985, p. 12.

285/ FAO/Alhéritière D., supra (note 2), p. 24.

introduction of financial and fiscal stimulants to encourage farmers to reduce the level of pollution, to improve their waste management and to adopt technologies that are environmentally less damaging. 286/ Certain legislators have taken note of this, as evidenced by a Chinese law of 1979 287/, wherein article 31 provides for economic incentives to be granted to enterprises that operate mainly on the utilization of gas and liquid or solid wastes. China, however, has a long tradition of waste recovery, treatment and recycling. For example, vegetable refuse, fruit skins and other household refuse have been converted by the peasants into organic fertilizer after fermentation. Statistical data indicate that 89 million tonnes of waste were recovered between 1956 and 1977, equivalent to a value of 19 500 million yuans. 288/

In Poland the storage of waste is subject to a tax introduced by article 86 of the law of 31 January 1980 regarding the protection and improvement of the environment. 289/ This tax, which is calculated according to procedures established by a regulation of 30 September 1980 290/ on taxation for the economic use of the environment, is paid into the Environmental Protection Fund, which serves to finance or subsidize actions to safeguard the ambient habitat. The incentive lies in the fact that the tax is reduced by 50% for enterprises that manage their waste in an ecologically satisfactory manner. 291/

Though it may not be possible, at this stage, to put forward a precise definition of agro-environmental stimulation, the foregoing paragraphs have at least served to indicate its underlying philosophy. It has been seen that certain agricultural policy choices contribute to the achievement of certain environmental objectives. Their convergence calls for measures that aim at economizing the renewable resources (improved use of agricultural inputs), at putting "nature to work" more successfully (maximization of the added biological value), protecting the. biological resources (biological control, protection of existing species and varieties, less specialized farming), ensuring soil, landscape and activity equilibrium (protection of agricultural soil against erosion, against urbanization, against abandonment), enhancing commodity quality (measures to upgrade agricultural commodities), improving the utilization of human resources (developing employment in rural areas), and enhancing the quality of life (farmers' working conditions, community facilities in rural areas). 292/ The implementation of such measures should prove to be concurrently beneficial to agricultural production, environmental quality and, simply, to development as such.

286/ UNEP/FAO, Legal Aspects of Agriculture and Agro-Industrial Waste Management (UNEP/FAO/ISS 4105), IJO, Rome, January 1977, p. 41; UNEP/FAO, Utilisation des résidus, gestion des résidus agricoles et agro-industriels. Une vue d'ensemble, UNEP, Programme de l'industrie, Paris, 1977, p. 24.

287/ Law of 13 September 1979 on the protection of the environment (in Revue juridique de l'environnement, 1981, pp. 335-340).

288/ Isaia H., La protection de l'environnement en Chine, Paris, Presses Universitaires de France, 1981, p. 76.

289/ J.L. No. 3, text 8, 1980.

290/ J.L. No. 24, text 93, 1980 (amendment: J.L. No. 21, text 154, 1982).

291/ Lopatka A., "Réglementation juridique de la procédure en matière de déchets industriels en République populaire de Pologne", in Prieur M. (under the direction of), Les déchets industriels et l'environnement, Paris, Presses Universitaires de France, 1985, p. 169 and ff.

292/ Ollone M. d' , "Développement de l'agriculture et protection de l'environnement en France", Rapport au Séminaire régional PNUE/CEE sur les divers types de développement et de modes de vie, Ljubljana, 1979, p. 16.

CONCLUSION

Rather than predicting future developments, the objective at this point is to describe and analyse the present situation for the purposes of comprehension and diagnosis. The examination of legislations and practices has produced observations and appraisals, which together portray the manner in which incentive law currently affects the environment. These observations permit a number of suggestions to be put forward to overcome the negative aspects that have come to light or, at least, to reduce their impact.

A. OBSERVATIONS

This study set out to be exploratory in nature and was expected, therefore, to produce observations. The environmental dimension of legal measures for the economic stimulation of agricultural production was to be grasped, "photographed" and characterized. Incentive legislation was to be X-rayed to provide a clear and complete picture of the situation, though, of course, certain areas remained shaded because of the boundaries set at the very outset. The findings, therefore, are many but they are not exhaustive. For example, the international aspects have barely been touched upon. The study could have been envisaged within the context of the North-South "dialogue" 293/, within the perspective of the (nascent) South-South cooperation 294/, or in relation to development "aid". 295/ Though occasionally touched upon, it has not been possible to examine these aspects in depth, despite their obvious interest, for this would have overstepped the comparative law framework of the study.

The analysis of national legislations has been illuminating, despite the exclusion of international law. First and foremost, the very notion of economic incentive has been seen to be conceptually ambiguous: the imprecise terminology, the vague definitions and the disparity of the incentives add to the conceptual confusion and uncertainty. On the operational level, economic stimulation has a capricious nature, for the results are at times encouraging, at other times disappointing. Success or failure depend on a multitude of factors that are difficult to control, and their interplay is capable of producing a contrary effect: instead of stimulating it in fact deters. The ambiguity and relativity of economic stimulation prevents the adoption of a uniform approach, for the notion is essentially multiform and unpredictable.

293/ El Bakkali B., L'environnement et la problématique des rapports Nord-Sud, Casablanca, Faculté de Droit, 1985, 171 pages; OECD, Economic and Ecological Interdependence, Paris, 1982.

294/ El Manjra M., "South-South Cooperation: A Peaceful Decolonization of the Future", IFDA Dossier, No. 38, November-December 1983.

295/ OECD, L'aide et la protection de l'environnement, Paris, 1982; Cox G., Atkins M.D., supra (note 4), p. 708 and ff.; Brown J. von, Haen H. de, The Effects of Food Price and Subsidy Policies on Egyptian Agriculture, International Food Policy Research Institute, 1983, p. 9; WFP, Food Works, Twenty Years of Food Aid for Development 1963-1983, Rome, 1983; Semiti, supra (note 33).

at other times disappointing. Success or failure depend on a multitude of factors that are difficult to control, and their interplay is capable of producing a contrary effect: instead of stimulating it in fact deters. The ambiguity and relativity of economic stimulation prevents the adoption of a uniform approach, for the notion is essentially multiform and unpredictable. The wisest course of action was, therefore, to establish a classification. With this in mind, the legislative complexity was simplified and incentives were divided into two categories: according to their nature - financial or fiscal, direct or indirect, positive or negative; according to their objective - to benefit agriculture (in the strict sense), forestry or fisheries. All things considered, this overview of economic incentives has not only served to note the fluidity of the concept, on the theoretical level, and its heterogeneity, on the implementation level, but also, and this is important from the perspective of this study, to draw attention to the extreme diversity of actual situations, and to the consequent need to qualify any assessment of the environmental effects of economic incentives for agricultural production.

The overall principles of incentive law were then analysed selectively, on the basis of sample national legislations. The research focused on the different kinds of agricultural incentive measures encountered in the legislative and regulatory texts examined. Given the huge quantity of such measures, two categories were highlighted in particular: those directed towards the agricultural sectors (agriculture, forestry, fisheries) and those oriented towards the agricultural resources (water, soil and genetic). Obviously, the respective attitudes adopted by the legislators vary considerably, so comparative law is far from homogeneous. Nevertheless, a number of regular features can be noted. For example, it is striking to observe a general tendency to proliferate and diversify incentive instruments, without always considering (this is often the case in fact) their ecological impact or establishing clearly defined environmental objectives. Admittedly, the preservation of the habitat and the conservation of resources are not totally ignored by incentive law, but these considerations are usually eclipsed by other concerns. For example, agricultural mechanization or intensification are prime candidates for State assistance, but little clear thought is usually given to their potential environmental harm (the unrestrained occupation of agricultural land, the uncontrolled use of chemical inputs, inappropriate irrigation techniques, aggressive farming practices, agro-industrial pollution, resource and energy wastage, the erosion of genetic resources, etc.).

However, a positive development does appear to be gradually emerging in comparative incentive legislation. Recent laws regarding agriculture and the environment seem to be more attentive to environmental consequences than in the past, when the issue was largely disregarded.

B. SUGGESTIONS

Just as agricultural development is inseparable from socio-economic development, so incentive law cannot be isolated from development law (which cannot itself be dissociated from environmental law). Freedom of action is limited in each case: the component is inseparable from the whole, the sector from the global situation. This applies to both legislative policies and development strategies. Just as economic planning must transcend the individual agricultural sector and tend towards the intersectoral integration of all the spheres of activity, so incentive law must transcend its immediate

productive objectives and aim at a judicious management of natural resources to ensure the lasting maintenance of an essential ecological equilibrium. 296/

Such an approach not only implies a drastic change in mental attitudes but also far-reaching institutional and legislative reforms. Yet, given the fragmentation of the legal and institutional structure, is it realistic, or even desirable, to advocate its complete re-organization for the integration intended? Such a brutal upheaval seems difficult to conceive, for in addition to the consequent legal vacuum, a legal reconstruction would require a superhuman effort. Perhaps the integrated approach ambitions should, therefore, be more modest in intent, and concentrate on the more receptive field of future legislation, particularly in those areas for which there is relatively little current legislation and which, therefore, offer considerably less resistance from pre-existing laws. However, the integrated approach also has a vital role to play with regard to the already well-established incentive law, a role that involves the introduction of corrective and enhancement provisions. 297/

Agricultural development is obviously dependent on its natural habitat. This is an essential reality which should not be denied either by the legislator or by other social decision-makers. The legislator should always be aware of this, including when enacting incentive measures for agriculture. This consideration will be a natural feature of agro-environmental incentives, as they combine and integrate the interests of the natural environment and those of agricultural production. Such incentives will, notably, involve the application of economical and clean farming methods, the promotion of resource and energy savings, the treatment and recycling of agricultural wastes, the prevention and control of agricultural pollution, the development of appropriate technology and the upgrading of human potential, etc.

A valuable tool for the promotion of incentive law is the use of the Environmental Impact Assessment (EIA), the merits of which have been widely described and illustrated: "The immediate purpose of an EIA, formal or informal, explicit or implicit, is to give a clear understanding of the potential environmental effects of a proposed activity, in order to allow decision-makers to act in full knowledge of the facts". 298/ One of the basic objectives of the EIA is precisely to integrate the ecological and the economic aspects. This assessment provides the decisionmaker with advance information on the ecological costs of his project, which, If he wishes, he can take into account when making the final decision. The EIA constitutes a predictive instrument to avoid serious environmental damage and is, therefore, of direct relevance to incentive law, particularly when the incentive measures involve major operations that are potentially detrimental to the environment (dams, land consolidation, land clearing, agro-industries, etc.). Given that

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296/ ECE, supra (note 84), p. 6 and ff; Labeyrie V., Ecologie et agriculture, Conference au Collège de France, 3 February 1981, p. 13; Malhorta R.M., "Développement rural. Amélioration nationale", Mazingira, July-August 1984, p. 3; Wignaraja P., "Towards a Theory and Practice of Rural Development", Development: Seeds of Change, No. 2, 1984, p. 3.

297/ European Environmental Bureau, The Common Agricultural Policy and the Natural Environment, Brussels, 1983, p. 23.

298/ FAO/Alhéritière D., supra (note 2), p. 62, together with the annexed bibliography (pp. 115-131).

agro-environmental stimulation is, by definition, aware of its environmental consequences, it should normally be accompanied by an EIA whenever necessary, though such un undertaking should be carefully evaluated, for "the introduction of a new administrative procedure should not be considered very lightly" 299/, particularly when this may be costly, technically complex and humanly demanding. What is important is that, in the absence of a formal EIA, any form of agricultural assistance considers its ecological repercussions and includes remedial provisions. 300/ The principle that prevention pays should, as elsewhere, guide the actions of the incentive legislator.

These few suggestions 301/ close a chapter but open up a wider debate on how to meet the challenge of feeding without destroying. 302/ How to guarantee each individual's justified right to food, given the world's finite resources? 303/ Until these haunting dilemmas have been conclusively resolved, it is to be hoped that these considerations will help to advance "eco-juridical" research for enhanced incentive law, for even though legislation is not a panacea, even though its role is not always pre-eminent, its contribution is nonetheless indispensable for sound development. Especially when ecologically appropriate and humanly equitable 304/, it serves to promote an agronomy based on scientific ecology 305/ that invests agriculture with its essential and traditional role of quality food production; its equally important role of managing, occupying and safeguarding the rural area and the natural habitat; its social role that finally ensures not only satisfactory living conditions, but also the maintenance of a balanced and dynamic rural fabric. 306/

299/ FAO/Alhéritière D., supra (note 2), p. 63, together with the annexed bibliography.

300/ Agriculture and Pollution, supra (note 4), pages 223-224.

301/ More could be added: see FAO/Giménez Landinez V.M., Reforma agraria y desarrollo rural integrado, Rome, 1979, p. 103.

302/ Lenoir R. Le Tiers Monde peut se nourrir, Rapport au Club de Rome, Paris, Layard, 1984.

303/ Spitz P., "Livelihood and the Food Squeeze", Ceres, Vol. 14, No. 3, p. 27.

304/ Dias C, "How to take the Law into Your Own Hands", in Mattis A. (editor). A Society for International Development: Prospectus 1984, Durham, North Carolina, Duke University Press/SID, 1983, p. 71.

305/ Labeyrie V., supra (note 296), p. 15.

306/ Le pouvoir de vivre, supra (note 273), p. 37 and ff.

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