# Rethinking Tourism Carrying Capacity – A Precursor

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Tourism is one of the most lucrative economic activities known to human society. It is lucrative since it is economically beneficial to the supplier and deeply satisfying to the consumer as an activity. However, for the last few decades tourism activity has been increased in leaps and bound in most of the countries. Unfortunately, though we see piles of research, policies, talks all over the world regarding how to make tourism more sustainable economically, environmentally and culturally, very little has been done beyond ideating things on paper. However, one can clearly see that not all the key components towards sustainability are ignored. On economic front, profit making has increased, while environment and culture remained neglected.

This is nothing new since for the business and Governments, tourism is that duck which lays golden eggs for them even if not nurtured. With the spread of internet and digital devices, one can find out hundreds of research papers highlighting how tourism is impacting environmental and cultural sustainability in various regions, without making much effort. Tourism industry is one of the largest contributors to carbon footprint of the world while it is also the largest contributor to GDP as well as employment. The challenge is all stakeholders know about this and, of course, are engaged in paper-work to show their concerns. But the good intentions as shown on paper works are not translated into implementable actions on ground.

The question remains that is this non-action deliberate on part of the stakeholders? In my opinion, it is 50-50. I believe there are two prime reasons for this non-committing stand on part of the stakeholders. First, the tools available to come out with concrete actionable policies is also rare for tourism industry since the activities related are in fact a conglomerate of various different activities. A large number of stakeholders from various domain are required to get involved in evolving actionable policies that can respond to the challenges faced by tourism industries. The second reason is simpler which all of us can relate to with an honest evaluation of our thought process. It is the motif of making quick money. Be it the government or the business, it is run with a premise on strategizing the priorities for the present, while the same for tomorrow can wait a while sitting at the back bench. Nothing new to this to anyone of us. We all do the same and certainly do not feel shame on the same. Unfortunately, that "Tomorrow" never comes and the backbenchers is always overlooked.

Let me explain a bit on both points. Why do I say that it is lack of awareness about the tools to handle the challenges? Let's take a few simple examples to make this more comprehensive. Assume about any destination. Tourism activities in any location involves government stakeholders such as tourism department, transport department, environment department,

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police, local municipality, road department such as PWD, other infrastructure department like water& sanitation, electricity, fire etc., archaeological department. I am sure that I have missed a few other department who are actively involved in a destinations tourism activities. Imagine the effort required only to coordinate across all these departments. Let's not forget about revenue department who are always sensitive about taxes generated from tourism activities. A destination management policy is needed to include concerns of each one of these departments for a holistic view.

This are just the government departments. Add to these the private sector participants like accommodation sector (hotels, homestays, dharmshalas etc.), private transport operators, retailers and sevral others. The destination management strategy needs to take care of concerns of all these stakeholders, many of which are in fact competitors. Therefore, a tool that can address concerns of all these stakeholders and also can evaluate the challenges that emerge from activities of these stakeholders has not yet been developed in most of the countries, forget about micro-locations. So, what is the likely outcome of this situation? As expected, we see a rosy picture on paper suggesting many different solutions that address the top level concerns in a superficial manner as policy prescriptions. While admitting whole heartedly that policy prescriptions are generally at a top level only, the problem with tourism sector is that challenges are so varied that addressing those from a holistic perspective is difficult unless a tool is available that clearly recommends situation specific remedies. Therefore, as a result at the grassroot level it is often seen that the policy has been implemented but that does not really solve the problem changing the existing situation.

Now. Let's come to the second problem of generating quick money by all stakeholders, both government and private. No one wants to loose revenue and surplus, which is quite understandable. We do not need to think twice to understand this looking at various examples like destroying amazon forests as approved by the government, evolving various means in promoting consumption of alcoholic beverages, food products with ill health impacts etc. Though we see cautions in cinema halls, on cigarette packs about the ill impacts of consumption of these items, but we do not stop selling these in the market. Though one of the logic behind continuing such products in the market is "not to curb individual freedom to consume", to me the primary motif is revenue generation. So, no point in blaming private sector also if profit making is the key concern for them too. However, when the government and private stakeholders are more concerned about their own survival, what is harmed is "Sustainable Development". The target set vis-à-vis the achievement towards the ame in the entire story tell us the true story.

When all these are logically simple, it is also understood that this cannot go on forever. At some point we need to bring a balance between the sustainability at present to that with future sustainability. In fact, these are not conflicting. Our greed is has made these two goals a conflicting one. But, without a tradeoff between these two on economic activity and more critically the mankind, cannot sustain. The sooner we understand and act accordingly, is better

for the human race. Importantly, no single entity can achieve this, unless it is a concerted effort from all. Climate change will not impact any single country that is not adhering to the protocols for reducing carbon footprints. It will impact its neighbours and probably the entire world.

However, let us come back to tourism sector without playing the role of a devil's advocate to the entire geo-political system. As we stated earlier that the challenges regarding tourism policy and management is lack of a tool that can capture tourism activity at micro levels holistically. The purpose of this article is primarily to point out that the stakeholders are clueless about to what extent tourism activity can be allowed in a particular destination in most cases. This is critical to limit tourism activity in a region or destination so that the local environment is not impacted adversely. That allows the conservation of the local environment, both physical and cultural.

This requires the concept of *carrying capacity*. Carrying capacity calculation takes into consideration a gamut of parameters that are normally impacted through tourism activities. According to UNWTO, the international tourist arrivals, which was 25 million in 1950, 1.5 billion in 2019 (the normal year before Covid 19 pandemic) will cross the number of 1.8 billion in 2030. While creating an enormous prospect to develop diverse type of tourist's products/activities and as a result the income, it will also cause negative impacts if it is not planned, managed and developed well. This well thought of planning, managing and developing requires a strategy which can help sustainable tourism. Using carrying capacity can be a useful to towards this direction. This concept of carrying capacity was used 1945 as the first attempt in wildlife management for assessing the capacity of the forests for grazing by animals. Tourism carrying capacity was used for the first time in 1970s and 1980s. a refined methodology as developed by Cifuentes in 1990 was implemented in various protected natural areas of Latin America and Galapagos National Park in Ecuador, Fernando de Noronha National Park in Brazil.

It was observed that the concept of carrying capacity is not only effective towards addressing environmental challenges, but also critical to the economic and social issues. The physical carrying capacity is identifies the maximum number of entities, for example people, vehicles, boats etc., which can be physically accommodated in a destination. Unplanned development of tourism infrastructure affects the destination's natural aesthetic attractions and creates a situation where the recovery of loss in the ecosystem is beyond control. This includes several problems including deforestation, vehicular pollution, waste management, water crisis, traffic jam and countless other problems for local people and the environment. Melting and receding glaciers are common in most of the countries due to climate change.

Whether in a structured form or not, in some of the destinations, maximum number of tourists allowed per day have already been practiced in India. Examples of these are Goumukh trekking from Gangotri, Taj Mahal etc. it is not known whether these restrictions have been decided on the basis of scientific research using carrying capacity/ similar methodology or in

an arbitrary manner that suits the local administration. We have discussed the methodology briefly to provide an idea how the carrying capacity is calculated and the components used in the same.

Physical Carrying Capacity (PCC) is defined as the maximum number of tourists who can be physically accommodated in a specific area or destination in a given time span. The general equation used to calculate PCC is given below.

$$PCC = A \times V/a \times R\,f$$

Where,

PCC = Physical carrying capacity

A = Area available for tourism purpose. This includes natural areas, area can be determined by natural boundary such as mountain range and river, whereas in conservation/protected area, space is used by tourist in different activities

V/a = area required per tourist for a comfortable tourism experience

Rf = Rotation factor or number of visits per day

From the above formula it can be easily understood that this cannot be applicable as it is in any and every area of tourism activities. One needs to take into consideration various other aspects that varies from place to place of tourism interests. Therefore, to address this problem, the concept of Real Carrying Capacity (RCC) has been evolved inducing corrective factors that are area specific. The concept of RCC can be expressed as:

$$RCC = PCC - Cf1 - Cf2 - Cf3 \ldots Cfn$$

The following formula better explains the RCC with corrective factors in percentages that is used in study:

$$RCC = PCC \times (100 - Cf1)/100 \times (100 - Cf2)/100 \ldots (100 - Cfn)/100$$

However, if this is scrutinized properly, one can in fact figure out clearly that it is easier saying than done. It needs to be refined on various fronts to arrive at a measure that is suitable for strategy making. Two critical things to be considered while developing the refined carrying capacity are:

- Understanding the organic population growth in the area and growth because of tourism activities. This requires a well thought of methodology since growth because of tourism have a multiplier effect that might be misled as organic population growth also.
- Because of the changes in population and economic activities multiple changes occur in the ecosystem, economic, environment and social. It is important to understand that so that the magnitude of each of those are estimated.

All these will allow to define the changes that can be envisaged because of increase in tourism activities and non-tourism activities. The requirement of the place in terms of all facilities and also because of various changes needs to be captured scientifically so that the carrying capacity can be calculated including each of the parameters that are involved in daily life of the local population as well as because of tourism activities. A proper strategy can be developed only if the carrying capacity is calculated basis a complete information about tourism and non-tourism activities in that area. Though this is tough and require certain specific datasets, but it is doable. If the policy making takes into account these aspects, as sustainable tourism regime in true sense can definitely be developed.