MODELLING OF ECONOMY IN SPECIALLY PROTECTED REGIONS

Proceedings of the international conference

held on 9-11 june 1994 in Drawno, Poland

MODELLING OF ECONOMY IN SPECIALLY PROTECTED REGIONS

Proceedings of the international conference

held on 9-11 june 1994 in Drawno, Poland

Editor: Bogdan Krawiec

Reviewed by:

prof. dr hab. Stanisław STACHAK

COMMITTEE OF HONOUR

1. **Prof. Zygmunt Dowgiałło**
   Chairman of the Commission of Organization and Food
   Economy Management of the Polish Academy of Sciences
2. **Mr Tadeusz Kohut**
   Director of Drawa National Park, Drawno
3. **Prof. Roman Kulikowski**
   Director of Systems Research Institute of the Polish Academy
   of Sciences, Warsaw,
4. **Prof. Marian Piech**
   Rector of Agricultural University of Szczecin,
5. **Mr Zbigniew Pusz**
   Gorzów Voivode,
6. **Mr Marek Taborowski**
   President of "POLCOOP" Ltd., Warsaw,
7. **Mr Waldemar Ślaski**
   Mayor of Drawno town and commune,
8. **Prof. Andrzej Szujecki**
   Secretary of State in the Ministry of Environment
   Protection, Natural Resources and Forestry, Warsaw,
9. **Dr Stefan Wroński**
   Director of Provincial Food Economy Bank, Szczecin.

ORGANIZING COMMITTEE

1. **Prof. Bogdan Krawiec** - chairman,
2. **Mr Bogusław Bil,**
3. **Prof. Ryszard Budziński,**
4. **Prof. Hans-Joachim Budde** (Germany),
5. **Prof. Paolo Gajo** (Italy),
6. **Mr Marian Kuc,**
7. **Prof. Michał Świtłyk,**
8. **Mrs Alfreda Winnicka** - organizational secretary.

ECONOMICAL EVOLUTION AND CONCRETE NORMATIVE ON PROTECTIVE AREAS IN ITALY

Paolo Gajo, Enrico Marone

University of Florence

The promulgation of the outline law on protected areas (Law No 394 of 26th November 1991) is without doubt a confirmation of the growing interest regarding recreative and environmental functions of forestal resources. Therefore studies and researches are always necessary to analyse the socioeconomical implications that are carried out by the same law and the objective of the research presented is to offer contribution in the above sense. After a brief analysis of the most important characteristics of the law outlined, the job is geared towards researching the methodological capability of the effective economical measurements tied to a political development in an environmental and recreative sense, providing an instrument to evaluate interventions on behalf of operators in public and private structures.

1. The principle outline of the law

The objective of the outline law intends to confirm the principal fundamentals effective for institution and the management of the protected areas with the scope of conservation and valuation. The law on protected areas suggests that: the methods used on conservation of natural environment should foresee the integration between the human beings and the environment, the promotion of educational activities, research and recreative compatibility with the enviromnent and the hydrogeological defence of territory. The natural areas being protected are classified as "National Parks, "Natural Regional Parks" and "Natural Reserve" in environmental terrestrial and "Protected Area" in marine environment.

One of the fundamental institutions of the outline law regarding the constitution of "Committee for the natural protected areas" consists of many tasks and of these important is to plan a classification of the protected areas to approve their listing and to adopt a programme for National and Regional development. Also the Committee must take into consideration service planning of national technicians according to the Law No 183/1989 when establishing the fundamentals of territorial planning[1].

Apart from its daily, tasks of classification and planning the natural protected area, the Committee has the support of a technical consultancy for natural areas who expresses technical and scientific opinions on topics relative to natural areas[2].

One of the most important tasks of this Committee is to plan

---

[1]The Committee includes Ministries (and the respective delegates under secretaries) the environment, Agriculture, Merchant Marine, Cultural Assets, Public Works, University of Scientific Research and six Presidents (or delegated conciliators) of the Regions.

[2]The consultantory includes nine experts chosen from association of enviromnental protection and the most important scientifical Academies in our country.

a program for the natural areas; for this program there should be an indication of the choice of territories that will be parts of the natural areas, the establishment of new protected areas, the division of available funds for each areas and the contributions of the capital account to be distributed. The duration of the programme is three years and is annually updated.

It is important to note that in order to divide the funds among the various areas, the Committee should have means of an economic survey, necessary to evaluate the economic effects depending on how the funds are spent. Therefore, we believe that the methodology further mentioned will provide some useful information. What is significant to point out is that, the Communes and the Provinces, which have territories within the borders of the park, now have available funds for the restoration and the improvement of the historical centres, for cultural and recreative activities of farm holidays which are not dangerous for the environment and the utilization of alternative source of energy.

Within the Protected National Natural Area each park is under submission of the authority of "Board of the park" that provides the regulation and the planning of the park. The Board of the Park[3] regulates the activities allowed inside the protected areas; in particular foresees a series of norms regarding the typology and procedure of construction, the development of activities in craftsmanship, sport and research, the regulation of sojourn and access to the territory. Also this regulation foresees job opportunities for the youth.

The plan for the park provides several regulations for natural and environmental protection. In particular, this plan intends to

---

[3]The Ente Parco consists of a President, Directive Councillor, Auditors and Park Committee.

organize the territory in different areas submitted to limitations progressively decreasing, such as to guarantee, in a first type of area called "Integrated Reserve", the absolute protection of the natural environment in its original state. In the others "Oriented General Reserve" and "Protected Area" the plan provides some compatible interventions. Furthermore, there is expected to be an area for economical promotion included in the limits of the same ecosystem, distinguished from the process of antropogenic for which the possibility to achieve a target-oriented goal towards the improvement of sociocultural life of local communities and the best enjoyment in the park itself for visitors is foressen, in compliance with the institutive aim of the park itself. Inside the different areas there are therefore different regulations concerning the utilization of the territory, the access to the same, the development of social services and intervention on plant life, animal life and the environment.

Particular attention should be paid to the "Park community" which, being an advisory organism of "Board of the park", has the function to promote and encourage economic and social development of the community within the protected area. The Community[4] should devise a long-term economic and social plan to promote compatible activities. Also in this case, the law states that in defining the plan of the park, the Community should evaluate the economic effects of the intervention on the enviromnent. It is important to take into consideration the fact that the outline law, also concerning national parks, provides an organized group of territorial representatives that have the possibility to put in their petitions to the "Board of the park" with the consequence of reducing the rupture, often created between the general interests generated by the existence of the park and those

---

[4]This Community consists of Region, Province and Mountain Community Presidents and of the Mayors of those areas that are also partially included into the boards of the park.

more particular, of the local residents. It seems that the objective of the law is to promote principle of compatibility between the social and environmental benefits provided by the existence of the parks and the social economic development of the areas in which they exist.

The outline law also provides the creation of "Natural regional parks" and "Natural regional reserve" by the Regions with participation of the Provinces, Communes and Mountain Communities which have territories located inside the protected area itself. According to the particularities of each area, each park or regional reserve by issuing a statute provide a different type of organization of the boards managing the park. The instruments available to the board management of the Park are park projects, and the multi-annual economic and social project for the promotion of compatible activities.

The outline law binds together the development and the protection of the natural areas and a territorial plan; also providing a major legislature regarding the protected areas. Parks and natural reserves do not consist anymore of entities strange to the territory in which they exist, but will become an element to force the compatible growth of the territory itself.

2. The model adopted

Thus, we have verified the interrelationship between the parks, considered as a productive reality of environmental and recreative goods, and the entire national economic system utilizing the methodology of input-output table. On these purpose we have enlarge the "Table of the Italian economic input-output" separating from category of "Cultural and recreative services" a

branch specified for parks. The analysed objective refers to several typologies of the actual natural areas on Italian territories that differ in the relationship between their complex structural kit and the services they can offer. It is important to take into consideration that the influence of the entire economic system of parks changes according to more or less organization of the area. The situation is probably less complex in Poland where the recreative and environmental political growth is still at the beginning and where the utilization of such a mean of an economic survey may result even to be more efficacious.

The input-output table of Leontief consists of a matrix that illustrates in each rows the manufacturing industries and in each columns the same industries considered as consumer. Each row supplies the summation of the production value, used in the manufacturing process that is added to the final use value which gives the final use value total of i-th industry. Instead of the summation per column supplies the value of the intermediate costs that is necessary for the production of each industry; adding to these costs the payments for the use of the factor of production, the importation and transfer payments, it is achieved the available resource for each industry considered, that coincides with the total value of the final use.

To pass from a model of countability to an econometrics more representative for the economy of a country, it is necessary to introduce some hypotesis considering both the peculiarity of the technology for each industry, the linearity and homogeneity of function of production and the dependency of level of production from the final demand. For this purpose it is possible to express the value of production of industry j-th in respects to goods i-th as product between technical coefficient, that represent elements which characterized the technology of industries,

and the total production of j-th industry.

It is possible to define in the way mentioned previously a system of equation where the a_{ij} indicates the technology of j-th industry, Y_i external variable to the system and X_i production.

The equation system can be briefly represented by the following matrix form:

$$Ax + y = x$$

and the solution of the model in terms of the product of each industry gives a certain vector of the final demand, is the following form:

$$x + (I - A)^{-1}y$$

The total for each column of the inverse matrix indicates the output multiplier O_j, that expresses the total effect on the economic system of the final unitary demand. Instead the total per row indicates the uniform demand expansion multiplier D_j, meaning the total effect on a particular sector of a generalized increment of a lire of the final demand in each branch.

3. The results achieved

On the basis of what has been expressed so far, it is now possible to analyse the obtained results of the enlargement of the Italian input-output matrix in relation to the natural protected area sector. This has been possible by using balance of several parks that consist of a representative sample of the population. We have been able to determine the production as factor cost of the "Park" sector that has been separated in respect to the "Cultural and recreative service sector". Therefore, basing on these

facts of a new enlarged matrix, a technical coefficient matrix and Leontief inverse matrix have been reconstructed. These matrix have made it possible to emphasize the direct - indirect principal effects on other sectors considered. The analysis of the technical coefficient matrix emphasizes the interrelation that links park sectors with other sectors of production. The first observation refers to the importance of the primary factors and in particular work factors (the t.c. added value at factor cost is 0,77) in park sector in respect to the other intermediate consumption; among these "Rental of building and other services" (that has a t. c. of 0,08) as the most significant and the sectors of "Energetic products", "Metalmechanical products", "Wood, paper, rubber and other industrial products", "Agricultural, forestal and fishing products", "Social and public administration service" and "Hotel and business" (with t. c. Varying from a minim of 0,015 to a maximum of 0,037) as the less significant. It is important to note that the prevalence between the intermediate consumption of the sectors referring to "Rental" is probably linked to the existence to the park of equipped structures which, also if they are for the moment insufficient, anyway have a great importance in the structure of productive technology.

Instead, the inverse matrix devised allows us to evaluate how much production is necessary in all economical sectors to obtain one unit of product in each studied sector to be destined to the final demand, in relation to the actual situation of economic system. The value of 1,39 of the output multiplier obtained indicates that in respect to £ 1.000 (lire) of production of park sectors that can be destined to a final demands (that in our case is referred to family consumption) it is necessary in all productive sectors a production equivalent to £ 1.390 (lire). We can see that it is necessary a production of £ 98 (lire) from the "Rental"

sector, £ 43 (lire) from "Hotels" sector, £ 39 (lire) from "Energetic products" and £ 38 (lire) from "Wood" sector. As it was predicted, the value of the uniform demand expansion multiplier is equal to 1 (one), because parks do not furnish any intermediate input to the other economical sectors and, consequently, it is necessary an increment of one lire to the value of production in the researched sector to fulfill the generalised increment of one lire of final demand in the entire economical sectors.

As we have previously written, one of the objectives of the present study was to be able to measure the effects caused by a variation of the final demand of outdoors recreation on the entire economical sector. Therefore, we have tried to separate the share of "Family consumption" from the final demand and, in particular, the part of family consumption that is destined to outdoors recreation. In this way, it has been possible to verify the modifications promoted by the variation of component of the final demand which we have already mentioned on other productive sectors. By doing sampling of the expenses sustained by visitors in various recreative areas, it has been possible to determine the "Final consumption of families on outdoor recreation" (from this point on defined as "Final recreative consumption") and the distribution between various production sectors.

The result of the evaluation of the final recreative consumption is equals to about 1.165 billion lire. Before analysing their division between the various productive sectors, it is necessary to state that the recreative daily expense sustained is totally different and at the same time the structure of the distribution between various productive sectors is also different. This is because of the notable difference that characterizes recreative sites present on our territory. Therefore, the figures we are providing refer to the average division of expenses sustained by visitors.

The major total percentage expenses is attributive to the hotel sectors which absorb 29% of the total expense, following combustible and foods 18% and 9% to the catering industry. The expenditure of £ 1.165 billion lire estimated for outdoors recreation induce a production equivalent to £ 2.410 billion lire which includes 52% of the intermediate expenses.

The work force activated from the final recreative consumption are 17.646 and corresponds to 0,44 employed for 1.000 recreative days and 1,1 employed per square meters designated to parks and reserves.

Basing on what we have learned in regard to the final consumption of families for outdoors recreation, we have verified the effects needed for, a variation on all productive sectors. The following methodology which refers to the equation:

$$x = (I - A)^{-1}y$$

for model open to importation and considering transfer payments becomes

$$x = (I - A)^{-1}(y - m - t)$$

where having given the technical coefficient matrix (A), the final demand vector (y), the importation vector (m) and transfere payment vector (t) it is possible it know the product at factor cost.

Let's assume an increase of 10% in the recreative final consumption which corresponds to £ 116 billion lire, we could verify an increase of the entire economic sector equivalent to £ 241 billion lire. This increment in production pertains in particular to the "Hotel" sectors - 21%, "Energetic product" sectors - 18%, "Food products, beverage and tobacco" sectors - 16% and to a minimal extent "Agricultural product", "Rental" and "Wood"

sectors. This total increment in production induces an increase of the incomes destinated to employees equivalent to £ 44 billion lire which correspond to about a work force of 1765. Also here, it is interesting to note how the increase in estimated labour is distributed between various production sectors. The sectors that get more benefits from this increase are the "Energetic product" and "Hotel" ones with a work force successively of 327 and 321, following the "Food product, "Wood", "Agricultural" and "Rental" sectors with a work force successively of 174, 152, 150 and 127. It is very important the labour increase in the hotel, trading and rental sectors because they are often located in fringe mountain areas where it is difficult to create new jobs. At the same time, these jobs would guarantee the presence of someone on the territory which is one of the fundamental element necessary for its safeguard.

4. Conclusions

The outcome substantially confirms that the sector receiving great employees benefits are the same ones in which there is a great increase in production resulting to be linked to the productive sector of parks as the analysis of the activation coefficient confirms. The first results of this research affirm that the increase of the final demand in the sectors of outdoor recreation determine positive effects on the rest of the economy. Consequently it is advisable, above all, that the provision of the new outline law are more widely applied especially to territorial planning. In this sense we believe that the proposed methodology, and its development, can represent an instrument to evaluate the economic intervention on the part of operators of the sector and public structures that must offer territorial planning.

Concluding, we therefore believe that the Italian experience within the development of natural protective areas and outdoor recreation can help to understand the necessity to provide efficient legislative and economic analysis instruments. This necessity is more important for countries which have notable environmental resources, and therefore can program a tourist and recreative utilization compatible to the protection of the environment.