

Methodological Framework for Evaluation of Tourism Carrying Capacity of Eco Sensitive Region.

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Abstract: This paper establishes relationship between the issues likes present growth of the tourist town which have eco sensitive character and exploration of natural resources along with the economy, environmental impacts with help of the evolution of carrying capacity exercise. Other terminologies regarding carrying capacity and assessment methodology are discussed in brief. There are various techniques for evaluation of carrying capacity as worldwide used and how they are applicable to eco sensitive area. The study examines various reports, case studies, assessment exercises done by different nations and agencies. Formation of methodological framework, criteria for selection of the appropriate framework and assessment for evaluation of carrying capacity of Eco sensitive area are discussed in this paper.

Keywords: Carrying capacity, eco sensitive, tourism, environment.

I. INTRODUCTION

Today's the rapid and haphazard trend of tourism along with urbanization in Western Ghats like Lonawala, Mahabaleshwar, Panchgani and its suburbs has extended relentlessly beyond its administrative boundaries. This explosive growth of tourism areas has brought about fundamental changes, not only to the physical landscape, but to people's perceptions of land and environment. Consequently, unsustainable pressures are placed not only on the environmentally sensitive landscapes but to the basic natural processes that have contributed to the physical form of the city. The tourism environment has been shaped by a technology whose goals are economic rather than environmental or social. The paper examines the evaluation of carrying capacity of this tourism growth trend on the region's natural resources, infrastructures and critically reviews the relevant environmental eco sensitive area regulations through the case studies of two major town within the environmental eco sensitive region- Mahabaleshwar and the Panchgani.

Carrying capacity of town will vary from place to place and character to character. A carrying capacity is ultimately assessments tool for the exploration of natural and artificial resources which contribute to the growth of town. Presently various assessments tools like ecological footprint, carbon footprint, qualitative and quantitative assessment techniques are used for evaluation of carrying capacity.

Carrying capacity is a vast concept which includes physical, social, environmental impacts. In this paper an attempt to is made to form methodological framework for evaluation of tourism carrying capacity of Eco sensitive area.

It is often observed that tourism generates a negative impact on the environment of destination places, among which the depletion of the natural capital is the most evident. The indicator of Tourism Carrying Capacity (TCC) can be particularly relevant to this purpose. In fact, it gives an idea of the threshold of tourists that can be accepted at a destination while considering the capacities of some components of the local tourism system. In this work, we approach a specific definition of TCC, and for its empirical measurement, we also develop a multidimensional model in the form of a mathematical programming application. Furthermore, we apply the model to some tourism destinations Mahabaleshwar and Panchgani, where evidence of unsustainable tourism management can be observed.

II. DEFINING CARRYING CAPACITY (CC)

The concept of carrying capacity is very old in wildlife management, and was used for the first time by Dasmann in 1945 for assessing the capacity of the forests for grazing by animals (Wall, 1983). It was from early 1960s that this concept was applied in recreational research for the purpose of determining the ecological disturbance from use (Lucas, 1964; Wagar, 1964).

World Tourism Organization (1993) defines CC as, the level of visitor use an area can accommodate with high levels of satisfaction of visitors and few impacts on resource. Mathieson and Wall (1982) defines it as the maximum number of people who can use a site without an unacceptable decline in the quality of experience gained by visitors.

The concept of carrying capacity of tourism activities can be explained on the basis of following interrelated elements: - (1) The amount of use of a given kind (2) a particular environment can endure (3) over time (4) without degradation of its sustainability for that use (Fennel, 1999). The technique of CC is very pertinent and has special relevance for the protected

areas (PAs) for analyzing the interactions of the biotic pressure, ecotourism and ecosystem to maintain the natural equilibrium, and the judicious and scientific determination of CC can serve to be an effective tool for the management of PAs and sustainable ecotourism (Bhattacharya and Banerjee, 2003).

A. Various Forms Of Carrying Capacity:-

There are number of different forms of carrying capacity referred to in tourism, however this paper will focus on the five most commonly used. These conceptions are useful only to some extent as they focus discussion and discourse, not practical application.

1. Tourism Carrying Capacity (TCC)

Tourism Carrying Capacity" is defined by the World Tourism Organization as "The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction". Whereas Middleton and Hawkins Chamberlain (1997) define it as "the level of human activity an area can accommodate without the area deteriorating, the resident community being adversely affected or the quality of visitors experience declining" what both these definitions pick up on is carrying capacity is the point at which a destination or attraction starts experiencing adverse as a result of the number of visitors.

2. Physical carrying capacity

This is the max number that area is actually able to support. In the case of an individual tourist attraction it is the maximum number that can fit on the site at any given time and still allow people to be able to move. This is normally assumed to be around 1m per person. "PCC per a day = area (in metres squared) x visitors per metre x daily duration" (Mow forth and Munt) This is a formula which has been used to calculate the physical carrying capacity.

3. Economic carrying capacity

This relates to a level of unacceptable change within the local economy of a tourist destination, it is the extent to which a tourist destination is able to accommodate tourist functions without the loss of local activities, take for example a souvenir store taking the place of a shop selling essential items to the local community. Economic carrying capacity can also be used to describe the point at which the increased revenue brought by tourism development is overtaken by the inflation caused by tourism.

4. Social carrying capacity

This relates to the negative socio-cultural related to tourism development. The indicators of when the social carrying capacity has been exceeded are a reduced local tolerance for tourism as described by Index of irritation. Reduced visitor enjoyment and increased crime are also indicators of when the social carrying capacity has been exceeded.

5. Biophysical carrying capacity

This deals with the extent to which the natural environment is able to tolerate interference from tourists. This is made more complicated by the fact that because it deals with ecology which is able to regenerate to some extent so in this case the carrying capacity is when the damage exceeds the habitat's ability to regenerate.

6. Environmental carrying capacity

It is also used with reference to ecological and physical parameters, capacity of resources, ecosystems and infrastructure.

III. A CARRYING CAPACITY EVALUATION AND ASSESSMENT

A Carrying capacity evaluation and assessment exercise are helpful in policy formation, frame work, planning infrastructural facilities, natural resource allocation etc. different policy question require different methodological approaches. Again the methodology will be decided on the basis of available data. A more descriptive method of evaluation of TCC is as follows.

IV. FORMATION OF METHODOLOGICAL FRAMEWORK

There is a variety of approaches, frameworks, method and tools to assess impact and carrying capacity, and to prepare adaptation techniques. Similarly there are many ways to categorize carrying capacity and adaptation assessment. Frameworks (Fig 1) are step by step methods that prescribe an entire process for tourism carrying capacity assessment exercise. Each step might have different methods or toolkits for doing the assessment. These frame work offers broad strategic approaches.

This framework evolution is totally based on tourism in eco sensitive region. We have considered the major factors which reflect the impact on tourism and environment on the cores of available data as well as assessment techniques. This framework construction has been done stage wise as per the physical planning requirements and impact on region. Four to five stages are involved in evaluation of tourism carrying capacity. It has started assessment of carrying capacity from the elementary definition, selection of factors according to definition, analysis based on the qualitative and quantitative output along with selected factors and then final evaluation based on the expertise judgement. Stages wise explanations are as follow;

Stage-I

from literature reviews it has been found that there are various form and definitions of carrying capacity and tourism carrying capacity, therefore its must to select the particular form and specific definition while assessment of evaluation of tourism carrying capacity in stage one.

The tourism activities are related to different exploited natural resources such as mineral resources, geo top, and cultural site. The rapid but unplanned exploitation and utilization of these resources create a risk of losing their recovery capacities, destroying the basic functionalities of ecosystem within tourism areas. Various tourism-related factors can be identified to have impact on these resources, among which the number of tourists would be the most important one. The concept of carrying capacity of a tourism site can be stem from this perception. This concept is important in the tourism planning which aims to sustainable tourism development. The definition proposed by The World Tourism Organization (WTO-2004) is considered for assessment of carrying capacity. Within this context goals and management objectives need to be defined, alternative fields of actions evaluated and a strategy for tourist development formulated. On the basis of this Tourism Carrying Capacity can be defined.

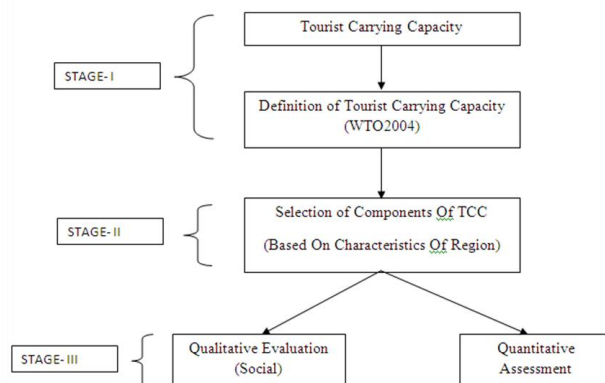


Fig No: 1. Flowchart shows evaluation of tourism carrying capacity.

Stage – II

It includes the selection of components of tourism carrying capacity based on selected specific definition and character of region. In chosen case, stages II has been developed based on the world tourism organisation 2004 definition and tourism and eco sensitive character of region as follow

On the basis of the main dimensions of development and environment interface, following a systemic analysis, the impacts of tourism in an area can be analysed in terms of three major axes: physical environment (natural and man-made including infrastructure), social (population and social structure and dynamics) and economic (including institutional and organizational). These can also provide the basis for analysing and assessing TCC in terms of main and distinct-but interrelated-components.

Selections of components are based on Physical-Ecological, Socio-Demographic and Political-Economic as well as the level of capacity of eco sensitive region. The selections of subcomponent are based on the specific characteristic of region such as tourism, climate, economy etc. The integrations of the major TCC components are as given the following flowchart.

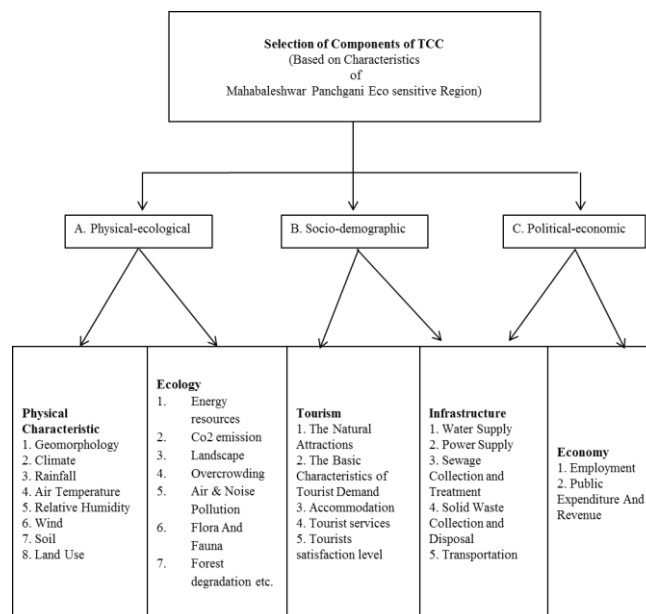


Fig No: 2. Flowchart shows selection of component of TCC.

Stage – III

Initial stages are predetermined stages in evaluation carrying capacity framework methodology structure and applicable to any case study. Stage three is key element of the methodological framework, based on this element we have to work out the final output custom with help of the available data and assessment tools. For the tourism and eco sensitive character required the qualitative and quantitative outputs mould to evaluation of tourism carrying capacity for formation of policy and planning point of view.

Therefore we can classify the stage three in two sub parts as per the output mould that is first qualitative analysis for tourist and local people satisfaction for social economic assessment. This describes how the system (tourist destination) under study works, including physical, ecological, social, political and economic aspects of tourist development. Second part consists of quantitative analysis which includes the multi-dimensional approaches, research technics, and equations. Describes how an area should be managed and the level of acceptable impacts. This part of the process starts with the identification (if it does not exist already) of the desirable condition/preferable type of development.

There are so many techniques available for evaluation of TCC. As per the out mould and eco sensitive region we had seen that miscarriage ecological footprint analysis of area because of topographical landscape features and outsourcing of other resources. Subsequently carbon footprint and carbon sink techniques effectively utilized to work out the environment and infrastructure impact on eco sensitive region. Also perceive the ecological landscape assessment technique for qualitative output mould.

Tourism perspective of town and quantitative analyses are included in methodological framework for effective assessment and evaluation of tourism carrying capacity which consist of the Batelle Environmental Evaluation System (BEES) used in environmental impact assessment (EIA) studies and limits of acceptable change (LAC) framework from the field of tourism research for qualitative analyses. In addition to quantitative analyses comprises Physical Carrying Capacity (PCC), Effective Real Carrying Capacity (ERCC), Linear Programming For Economic Analysis.

All quantitative techniques used in this methodological framework form that we can estimate the lower limit value and upper limit value in tourist per day or per year for effective assessment and evaluation of tourism carrying capacity.

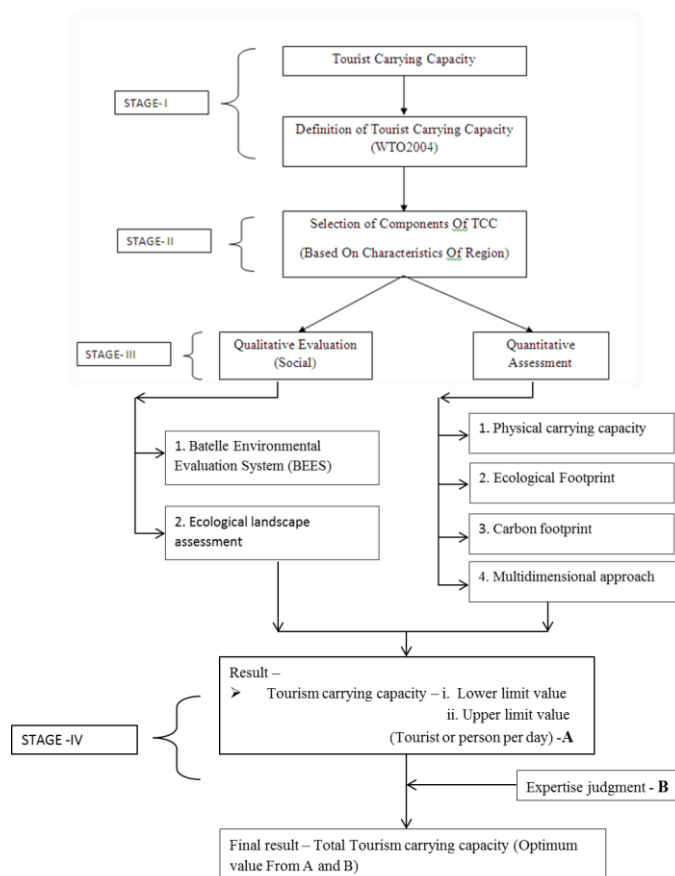


Fig. 1. Flowchart shows the methodological framework for evaluation of tourism carrying capacity.

Stage IV and V

Assessment methodology framework gives us various customs of output moulds such as carbon dioxides in tonnes per year, economy in term of rupees, area in meter square, no of tourist beds. We have to, done conversion of all various values in terms of tourist per day. Then select the lower limit value and an upper limit value previous stage along with this results we had recommended to take the expertise judgment for precise evaluation of TCC

V. CONCLUSION

Overall measuring Tourism Carrying Capacity does have to lead to a single number (threshold), like the number of visitors. An upper and a lower limit of TCC can be of more use than a fixed value. TCC assessment should provide not only the maximum but also the minimum level of development, which is the lowest level, necessary for sustaining local communities. In addition, TCC may contain various carrying capacity limits in respect to the three components (physical- ecological, social-demographic and political –economic). The eventual limits must be considered as guidance. They should be carefully assessed and monitored, complemented with other standards, etc. Carrying capacity is not fixed. It develops with time and the growth of tourism and can be affected by management and planning techniques and controls.

VI. REFERENCES

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BIOGRAPHY



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