

Lagos, Dimitrios; Stamatiou, Eleni

**Conference Paper**

## Sustainable Tourism Development Through Endogenous Growth Models

46th Congress of the European Regional Science Association: "Enlargement, Southern Europe and the Mediterranean", August 30th - September 3rd, 2006, Volos, Greece

**Provided in Cooperation with:**

European Regional Science Association (ERSA)

*Suggested Citation:* Lagos, Dimitrios; Stamatiou, Eleni (2006) : Sustainable Tourism Development Through Endogenous Growth Models, 46th Congress of the European Regional Science Association: "Enlargement, Southern Europe and the Mediterranean", August 30th - September 3rd, 2006, Volos, Greece, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/118347>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Sustainable Tourism Development through Endogenous Growth Models

Dimitris Lagos\*, and Eleni Stamatiou\*\*

\* Associate Professor

Tourism Economics & Tourism Management Administration  
Department of Business Administration at the University of the Aegean  
6 Tsimara, Ymittos, Athens 17236, Greece

E-Mail: [d.lagos@aegean.gr](mailto:d.lagos@aegean.gr)

\*\*Architect-Dr. Town Planner, Regional Planner, (PhD, PPhD),

\* E. Stamatiou, 144 Amfitheas Ave, Athens 17562, Greece; e-mail: [rlacroix@otenet.gr](mailto:rlacroix@otenet.gr)

*Abstract:* The effective comprehension of mechanisms of achievement of sustainable tourism development presupposes the existence of standardised models. Endogenous growth models constitute decisive factor for the development of theoretical discoveries and in the tourism activity. The modern bibliography provides usually inaccurate criteria of sustainability, mainly because of the restrictive standardisation of environmental components. This fact influences considerably the choice of policies, because in certain cases it is likely that dilemmas of the environment or development will present themselves. Moreover, the importance of the consuming behaviour of tourists tends to be neglected in the effort of finding ecological ways of development, even though this analysis allows the discovery of new tools of tourism policy for public organizations. In the frame of the above reflection with this proposal is targeted the critical research of the possibility of integration, but also the way of incorporation of sustainable tourism development in the various models of endogenous growth. In the theoretical analysis of this subject, the detailed description of various endogenous models of growth will be sought. Then, will be examined the importance of sustainable tourism development and the necessity for its integration in the endogenous growth models. Immediately next, will be examined critically the functional incorporation of the tourism activity in each model of endogenous growth and will be underlined the importance that it has on tourism policy.

**Keywords:** Sustainable tourism development, Endogenous Growth Models

## 1. Introduction

Although the concept of sustainable development is known since the 18<sup>th</sup> century, the term of “sustainable tourism” became popular the recent years. This is attributed to the fact that tourism results in a new economic activity with multiple impacts to the productive and consuming circle of tourism destinations. Until recently the terms of sustainable development and sustainable tourism were handled separately. In this regard, many governments were making use of sustainable development in their attempt to achieve the development of entire geographic regions. For instance:

- ❖ In the U.S. and the U.K., the principles of sustainable tourism were used for renewal of old industrial cities like Baltimore and Liverpool.
- ❖ In France, Italy, Portugal and Spain, Agricultural tourism was used for the purpose the attainment of sustainable development for agricultural areas and vitalization of the declining trend of the agricultural production.
- ❖ In developing countries such as Cuba, Laos and Vietnam the development of tourism was used as a vehicle for the achievement of the sustainable development of the national economy.

Generally speaking, interesting for the sustainable of tourism remain the developed countries which are the most desired as tourism destinations, rather than countries which currently receive tourists. On the contrary, very little interest have shown the lesser developed countries

of the Mediterranean, Eastern Europe and Asia. These last countries are interested mainly in the short term economic development and not the long-term maintenance of their natural resources. In any event, the subject of sustainable tourism has started to take worldwide dimensions, primarily because of the action of international organizations such as the World Tourism Organization (WTO).

Searching through international bibliography one finds that there exists confusion in the conceptual determination of viability. The definitions that have been given for sustainable development are many. They point, based on circumstances to environmental, financial, and social dimensions of the phenomenon. However the environmental dimensions are these which have been established in the dialogue about sustainable development.

In tourism, the most widely accepted term is the one found in Brundtland's 1987 report *Our Common Future*, WCED as "*Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs*".

Some analysts believe that the attempt to define sustainable tourism perhaps may turn out dangerous, as general definitions can attribute simplicity to a phenomenon which is complex. On the other side, the narrow definitions limit the range of subjects which includes sustainable tourism. However, the lack of as generally speaking of an acceptable definition can lead to confusion with regard to the significance of sustainable tourism.

Based on the above frame of reference, an examination of relation between the environment and the economic activities will be sought. Then, there will be a short examination of theories of regional development and of various endogenous models of growth which are connected with the environment. Finally, we will be investigated the incorporation of tourism activity in each model of endogenous growth which will be exported for the relevant conclusions.

## **2. The relationship between environment and financial activities**

At the beginning of the 70's, environmental problems were handled as a pretext for the discussion of the undesirable effects they can cause to economic development. The arguing of the existence of a relation between of environment and economic development is not something obvious for everyone. From antiquity, certain Greek philosophers already had focused on the negative effect it could cause to economic development in the maintenance of structures of society. This opinion is also strengthened with the ascertainments of the Club of Rome that leads to the conclusion of existence of incompatibility between the economic development and the respect of the balance with nature which support this contradictory view (Meadows, 1972).

However, recent research (Holtz - Eakin and Selden, 1992) is negating this hypothesis and explains that the curve which relates the flow of financial resources with the revenues is bell curved. One of the elements which explain this phenomenon is that the technological progress drives towards a production with causes fewer harmful consequences to the environment.

The mutual effects between ecosystem and economic activities are numerous. For instance, the natural resources constitute surges in the production or are consumed immediately by the households, the emissions of pollutants, liquid and solid waste in combination with the economic activities, influence the quality of the environment. The results of degradation of the environment are changed in exterior effects affecting the producer or the consumer. The way to determine these effects is in the incorporation of environmental indicators in the production process or in the process of evaluating uses. This occurs in the various models that study this relation. These models attribute the criteria of sustainable in terms of maintenance of the resources by type as if they were financial capital. In the case un-renewable resources, the exhaustion of natural reserves should be compensated with the increase of natural

resources capital. In the case of renewable resources, their use will be supposed with respect to the renewal rate.

### **3. Examination of the Theory of Regional Development**

A concise **examination in the theory of regional development** allows us to distinguish the steps which were accomplished by theoretical thought for the interpretation of economic development. Initially the interest of economists was focused on the achievement of balanced development. The fundamental studies of Harrod (1939) and Domar (1957) determined the conditions that ensure balance in development. The paradox in their results is found in the unstable and perhaps improbable characteristic of this development. The new theoretical approaches placed these affairs in contestation. Concretely Thus Solow (1956) changing the production process to being more flexible, proved the existence of a constant and balanced development. The post Keynesian economists were led to the same conclusions, allowing bigger flexibility in the rate of saving through wider fluctuations in the distribution of the income.

The existence of multiple ways of achievement of balanced development led a lot of writers in the decade of the 60' to follow the studies of Ramsey (1928) and to show interest in the finding of a more suitable and favourable development, that is based on the maximisation of the usefulness of consumers.

In the decade of the 80's the theories of economic development were renewed with the appearance of the "theory of endogenous growth". Initially, the particular theory supported the neo-classical model of Solow (1956), which however presented an important weakness, that is related with the existence of sustainable development that depends to a large extent on the exogenic technological development on the productive process.

This weakness did not explain the resources and the mechanisms of economic development. Endogenous models of economic growth that were developed covered this void, giving accent on the factors and on the behaviors that produce technical progress. The usefulness of endogenous models of growth is found in the standardization of the process of accumulation of surges. These increases or at least continuous output of scale of surges cause positive marginal productivity and constitute essential factors of sustainable development. Consequently, the theoretical background of theories of regional development, through the various models can incorporate the variable of the environment and explain theoretically and empirically the relation of development and the environment.

### **4. Models of Endogenous Economic Development and the Environment**

Below, are analyzed **three** basic types of models with the purpose the examination of their usefulness in the effort of achievement of sustainable development (Amable and Guelllec, 1992). They are models which are based on the accumulation of natural capital (capital stock) and technological externality; these models are related with public expenses and with models that are related with the technological innovations.

#### **A. Models that are based on the accumulation of natural capital**

This category of models supposes that the reserve of human knowledge is found in proportion with the reserve of natural - material capital.

**Michael and Rotillon** (1993) incorporate the environment factor in their model through the proportion that exists between pollution and production. The lever of endogenous growth constitutes the accumulation of capital stock. When the reintroduction of balance is sought in the most excellent point and there exists a zero rate of growth, the suitable sustainable policy that will need to be applied is that of taxation of the capital.

The natural environmental indicator is the size of pollution. In the case where the size of pollution has negative effects in the marginal usefulness of consumption, the more favorable situation is a constant situation with proportionally constant consumption and pollution, while the balance includes also positive development and continuous devaluation of the environment. On the contrary, when an increase in the size of pollution increases the marginal usefulness of consumption, the achievement of a positive rate of growth can constitute reality.

**Musu and Lines** (1993) make use of similar model, as this includes proportion of pollution and production, development in the reserve of pollution and sensitivity of consumers with regard to the reserve of pollution. Moreover, in this model, are imported the reductions of output of scale and the economic transactions between enterprises and households. The producers compensate the consumers for the devaluation of the environment and reversely, the consumers compensate the producers in the case of improvement of the environment. Because of external influences (learning by doing for the companies and environmental quality for the consumers), the point of balance has a smaller rate of growth from that the optimal best or most favorable point is independent from the interest of consumers for the environment. Also, the level of pollution is always as minimal as possible.

**Michael** (1993) imports the environment factor through two influences. First is the existence of the exhaustion of natural resources (fuels) as surges in the production process and second is the pollution that is caused because of the production in proportion with the fuels which are used. The development of the size of pollution is given and the consumer is influenced by this. The motivating force of endogenous growth is, again, the effect of accumulation of natural capital. The process of recession while it is inherent in the best point of development, at that point of balance it appears only in combination with the imposition of taxation for the use of energy, aiming at the financing of industries that are in recession.

## **B. Models that are based on public spending**

In this case, the motivating force of endogenous growth constitutes the “productive” public expenses that act as surges in the productive process. The enterprises owe the constant output of scale in two factors (private capital and public expenses). The environmental indicator influences the consumer and depends on two factors. The flow of the size of pollution in proportion with the production and the size of public expenses in environmental questions. Consequently, in this model the state plays a very important role, as it regulates two basic variables. The more general public expenses and the environmental expenses and with this the way it influences so much the growth rate, as much as the environment. All these expenses are financed through the imposition of tax of income.

In detail determination of environmental indicator plays fundamental role in the resolution of the model. The writers are separated between those that attempt the approach from the side of the flows (flow approach) and those that approach it by taking into account the side of the reserve (stock approach). In the first case, the flow of the size of pollution that is caused by the production and the public expenses for the environment, they influence the level of the environmental indicator. In the second case, the same variables influence the rate of divergence of the environmental indicator.

## **C. Models that are based on the innovation of products.**

These models are based on the innovation of consuming products or on the application of innovations in the production process.

### **❖ Models based on the innovations in the production process**

Bovenberg and Smulders (1993) import the environment parameter through two factors. First are the natural renewable resources as surges in the production process, the size of which

influences positively the consuming usefulness. Second is the creation of pollution through production, which influences negatively the Defence faculty of the ecosystem.

In the case of the challenge of environmental pollution, the more suitable policy is the imposition of taxation that is larger than the pecuniary resources that are required for the maintenance of the public interest. The writers examine with attention the effects that it will have on the reduction of the most optimal level of pollution with the existence of a larger interest of consumers for the environment. The environmental indicator is the flow of the size of pollution. In the best point the positive rate of growth keeps pace with the constant flow of pollution and constant reserve of natural capital. When the natural resources do not constitute surges in the production process there emerges a dilemma between environment and development. In the opposite case, the results are different and depend to a large extent on the defensive faculty of the environment.

#### ❖ Models based on the innovation of final goods

Verdier (1993) focuses his research on the analysis of results of taxation and technological models in the reduction of the level of pollution. He considers that the operation of usefulness is characterized by big diversity. Each produced good has been discovered by a sector of R&D, each innovation corresponds to a license - patent, so that the enterprise maintains her monopolistic place. In such an economy the motivating force of endogenous growth is the character of the state of interest that belongs to each innovation.

The households are characterized also in these from their sensitivity to the subject of the proportion between pollution and production. Nevertheless the consumers do not internalize this fact and do not modify their behavior according to the repercussions of their decisions in the quality of the environment. Verdier connects the lever of development with the quality of the environment. Of course, the various consuming goods are characterized by separate rates of pollution, which depend from the efforts of the R&D sector. A decreased rate of pollution per unit of production requires more research and development. Under these assumptions, each policy that aims in the reduction of this rate of pollution, will cause a reduction also of the rate of growth. The writer nevertheless, proves that the harmonisation of increasing rate of development and the alleviation of emissions of pollution are feasible, if it is applied in the imposition of taxation. It deserves to be noted that a reduction in the flow of pollution does not mean essentially also the automatic improvement of the environment. If the flow remains bigger than the absorption faculty of the environment, the reserve of pollution will continue to increase, even if this increase is slower.

Consequently, viable development (that is to say not increasing the reserve of pollution) exists only in the clean balance, where the absorption faculty is bigger than the flow of pollution. The choice of households for ecological products (“green products”) constitutes a decisive factor of the rate of development of the reserve of pollution. Thus, the growth of this parameter could constitute an objective of the environmental policy. If the public institutions render consumers sensitise to the subject of the environment, it is likely that an environmental improvement will be achieved without the use of restrictive measures, as in the case of taxation. Such a policy would cause the emertion of a dilemma between the environment and development.

#### **5. The Incorporation of Viability in the Models of Endogenous Tourism Development**

The environment and tourism constitute without doubt the new parameters that dominate in the estimate of each developmental initiative that was attempted in the past few years aiming at the qualitative improvement of life. On the one hand, the deterioration of the environmental conditions of our planet, a consequence of development and exploitation of wealth-producing sources and on the other hand, the enlargement of tourism sizes which have significantly intervened in the comprehension of the critical situation, in the import of powerful tools of control of development and finally in the routing of new administrative models that ensure the maintenance of the precious natural resources of our planet (Ahn - Lee - Shafer, 2002:1 - 23).

With such a visible danger, the effort of safeguarding the environment, which draws and develops tourism, cannot but constitute a continuous and with insistence - exclusive care, so as to ensure the duration and the positive repercussions of this investigation. The weight is consequently located in the configuration of suitable political management of tourism products that would maximize the benefits and minimize the negative repercussions, something that only sustainable tourism development can ensure. It is obvious, from the above analysis, that the models of endogenous growth can incorporate the tourism activity through the various environmental indicators. Concretely, the models that are based on the accumulation of natural capital can include also the materials or technical elements that compose the structure of the tourism product. The models that are based on public expenses can include also the public tourism expense (investment and consuming) which in fact creates repercussions in the natural and anthropogenic environment. The models that are based on innovation can include also the new innovative tourism products which are created by special and alternative forms of tourism. The incorporation of the tourism activity gives the possibility for negative repercussions of tourism to be appreciated in the tourist destinations and for the essential measures of this policy to be taken for their softening. Between the useful tools to design the required policy, is the methodological tool of spatial carrying capacity for tourism development (CCTD). And this because of the interdependence of tourism and the environment, which imposes a cross-correlation with the gravity of the environmental problem at a global level, but also at a local level.

## **6. CONCLUSION**

The CCTD as a management tool has a main interconnection with the environment and its precious resources, which it is called to protect, it elects and appears as a sure way to determine the limits and the rules that will work out in order to be used by the protagonists of tourism development of the tourism product (tourism, travel agents, local population, organizations and local decision-making institutions) along the course of tourism development. The ascertainment that tourism, as a permanently changing system of recreation, education, treatment, exercising, briefing, exchanges and transactions of persons with the "environment" (nature - person), is still an "unknown object", complicated and interesting. This reveals the reasons for the poor until now involvement of experts and stresses the difficulty of registering a proposal which would have a proportional dynamic with the examined tourism system.

Consecutively the proposed requirement of the constituted viable tourism development (Sustainable tourism Development) will have to result in a governing policy, and in parallel with the sought protection of the natural and cultural environment through which is accelerated the simultaneous continuation - maintenance of the evolutionary process and of the circle of life of tourism and of the environment. The various models of endogenous growth incorporate the tourism component and lead to a tourism viability in the regions of destination of tourists. Further, the methodological approach of CCTD is appreciated as it can offer practical solutions for the confrontation of problems, which creates the presence of tourists in a region. This is achieved through the means of an action mechanism which is connected with the planning of the environmental system, the development of complete policies of intervention, and the importing of a series of supporting motives at local, regional and national levels. Thus, tourism development is observed systematically and is included functionally in the complete endogenous local development with as a driver the principles that sustainability is economically also socially viable. With such a prospect, the actions are included in the more general frame of endogenous models of tourism development, where the development of a special strategy for sensitive ecological, coastal and agricultural areas are compatible with European policies, administrative and the legal frame, but also with the disposal of the necessary economic resources with the objective goal to prepare a comprehensive strategy for each environmental area with a local, regional and national action.

## 7. BIBLIOGRAPHY

Ahn, B. Y., Lee, B., Shafer, C. S. (2002), "Operationalizing sustainability in regional tourism planning: an application of the limits of acceptable change framework", *Tourism Management*, Vol. 23, pp. 1-23.

Amable, B. and Guellec, D. (1992) Les Theories de la Croissance Endogene, *Revue d'Economie Politique* 3:313-377

Bovenberg, A.L. and Smulders S. (1993) *Environmental quality and pollution – saving technological change in a two – sector endogenous growth model*. Center for Economic Research (9321). Tilburg University.

Brundtland (1987), *Our Common Future*, WCED-World Commission on Environment and Development.

Domar, E. D. (1957) *Essays in the Theory of Economic Growth*, Oxford University Press, Oxford.

Harrod, R.E. (1939) An essay in dynamic theory, *Economic Journal* 49:14-33

Holtz – Eakin, D. and Seldon. T.M. (1992), *Stoking the fire? CO2 Emissions and Economic Growth*, NBER Working Paper (4248)

Meadows, D.H. et al. (1972) Rapport sur les limites de la croissance. In: *Hulte a la croissance*. Editions Fayard, Collection Ecologie

Michel, P. (1993) *Pollution and Growth Towards the Ecological Paradise*, mimeo, Paris.

Michel, P. and Rotillon, G. (1993) *Pollution's Disutility and Endogenous Growth*, mimeo, Paris.

Musu, I. and Lines, M. (1993) *Endogenous Growth and Environmental Preservation*, mimeo, Paris

Romer, P. M. (1990) Increasing returns and long – run growth, *Journal of political Economy* 94:71-102.

Solow, R.M. (1956) A contribution to the theory of economic growth. *Quarterly Journal of Economics* 70:65-94

Verdier, T. (1993) *Environmental Pollution and Endogenous Growth: a Comparison Between Emission Taxes and Technological Standards*, mimeo.