

Conservation of endemic and endangered freshwater fishes of Western Ghats biodiversity hotspot, Kerala, India—Concept of protected areas and ecotourism

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This paper discusses national development issues that nations today are facing in light of the pressures to competitively manage natural resource, such as in ecotourism. The first section highlights issues related to development, competitiveness, tourism and natural resources. In the second section, the case of Kerala's endangered ornamental fish is presented to illustrate the real world complications that the government faces. The third section highlights other alternatives that may be considered, followed by a conclusion section.

I. Development, competitiveness, tourism and natural resources

Countries have always strived towards a balanced socio-economic development policy, especially in environmentally sustainable ways. At the same time, countries also seek to be competitive in the international trade arena, particularly in sectors that are major sources of foreign exchange such as tourism. These issues are now briefly addressed.

National Development and Tourism

National development is about improving the quality of life, which entails matters that are far more delicate and complex than a the dollar amount of a person's salary or numerical percentage increase in national productivity. Various qualitative aspects have been addressed by alternative approaches to development, by taking into consideration critical concepts that provide a more holistic view and offer more balance. Thus, by supplementing the predominant Neoliberal development policies which focuses on quantitative development measures like GNP and personal income, other development approaches make it possible to also qualitatively measure the progress of development.

A variety of supplementary approaches are available—from the UN's Sustainable Development which is universally accepted and practiced, to insightful formulations by academics such as Amartya Sen's Capabilities approach to socio-economic valuation (Sen, 1985, 1999, 2000, 2002). Other countries have implemented alternatives such as India's Gandhian Self-sufficiency path to development in the past, to Bhutan's unique Gross National Happiness (GNH) or the Middle Path of development (Uddin, Taplin and Yu, 2007) to balance the pressures of society, economy, politics, culture and the environment.

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Likewise, Thailand has been implementing HM the King's sufficiency economy philosophy alongside the Neoliberal development policies, to address concerns such as resource constraint, good governance, human capacity, poverty alleviation, environmental conservation, etc.

Increasingly over the last four decades, governments and international development agencies have been committing themselves to tourism as a strategy for developing their economies. Countries are driven by strong economic demands towards tourism because it is a major source of foreign exchange for most countries. International organizations such as the World Bank also see a role of tourism in fulfilling the United Nations Millennium Development Goals (Hawkins and Mann, 2007).

Competitiveness

Today, competitiveness has been receiving enormous attention all over the world at all levels, by academics, policy makers and decision-makers at international, national, industry and firm levels. Both international organizations, advanced and developing countries, public and private institutions are all keen on the 'competitiveness' agenda.³

There is active ongoing debate and research seeking to understand competitiveness, to identify both the determinants of competitiveness and the conditions that could upgrade competitiveness, and how to go about pursuing it. However, competitiveness is not only a *broad, complex and multi-faceted* concept, but also a *relative* concept (Spence and Hazard 1988, Hu 1995; Kay 1993). There are uncertainties regarding how competitiveness is generated-- from within or from without? And where competitiveness is driven from-- at the micro or macro level?

The determinants of competitiveness are also highly varied and ambiguous. The competitiveness of nations is said to be influenced by climate, morals, power of the state, cultural values and moral discipline (Franke, Hofstede and Bond 1991; World Economic Forum, 2001). This also applies to the competitiveness of a tourist destination, where Crouch and Ritchie (1999) added historical and cultural resources for the tourism context. Even subjective perceptions by the tourists of the *reality* of the destination matters to destination competitiveness. Tourists' perceptions are influenced by a country's social, economic and political polities, along with history, culture, ethics, as well as the environmental health of the surroundings. The experience of the tourist customer matters when it comes to developing destination competitiveness.

³ To name a few--The World Bank Group and Competitiveness Indicators <http://wbln0018.worldbank.org/psd/compete.nsf/>, The European Union's EUROPA and Competitiveness Report 2002 europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/, Council on Competitiveness (US) www.compete.org/, The Competitiveness Institute www.competitiveness.org, National Center for Industrial Competitiveness www.ncicfund.org/, Washington Competitiveness Council www.governor.wa.gov/wcc/wcc.htm, Bulgaria Competitiveness Analysis Exercise <http://www.competitiveness.bg/>, Sri Lankan Competitiveness Initiative <http://competitiveness.lk/>

Global Tourism & Sources of Destination competitiveness

In the case of tourism, the global tourism market provides a macro level context, presenting a situational context where the resources of the country can be applied and tested at the macro level from the supply side. However, while global marketing of tourism destinations operates at the macro level, tourism destination competitiveness models acknowledge both macro (global) and micro environmental influences equally. Neither the firm nor the state can be identified as the key active generators of competitiveness. For tourism destinations, competitiveness operates at the macro level, but also recognizes both internal and external determinants. In other words, the source of competitive advantage over rivals for the tourism sector is in linking supply side strategy to available internal resources and capabilities at the micro level.

Competitiveness of a nation also stems from companies within that nation, so firm-specific factors that lead to competitiveness should be identified at the macro level as well (Rumelt 1984, Porter 1985, Barney 1991, Grant 1991, Waheeduzzan and Ryans 1996). Therefore alertness to the micro environment is also vital, which in this context is the destination's macro level management capabilities, such as immigration regulations, policies to enhance the overall vitality of firms that are operating in that destination's tourism industry. At the macro level, just as for the micro level, management has to focus on "development and maintenance of meaningful assets and skills, the selection of strategies and competitive arenas to exploit such assets and skills and neutralising of competitors' assets and skills" (Aaker, 1989).

Natural resource as a source of tourism destination competitiveness

Definitions of destination competitiveness in the tourism literature credited competitiveness to various abilities and resources, summarized in Table 1 below.

Tourism is marketed globally, hence "destination competitiveness" operates at the macro level, where "destination" may refer to a country, a region, or even a tourist area as a destination. However, existing tourism destination competitiveness models do not look specifically at either the firm or the state, and neither the firm nor the state was identified as active driver of competitiveness. There are several factors that interplay to result in tourism destination competitiveness.

An abbreviated version of the two sophisticated, comprehensive and highly acclaimed models of tourism destination competitiveness highlights the role of natural resources in tourism competitiveness. These are: 1) the Crouch-Ritchie Model and 2) the Dwyer & Kim Integrated Model. The constructs and dimensions of these two models are summarized and presented in Table 2 below.

Table 1 Definitions of Destination Competitiveness from Tourism Literature

<i>Tourism Research</i>	<i>Definition of Destination Competitiveness</i>
Dwyer and Kim, (2002)	Destination competitiveness is linked to the ability of a destination to deliver goods and services that perform better than other destinations on those aspects of the tourism experience considered to be important by tourists.
d'Hartserre (2000)	Competitiveness has also been defined as ,---the ability of a destination to maintain its market position and share and/or to improve upon them through time
Hassan (2000)	The destination's ability to create and integrate value-added products that sustain its resources while maintaining market position relative to competitors.

Table 2 Destination Competitiveness Constructs: Complementarity between Crouch-Ritchie Model, Dwyer & Kim Integrated Model, and Constructs of Competitiveness

Crouch-Ritchie Model (Tourism)	Dwyer & Kim Integrated Model (Tourism)	Constructs of Competitiveness				
Core Resources & Attractors	Endowed Resources	Advantage-Generating Resources				
		History	Culture	Politics	Comparative Advantage	Price Competitiveness.
	Created Resources	Yes	Yes	Yes	Yes	
Supporting Factors & Resources	Supporting Factors and Resources	Yes	Yes	Yes	Yes	
	Situational Conditions	Yes	Yes	Yes	Yes	
	Price competitiveness					Yes
Competitive (micro) Env.	Competitive (micro) Env.	Strategy & Management <ul style="list-style-type: none"> Effectively identify, develop and market Informed by situational (Micro and Macro) demand conditions 				
Global (macro) Env.	Global (macro) Env.					
Destination Management	Destination Management					
Destination Policy, Planning, Development	Destination Policy Planning, Development					
Qualifying & Amplifying Determinants	Demand Conditions					

Both models equally acknowledge not only external factors such as micro environment and global environment, but also internal determinants such as destination management, inherited and created resources. Therefore, to better illustrate this, the following section presents a case of natural

resource management challenge, namely the endemic and endangered freshwater fishes of Western Ghats biodiversity hotspot, in Kerala, India.

II. Case of an endemic and endangered freshwater fishes of Western Ghats biodiversity hotspot, Kerala, India

A real world case example of an native ornamental fisheries in Kerala, India involving endangered and endemic species can be used to illustrate the delicate micro level complexities that exist amidst the macro level influences--socio-economic incentives of international trade; the government's development vision and objectives for a non-renewable natural resource that is found at the regional level; and individual stakeholders such as forest-dwelling communities.

The setting

The riverine ornamental fisheries of the WG in the South Indian state of Kerala is widely considered to be one of the best in the world (Ramachandran, 2002) with the presence of more than 100 species. Since the early nineties, there has been in existence a trade related to the collection and export of native ornamentals. Over the years, this sector has developed and has shown a ten fold increase in the number of fish species exported from just ten at the beginning of this decade (Kurup *et al.*, 2003) to more than one hundred at present (Anon, 2005). The native ornamental fishes have a high demand in the markets of Southeast Asia, Far East and Europe and command exceedingly high prices (Ramachandran, 2002), some species (for eg. *Puntius denisonii*) fetching as high as 30 US dollars per piece (Anon, 2006a, b).

Lack of Governmental and institutional back up

The fishery for the native ornamentals is an open access fishery devoid of any quotas or restrictions. No regulation on either catch or effort is in place nor there are policies specific to native ornamental fisheries. Legal issues on ownership and harvest are poorly understood in this part of the world not only with regard to the native ornamental fishes but inland fisheries in general. This makes the sector highly vulnerable to over exploitation. Worse so, the government of Kerala is actively promoting the trade in native ornamentals and is urging locals to do more, to cash in on the current boom in tropical fish exports (Clarke, 2007). Such an attitude from the government is highly discouraging and is sure to have a negative impact on biodiversity of the region.

Since, the exploitation and trade of native ornamentals has been a sunrise industry that developed rapidly in the last few years, adequate time and expertise for monitoring and research has been unavailable. This has affected the planning and implementation of conservation and management strategies for these native ornamentals.

Stakeholders

The WG is home to a large population of tribes and forest dwelling communities who for centuries have depended on the natural resources including fish for their livelihoods. These tribes and local communities living in the forests of WG are an important link in the native ornamental trade, as they carry out the fishing and collection of the native ornamentals and supply to the wholesalers or directly to exporters. Ornamental fish collection has therefore become the livelihood option for hundreds of such local communities residing along forest streams.

Towards sustainability – conservation and management

Based on the understanding of the nature of the native ornamental fish exploitation and trade in this region, the following management practices maybe followed to direct the fishery and trade into a sustainable enterprise. Fishery management strategies based on input and output control, technical measures, ecologically based management and indirect economic instruments can be used with necessary modifications to suit local needs. Regulating catch and effort through granting licenses and access rights can be one of the most successful strategies that can be enforced in the present scenario. The process of granting export licenses and collection permits should be streamlined and the number of such orders issued strictly regulated by the Government agencies concerned. As suggested by Woods (2001), a meaningful way of reducing overall collection pressure and maintaining status quo is by limiting the volume of stock that can be exported. However this can be successfully enforced only after detailed stock assessment of this species in the rivers of this region are carried out. Results of such studies can subsequently form a baseline for setting up restrictions on export volumes in the future.

Captive breeding as a conservation tool – panacea or a paradox

Captive breeding is widely considered as a key tool for conservation of threatened and endemic fish (Phillipart, 1995). However, captive breeding and small scale aquaculture may act as an alternative to wild collection and/or fishing only if it is able to provide sufficient incentives in the form of returns to “displace and not supplement” the wild collection. In addition, local communities collecting marine reef fishes for the ornamental trade are known to be non supportive of aquaculture initiatives and have been known to oppose a shift from wild fish collection to captive rearing (Pollnac, 1982; Pollnac, 1990; Watson, 2000). Furthermore, captive production is often associated with a shift from a rural setting (where collection is normally carried out) to a more developed urban region as seen in the Amazon (Gerstner *et al.*, 2006). The urban regions have better facilities for breeding and marketing including the presence of international airports.

In Kerala, many forest-dwelling local people earn their livelihoods from collection of native ornamental fishes and would be negatively impacted by any mass adoption of captive breeding and rearing technologies. Hence, a detailed understanding of the existing socio-economic conditions of local

communities and ensuring their participation are vital pre requisites for popularizing captive breeding technology of native ornamentals of this region.

It is to be understood that conservation of endangered species in a developing country is an expensive task and the opportunity costs of both in-situ as well as ex-situ conservation strategies could be high (Damania and Bulte, 2007). This makes it imperative that strategies such as protected areas and eco-tourism ventures be promoted to conceive holistic resource management strategies by which both the natural resource as well as communities dependent upon them are benefited.

III. Concept of protected areas and sustainable ecotourism

Given the scenario described above, in conjunction with the constructs highlighted by tourism destination competitiveness models in the first section, sustainable development of ecotourism may be able to offer a solution for Kerala's invaluable natural fish resource. In fact, fish based ecotourism especially with native (endemic) and threatened ornamental fishes have already been implemented in the Brazilian Amazon through the conduct of ornamental fish festivals (Chao, 2001). This section discusses some of the concerns that have been addressed by past research and case studies on economic development through ecotourism.

Concerns towards a sustainable economic development

It is true that in some cases, economic objectives are best left to be driven by market forces, but this does not work when the commodity is non-renewable, such as the case of endangered species. Past cases have shown that hidden environmentally damaging subsidies which have a very large negative impact on the environment exist at a global scale (de Moor and Calamai; Myers; Roodman and van Beers and de Moor). These 'perverse' subsidies encourage activities that leave both the environment and the economy worse off.

When species are seen as a commodity as described by the case of Kerala's endangered freshwater fishes, the income generated from this dwindling resource cannot be sustainable in the long term for forest-dwelling communities. Over harvesting by poachers for short term gains lead to species extinction and the destruction of its habitat, the forest-dwelling communities would have no commodity left to make a decent living from.

Financial incentives for habitat conservation for Kerala's ornamental fishes

Revisiting tourism competitiveness models highlights a fact--that Kerala's unique natural environment is home to as many as 114 ornamental species that are famous among fish enthusiasts presents an opportunity for ecotourism. The popularity of Kerala's fish resource for collectors has great potential for capturing the interests of tourists, and creates an ideal case for the government to implement development strategies to create financial incentives from ecotourism.

Ecosystems are a country's natural capital, from which economic benefits can be generated in

the long term. However, there has been continuous loss and degradation of remaining natural habitats all over the world (Constanza *et al.*, 1998 and Balmford *et al.*, 2002). Thus, the government's inaction to protect Kerala's unique natural resource may serve to encourage small short term benefits for forest communities, but which unfortunately could hasten the extinction of a national commodity that could be better managed to provide larger economic gains in the long term at the regional and national level.

Ecotourism is a rapidly growing industry where developing nations are increasingly popular destinations (Gössling, 1999). While the price of a rare and sought-after ornamental fish is much higher than other more common fish, consumers are willing to pay much more for a tourism experience than for an ornamental commodity. For example, e.g. visitors to African protected areas happily pay more for a wildlife experience (Moran, 1994 and Barnes and de Jager, 1996). If the local communities could receive economic benefits from ecotourism to offset the opportunity costs of foregoing income from harvesting wildlife (Moran, 1994), then their attitudes towards conservation would be changed for the better (Infield, 1988). Past cases have shown that economic interests need to form the basis of conservation efforts for it to be successful. For example, the case of the African wild dog *Lycaon pictus* conservation derived sufficient economic benefits from ecotourism to offset the costs of three wild dog conservation options (Lindsey *et al.*, 2005, and Fanshawe *et al.*, 1991).

However, ecotourism management requires a multifaceted approach. Not only is it necessary to ensure that derived benefits are distributed to local communities, it is also necessary to conduct awareness campaigns to educate and encourage cooperation among stakeholders. For eco-tourism to be sustainable, tourism activities has to be controlled in order to ensuring eco-efficiency of destinations (Kelly *et al.*, in press and Becken and Gnoth, 2004), since tourist high visitation levels can also negatively impact the ecosystem (Ashforth, 1992). For example, tools such as the Ecological Footprint (EF) method might be applied to identify sustainability indicators (Wackernagel and Rees, 1995, Wackernagel *et al.*, 1999, Monfreda *et al.*, 2004 and Rees and Ecological Economics, 2000).

IV. Conclusion

Economic development through tourism is increasingly pursued by governments and recommended by development agencies as a more holistic approach to national development. The models of tourism destinations competitiveness further emphasize the critical role of natural resources as sources of competitiveness, which calls for sustainable management of natural resources if sustainable competitiveness is desired.

Existing resources in tourism can be enhanced by macro-level strategy and management. Crouch and Ritchie (1999) pointed out that a destination endowed with a wealth of resources (absolute and comparative advantage) may not be as competitive as a destination lacking in resources but which is utilizing the little it has much more effectively. They also observed that competitiveness in any sector,

including tourism, can be improved by shifting resources away from other sectors. There needs to be a "tourism vision" if the role tourism is to play in economic and social development, and this vision has to be shared among all stakeholders, who should have an understanding of the vision's strengths and weaknesses. Only then can there be development of an appropriate marketing strategy, and the successful implementation of the strategy for national development in a way that fosters sustainable competitiveness.

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