

# **REEF-RELATED TOURISM AND INTEGRATED COASTAL MANAGEMENT: RESEARCH DIRECTIONS FOR KOH TAO, THAILAND**

Panwad Wongthong  
Geographical & Environmental Studies  
University of Adelaide, Australia

## **Abstract**

Reef-related tourism is experiencing increasing participation rates and contributing significantly to the gross domestic product of many countries around the world. If managed properly, the tourism industry can generate benefits to coastal communities including foreign investment income, employment, infrastructure development and displacement of environmentally destructive practices. However, most attention is given to short-term economic gain rather than long-term sustainability. Reef-related tourism has previously been thought of as low-impact coral reef use but recent evidence has demonstrated degradation of reefs as a result of poorly planned or intensive tourist use. Infrastructure development, recreational activities and socio-cultural interactions are major impacts. Inadequate and ineffective legal and institutional arrangements multiply adverse consequences to the coastal environment.

Consideration of recreation and tourism has become increasingly important in coastal management. Integrated coastal management (ICM) is the internationally-accepted framework for managing coastal zones and accommodating growing pressures from tourism development. Integrated planning and management can reduce human impact on coastal environments and ensure that investment into tourism products supports sustainable coastal tourism. This research investigates dive-related tourism and its coastal impacts including direct and indirect impacts on nearby coasts. The study uses lessons learned from Australia to develop an integrated plan for Koh Tao, Thailand. The research will conduct surveys of stakeholders' involvement with ICM and examine measures to encourage sustainable reef-related tourism on Koh Tao that benefits local people as well as the environment.

## **Reef-related tourism**

SCUBA diving is a rapidly growing tourism industry internationally. Most recreational SCUBA divers come from Australia, the United States, the UK and Japan (Birtles, Valentine, Miller & Curnock in prep; Curnock 1998; Davis & Tisdell 1995). Increasing popularity of recreational diving is due to large numbers of divers being trained and increased interest in and access to remote coral reef areas (Davis & Tisdell 1995; Harriott, Davis *et al.* 1997). The major diving destinations are the Caribbean, the Mediterranean, the Red Sea, Africa and the Asia-Pacific. Southeast Asia developed its dive tourism industry later but at a faster rate than anywhere in the world (Wong 1990; Wilkinson 1996; Gormsen 1997; Wong 1998; Hall 2001; Cope 2003; Chua 2006).

Coral reefs of Thailand cover an area of approximately 180,000 hectares along the Gulf of Thailand and Andaman Sea. Figure 1 shows the distribution and conditions of coral reefs in Thailand. Estimated coral diversity of 357 species (Luke & Wilson 2006), crystal clear water, tropical weather and white sandy beaches offer Thailand spectacular diving destinations. The dive tourism industry has experienced a sharp increase by more than twenty-fold from 1985.

Thailand welcomes over 550,000 dive tourists each year (Tourism Authority of Thailand 2009). A large number of tourists obtain their dive certification in the country, with Koh Tao (Turtle Island) processing the highest number of dive certifications in Asia (Luke & Wilson 2006). According to Hartley (2009), the Tourism Authority of Thailand (2009) and Travelfish (2009), Koh Tao grants the second highest dive certificates in the world, following Cairns in the Great Barrier Reef region of Australia.

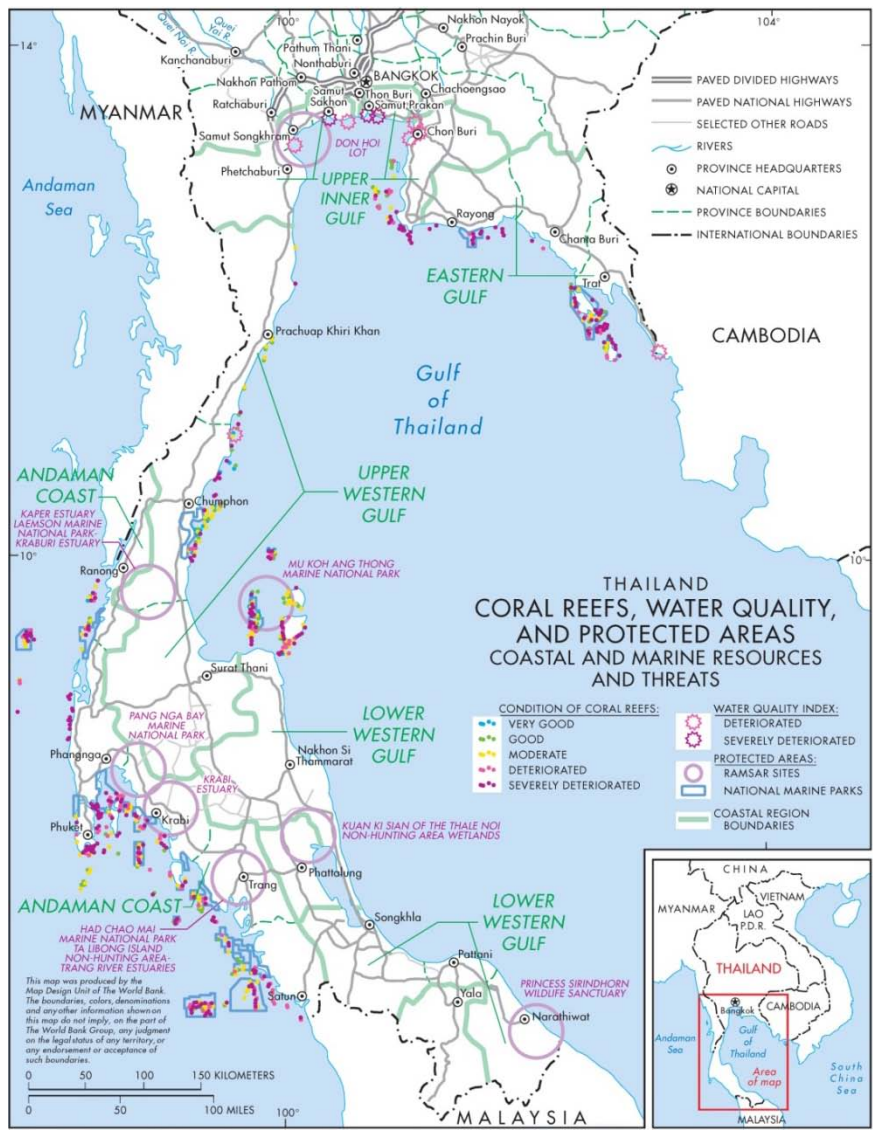


Figure 1 Distribution and condition of coral reefs in Thailand.

### Consequences of poorly-managed dive tourism development

SCUBA diving has been discussed as a low-impact option for coral reef use when compared to dredging, coral mining, natural disturbance and other coastal development. However, recent literature has demonstrated degradation of reefs as a result of poorly planned or intensive tourist use (Wong 1993; Hall 1996; Jameson; Tratalosa and Austin 2001). The increase in tourism itself, through careless tourists and unregulated construction as well as irresponsible operation of tourism-related facilities has caused damage to the reefs (Cesar 2003). Some popular dive sites have been decreed to be close to or even above their carrying

capacity for underwater activity (Harriott, 2002; Harriott, et al., 1997). Inadequate and/or ineffective legal and institutional arrangements multiply adverse consequences to coastal and marine environment (Chua 2006).

Impacts can be short or long-term; positive or negative; local, regional, national or global; direct, indirect, or interrelated; socio-economic, cultural or environmental (Hunter and Green 1995; Goodwin 1996; Cicin-Sain and W.Knecht 1998). Reef-related tourism impacts show consistent patterns worldwide, including Thailand, in numerous studies such as increased consumption and exploitation of coastal resources, higher coral damage at heavy dive sites, coastal erosion, sedimentation and pollution, seasonal congestion as well as higher forms of drug-abuse, spousal abuse and more generalized violence (Beekhuis 1981; Hawkins and Roberts 1994; Zarate Lomeli, Vazquez et al. 1999; Diedrich 2007; Murray 2007). As the number of divers increases and activity becomes more concentrated in popular areas, concern about localized deterioration of sites has increased subsequently (Plathong et al. 2000). Exact numbers of participants in this activity are difficult to determine. However, it is estimated that more than 15 million certified SCUBA divers worldwide visiting over 2,000 dive centres located in 19 countries and states (Spalding, Ravilious & Green 2001).

## **Research strategy for Koh Tao, Thailand**

### *Rationale*

Recreation and tourism are becoming increasingly important factors in coastal management. According to previous research, the overall understanding of the interaction between tourism and coastal environment as well as basic data of its associated impacts is limited. The literature suggests that an integrated strategic approach can reduce the consequent conflicts of recreation demand and ensure sustainable coastal and marine tourism (Kenchington 1993; Gibson *et al.* 1998; NOAA 1998; Björk, 2000; Chua 2006 ; Phillips and Jones 2006; Murray 2007). The coastal tourism industry's greatest challenge is that of integrating the needs of all coastal zone stakeholders in a sustainable management plan that takes into account the environmental, socio-economic, and cultural dimensions (Kanji 2006). The concept of integrated coastal management (ICM) is internationally accepted for managing pressures in coastal zones. However, a significant issue is how to integrate tourism development within the context of ICM (Cicin-Sain & Knecht 1998).

This project is proposed to respond to the issues mentioned above. The Great Barrier Reef Marine Park (GBRMP), Australia and Koh Tao (Turtle Island), Thailand were selected as case studies. The GBRMP and Koh Tao study sites grant the highest and second highest number of dive certificates, respectively and share the common critical issue in impacts of tourism development. The adverse consequences of rapid tourism development in Koh Tao continue to grow without adequate regulations and management, while the management of tourism and recreation in the GBRMP has been acknowledged as an example of the best management practice in the world. Nevertheless, such management practices in the GBRMP may not necessarily be directly transferable to Koh Tao.

### *Case study of Koh Tao, Thailand*

Koh Tao is located 70 km from the southern peninsular in the Gulf of Thailand. It covers an area of about 21 km<sup>2</sup>. The economy of the island is exclusively centred on tourism, especially SCUBA diving. Koh Tao is Thailand's most popular diving destination for all dive beginners. The coral reefs of Koh Tao exhibits abundant diversity and natural beauty, attracts at least

320,000 tourists from around the globe annually and gains more than US\$61 million per annum.

The increasing number of tourists has created environmental pressures on this small island. There are more than 120 hotels/resorts, 43 dive tourism operators and approximately 115 bars & restaurants operating on Koh Tao as of December 2009. The development of infrastructure and services continues to grow in order to meet tourist demands. Subsequently, the quality of the coastal environment is under a constant threat by the growth and development within the tourism sector itself. Rubbish is a major problem occurring due to tourism development along with deforestation, shoreline erosion, landslide, lack of freshwater, wastewater release into the sea, including social problems (Save Koh Tao 2009). Figure 2 shows examples of tourism impacts in Koh Tao.



Figure 2 Impacts of the increase in tourism, irresponsible operation of tourist-related facilities and inadequate and/or ineffective legal and institutional arrangements in Koh Tao.

- a) Rubbish overloads    b) Release of untreated wastewater into the sea  
c) Overcrowding        d) Erosion due to deforestation

In order to design integrated coastal management plans with regard to tourism which suit the local conditions of Koh Tao, primary and secondary data will be collected. The primary data will be collected through structured questionnaires, in-depth interviews and field observation. A survey will be conducted with various key informants, including local community members, government agencies (local, provincial and national), tourists, coastal and marine resource managers, as well as marine tourism providers (hotels, cruise lines and dive operators). Organizations related to marine and coastal management and tourism (e.g. Department of Marine and Coastal Resources, Tourism Authority of Thailand) will be sources of secondary data.

### **Expected results**

The primary and secondary data detailing the consequences of tourism and current management practices in Koh Tao will be analysed. The results together with data from the GBR will lead to identifying transferable and/or applicable practices to Koh Tao. The

ultimate outcome is to develop recommendations for an integrated coastal management strategy which take into account of all relevant stakeholders. It is also proposed to present these recommendations in a format applicable for decision-making processes so that they can be used as a model for dive tourism within the context of ICM in local and other areas. The sustainable and integrated management of reef-based tourism can generate various benefits to the coastal community of Koh Tao including foreign investment income, increased employment and career opportunities, increased infrastructure, and displacement of environmentally destructive practices.

### **Acknowledgement**

I would like to acknowledge Professor Nick Harvey and Associate Professor Poh Poh Wong, University of Adelaide for encouragement and guidance to this project.

### **References**

- Beekhuis, J. V. (1981). Tourism in the Caribbean: Impacts on the Economic, Social and Natural Environments. *Ambio*, 10(6), 325-331.
- Birtles, A, Valentine, P., Miller, D.K. & Curnock, M. (in prep). A closer look at certified SCUBA diving on the Great Barrier Reef.
- Björk, P. (2000). Ecotourism from a conceptual prospective, an extended definition of a unique tourism form. *International Journal of Tourism Research*, 2(3), 189-202.
- Cesar, H. (2003). *The Economics of Worldwide Coral reef Degradation*. Arnhem, The Netherlands: Cesar Environmental Economics Consulting (CEEC).
- Chua, T. E. (2006). *The Dynamics of Integrated Coastal Management: Practical Applications in the Sustainable Coastal Development in East Asia*. Quezon City, Philippines: PEMSEA.
- Cicin-Sain, B., & W.Knecht, R. (1998). *Integrated Coastal and Ocean Management: Concepts and Practices*. Washington D.C.: Island Press.
- Cope, R. (2003). The international diving market. *Travel and Tourism analyst*, 6, 1-39.
- Curnock, M. (1998). *A comparison of Japanese and non-Japanese SCUBA divers experiences and perceptions of the Great Barrier Reef, with a focus on dwarf manke whale-diver interactions*. Unpublished Honours Thesis, James Cook University, Townsville.
- Diedrich, A. (2007). The impacts of tourism on coral reef conservation awareness and support in coastal communities in Belize. *Coral Reefs*, 26, 985-996.
- Gibson, J., McField, M., & Wells, S. (1998). Coral reef management in Belize: an approach through Integrated Coastal Zone Management. *Ocean & Coastal Management*, 39(1998), 229-244.
- Goodwin, H. (1996). In pursuit of ecotourism. *Biodiversity and Conservation* 5, 277-291.
- Gormsen, E. (1997). The impact of tourism on coastal areas. *Geo Journal* 42.1, 39-54.
- Hall, C. M. (2001). Trends in ocean and coastal tourism: the end of the last frontier? *Ocean & Coastal Management*, 44, 601-618.

- Harriott, V. J., Davis, D., & Banks, S. A. (1997). Recreational Diving and Its Impact in Marine Protected Areas in Eastern Australia. *Ambio*, 26(3), 173-179.
- Harriott, V. J. (2002). *Marine tourism impacts and their management on the Great Barrier Reef*. Townsville, Australia.
- Hartley, G. (2009). Joe & Gemmas Round the World Trip. *STA Travel Blogs*, from <http://blogs.statravel.com.au/hartlg0/blog/thailand/ko-tao>
- Hawkins, J. P., & Roberts, C. M. (1994). The Growth of Coastal Tourism in the Red Sea: Present and Future Effects on Coral Reefs *Ambio*, 23(8), 503-508.
- Hunter, C., & Green, H. (1995). *Tourism and the Environment: A Sustainable Relationship?* London: Routledge.
- Jameson, S., Ammar, M., Saadalla, E., Mostafa, H., & Riegl, B. (1999). A coral damage index and its application to diving sites in the Egyptian Red Sea. *Coral Reefs*, 18, 333-339.
- Kanji, F. (2006). *A global perspective on the challenges of coastal tourism* Bangkok: Coastal Development Centre.
- Kenchington, R. (1993). Tourism in Coastal and Marine Environments-A Recreational Perspective. *Ocean & Coastal Management*, 19(1993), 1-16.
- Murray, G. (2007). Constructing Paradise: The Impacts of Big Tourism in the Mexican Coastal Zone. *Coastal Management*, 35, 339-355.
- NOAA. (1998). 1998 year of the ocean-coastal tourism and recreation., from [http://www.yoto98.noaa.gov/yoto/meeting/tour\\_rec\\_316.html](http://www.yoto98.noaa.gov/yoto/meeting/tour_rec_316.html)
- Plathong, S., Inglis, G., & Huber, M. (2000). Effects of self-guided snorkeling trails on corals in a tropical marine park. *Conservation Biology*, 14(6), 1821-1830.
- Phillips, M. R., & Jones, A. L. (2006). Erosion and tourism infrastructure in the coastal zone: Problems, consequences and management. *Tourism Management*, 27(2006), 517-524.
- Spalding, M., Ravilious, C., & P.Green, E. (2001). World Atlas of Coral Reefs. Retrieved 3 September, 2009, from <http://www.unep-wcmc.org/marine/coralatlas/index.htm>
- Tourism Authority of Thailand. (2009). Green Fins: Eco-friendly Diving in Thailand. Retrieved 28 August, 2009, from <http://www.tatnews.org/emagazine/3496.asp>
- Tratalosa, J. A., & Austin, T. J. (2001). Impacts of recreational SCUBA diving on coral communities of the Caribbean island of Grand Cayman. *Biological Conservation*, 102, 67-75.
- Travelfish. (2009). Travel Thailand. Retrieved 14 October, 2009, from <http://www.travelfish.org/feature/9>
- Wilkinson, C. (1996). Global change and coral reefs: impacts on reefs, economies and human cultures. *Global Change Biology* 2(1996), 547-558.
- Wong, P. P. (1990). Coastal Resources Management: Tourism in Peninsular Malaysia. *ASEAN Economic Bulletin*, 7(2), 213-221.

Wong, P. P. (1993). *Tourism vs. environment: the case for coastal areas* (Vol. 26). Dordrecht: Kluwer Academic Publishers Group.

Wong, P. P. (1998). Coastal Tourism Development in Southeast Asia: Relevance and Lessons for Coastal Zone Management. *Ocean & Coastal Management*, 38(1998), 89-109.

Zarate Lomeli, D., Vazquez, T. S., Galaviz, J. L. R., nez-Arancibia, A. Y., & Arriaga, E. R. (1999). Terms of reference towards an integrated management policy in the coastal zone of the Gulf of Mexico and the Caribbean. *Ocean and Coastal Management*, 42, 345-368.