

LIFE CYCLE MODELLING FOR TOURISM AREAS

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ABSTRACT: Modelling tourism development cycles associated with planning and investment cycles intends to be a contribution to the understanding of the tourism activity within a *continuum* process. It allows a better apprehension of the sequence of interdependencies that exist and can be addressed enlarging the well-known concept of tourism product and its life cycle. The proposed model can contribute for monitoring the tourism activity and improve its development in a sustainable way. If the tourist sites use this tool they have more probability to have success, because when the tourism life cycle is monitored it is possible to introduce some corrections upon the inadequate trend. The use of the appropriate indicators to measure the activity is essential to the success of the proposed life cycle modelling, such as can be observed in Madeira Region case study.

KEY WORDS

Life cycle, modelling, plan-processes, tourism development.

INTRODUCTION

Life cycle as a graphical tool, representing a succession of phases in a normally long period of time, can be a very relevant tool for monitoring several areas of knowledge. The specific approach to life cycle modelling was launched in the sixties and it concerned economic production by phases. This analytical tool has now been expanded to processes and into several areas, namely geography, urbanism, tourism and marketing as well as civil engineering. It allows low cost monitoring but it has specific problems, namely lack of large data sets.

The main objective of this paper is to present the research methodology of a PHD thesis under way at Minho University and incentive discussion and new approaches on this subject. A specific aim of this paper is to present the model about plan-processes proposed by Lourenço [9] and apply it to areas for tourism development.

Some authors argue that in tourism research there has been “an unfortunate tendency to gloss over questions of theory and method, and a concomitant failure to acknowledge their interrelationship”, that is “the tourism research falls into one of three categories. Either the research is theoretical without empirical evidence or empiric without theory or descriptive studies that are impressionistic and anecdotal” [6]. This paper pretends to cross theoretical analysis on life cycle and empirical qualitative/quantitative data where available. Several researchers have been working with some models based on Butler’s tourism area model. Nevertheless, there are a significant number of older and recent models that portray graphically the life cycle of a product, market or industry.

The first part of this paper presents the work methodology and delineates the importance of Plan-Processes and the relationship of this issue and tourism activity. The continuum process of planning and the integration of all sector policies are considered basic factors for tourism development in the proposed model. The second part presents the state of art on life cycle of tourism activity and the Lourenço’s Model. Afterwards, the hypothesis for modelling a tourism development process is sketched as well as the proposed model and measurement indicators. Finally, in the third part, the applicability of the model is tested on Madeira Region, Portugal and some concluding remarks will be presented.

It is essential to emphasize that the tourism area development process model sketched in this paper is still under progress. The research hypothesis concerning the proposed model states that the structuring of tourist destination, the efficient marketing and the environmental sustainability of the tourism product, can bring up better levels of tourism development. In this way, the proposed modelling is portrayed graphically, as well as the variables analysis and the respective indicators for the applicability in tourism areas.

METHODOLOGIES

The proposed methodology is supported by the theory of life cycle and the Lourenço's model. Nevertheless, the working hypothesis and explaining model for the tourism development process are still being studied. However incipient the interaction of the presented models from economic research such as the ones from Fox, Hill and Jones, to the tourism research such as the ones by Fuster, Jain, Knowles, Ruschmann and Cooper as well as the incorporation of urban modelling by Lourenço, they seem to converge to a successful working hypothesis.

Obviously, the lack of information is one of several expected limitations in the use of the model which must be seen as a tool for analysis of the tourism activities. Furthermore, data on tourism issues is seriously affected by dispersion of information and services, infrastructures and equipments can be shared by inhabitants. Therefore, it is more difficult to estimate the tourism impact namely on employment generation and tourism support capacity [14].

The use of Lourenço's model is a subject to be further analysed, particularly in areas for tourism development where ground for innovation exists. In the meantime, it is important to emphasize that this model was developed for urban growth areas and the corresponding land-use plan-process. The model applicability for tourism areas is being tested on Madeira Region and further re-modelled. The reason for the choice of this case study lies on the data availability on a 25 year period and because it is an Island that has had quality tourism development since the XIX century. The existence of a data series allows overcoming one of the major shortcomings of modeling life cycles that is finding long enough series of information. Also, the fact that the research is being carried out for a small confined territory such as an island, helps to focus on data collection issues.

PLAN-PROCESSES AND THE IMPORTANCE OF THIS ISSUE

Plan-process is a concept specifically developed since the seventies of the XX century where development, meaning actions and investment of financial resources, is put forward within a process of planning where plans are of utmost importance. Therefore, between the decision to invest and the action or investment itself, a tool exists that is a plan. This plan can be of different origins and typologies. In the seventies, the plans were basically static aiming at certain point in time, considering that starting conditions would be maintained throughout time. The importance of plan processes revived again in the nineties of the XX century in Europe and always kept in the most organized and developed territories such as in the Netherlands and United Kingdom. The existence of a plan-process in a *continuum* allows for feed back of the system. In this way, the desires and values of the community would be listened and the environment could be developed in a more sustainable way. Likewise, it is possible to evaluate the plans, the possible alternatives, to incorporate the gaps and uncertainties in the system. The plans are then made more effective because they are monitored.

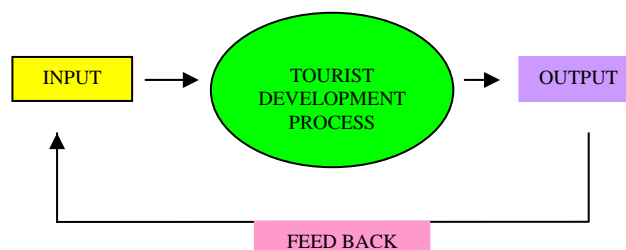


Figure 1 - Incorporating Feed-back in the Tourism Development Process

One of the biggest problems of the tourism development plans derives on the lack of integration with other social, economic and physical programs of territories. Thus, they are made in rather isolated way; therefore they end up not attaining the proposed objectives [11].

It is essential then to bring together physical and economical planning on the agenda. In fact, in the appropriate land-use tools these two facets of planning have been more and more looked for [8]. This fact derives from the complexity of the decision-making process taking into account their social, economic, political and environmental relevance as well as their territorial specificities.

LIFE CYCLE OF TOURISM ACTIVITY

Researchers that analyzed the tourism activity and made contributions for its monitoring and evaluation, developed theories related with the life cycle of the tourist product. This tool appeared in the sixties and was related directly with economic analyses, but currently the most diverse areas of knowledge apply the concept of life cycle to assess performance.

In the seventies, several adaptations have been developed to portray graphically the development of the life of a product, market and or industry such as the one put forward by Fox in 1973. The models keep being similar although the number and names of the stages have varied throughout time. From five stages: pre-commercialization, introduction, growth, maturity and decline [7] to one of the most recent versions keeping the same number with different names such as embryonic, growth, shakeout, maturity and decline [8].

In the eighties, Butler adapted the life cycle product model to the tourism industry and created the "Tourism Area Life Cycle (TALC) model" [3] (see figure 2). He established six stages but he used different names: exploration, investment, development, consolidation, stagnation. He then introduced one innovation after stagnation stage: the product can decline or revitalize.

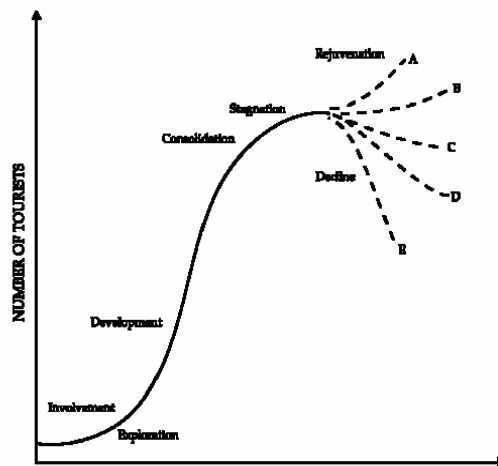


Figure 2: Tourism Area Life Cycle model – Butler (1980)

More than 30 tourism areas have been subject to "Tourism Areas Life Cycle model" of Butler and some comply with it and others. The first research to apply the TALC was Hovinen (1981) in Lancaster County at Pennsylvania. Butler tested the model in 1985 at Scottish Highlands, and it was further tested in the eighties: Keys (1985), Haywood (1986) as well as in the nineties, especially by Cooper.

In Portugal, the first known TALC study dates from 1997 and was applied to Algarve: it identifies stages and links TALC to regional strategies and concludes area should plan for a long period of stagnation and stabilisation [2]. The life cycle of the tourism activity is being presented in technical reports nowadays such as the Action Plan of the tourism area of Lloret del Mar, Spain. The following transcription exemplifies this statement.

"As in other economic sectors, tourism follows a determined "product life cycle", with a curve similar to that of the attached graph. In this process several stages can be identified:

- A first stage called **discovery**, in which tourism begins to implant itself timidly in a territory for the first time. The practices involved are accessible to a minority, characterised by improvisation, singularity and the integration of the tourists with the territory which they are visiting and with its surroundings.
- A second stage known as **launch**, in which the tourism phenomenon grows spectacularly and very quickly. There is a change from minority practices to others of general scope, characterised by an enormous quantitative increase of both demand and supply, following a pattern of discontinuous growth.

- A third stage of **stagnation**, in which saturation is reached: the quality of the offer falls, demand levels off, and the environmental degradation of the tourist destination begins to be obvious and worrying.

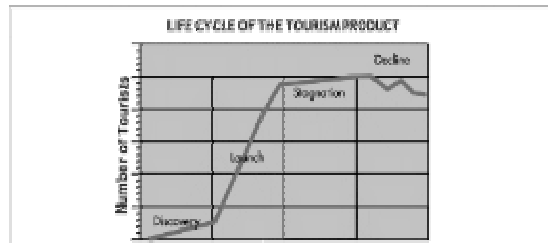


Figure 3 - Life cycle of the tourism product

- A fourth stage of **decline**, which represents the current state of the mature tourist destinations (that is, coastal areas developed for mass tourism in the 50's and 60's). The problems which were sensed in the stagnation stage now manifest themselves clearly, the model of tourism adopted becomes exhausted and it is necessary to redress the situation, to invert the downward trend of the curve. In the face of this situation the mature destinations can opt for various solutions:

1. Continued decline, due to the passivity of the public and private agents, which force the model until there is no longer any solution.
2. Stagnation, due to the application of piecemeal measures which do not attack the root of the problems but only the most evident effects.
3. A radical change of mentality, leading to the adoption of measures which even entail a new tourism model, based on sustainability and the integration of tourism with the territory, the economy and the local population" [10].

Recently, for sake of applicability, Berry classified the phases of the tourism destinations in three groups: areas of decline, areas of rejuvenation and areas of constant stability [2] and Russo developed the theory of the "vicious circle", where he considers the tourists/visitors of one day and their relation with the quality of the destinations [12].

The life cycle stage is difficult to quantify even if many destinations may intuitively know their position. Here, Knowles (1996) identifies eight factors which can assist in identifying the life cycle stage: market growth rate; growth potential; range of product lines; number of competitors; distribution of market share amongst competitors; customer loyalty; entry barriers; and technology. Another approach is to consider growth indicators (Cooper, 1992) such as: rates of volume growth; ratio of repeat to first-time visitors; length of stay; visitor profiles; expenditure per head; and visit arrangement (package/independent) [4].

LOURENÇO'S MODEL AND THE TOURISM DEVELOPMENT PROCESS

The proposal of Lourenço's model was based in the *quasi-model* of Holton and then adapted for urban areas with a territorial plan-process. In the current PhD analysis, this model is adapted for tourist areas where tourism development plans occur aiming at the development of the tourist activity.

As such, and based in previous meta-heuristic models used for boom growth in mining villages and for research growth as the *Quasi-model* of Holton (see Figure 4), an ideal model of a plan-process was designed (see Figure 5).

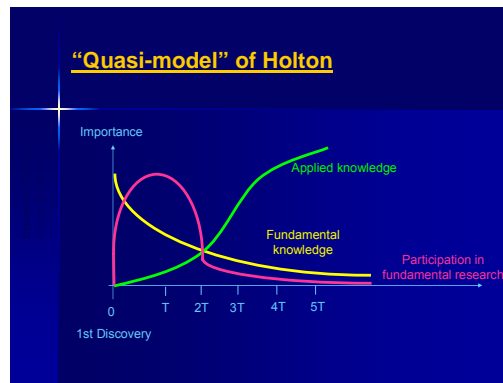


Figure 4 – Quasi-model of Holton

The explanation of the *quasi-model* of Holton will be presented along Lourenço's model (see Figure 5). In this last model, the horizontal axis also represents time but the period T is equal to ten years. In the vertical axis, the representation of the importance of the ideas, knowledge, etc, was parameterised in three classifications: minimum (I), medium (II) and strong (III) according to the stages of a planning process rising from birth, then apogee culminating in decline. The variable "importance" in the *Quasi-Model* of Holton is the intensity of the cycle in Lourenço's model. These three stages represent a cycle of a planning process related to actions and life-cycles, for a specific urban expansion area.

That is, on a bi-dimensional graph over intensity of cycle and time dimensions, an attempt to portray the planning efforts, the investment on urbanization, public infrastructures and equipment and the adherence of the population is quantified at the mentioned three levels. As can be noticed from the graph on Figure 4 from rise to death of a planning cycle for the growth of an urban area, 70 years are taken into account.

After 10 years planning production, the rate of planning decreases significantly on that area, reaching a minimum level after 20 years from starting point. After seventy years of the start of urbanization even a prime area that keeps successful must have an increase in its planning activity. The actions and living curves follow a low level start and increase significantly over time, having respective peaks at twenty and forty years later, respectively.

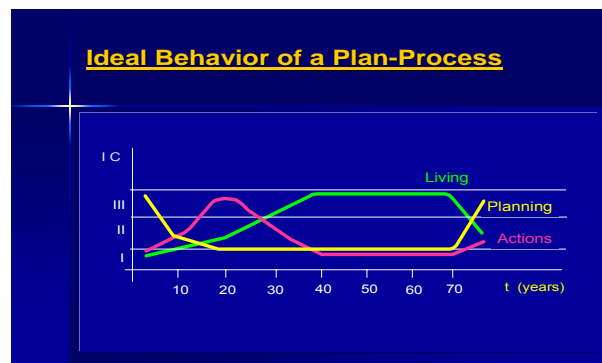


Figure 5– Ideal Behavior of a Plan-process: Lourenço's Model

The main objective was to find the fundamental characteristics underlying the process of making and implementation of land-use plans derived from the context in which they are generated as well as from the logics of public and private action, especially in the fields of plan negotiation and development control as well as action programmes and local policies. As such, underlying factors were divided into decisive and critical, the first grouped among three levels (physical, technical and cultural). The critical factors were found to be the persistence on attaining the proposed objectives and the perception of innovations. This hypothesis was tested in seven case-studies aimed at expansion areas with zonings normally difficult to implement in Portugal such as green, industrial, conservation and urban fringe areas. This in-depth micro-research for seven Portuguese urban places chosen for standing out of the ordinary was carried out so that the critical factors could find maximum enforcement.

Some numerical modelling concerning the expansion areas around four of the case-studies was performed in digital form through aerial photography computer mapping as well as plans analysis at three periods: up to 1945, from this time to 1970 and between this year and 1990 (see Figure 6).

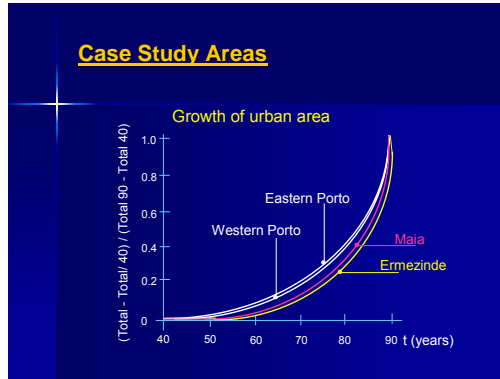


Figure 6 – Case study areas

Applying the *quasi-model* of Holton for each study-area validated the model. As such as while in Maia I, for example, the ideal model can be adapted after the seventies, in Ermezinde the planning cycle does not follow the ideal model, showing three cycle breaks, while the actions and living cycles keep at low level for a long time (see Figures 7 and 8).



Figure 7 – Maia's Results



Figure 8 – Ermezinde's Results

In sum (see Table 1), Perception of Innovations can be considered a critical factor of the Plan-Process. There remains a successful application of the heuristics model of Holton to a land-use planning process with innovations. If the model does not stand, a matrix of the relevant actor's behaviour towards innovation can explain the differences in the graphical forecasting model.

		<u>Case-Studies Results</u>						
		Study-Areas						
Factors		Parque Ocid.	Parque Orie	Mala I	Ermez.	Pinhão	Chelas	Ajuda/ Belém
Persistence (on Aims)		●	●	●	●	●	●	●
Innovations (Perception of)		●	●	●		●	●	●
Politicians		●	●	●		●	●	●
Technical Staff		●	●	●		●	●	●
Private Group		●	●	●	●	●	●	●
Lobbies					●	●	●	●
Nº of Innovations		+ 4	+ 3	+ 3	- 3	- 4	- 2	- 3
Consensus		●	●	●	●	●	●	●
Conflict					●	●	●	●
Strategies Inflexion		●				●	●	●

Table 1 – Case-studies results

Lourenço's model allows a successful achievement of the objectives as the graphical forecasting model combined with a matrix of the behaviour of the relevant actors related to the critical factors can prove quite effective in the monitoring of a plan-process and its possible trends. It is not a prescriptive model but basically a tool for monitoring a plan-process.

MODELLING A TOURISM DEVELOPMENT PROCESS

The determinant factors to assess the planning cycle still to be further developed and being looked at, presently, are:

- The need to plan before hand tourist actions activities;
- The need to have market research.
- The importance of public participation and integrated approach of all sectors involved on the management of the tourism development;

Thus, the research hypothesis plus the determinant factors need some modelling that supports the theoretical framework and that allows it to be validated. After analysing this life cycle type of model and incorporating the cycles considered within Lourenço's model: planning, action and living, an attempt to adjust both type of models will be presented. Previously, some considerations on the proposed tourism plan-process model are introduced and discussed.

The model being presented portrays graphically a tourism area development process and not merely the identification of the life cycle of the tourist activity. The model uses two variables: in the vertical axis the intensity of the cycle, and in the horizontal axis the time variable. Three components, planning investment and living, are portrayed in the graphic through indicative data. In sum, this graphical portrayal of a tourism development plan-process is still being sketched. But empiric evidence suggests that the life cycle period of the tourism activity is shorter than the urbanization activity. Furthermore, it can be regarded as a tool for monitoring tourism activity but not for prescriptive behaviour. Specifically, the living space of tourism and its shifts along time are traced and monitored with the proposed tool.

The planning curve (see figure 9) can be represented by data such as: number of tourism plans, public policies with impact on tourism, government commissioned studies, for example on structuring of tourist destination, market research. In the beginning, this analysis can be merely quantitative.

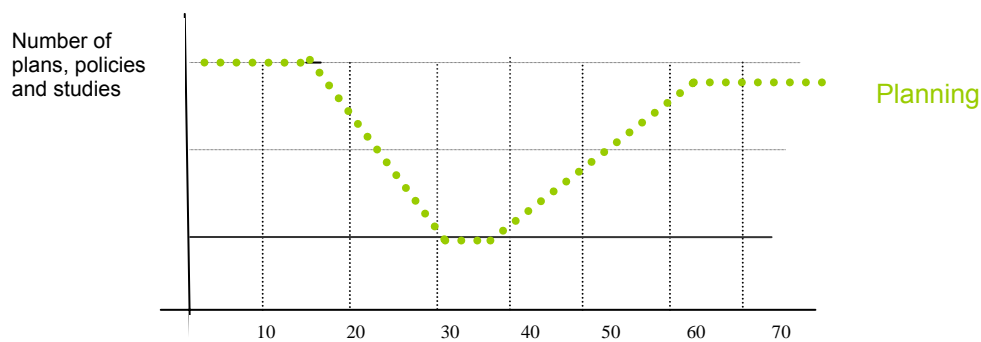


Figure 9: Planning cycle and indicators

The action curve (see figure 10) can be analysed such as public funding by different levels of government on airports, accessibility, tourism information, tourism equipments and diffusion such as leaflets. Private investments are traced on the living curve.

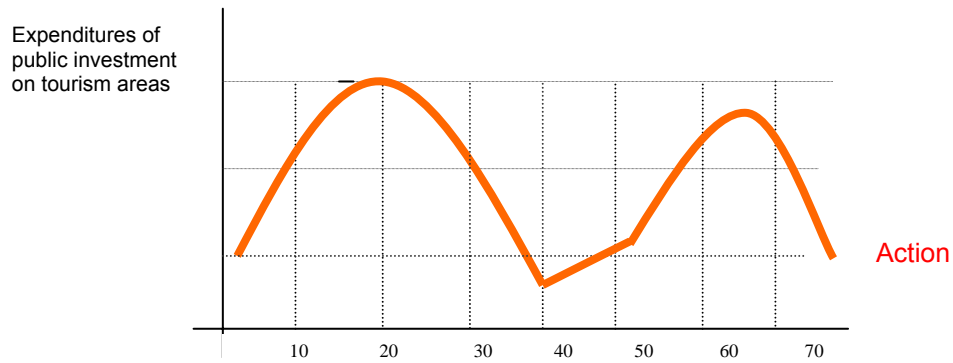


Figure 10: Action cycle and indicators

The living curve is the one similar with Butler's tourism area model because it portrays the growth of tourism activity. Indicators can be, following Cooper's quantitative approach, number of beds X rate occupancy (see figure 11).

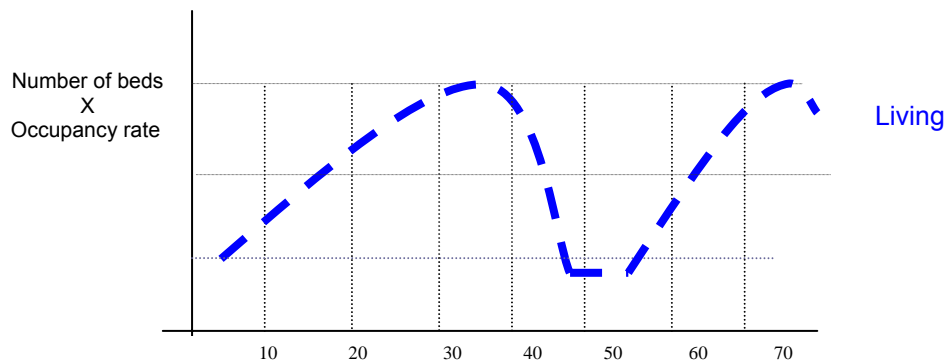


Figure 11: Living cycle and indicators

The proposed living curve does not represent qualitatively the living of the tourists. It does not also incorporate the tourism activity impact on inhabitants and area. These topics will be incorporated later on, based on conceptual relationships such as the ones presented in table 2.

Relationship Tourist X Community	
<input type="checkbox"/> Friendliness	<input type="checkbox"/> Hostility
<input type="checkbox"/> Cultural Exchange	<input type="checkbox"/> Cultural Domination
<input type="checkbox"/> Respect	<input type="checkbox"/> Imposing
<input type="checkbox"/> Business and socio-cultural	<input type="checkbox"/> Only business

Table 2: Matrix relationship between tourist and community

The relationships between the model and the lifecycle phases are thus presented. In the first stage "discovery", at the initial start of tourism activity, there must be a big planning effort as well as capital investment to structure the destination in order to attract tourists. In the twenty initial years, the intensity of the planning cycle is very strong (III) while the actions and the living cycles start to grow.

In the second stage, the tourism **launch**, planning is still strongly needed. In the meantime, after around twenty years, the planning activities are consolidated (II). At this moment of the time period, the living is more intense and the actions still grow.

In the third stage, either stagnation or **decline** will occur. The planning, living and actions cycles go down until the minimum level (I). There are only low efforts in all variables under analysis: planning, living and action (see figure 12).

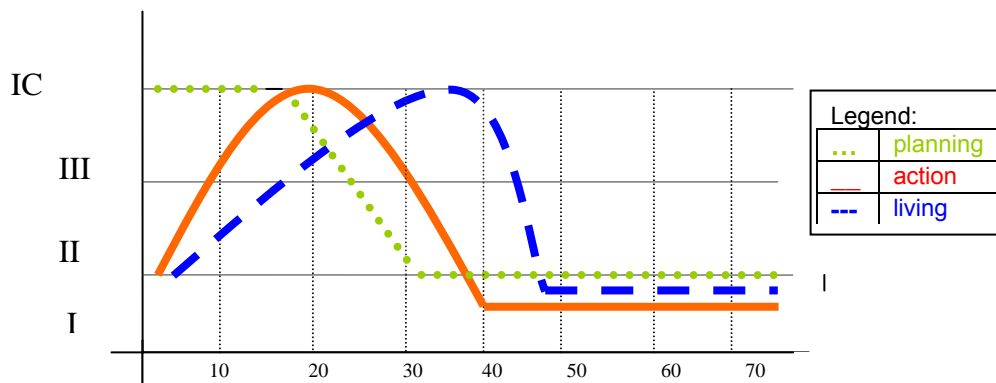


Figure 12 - Tourism development ending in stagnation or decline

Nevertheless, in the third stage it is possible to do something to **launch again** or **revitalize** the tourism product. For this it is essential to plan and invest again. That need explains why in the model proposed, actions grow again since around the 40th year, then the living may increase also (see figure 13).

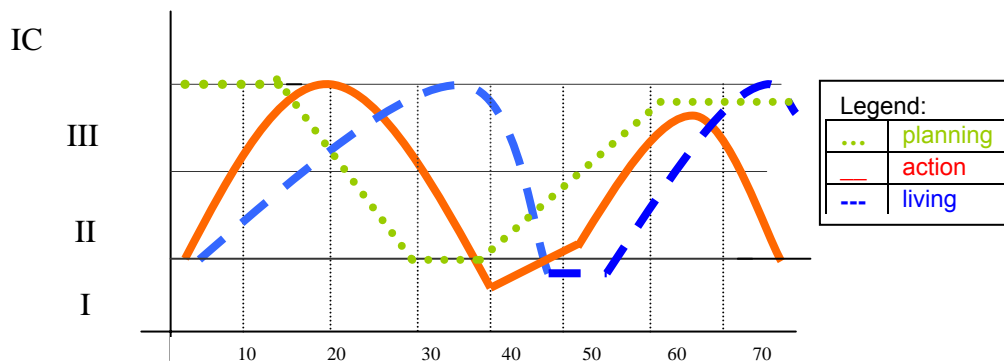


Figure 13 - Successful tourism development processes (launch or revitalization)

It is highlighted that the model proposals sketched in figures 12 and 13 allow for visualization of different positions: in the first, tourism ends in stagnation or decline where as in the other, there is launch or revitalization. Nevertheless, the model being applied in this paper is the *Successful tourism development process* (figure 13), knowing that this is an ideal model.

The relation between the components named as planning, action, living can be of different sorts:

- ideally, as already described as the successful model;
- with delayed planning;
- with active living and delayed action and planning;
- with delayed action;
- without action or planning.

In the case that delayed planning happens, investments and some living rise while planning activity has not yet started, that is the tourist plan and the definition of goals come later. This fact may, in some

cases, have a negative impact in the environment. Tourism areas *with active living* portray a tourism process that starts developing by itself. Mass tourism destination is a probable outcome as there is no planning of goals, no threshold for support capacity nor an idea about appropriate type of tourism for the specific destination. In the case that there is delayed action, there is a shortage of structure supply of infrastructures to receive the tourist. Other situation is the life cycle tourism development process without action or planning. This may result in missing destination structuring.

MODELLING MADEIRA REGION TOURISM DEVELOPMENT

The Madeira Region incorporates the Madeira and Porto Santo Islands. It is located west of the African coast between the Azores and the Canary Islands. The tourist attractions which are beautiful landscapes, cultural traditions and the Madeira wine, associated with good weather without extreme temperatures and high quality accommodation, makes it the third destination in Portugal, after Lisbon and Algarve.



Map 1: Madeira Region

An attempt to test the proposed model in Madeira Region uses a period of 30 years (1975-2005). There follows a description of the corresponding visual representations for Madeira as defined in the previous section.

Concerning planning in Madeira region, there seems to be some activity in this field as it is one of the few Portuguese regions that has an approved Tourism Plan (DR n° 17/2002/M) since 2002 [5]. Some structuring on this field seems to have started in 1930 with the creation of the Tourism Delegation of Madeira, following the original Tourism Commission, upgraded to *Secretaria Regional do Turismo* in 1978.

Likewise, the planning cycle, represented in Figure 14, has a major increase after 1978. By the end of the eighties, beginning of the nineties, planning policies were being discussed and implemented in Portugal. Likewise, it is considered that the intensity of planning increases until a peak in 2002, when the Tourism Plan was approved. After this approval, the intensity of planning is decreasing.

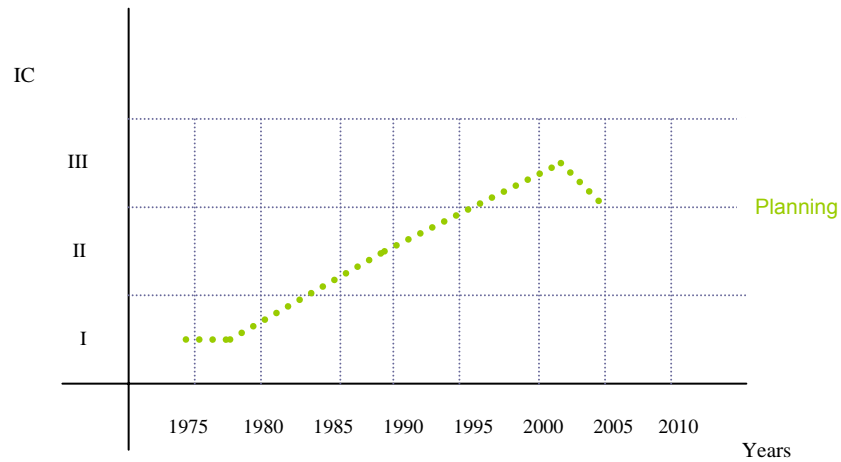


Figure 14: Planning Cycle at Madeira Region 1975-2005

In terms of public investments with available information there has been funding allocated to major infrastructures, equipments and marketing. The renovation of the airports of Funchal and Porto Santo, respectively in the years 2000 and 1995, meant a very strong capital investment in Madeira Region, directly concerned with tourism activity.

The Island received other tourist investments such as a Panoramic Balloon in 2004, located in the harbor area and ordered by the Local Authority. In 2005, there will be strong investments in pedestrian paths. A last relevant investment is the new site of Madeira Island launched in 2004, aimed at giving information to tourists and tourism researchers.

The public investment (see figure 15) has been slowly increasing from 1975 to 1995 with a sharp increase since this last year until 2005.

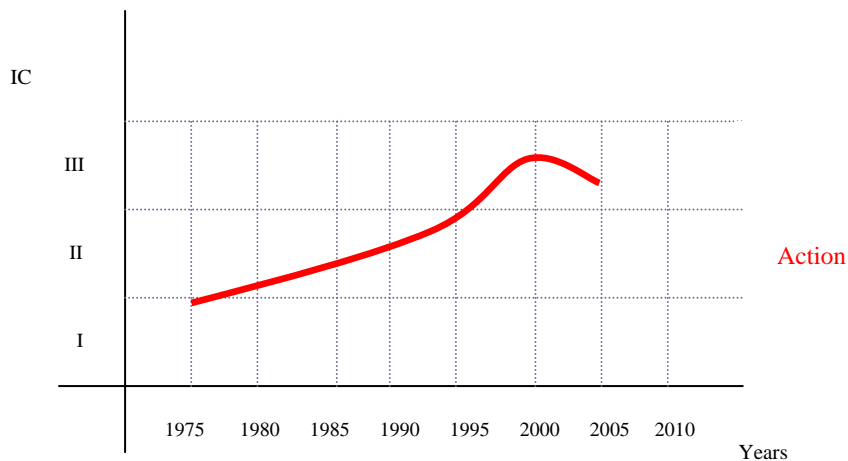


Figure 15: Action cycle at Madeira Region 1975-2005

The living cycle (see figure 16), representing tourism rise, maybe analyzed after supply indicators. Several types of data show a big rise from 1975 to 1990 and an increase at a higher rate from this year until 2005: this is so for airport traffic increase (100% increase from 1989 to 1990) as well as for number of hotels.

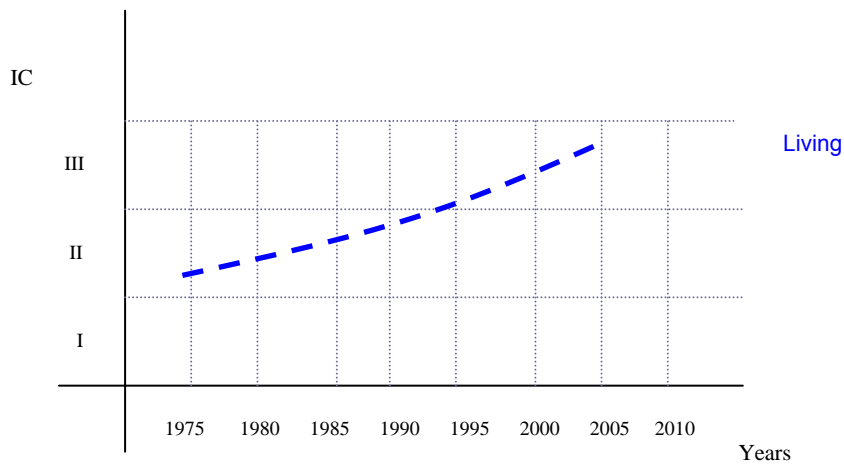


Figure 16: Living Cycle at Madeira Region 1975-2005

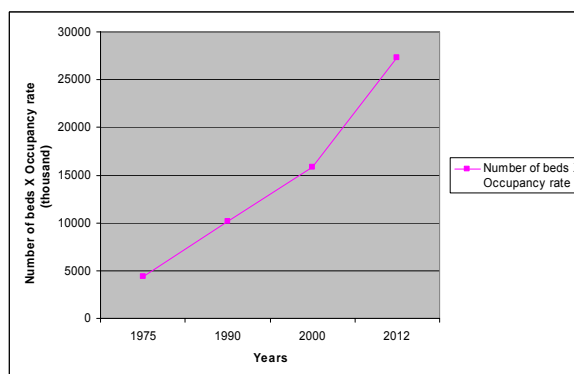
Available data for accommodation supply, allows a numerical modeling of this period. As such (see table 3), the number of beds has tripled in thirty years. There were 8.433 beds in 1975, increased in 1990 to 13.419 [1], amounting in 2000 to 24.520 [13] and in 2005 to 29.523 camas [13].

Years	Number of beds	Occupancy rate	Number of beds X Occupancy rate
1975	8.433	52.0%	4.385
1990	13.419	75.9%	10.185
2000	24.520	64.8%	15.889

Source: Direcção Regional de Estatística da Madeira, data collection based on [1]

Table 3: Tourism Accommodation in Madeira Region - Number of beds X Occupancy rate, 1975-2000

In this numerical modelling, the increase of tourism activity has been permanent over the period and it may reach a maximum of 39.000 beds by 2012. The occupancy rate is estimated at 70%. These figures derive from the Madeira Tourism Plan and made possible the numerical modelling of the living cycle on the period 1975-2012 (see figure 17).



Year 2012 – planned forecast

Source: Direcção Regional de Estatística da Madeira data collection based on [1]

Figure 17: Number of beds X Occupancy rate

The application of the tourism development process model to Madeira Region was possible in the period 1975-2005. As such, a graphical portrayal of the Madeira Region development process in the

study period shows a delayed tourism planning process (see figure 18). In fact, the planning cycle starts increasing from the seventies, reaching a peak in 2002, after the peak of investments.

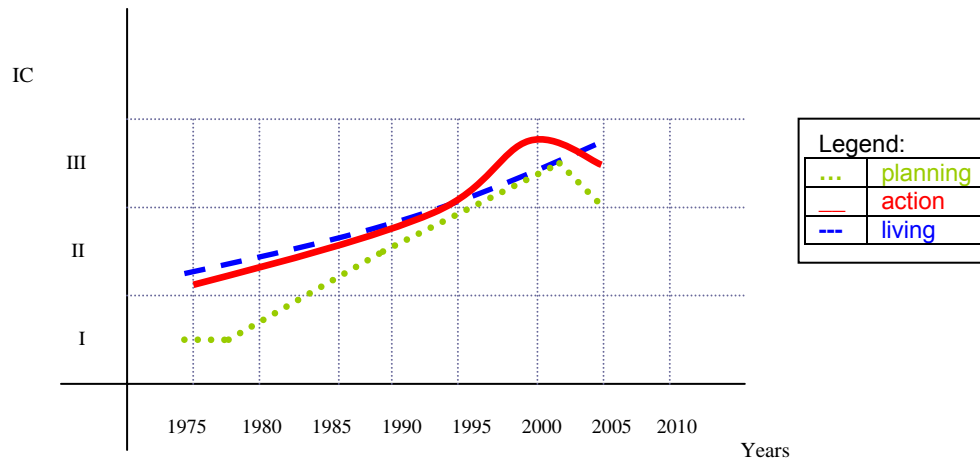


Figure 18: The proposed model applied to Madeira Island

Some 2004 preliminary data show a probable declining trend in the living cycle even if it keeps rising from 1975 until 2000. It may attain a local peak in 2012, if investment follows the planned proposals.

CONCLUDING REMARKS

Life cycle analysis is one of the most effective tools in analysing processes over long time periods. These processes include tourism areas development. The proposed methodology, working hypothesis and explaining model for the tourism development process are still being developed; nevertheless the three components of living, action and planning of a tourism development process can be modeled, as shown in the case study presented.

Current research has been characterized by a gap between practice and theoretical models. The validation of the model on Madeira Region based on empirical evidence is a first step forward and it proved its importance for monitoring the tourism activity and improve its development in a sustainable way.

The use of this tool fosters the probability to have success, because the monitoring of the tourism life cycle fosters the introduction of some corrections upon the inadequate trend. This advantage must be reinforced by the use of the appropriate indicators to measure the activity. A careful selection is essential to the success of the proposed life cycle modeling. The applicability of the model to Madeira Region was feasible even with specific numerical data missing on planning and action cycles. An attempt to develop a quantitative analysis with a specific combined multiplier was successfully carried out for the living cycle on the period 1975-2012.

The result of tourism development process life cycle modeling for Madeira Region was a delayed tourism planning process, albeit the action cycle shows investments that structured the area. The living cycle is still increasing but recent trends should be carefully monitored as there is recent evidence for slowing tourist activity.

The application of the proposed model can be a relevant tool for monitoring a tourism development process. It allows for earlier awareness of negative trends and therefore for higher rate of success when attempting to overcome the problem for both supply or demand sides. The case study shows this evidence.

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