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REPORT OF THE WORKSHOP ON NATURAL HERITAGE INVENTORIES AND ACCOUNTS FOR THE CHICHINAUTZIN BIOLOGICAL CORRIDOR IN THE STATE OF MORELOS, MEXICO

(Cuernavaca, Mexico, 11 and 12 September 1989)

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Preface

This report contains background information prepared for the Workshop on Natural Heritage Inventories and Accounts for the Chichinautzin Biological Corridor in the State of Morelos in Mexico held at Cuernavaca, Mexico, on 11 and 12 September 1989, and a summary of the debates held at that workshop.

The workshop was carried out as part of the ECLAC project on natural and cultural heritage inventories and accounts assigned to the Joint ECLAC/UNEP Development and Environment Unit with financial support from the Federal Republic of Germany.

I. ORGANIZATION OF WORK

Place, date and objectives of the meeting

1. The meeting was held at the Autonomous University of the State of Morelos located in Cuernavaca, Mexico, on 11 and 12 September 1989.

2. The two main objectives of the workshop were:

a) To present and discuss the results obtained in respect of the preparation of a natural heritage inventory and natural heritage accounts for the Chichinautzin biological corridor.

b) To use the studies presented as a contribution to the preservation and consolidation of an ecological belt around Mexico City.

Attendance

3. The list of participants may be found in annex 1 to this report.

Organization of work

4. The Workshop was organized on the basis of discussions held concerning contributions made by two ECLAC advisors --Mrs. Julia Carabias and Mr. David Montaño-- and of additional contributions made by Mrs. Marisela Taboada and Mr. Rafael Monroy.

II. SUMMARY OF DEBATES

5. The style of development which prevails in the Chichinautzin corridor has taken its cue from the excessive exploitation of its natural resources, which has affected their capacity to reproduce or recover and hence has resulted in their deterioration.

6. The study under consideration was based on the assumption that the systems of production currently used within the corridor contribute less to the national economy than they would if the corridor were maintained as a protected area in which the aquifers in the great Yautepec and Apatlaco river basins could be

refilled, as a container of erosion and as a habitat of indigenous flora and fauna.

7. In 1988, 37 000 hectares of land in the Chichinautzin biological corridor were declared an area for the protection of flora and fauna, with three conservation zones and some absorption zones. However, some of the land on the periphery of this area was devoted to farming and forestry, and a number of human settlements were located there.

8. Within the corridor, the processes involved in the expansion of the agricultural frontier in the direction of the highest, most rugged areas could be observed. Crops consisting in maize, oats, tomatoes and potatoes have been grown on a seasonal basis. Small and large animal husbandry has been based on free range grazing in wooded areas. The use of the forest has been reduced to the felling of trees on a selective basis for local use. In addition, wood has also been gathered in the traditional manner for home consumption and for sale on the local market.

9. To evaluate the environmental impact and the environmental cost of the present system of soil usage, it was necessary to focus attention on the deterioration caused by crop farming, stock breeding and some wood-gathering practices.

10. In general, one of the defects which notably reduced the possibilities for assessing the environmental cost of many activities was the shortage of data and their dispersion and lack of continuity and credibility.

11. The most difficult exercise was found to be that of identifying a criterion or a set of methods for raising the economic value of resources (not only resources with a market value but also those which are not marketed) to the highest possible level.

12. To do this, it was necessary to find a global conceptual framework in which to incorporate all resources with enough economic rationality to be used to construct natural heritage accounts or at least to construct an indicator which could be used to modify the economic indicators now in use.

13. Since resources are regarded as such because of their capacity to generate income, the need arose to identify a concept of income consistent with the idea of environmental sustainability which implicitly incorporated the notion of natural heritage accounts. The definition chosen was that of Hicks, according to which income is the quantity which can be spent in a period of time without being any poorer at the end of that period. To put it another way, it is the amount which can be spent for purposes of consumption without decreasing the capacity of the income generator to produce income in the future.

14. On the basis of that definition, adjusted income was defined as the difference between the income generated by the production sector of the area and the assessed environmental cost.

15. The assessed environmental cost was defined as the cost generated through the decline in other functions and was calculated on the basis of the cost of restoration.

16. As for the deterioration caused by crop raising, the loss of water filtration was assessed and assigned a cost, since cultivated soil has less capacity to retain water than wooded soil. Soil loss due to erosion was also taken into account. The environmental cost of such a system of soil use for crop-raising purposes was determined by calculating the cost of restoring the resource lost. For purposes of assessing the benefit which has accrued to the region through crop production, the income received was determined, and a balance was drawn between the two values. The conclusion was that in view of the ecological benefits the present forest ecosystem represented for the region, it was more viable to protect it than to continue expanding the agricultural frontier.

17. As for the livestock subsector, the damage sustained by a forest as a result of livestock browsing on regrowth and thereby destroying the regenerative capacity of the forest was assessed and a value assigned to it. For purposes of estimating the environmental cost of that part of the production sector, it was decided that 50% of new growth is affected and suffers notable deterioration owing to the livestock subsector, which causes the production of wood to decrease in the same amount. In addition, consideration must be given to the fact that some of the production of the crop-raising subsector is used for food to maintain the extremely high density of cattle per hectare. Because of lack of sufficiente data consideration was not given to the damage caused by cattle trampling the soil underfoot and compacting it. Another factor which was taken into consideration was the incidence of forest fires set to encourage growth in the underbrush for purposes of grazing.

18. The environmental cost of forestry activities was difficult to estimate because of a lack of sufficient data and the fact that forestry is practised clandestinely and is of little economic significance in the area. Owing to its limited impact, it has not been taken into consideration as a factor responsible for deterioration of the resource.

19. The impact of fruit growing in the area has not been taken into consideration either because the only deterioration it has been known to cause is loss of habitat, which is an intangible value.

20. Nor has any cost been assigned to the environmental impact of recreation since the activities involved are usually confined to parks which provide the necessary infrastructure. The remainder of the zone is not regarded as a recreation area.

21. On the basis of Hicks's definition, an adjusted income was calculated by decreasing what would have traditionally been the income by the amount of the environmental cost. This method made it possible first to determine that part of the income which would have been compatible with sustainability and second to identify the percentage share of the environmental cost in the total income. This method of calculation made it possible to determine what share of the income in a given period was generated at the cost of eroding the natural heritage and, in the last analysis, of damaging the future capacity to produce the same income in the future.

22. On the basis of data for the period 1973/1980, a lineal projection up to the year 2000 was made, in which the adjusted income and the environmental cost per unit of income were considered in percentage terms. In other words, that share of the income which generated the environmental cost was estimated. The projections obtained showed that this percentage should increase until the figure of 90% is reached in the year 2000.

23. The environmental cost was always estimated for the reference year used in calculating the income. Thus, no attempt was made to estimate the natural heritage as a whole but only to gauge the volume of the flows.

24. Although in this case the calculations were based on the cost of restoration, it became very clear that that represented only an approximation of the real replacement value and cost, which would be much higher and in many cases would probably be impossible to calculate in ecological terms. An extinct species represents an irreparable loss, and many cases of soil erosion, river sedimentation, soil compression and the like constitute irreversible and unalterable processes.

25. With regard to the assessment of many ecological and socio-cultural factors, it was clear that aspects which were intangible and therefore could not be evaluated or quantified in economic terms were involved. In the case of the Chichinautzin biological corridor, one aspect worth mentioning is the loss of indigenous flora and fauna habitat and with it the loss of biodiversity, of the contribution that habitat made to the region as an air purifier and of its usefulness as a pollution absorber between Mexico City and Cuernavaca. The fact that some characteristics can be described while others must be translated into economic values must be accepted.

26. Although this approach provides a way of correcting national accounts, it does not make a difference in the impact which "environmental spending" has on the natural heritage as a whole. In other words, situations may arise in which the entire process of generating income may involve deterioration and exploitation of the natural heritage, which would mean that the adjusted income would be close to zero or negative. At the same time, however, an area's natural resources or natural heritage may be so large that the part consumed is of no importance. For that reason, the Workshop recommended that physical accounts should be kept in addition to calculating percentages of gross domestic product produced through consumption of national heritage.

ANNEX I

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