Balancing water, religion and tourism on Redang Island, Malaysia

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Abstract
Redang Island (Pulau Redang) is an island off of Peninsular Malaysia that is part of a Marine
Park archipelago of corals and thousands of fish and invertebrates. The relatively isolated local
community is generally centered on fishing, and Islam guides daily life. Recently, the tourism
industry has expanded on the island. New hotels and resorts provide jobs, but also expose the
locals to western culture and touristic behavior, which may clash with deeply traditional
community values. Further, the tourism industry may be putting a strain on the natural
resources, especially the quantity and quality of freshwater. The island village may become
divided between those who support the tourism industry and those who do not. Here we present
an exploratory investigation into the development–environment–culture dynamics of tourism,
water and religion on Redang Island while building collaborations between universities of this
Muslim state and the West.

1. Introduction

The tropical island of Redang Island (Pulau Redang), located
45 km from Kuala Terengganu, Malaysia, is the largest
($\sim$40 km^2) of 9 islands in the Redang archipelago (5.7716°N,
103.0066°E) in the South China Sea (figure 1). The Redang
archipelago was designated as a Marine Park in 1994 to
conserve the 500 species of corals and the thousands of fish
and invertebrates living among them. A number of studies
have investigated the marine biology around the island (Ng
1990, Mortimer 1991, Liew and Chan 1993, Phang 1994, Papi
et al 1995, Luschi *et al* 1996, Pin *et al* 2001); some reports

have focused on the Marine Park at Redang Island (White
1988, Rahman and Ibrahim 1996). The island is inhabited
by an ephemeral population of 600–1500 villagers, comprised
roughly of 250 Muslim families reliant on fishing.

Juxtaposed with the pristine waters and untouched
landscape is a growing tourism industry. The tourism industry
totaled 19 resorts (1103 rooms) with more resorts under
construction. The island receives up to 8000 tourists per day
during the peak season. The tourism industry provides wealth
and jobs to some of the villagers, but also puts a strain on the
natural resources, in particular the fresh water supply.

Because Malaysia is a predominantly (60%) Muslim
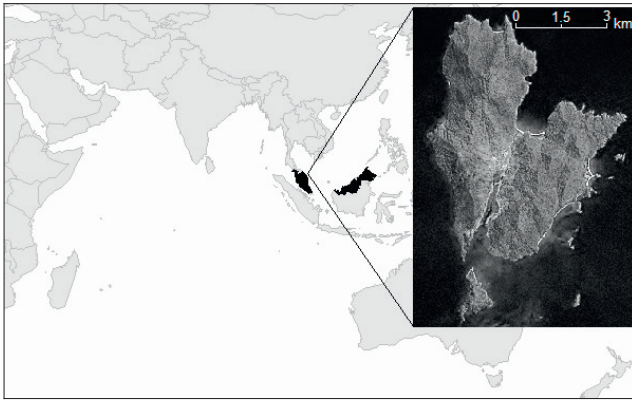country—Islam is the official religion of Malaysia—we were

Figure 1. The island of Pulau Redang off the east coast of western Malaysia in the South China Sea.

interested in how Islam guides two aspects of this exploratory investigation: expanding tourism and water resources. In Muslim countries, tourism plans often do not facilitate local control and expression (Fagence 1998), but may still be guided by Islamic teachings (Kostolansky 1998). In fact, it has been argued that Islam is counter to consumerism and postmodernism (Godazgar 2007). Local attitudes to expanding tourism may be either positive or negative. Positive attitudes result from notions that tourism creates community development, improves agricultural markets, generates income, and may bring good fortune; these attitudes could potentially lead to pro-tourism behavior following the Theory of Reasoned Action (Lepp 2007). Local attitudes to tourism could be negative, especially because the tourism centers (i.e., the new hotels/resorts) are perceived as guests to the locals, but the hotels/resorts act as local hosts to outsiders and may misrepresent the locals to new guests (McNaughton 2006). The hotels/resorts may act inappropriately in either or both roles as guest and host. Finally, benefits reaped by the hotels/resorts may not be well re-distributed back to the entire community (Shoup 1985, Din 1989).

Government interest in tourism to Malaysia in particular was limited until the 1970s because of concern with liberal attributes associated with Western permissiveness (Din 1982). But, Malaysia has generally been considered comparatively moderate (Ap *et al* 1991, Kayat 2002). The Malaysian Tourism Development Plan (1975), which was prepared by a Hawaii-based company, sought the expansion of foreign exchange and the labor market. It allowed for special provisions for tourism in poor regions, as contained in the Investment Incentive Act of 1968 (amended in 1986) (Malaysia 1986). These provisions may be consistent with the welfare-oriented philosophy in the basic tenets of Islam (Din 1989). The Tourism Development Corporation Act (1972) continued the growth of the industry (Malaysia 1978), but there were no explicit references to Islamic ideas or goals. Promotion did contain Islamic motifs such as mosques, architecture and Muslim festivals, but they also contained images that went against Islamic principles (Hofmann 1979). More recently, however, there was minimal portrayal of Muslim images by Malaysian tourism destination organizations (Hashim *et al* 2007).

It has been found that tourism development in Malaysia has given insufficient attention to local capacity building, reluctance to integrate local settlements, misplaced notion of professionalism, and insensitivity to cultural and ethnic differences (Liu 2006). Although Islam prohibits prostitution, gambling, and the consumption of alcoholic beverages, it does not exert any significant influence on the operation of tourist-related activities (Din 1989, Henderson 2003), which are Western-inspired and run counter to the Islamic concept of tourism in stressing the sacred goal of submission to the ways of God (Graburn 1977). Tourism has been blamed for sexual permissiveness, flagrant indulgence in alcohol, gambling, drugs, pornography, voyeurism, particularly threatening local youths (Din 1989, 1997).

In addition to the social-cultural impacts of tourism on Islam, so too are there environmental impacts, particularly with water, and associated Islamic implications (Khalid 2002). The Quran[7] and Hadith[8] have relatively elaborate strategies for water conservation and pollution-prevention that are widely accepted and complied with by Muslims when linked to state policies (Amery 2001). Women play a central part in the provision, management and safeguarding of water resources (Faruqui *et al* 2001). Water has an economic value, which is compatible with Islam. But, the distinction between 'public' and 'private' water may be unclear (Faruqui *et al* 2001). Further, the issue of wastewater reuse is controversial when it provides relatively clean water in drought-prone regions yet potentially blemishes religiously significant practices with potentially 'impure' water (Faruqui *et al* 2001).

The objectives here are to explore the water quality and quantity issues on the Redang Island. Of particular interest is the relationship between the local villagers and the emerging resorts. Because Islam guides the religious and day-to-day practices of the villagers, we are also interested in the relationship between Islam and water conservation practices.

2. Methods

We conducted semi-structured interviews (Huntington 1998) about water sources, usage, quality, conservation and disposal with locals from the village and managers and staff from the resorts. Semi-structured interviews were an appropriate method for gathering information in an open-ended format, particularly useful in an exploratory study. All interviews with villagers and resort staff were conducted in Malay and translated by the Malaysian researchers; interviews with resort managers were done in English. Because Malaysia is a predominantly Islamic country where the Quran and Hadith guide not only religious practices, but day-to-day living habits as well, we investigated whether water use was in any way influenced by the Quran/Hadith, particularly among the villagers (Smith and Ali 2006). Faruqui *et al* (2001) report that these Islamic texts place great importance on water and its conservation—the Arabic word for water occurs 63 times in the Quran, and water use and wastage guidelines are described in the Hadith.

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[7] The central religious text of Islam.
[8] Written traditions that determine the Muslim way of life.

In the village, we interviewed 15 women and 11 men, all but one of whom were metered for water consumption. Ages ranged from 27 to 53. Professions included business, carpenter, fisherman, police officer[9], resort employee, restaurant owner, shop owner, and waitress. In addition, we were able to talk with the head of the village, who is also the religious head (Imam), and with the 'second man' of the village, who is also the head of water distribution for the island. Respondents were selected from restaurants and a community center, and from walking door-to-door in three different neighborhoods. The village is located in the interior of the island, and the resorts are located along the coast. We visited the six largest resorts (of 19) where we interviewed supervisors ($n = 6$) in charge of water supply and quality (managers and engineers) and support staff ($n = 10$) (maintenance, handymen, gardeners and swimming pool cleaners). We also interviewed 10 tourists at the island's airport, on a boat and at a restaurant.

Limitations to our methods included general qualitative assessment biases due to the individual analyst and subject in a socially constructed environment, representative samples in space, time and depth, and interpretation of the results (Madill *et al* 2000). We aimed to maximize the credibility, competence and perceived trustworthiness of the qualitative researchers and triangulated where possible to increase reliability (Patton 1999). Establishing credibility, competence and trustworthiness of ourselves was relatively straightforward. We initially explained that we were researchers at universities from the UK who were interested in water and resort issues. The fact that we were associated with universities rather than government agencies immediately helped to build credibility and trust (mistrust was associated with government agencies), in addition to competence. We attempted to triangulate by comparing (a) interviewee response to the same questions posed by different researchers (e.g., questions posed by Malaysian versus UK researchers), and different interviewee responses to the same questions about a particular topic (e.g., upper management versus maintenance worker resort employees about water), (b) interviewee claims to specific behavior and observed behavior (e.g., mosque attendance), and (c) interviewees response and official published documentation (e.g., population counts).

However, we were unable to calculate a proportional reduction in loss (extension of Nunnally's rule of thumb for Cronbach's alpha in quantitative measurement), nor produce a rigorous calculation of judge number and agreement (Rust and Cooil 1994). Judge number and agreement is analogous to sample size and standard deviation (or standard error). In quantitative sampling, there is a central tendency to the population mean and reduction in standard deviation (or error) to that mean as the number of samples increases. It is therefore possible to estimate the number of samples required from an initial sample and standard deviation to obtain that standard deviation with statistical power. In qualitative sampling, we also aim to find the 'true' or mean value, but this value is qualitative rather than numerical. The 'true' value is determined based on judge (or interviewee) agreement or thematic similarity in answers to questions. Unlike measuring a physical property, like air temperature where a given temperature is recorded for a given measurement, a qualitative 'measurement' carries with it a degree of certainty whereby the respondent may or may not be 'sure' as to their answer. Bias on the part of the recorder is possible in both quantitative and qualitative research, but air temperature, for example, is what it is—it is never unsure as to what its value is. Proportional reduction in loss is therefore a statistical method for qualitative research to minimize the error in certainty with which a respondent feels confident about his or her answer. Because the research was exploratory, we did not implement this method but the method would be useful for further research.

3. Results

3.1. Village

The villagers received their water piped in from the mainland. A 151 m^3 (40 000 gal) tank supplied water to 238 households in the village. Each household paid on average $1.35 US (RM 5) per month for their metered water bill, which they all felt was a fair price. One household took their water from a nearby hill source and paid no bill. All households rated the water quality as good, though a few mentioned as a matter of course that the water always needs to be boiled. Primary water uses were cooking, cleaning and drinking.

In times of shortage the households took their water from the nearby hill. One household had its own well that was used in times of water shortage; the family shared the well water with neighbors and relatives. Nine people agreed (with few or no reservations) that they would be willing to use recycled water; however, four people were against recycled water use. Ten people indicated that in times of severe water shortage they would be willing to use seawater for ablution—the religious ritual of washing before prayer—but three were adamantly opposed.

When asked if the respondents had heard any lectures or advice on water conservation from the religious head (Imam), four people indicated that they had while nine said they had not. However, every respondent said that their use of water was influenced by the Quran and Hadith, but none could recall any specific passages or mentions from the teachings. All but one of the interviewees were interested in hearing any or additional lectures or advice on water conservation. Religious involvement (prayer, mosque attendance, read Quran/Hadith) ranged from regularly/always, sometimes and two days per week.

The villagers viewed the resorts from a largely socioeconomic, rather than environmental, standpoint. They were pleased that the resorts provided jobs for them, including women, and many of the villagers who worked at the resorts had been fishermen previously. Still, the villagers voiced disapproval of tourist behavior and concern that their children were being exposed to that behavior while working there. The villagers were generally unaware of the environmental impacts

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[9] When asked what were the most common crimes on the island, the police officer explained that there were no crimes because the island is too small and everyone is related to each other in some manner. When asked why the police station and his job exist, he said that it was for the tourists to file theft reports for insurance when they lost their mobile phones, watches, and other valuables.

from the resorts and tourists primarily because of lack of access to the tourist areas. Although the resorts took water from the same sources used by the villagers, the relationship could be reciprocal—one resort worker said that when her water ran out at home she would bring back water from the resort.

3.2. Resorts

The Ministry of Tourism developed an Infrastructure Development Study for Tourism Islands, Peninsular Malaysia. One objective was to ensure water security for tourism. It was stipulated that the first option is to utilize local sources including exploration of common harvesting of natural resources such as rivers or ground water prior to importing water. Studies are required to avoid environmental damage when harvesting local sources. Only where the local source is deemed insufficient could water be imported. Desalination plants would only be considered for islands far out at sea where pipeline installation is difficult and there is also high current or future projected demand. Water conservation techniques should be taught and rainfall harvesting encouraged.

All of the resorts on Redang Island must pump their water from groundwater—none of them have been granted access to the mainland piped supply from which the villagers receive their water, with one exception. The largest resort managed a deal to secure access to the piped water—the resort helped set up the piped water access to the villagers and in return gained access as well; this resort used groundwater for 'decoration' (i.e., fountains). Another resort used groundwater for the pools and gardens, and used hill water for the kitchen and drinking. The most popular (highest annual visitor numbers) resort shipped in drinking water by barge every two days. The smaller resorts reported water use of $\sim$190 m^3 (50 000 gal) per day. One manager stated that all of the resorts would be receiving mainland piped water by the end of the year, but no other resort manager would confirm that report.

Responses about water shortages and conservation practices were varied and inconsistent. Most of the managers or lead engineers reported that there were never any shortages and, hence, there was no need for conservation measures. Other reasons issued against conservation measures were that the resorts 'do not want to stress the tourists[10],' and because water was so cheap, there was 'no economic incentive.' Many resorts were unaware of the water conservation guidelines issued by the Marine Park. One resort lead engineer, when asked what they do with the water conservation guidelines, said, 'We slip those under the rug.'

During one interview with a resort manager we were told that there were no water shortages. Meanwhile, another one of our Malaysian researchers was interviewing the resort's swimming pool cleaner, who revealed a different story. This employee disclosed that there were generally two water shortages per year as an annual trend. The resort's response

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[10] The tourists were largely unaware of the social or environmental issues of the island, though this varied depending on country of origin. Some tourists did not know there were native villagers to the island. While we were on a boat, one tourist pulled off a piece of coral while snorkeling and brought it back to the boat.

Figure 2. One of the groundwater wells contaminated by saltwater encroachment. The sea is located just beyond the end of the path.

to these water shortages was to cut the water supply to the staff housing.

Responses about water quality were also varied and inconsistent. Two resorts denied any problems of saltwater encroachment; another resort explained that there were no water quality problems on the entire island, though another nearby island had problems. One manager told the UK researchers that there were no water quality problems, but he revealed in Malay to the Malaysian researchers that there were some problems with brown water. Another resort used reverse-osmosis to purify the groundwater, but the manager said that this method 'makes the water taste bad.' The resort that shipped in drinking water showed us their ten groundwater wells and the two that were contaminated (figure 2). The resort lead engineer, on saltwater encroachment, stated, 'This is a huge problem. All of the resorts (on Redang Island) have this problem.' Signs are displayed in each of their rooms warning not to drink the water. Additionally, the researchers were given a tour of the rather extensive and expensive water treatment facilities on site. These facilities were the most sophisticated of the treatment mechanisms in place on the island that we surveyed. The simplest system from a smaller resort released untreated wastewater to the immediate rear of the resort (metres away from their groundwater well).

4. Discussion

In the village, access to information was initially a concern for us. The villagers tended to distrust the Malaysian outsiders

as coming in to impose problematic policies. However, when the Malaysian researchers introduced the Western collaborators (both Muslim and non-Muslim), the villagers opened up readily (credibility, reliability, competence, and trustworthiness) (Patton 1999). The villagers wanted to explain the issues of the village to the UK researchers so that this information could be brought back to the West. Furthermore, because the UK researchers had contacts with Malaysian policy-makers (i.e., Malaysian Ministry of Energy, Water and Communication), the villagers hoped that their concerns would be passed on to the Ministry. Some of the villagers were particularly sensitive to two of our questions—on recycled water and on seawater for ablution. The strong opposition expressed was surprising, and perhaps indicative that they were unaware of the Islamic ruling on the use of seawater for ablution during sea voyages with limited freshwater supplies (Farooq and Ansari 1983).

Our research group of five men was concerned that we would not be able to interview the village women (social context), who were generally the unspoken voice behind household management (Faruqui *et al* 2001). Interview access to the women came readily, however. During an afternoon prayer, when the Malaysian researchers and one (Muslim) of the two UK researchers went to the mosque with all of the men in the village, the non-Muslim UK researcher was left alone in a restaurant. The women, who were also left behind, took an interest in the researcher and our research group was invited to dine with the women following the prayer. This resulted in not only our ability to interview the women, but also a greater number of female interviews than male interviews. We followed up the initial set of interviews with a female collaborator who easily gained access to female interviewees.

One of the women anomalously attended the mosque regularly with the men. The woman and her husband were uncharacteristically relatively well-educated and up-to-date with current affairs. In fact, she explained to the researchers the water purification system in place in Singapore and expressed a desire for a similar system to be brought to her island. She also highlighted that she uses the Quran as the basis for educating her children on wise water use.

Perhaps the most interesting finding presented here was the disconnect in answers among resort managers and lower level staff employees, and between resorts, which is most certainly due to the context in which the interviews took place (Madill *et al* 2000). With such a high degree of variance, it is difficult to determine the 'real story' behind the water issues and which narrative is the 'correct' one. Certainly, upper level resort employees have a responsibility to market the best interests of their employer. Lower level employees may be treated unfairly and thus motivated to use the interviews as a means of retaliation, or they may feel a sense of loyalty to their employers and thus motivated to support the best interests of the resort. This delicate balance may also be related to the villagers' give-and-take view of the resorts: the resorts provide jobs, but they also provide exposure of unwanted tourist behavior to their children (Din 1982). Regardless of what the truth is behind the interviews, it is nonetheless interesting that the truth is obviously masked; there appears to be an underlying tension with respect to these issues.

The findings we report here are by no means statistically significant due to time and sampling design constraints, but are useful as an initial probe for further studies. Future research should be methodologically designed not only based on our initial results as a guide, but also with a systematic plan to reduce uncertainty in the findings and 'unravel the truth' on issues such as the discordant answers between upper management and lower level resort employees. Limitations detailed in the methods section should be actively addressed—reducing the subjectivity of the analyst and subject in a socially constructed environment, increasing the number of samples and representativeness, assessing change (answers, policies, demographics) over time, refining the questions to reduce the openness of interpretation of the results, and triangulating different sources of information and methods to clarify contrasting results. Further research should build upon the credibility, competence and perceived trustworthiness that we established with the villagers. Finally, introducing a more quantitative and statistical approach to this qualitative research (e.g., calculation of the proportional reduction in loss; increased sample size) would strengthen the results.

Further, conventional environmental management strategies for islands that have had limited success may need to consider the cultural and religious backgrounds of the island inhabitants. For instance, a recent Islam-oriented environmental education program for fishing communities, government officials and religious leaders of a small island off the coast of Zanzibar has been developed in coordination by the World Wildlife Fund, Care International, and the Islamic Foundation for Ecology and Environmental Sciences (Higgins-Zogib 2005). Inasmuch as these collaborative efforts inform conservation strategies, they can also harmonize with Malaysian conservationists and inform the West.

A November 2006 Nature issue focused on 'Islam and Science: Must the Muslim world stay science-poor?' Malaysia was argued to have been isolated from international science (Cyranoski 2006). The opening editorial called for cooperation and collaboration between Muslim states and the West (Editorial 2006). In this work, UK scientists successfully collaborated with Malaysian scientists, addressed environmental issues with an Islam/culturally-sensitive framework, and opened doors to future research opportunities.

As the tourism industry on Redang Island grows towards maturity, the industry will become increasingly institutionalized and dominated by outside interests (Din 1989). Two actors stand to lose in this development: the villagers and Islam. Further research with a rigorous assessment framework based on our initial results should assess the balance between religion, economic development and environmental sustainability for Redang Island, and what the future holds for the strengthening or weakening of those parts.

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