

Environmental Impact Assessment and Sustainability of Garden Tourism in Jammu and Kashmir

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ABSTRACT

Horticulture sector has an important role to play in tourism, as it does in all aspects of human health, well-being and welfare. Horticulture can play a better role in sustainability of Tourism in Jammu and Kashmir (that has a rough topography) by turning the barren and mountain lands of the State into potential horticultural destination (by planting fruit trees, flower cuttings, shrubs etc.) the environmental damage of erosion and land sliding can be minimised. Using Environmental Impact Assessment on terrace floriculture (making terraces on mountain land and planting different flowers) and mountain horticulture (planting of fruit trees on barren mountains) we can assess the sustainability of horticulture tourism in the state. The present paper aims at minimising the trade-off between sustainability and tourism in J&K. The paper also tries to find the alternative ways of turning the existing horticulture gardens (apple orchards, almond orchards etc.) as seasonal tourist destinations of the state. The central focus of this paper is to find the net externality of orchard tourism and terrace horticulture on environment and welfare of the people.

KEYWORDS: *Mountain Horticulture, Terrace Floriculture, Tourism, Trade Off, Sustainability, Welfare, environment, erosion.*

Introduction

Background of Jammu and Kashmir:

Geographical Location Strategically located Jammu and Kashmir State constitutes the northern most extremity of India. The State of Jammu & Kashmir is situated in extreme north of India between 32°15' to 37°05' latitude north and 72° 35' to 80°20' longitude east. It is bounded by China in the north and east, by Afghanistan in the north-west and by Pakistan in the west. Punjab and Himachal Pradesh States border it in the south. Jammu & Kashmir State has a geographical area of 222,236 km² comprising 6.93 per cent of the total Indian Territory.

It has four geographical zones:

1. Sub-mountain and semi-mountain plain known as kandi or dry belt,
2. The Shivalak ranges,
3. The high mountain zone constitutes the Kashmir Valley, PirPanchal range and

its off-shoots including Doda, Poonch and Rajouri districts and part of Kathua and Udhampur districts.

4. The middle runs of the Indus River comprising Leh and Kargil.

Table 1 :Area of Jammu and Kashmir State

Total Geographical Area			Present Area		
Area	km ²	Percentage	Division	km ²	Percentage
India	1,01,387	46%	Kashmir	15,948	15.74%
*Pakistan	78,117	35%	Jammu	26,293	25.93%
#China	42,735	19%	Ladakh	59,146	58.33%
Total	2,22,236	100%	Total	101,387	100%

Source: Census of India 2001. (*# Area under illegal occupation)

Jammu and Kashmir is home to several valleys such as the Kashmir Valley, Tawi Valley, Chenab Valley, Poonch Valley, Sind Valley and Lidder Valley. The main Kashmir Valley is 100 km (62 mi) wide and 15,520.3 km² (5,992.4 sq mi) in area. The Himalayas divide the Kashmir valley from Ladakh while the PirPanjal range, which encloses the valley from the west and the south, separates it from the Great Plains of northern India. Along the north eastern flank of the Valley runs the main range of the Himalayas. This densely settled and beautiful valley has an average height of 1,850 metres (6,070 ft) above sea-level but the surrounding PirPanjal range has an average elevation of 5,000 metres (16,000 ft).

Because of Jammu and Kashmir's wide range of elevations, its biogeography is diverse. North-western thorn scrub forests and Himalayan subtropical pine forests are found in the low elevations of the far southwest. These give way to a broad band of western Himalayan broadleaf forests running from northwest-southeast across the Kashmir Valley. Rising into the mountains, the broadleaf forests grade into western Himalayan subalpine conifer forests. Above the tree line are found north-western Himalayan alpine shrub and meadows. Much of the northeast of the state is covered by the Karakoram-West Tibetan Plateau alpine steppe. Around the highest elevations, there is no vegetation, simply rock and ice.

Tourism is one of the State's major industries. It has played an important role for developing the economy, particularly in the region of the Valley and Ladakh. The industry has given jobs to a very large number of people, particularly of the younger generation and generated economic activities in the primary, secondary and tertiary sectors in the State, which owes dependence to a large extent to this industry.

Some of the key attributes of the tourism industry in J&K are as follows:

Virgin Areas	Different Geographical Locations,
Climate,	Architecture,
Pilgrimage,	Culture,
Handicrafts,	Hospitality,
Historical heritage,	Landscape etc.

Jammu & Kashmir is full of colourful rocky mountains, valleys, trekking trail, several high rising chortens, snowy mountains, meadows of flowers, lakes, garden and orchards, monuments and mandirs and forts and palaces, Ladakh is famous for its spectacular caves, monasteries, etc. while Jammu is famous for its temples/religious tourism.

The region of Ladakh is the choice of foreign tourists; Jammu attracts pilgrim

tourists, while the Valley attracts a larger number of domestic tourists and a fair sprinkling of foreign tourists. At the time of writing this report Ladakh had quite a few tourists from Israel, Germany and France while in the Valley, a thin presence of tourists mostly from Italy and England were noticed. The foreign tourist's season in Jammu regions has only transit passengers and not destined to any tourist spots in the area; therefore they do require current mention herein.

Mountain regions and communities often have fragile environments and socio-economic relations, the latter frequently important factors in environmental management. Problems associated with tourism in mountain regions include: sewage pollution of rivers, sedimentation and emissions from construction activities, erosion and landslides linked to trails and skiing/ snowmobiling, water extraction from streams to supply resorts, damage to habitats during construction and use, interruption by roads and construction of animal migration between life zones, litter accumulation on trails.

In many mountain areas, concern has grown about the negative impacts of tourism on the natural environment, village economies and cultural traditions. But these concerns can be addressed by practicing multiple land use methods of resource management combined with sustainable community development. If all activities are carried out with the full participation of local people and communities which make them guardians of their resources and are designed to ensure that local people benefit from trekking tourism and conservation then also these could be addressed. The main potential adverse impacts of tourism on the environment include:

1. Pressure on natural resources The main resources at threat are:
 - a) Land and landscape: mining, land erosion, soil erosion, urbanisation, road and airport building leading to land degradation, loss of wildlife habitats, deterioration of scenery.
 - b) Water resources: recreational impacts, (scuba diving, snorkelling, sport fishing), damage to water/ lakes eco system and fisheries.
 - c) Atmosphere: high levels of energy use in tourism facilities and in transportation.
 - d) Freshwater: overuse of critical water resources for hotels, swimming pools and golf courses.
 - e) This is of particular concern in lower regions where water resources are scarce and each tourist consumes more than 100 -150 litres a day.
 - f) Pressure on other local resources: for example energy, food, and other raw materials which may be in short supply locally.
2. Harm to wildlife and habitats, with associated loss of biodiversity The main harm to wildlife and habitats is:
 - a) Biological resources: disruption of wildlife habitats, clearance of vegetation for tourism developments, increased pressure on endangered species due to trade and hunting; extra demand for fuel wood, forest fires.
 - b) Ecologically fragile areas: such as rain forests, wetlands, mountains, if not properly planned and managed nature tourism threatens the world's most ecologically fragile areas including parks and natural world heritage sites.
3. Pollution and wastes Pollution and wastes contaminate:
 - a) Land: solid wastes and litter (a tourist produces an average of about 1 kg of

waste a day)

- b) Freshwater: pollution by sewage x Water: sediment run off, pollution from land-based hotels; waste & litter linked with water sports
 - c) Air: at local level, air pollution from tourist transportation, global impacts, especially from CO₂ emissions, related to energy use in transportation, air-conditioning and heating of tourist facilities, etc.
 - d) Noise: related to ground as well as air transportation.
4. Social and cultural pressures related to conservation and sustainable use of biodiversity.
- a) Social and cultural impacts: tourism means disturbance to the local way of life and disturbance of social structures, and can adversely affect traditional practices that contribute to the conservation and sustainable use of biodiversity.
 - b) Adverse impacts on livelihoods and lack of benefit sharing with those who bear tourism related costs to both the human and natural environment.
 - c) Resource use conflicts: competition between tourism and local populations for limited resources of water, sanitation and energy, competition with traditional land uses, especially in heavily used areas.

Positive Environmental Impact

- a) Tourism is encouraged as a part of effort to regenerate the area and interiors. Tourism is generally encouraged in the periphery towns and city areas with less number of buildings and vacant land. The meaning of development of tourism in these areas is investing the money for environmental improvement. Tourism development can be seen as a vital aspect in physical and economical regeneration of remote and under developed areas as it contributes to attractive appearance of the environment like better water supply system, planned sewage and solid water disposal and overall improved environmental quality.
- b) Tourism helps in conservation the old historic monuments, protected and reserved forests assets etc. that could be neglected otherwise.
- c) There is a close synergy between handicrafts and tourism. Handicrafts are great tourism boosters. Handicrafts and its process of manufacturing are great means of attractions for the visiting tourist. On the other hand tourism also helps in revival of dying arts and crafts, it provide a source of income to the craftsmen and artisans with lesser investment.

Negative Environmental Impact Tourism is the world's largest industry. Although a "smokeless" industry, it has important environmental implications. It is a fact that all over the world man has been using the natural resources without even thinking the consequences of the misuse, which is creating environmental misbalance. Today environmental pollution poses a serious threat to life in earth not only in industrial areas but also areas where there is a great concentration of tourist. Unfortunately, the various areas with tourist concentration are dumping ground for municipal and industrial waste. Think of the health hazards involved for tourists vacationing in the hill areas. In the tourist areas various diseases are often transmitted by contaminated food. Locals of the area mainly face the severity of problem as during the peak period the demand of public services reaches saturation point, there are generally shortage of water, unclean environment due to piled

garbage and lots of pollution.

Agri-Tourism can be comparatively a new and promising trend for small farms. Simply stated, Agri-tourism is the visitation of farms and ranches by those seeking to experience the place and or the agricultural products. It contributes to sustainable agriculture in three major ways:

1. The visitors gain a deeper understanding of what agriculture is about because they see it up close and personal.
2. The farmer or rancher becomes more acquainted with the urban and suburban visitors and develops a deeper appreciation of what they value and are seeking from the agricultural system.
3. The farmer derives an additional revenue stream from the farm; something needed by most farmers and ranchers today. Increasingly diversified tourism products consistent with customer expectations are to be offered to attract more and more tourists from different parts of the world.

Horticulture (Garden) Tourism in J&K

In order to promote farm tourism and add new tourism product, the department of tourism Kashmir organized a FAM trip of the Valley's tour operators and houseboat owners to Central Institute of Temperate Horticulture (CITH) at Rangret where different varieties of fruits and vegetables.

Besides having natural beauty, J&K is the only state in the country where almonds and saffron grow. We also have monopoly in other fruits like walnut and apple. CITH has grown hundreds of high-yielding varieties of fruits and vegetables here which we can exploit for tourism purposes.

Tourists in Kashmir want to make the purchase of apple, walnut, almonds, saffron which are known world over for their taste and quality. Tourists used to buy such products from markets. Here they can have farm tour and get the fresh fruit from directly from the orchards.

Scope of Garden (Leisure) Tourism in Jammu and Kashmir

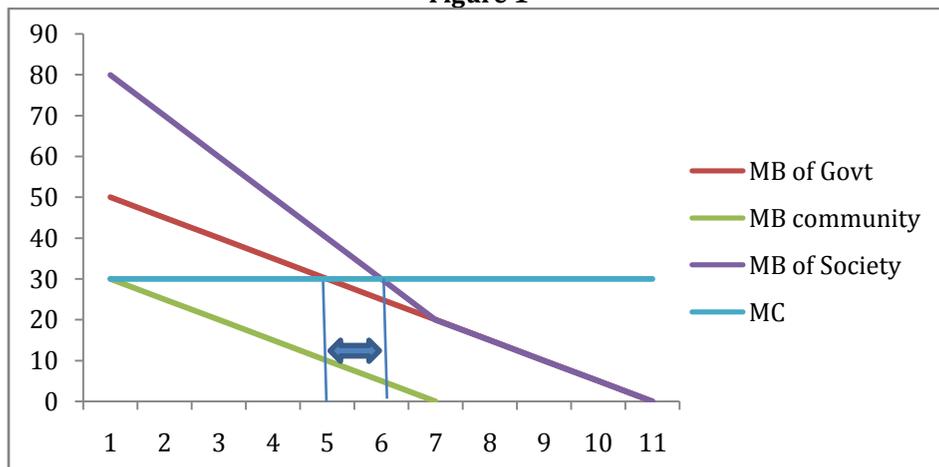
The state's leisure tourism potential is well recognized. However, the number of destinations developed has remained practically static for the past few decades. This not only causes congestion and pressure on natural resources of these regions but is also a potential recipe for unbalanced growth. As mentioned earlier, incentives to the private sector are area specific and this list is now being reviewed by the state government which is welcome. Some potential tourist circuits are Mughal Road circuit which will require development of heritage sites along the road, Katra-Patnitop, Sansar-Dessa, Kapran-Pehalgam circuit, lake circuit in Ladakh, Samba-Mansar circuit and development of Srinagar city as a destination. Border tourism provides yet another option to attract tourists and to start with a project has been approved for developing the Suchetgarh border on the lines of the Wagah border.

Let us take a hypothetical example. Suppose Government of J&K take an initiative to plant apple trees or rose cuttings on the barren land with constant MC. Suppose by planting apple trees on a unit of land the marginal benefits of Government, Community residing around the barren land and whole society (Government + Community) is shown in the table below:

Table 1 :Marginal Benefits received by Government, Community and whole Society

No. of Units	MB ofGovernment	MB ofCommunity	MB ofSociety	MC
1	50	30	80	30
2	45	25	70	30
3	40	20	60	30
4	35	15	50	30
5	30	10	40	30
6	25	5	30	30
7	20	0	20	30
8	15	-	15	30
9	10	-	10	30
10	5	-	5	30
11	0	-	0	30

Source: Coase theorem Wikipedia.

Figure 1

Source: Table 1.

Table shows that marginal benefit is reduced when more and more units of barren land is planted with apple trees. Government will stop after 5 units of barren land are taken under cultivation. The community around barren land let them stop at 1 unit. But the society as a whole let be in equilibrium at 6 units. Society acted as a check and balance internalises the externality and let the equilibrium to be happen at 6 units instead of 5.

Thus planting trees and making terrace gardens on the mountainous barren land will provide a check on pollution and sustainability of tourism in the state. This will also lead to increased tourist inflow because of increased tourist destinations.

Environmental Impact Assessment (EIA)

EIA of constructing terrace floriculture or mountain gardens in Jammu and Kashmir is summarized in the table below.

Environmental Component	Phase of Project	Impact	Mitigation Measures	Environmental Measurement Plan
Air Environment	Construction	Small dust pollutants while forming Terraces	Increased tourist inflow and Air quality	Regular maintenance of terrace gardens can reduce
	Operation	Terrace Garden shall improve the quality of Air. Increased tourist inflow have negative effect on quality of environment		
Water Environment	Construction	Muddy Water	Proper usage of runoff water	Positive impact on the community around the terrace and mountain gardening
	Operation	Reduces Run-off Water and used for irrigation of terrace gardens		
Land Environment	Construction	Soil erosion at initial level	Reduces Soil erosion after terrace gardens are formed	Reduction of Land degradation
	Operation	Reduces soil erosion after plantation		
Noise Environment	Construction	Some level of noise	Tourist influx shall enhance the noise	Overall increase in noise
	Operation	Increase in noise		
Socio Economic Environment	Construction	Change in socio economic relations	Development of Community around formation of terrace gardens	Overall Development of society will increase
	Operation	Positive development of both socially and economically		

Conclusion

Horticultural tourism is a new concept of tourism to organize the all component of gardening and ecological attraction in relation to aesthetic value of particular crops for visitors' in particular area. It's valuable tourism concept with proper

ecological balance and sustainable development of tourism industry in Jammu and Kashmir. Jammu and Kashmir has a great potential of horticulture tourism. Coase theorem shows that additional benefit comes to society when more mountain land is taken under horticulture tourism. Environmental impact assessment shows that eradication of environmental pollution by increasing fresh air, reduction of soil erosion and proper management of water runoff. In other words in spite of overall environmental development there is also enhancement in socio-economic development of the society by planting horticulture trees and promoting tourism of these destinations.

Results

By making terrace gardens and planting fruit trees on barren and mountainous land following changes shall happen in the economy:

- Land degradation can be reduced.
- Labour Employment will increase.
- Proper allocation of natural resources will happen.
- More recreation and tourist destinations will appear.
- Discretionary demand will increase because of increased money income in the economy.
- Leisure-labour trade off shall increase which has a positive effect on economy.

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