

APPLYING SOCIAL CAPITAL THEORY ON CONSERVATION POLICIES OF PROTECTED AREAS: A CASE STUDY OF PENANG, MALAYSIA

Teik Aun, Wong*

*Center for Australian Degree Program (CADP),
Inti International College Penang, Malaysia*

Mohammad Reevany, Bustami

*Center for Policy Research and International Studies (CenPRIS),
Universiti Sains Malaysia, Malaysia*

Sazlina, Md Salleh

*Center for Policy Research and International Studies (CenPRIS),
Universiti Sains Malaysia, Malaysia*

ABSTRACT

Environmental conservation efforts internationally and in Malaysia are focused on the establishment, maintenance and conservation of Protected Areas. The phenomenon of Protected Areas is justified by both biological considerations and social considerations. Biological considerations are commonly articulated. This research attempts to balance the narrative by focusing on social considerations, specific on the component of social capital, as derived from Social Capital Theory. Social capital is not commonly employed in the discourse on conservation policies of Protected Areas. However, social capital is postulated to have a tangible influence, as witnessed by its successful application in other contexts such as housing policy and social development. To explore the applicability of social capital towards Protected Areas, a case study of Penang in Malaysia is utilized. Document analysis and field observations are adopted as the research methodology and the data is analyzed thematically. The findings indicate that social capital has a tangible effect on the conservation policies of Protected Areas. Subsequently, public policy recommendations are proposed in light of the findings.

Keywords: Social Capital Theory, Protected Areas, Environmental Conservation, Case Study, Nature Park Management

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* Corresponding author: Center for Australian Degree Programs, Inti International College Penang, 1-Z Lebu Bukit Jambul, 11900, Penang, Malaysia. Tel: 604-6310138, Email: teikaun@yahoo.com

1. INTRODUCTION

Environmental conservation efforts in Malaysia and internationally are focused on establishing and maintaining Protected Areas. Protected Areas include national parks, state parks, marine parks, forest reserves, recreational forests, and other land areas whose use is restricted to protect the environment. The United Nations' "Aichi Target 11" for signatory countries target that "By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved..." (Convention on Biological Diversity, 2020). Similarly, Malaysia's National Policy on Biodiversity targets to safeguard all key ecosystems, species and genetic diversity by 2025 (Goal 3, Targets 6-8) (Ministry of Natural Resources and Environment, 2016). Protected Areas are a social construct created from legislation. The justification for legislating Protected Areas fall onto a mix of biological and social considerations. Biological considerations include the value of the area in terms of biodiversity, threatened and/or endangered species, ecological integrity, and environmental sustainability. Social considerations encompass the value in terms of human appreciation, enjoyment, recreation and utility.

Social considerations are diverse, with different components contributing differently towards the conservation policies of Protected Areas. The objective of this research is to contribute towards scholarship of social considerations in the conservation of Protected Areas from a distinct context and region. Within the broad umbrella of social considerations, lies the concept of social capital as articulated by Social Capital Theory. It is postulated that social capital has a tangible effect on the conservation policies of Protected Areas. Social capital, as a distinct component, is not well represented in conservation policies of Protected Areas, as it is frequently subsumed as part of other broader social considerations (Bennett et al., 2017; Pretty & Smith, 2001). It is deemed timely and instructive to specifically focus on social capital in the discourse of public policy surrounding Protected Areas.

The postulation that social capital has a tangible effect is investigated through a case study of Protected Areas in the state of Penang in Malaysia. Protected Areas with more social capital are anticipated to have stronger social considerations for establishing, maintaining and enhancing them. On the other hand, Protected Areas with less social capital are anticipated to be at risks of downgrading, downsizing and de-gazettement. Furthermore, in the event of a threat towards these Protected Areas such as proposed development plans that are perceived to undermine their protected status, public reactions will be illuminating on the presence and tangible effects of social capital.

Data-gathering instruments consist of document analysis of published records, journal articles, press reports and official websites, and field observations of all the areas researched. The findings suggest that social capital has a tangible effect, and hence should be incorporated accordingly in the discourse of conservation policies surrounding Protected Areas, and the environmental conservation agenda in general.

2. LITERATURE REVIEW

Social considerations are the basis of pioneering Protected Areas. The first Protected Area of the modern era, Yellowstone National Park in the U.S was established in 1872 on the basis of social considerations “as a public park or pleasuring ground for the benefit and enjoyment of the people”. Similarly, Yosemite National Park, another iconic Protected Area was established for “public use, resort and recreation” (National Park Service, 2020). ‘Social considerations’ in this context are broad-based considerations that are deemed (perceived or otherwise) to benefit humans, either individually or in a group. ‘Benefit’ presupposes value and utility, in other words, the well-being of humans (in its various forms that includes physical, mental, emotional, social and spiritual) are the locus of consideration. Social considerations are juxtaposed against ‘biological considerations’ that are deemed to benefit all lifeforms, either individually (species) or as a group (ecosystem). As an expansive concept, social considerations is multi-dimensional encompassing politics, sociology, economics, business, psychology and health. In legislative and political deliberations on Protected Areas, social considerations, particularly in terms of community considerations, tourism value, economic ramifications and recreational utility, are customarily the main justification for their establishment (Arrandale, 2006; Orr, 2005; Eagles, 2002; Frisch & Wakelee, 2011).

As a social construct born out of legislation, Protected Areas are not permanent and perpetually ‘protected’. Their continued existence and maintenance rest on a constant evaluation of their biological and social considerations. After their establishment, they can be downgraded, downsized and de-gazetted. The causes include changes in social considerations in forestry, mining, oil and gas, industrial agriculture, industrialization, infrastructure, land claims, rural settlement, subsistence, degradation, shifting sovereignty, refugee accommodation, and conservation planning (Mascia & Pailler, 2011). Noteworthy is that biological considerations are conspicuously absent. The ongoing debate on oil drilling in the Arctic National Wildlife Refuge in the U.S. is illustrative. Due to shifts in the perceived value of oil in the said Protected Area, public policy priorities and hence social considerations are changing (Bourne, 2018; Johnson et al., 2019; Rutkin, 2015). Biological considerations are not the focus of debate despite the comparative increase in its biological value due to the adverse effects of environmental degradation and climate change worldwide. Two observations are pertinent in this case. Firstly, social considerations are dynamic, and their contribution towards the justification calculus of the Protected Area varies over time. Secondly, social considerations drive the narrative of establishing, maintaining and enhancing; or downgrading, downsizing and de-gazettement of Protected Areas.

The importance of social considerations in the conservation agenda is clearly anticipated and articulated by many researchers (Ban et al., 2013; Bennett et al., 2017; Ostrom, 2009). However, these same researchers also reveal that social considerations (‘social science’, ‘social-economic policies’ and other derivative terms are used interchangeability) are often not adequately incorporated and factored. “Yet among conservation scientists and practitioners, there remains a lack of awareness about social science” (Bennett et al., 2017). A contributory factor is the broad scope of social considerations derived from diverse social science disciplines, making its applicability towards the conservation agenda complicated (Ostrom, 2009). Complexity aside, there is unequivocal agreement that social considerations are essential in the conservation agenda. Moreover, due to the inherent complexity of social considerations, it is crucial to expand the collection of data from diverse contexts and regions (Ban et al., 2013).

Social Capital Theory originates from the founding fathers of Sociology, Tonnies, Weber, and Durkheim, who were all concerned with issues of the individual's place in society, social relations, and social order. Contemporary elaborations from Bourdieu (1986), Coleman (1988), and Putnam (1995) established the cornerstones of the modern Social Capital Theory. "Today's concept of social capital however is a result of a mixture of functionalist, critical and rational theoretical traditions." (Tzanakis, 2013). There are variations in the definition of social capital and for this research; the definition adopted is that commonly used in discussions vis-à-vis public policy, namely, "stocks of social trust, norms, and networks that people can draw upon in order to solve common problems" (Lang & Hornburg, 2010). In this definition, social capital is a social phenomenon derived from relationships among individuals, between individuals and groups, and among groups. Relationships are formed, developed and nurtured from daily interactions and experiences. Social capital is intangible, but has value and tangible effects, and can be converted into other forms such as economic and political capital. Though intangible, it can form connections with a physical place. This happens when a physical place forms the basis for a group or institution. An example would be neighborhoods, which have been described as having various levels of social capital (Baumgartner, 1988; Rohe & Stewart, 1996). Other examples are schools and universities, whose social capital reside among its current students, students' parents, alumni, teachers, management and other associated individuals.

The application of social capital towards public policy gained prominence in the 1990's from Putnam's essay *Bowling Alone* (1995). "The image of a solitary bowler, as opposed to one bowling in a league, served as a metaphor for America's disengagement from group life" (Lang & Hornburg, 2010). Putnam proceeded to identify two kinds of social capital: *bonding social capital*, which is between people who share social and cultural traits (e.g. family, neighbors, friends), and *bridging social capital*, which is between individuals who are of differing backgrounds (e.g. workmates, acquaintances). A third kind, *linking social capital* (Office for National Statistics, 2020) connects with people in positions of power and is characterized by relations between hierarchies where there are differing levels of power. Currently, social capital is recognized as an important consideration in public policy. The United Nations taps onto social capital towards achievement of Sustainable Development Goals (SDG) and publishes the World Social Capital Monitor. "The first World Social Capital Monitor will activate and stimulate the Social Capital worldwide to meet the SDG" (United Nations, 2021). The United Nations Development Programme uses the concept of social capital specifically in the post-war reconstruction of Bosnia and Herzegovina (Nixon et al., 2009). In a similar vein, the Organization for Economic Co-operation and Development (OECD) has commissioned a project on the measurement of social capital (OECD, 2021). In Malaysia, social capital has been found to be a suitable framework to understand Corporate Social Responsibility (CSR) and pro-social behavior among micro and small businesses (Wong & Bustami, 2019).

2.1. Social Capital and Protected Areas

The social capital of Protected Areas reside in the relationship of people, as either individuals or groups, and the Protected Area concerned. The various groups of people include local communities adjacent to the Protected Area, tour guides, management authorities and visitors (Azreen et al., 2018). In this research, visitors are further divided into domestic visitors and international tourists. Different groups of people will relate to Protected Areas differently. For local communities, Protected Areas might be a source of sustenance and livelihood; for management authorities a source of employment; for domestic visitors a source of socialization and recreation; for

international tourists a source of entertainment and enjoyment. Within these groups, individual experiences will vary. Membership of these groups are not exclusive, it is possible for individuals to belong to more than one group such as domestic visitors who are from the local community.

An individual's experience of Protected Areas can range qualitatively from positive to negative; and quantitatively from superficial to deep-rooted. Though social capital is often associated with pro-social behavior, studies have also shown its application in unsavory behavior such as organized crime (Coleman, 1988; Wing, 2010). The collective relationships of individuals coalesce into social capital at a community level. Coleman (1988) delves into the relationship of social capital at the individual level and at the aggregate or community level, the so-called micro-macro transition. He argues that "Social capital despite its less tangible character, shares with financial capital the ease of making the micro-macro transition. As such, social capital can be used conceptually at both micro and macro levels without requiring a separate theory of social structure working at the two levels of inquiry." (Tzanakis, 2013). Similarly, Putnam (1995) focused on aggregate or collective social capital across communities, cities, regions and even nations. This aggregate or community level social capital is applied in the context of Protected Areas in this research.

The social capital of a Protected Area is constantly changing as it is derived from subjective individual relationships and group experiences. As an intangible social phenomenon, social capital does not lend itself easily to measurement. Nonetheless, an overall qualitative assessment of it can be inferred. The qualitative experience of local communities towards Protected Areas gives an indication of presence of social capital. Their experiences are mixed, with positive experiences reported in Malaysia, Myanmar and Taiwan, negative experiences in Thailand, and neutral experiences in the U.S., Nepal and Uganda (Allendorf et al., 2006; Bavinck & Vivekanandan, 2011; Bennett & Dearden, 2014; Hind et al., 2010; Mehta & Kellert, 1998; Lai & Nepal, 2005; Smith & Krannich 1998; Zakaria et al., 2019). Protected Areas can positively affect the livelihood of local communities from the job opportunities and economic activities generated by domestic visitors and international tourists. On the other hand, physical displacement or access deprivation to resources from the Protected Areas (the phenomenon of "fortress conservation") adversely affect their livelihood. Other experiences abound, reflecting a broad range of social considerations. In the case of Waza National Park in Cameroon, the local community voice support not from a livelihood or economic perspective, but from a security perspective. Apparently, the presence of park officials and forest rangers provide physical security to the local community, as their absence leads to lawlessness and influx of criminal elements (Kelly, 2015).

Likewise, domestic visitors, defined as visitors from the same country the Protected Area is situated, have diverse experiences. Domestic visitors can also be part of the local community. Both domestic visitors and the local community are citizens of the country the Protected Area is situated. Their combined experiences constitute a major portion of the social capital of Protected Areas. The importance and prominence of domestic visitors vary considerably by country. In developed countries like the U.S., domestic visitors are a crucial and vocal constituent strongly influencing public policy. In less-developed countries, domestic visitors can be much less influential as their Protected Areas cater more for international tourists.

International tourists form the bulk of visitors in less-developed countries particularly in Africa. In Kenya, her national parks is the pillar of the country's tourism industry hosting over 1 million

international visitors annually (Akama & Kieti, 2002). “Across southern Africa, nature-based tourism reportedly now generates roughly the same revenue as farming, forestry, and fisheries combined (Scholes, 2004 cited in Balmford et al., 2009). In comparison, international tourists comprise only 7% of visitors in Taman Negara (Malaysian National Park) in 2011 (Daud & Rahman, 2011). Overall, visitations to natural areas are increasing worldwide, despite declines in selected countries like United States and Japan. This increase, particularly in less-developed countries is tied to international tourists (Balmford et al., 2009). “Nature-based tourism is a rapidly growing sector of the global economy, is an important ecosystem service, and generates support for conservation” (Karanth & DeFries, 2010). This increase suggests that international tourists generally have a positive experience. In the specific case of Tsavo West National Park in Kenya, “an overwhelming majority of tourists (over 70%) indicated that they have a satisfactory experience” (Akama & Kieti, 2002).

It is acknowledged that the popularity of a Protected Area among local communities, domestic visitors and international tourists may not accurately reflect the presence of social capital. Popularity in terms of visitations and experiences are also affected by various other variables such as advertisements and promotions, economic factors, social customs, individual lifestyle, culture and religious/spiritual beliefs. A case in point is the Japanese practice of *shinrin-yoku* or ‘forest-bathing’ (Hansen et al., 2017; Tsunetsugu et al., 2007) that combines the experience of nature with cultural and spiritual beliefs. Nonetheless, the popularity of Protected Areas is arguably a proxy for social capital, particularly vis-à-vis public policy. Domestic visitors and international tourists go to a Protected Area largely by choice. Particularly for domestic visitors, many are regular and repeat visitors. They have the option of spending their time, energy and money elsewhere, but select to do so in particular Protected Areas. In other words, there appears to be a significant and positive relationship between these domestic visitors and international tourists with the Protected Areas concerned, which alludes to the presence of social capital.

3. METHODOLOGY AND RESULTS

A case study on the state of Penang in Malaysia employing document analysis and field observations is undertaken. Document analysis enables historical and contemporary data to be evaluated concurrently (Denscombe, 2007). The strengths of document analysis as a methodology include efficiency, availability, cost-effectiveness, lack of obtrusiveness and reactivity, stability, exactness and coverage (Bowen, 2009). For this research, the documents analyzed are historical records, government reports, academic journals, book publications, press articles and reputable websites. Field observations are used to supplement document analysis to ascertain the current situation of the Protected Areas and fill gaps where documentary information is not available. Field trips were made to all the Protected Areas in this study. Activities such as hiking and camping were conducted, and observations made on the level of maintenance, management authorities, domestic visitors and international tourists. Thematic analysis, which is a form of pattern recognition within the data, with emerging themes becoming the categories for analysis (Fereday & Muir-Cochrane, 2006), is employed. Thematic analysis is selected for its flexibility and ability to be applied in a wide range of theoretical frameworks and research interests (Clarke & Braun, 2013).

Penang is one of thirteen (13) states in Malaysia. It is densely populated with 1.77 million inhabitants in 2019 (Department of Statistics Malaysia, 2020) spread over 1,048 square kilometres

(405 square miles). The high population density makes land-use a highly contested and contentious issue. Recent proposals to construct three (3) new highways in Penang (Penang State Government, 2018) have generated heated debate among the general public (Lim, 2016). Similarly, a proposal to build a cable car system linking Teluk Bahang and Penang Hill attracts opposition (Dermawan, 2017).

Protected Areas in Penang comprise recreational forests (*hutan lipur*) or reserve forests (*hutan simpanan*) managed by the State government and a national park managed by the federal government. Within recreational forests, strategic areas are developed into forest parks (*taman rimba*) for public access and usage. The total area of recreational forests is 38.87 square kilometres and the national park 12.66 square kilometres (Jabatan Perhutanan Negeri Pulau Pinang, 2019). The total Protected Area of 51.53 square kilometres represent 4.9 percent of the total land area. The Protected Areas in Penang are summarized in the table below:

Table 1: Protected Areas in Penang, Malaysia

	Protected Area	Size
1	Penang National Park	1,266 hectares
2	Teluk Bahang Recreational Forest inclusive of Teluk Bahang Forest Park (32 hectares)	830 hectares
3	Air Hitam Dalam Education Forest	10 hectares
4	Bukit Mertajam Recreational Forest inclusive of Bukit Mertajam Forest Park (37 hectares)	313 hectares
5	Bukit Panchor State Park	446 hectares
6	Government Hill Recreational Forest inclusive of Penang Hill	2,288 hectares
	TOTAL	5,153 hectares or 51.53 square kilometres

Relative popularity in terms of visitations is used as a proxy to infer the presence of social capital. Penang National Park is popular among both domestic visitors and international tourists. From 2004 to 2017, domestic visitors increased from 16,830 to 87,850, and international tourists from 4,938 to 69,382 (Azreen et al., 2018; PERHILITAN, 2021). It was formerly the Pantai Acheh Forest Reserve and was upgraded to a national park in 2003 (Kumar, 2004). The local community, domestic visitors, academia, and non-government organizations (NGO's) led by Malaysian Nature Society (MNS) initiated and supported the conversion to a National Park. The successful gazettment as a national park is noteworthy as social considerations and justifications were predominantly employed. "Biological justification alone was insufficient and MNS had to employ social justification by engaging the academic community, local residents, domestic visitors, general citizens and political interests in order to prevail" (Wong et al., 2019). Field observations reveal considerable domestic visitors and international tourists, with some voluntarily practicing 'plogging' (concurrently hiking and collecting rubbish), suggesting a meaningful relationship with the Protected Area and the presence of considerable social capital. In terms of type, bonding, bridging and linking social capital are inferred present as will be elaborated in the discussions section.

Government Hill Recreational Forest hosts the iconic Penang Hill. Penang Hill is a hill station developed by the British (Penang was formerly a British colony) for recreational purposes as a respite from the tropical heat. Development is limited to low-density bungalows, some administrative buildings, nature-based tourist attractions and a funicular railway system. Penang

Hill is popular among domestic visitors and international tourists. Based on ticket sales of the funicular railway, the number of visitors have increased steadily and hit a record of 1.74 million in 2018 (Penang Hill Corporation, 2021). Proposals by business interests to develop Penang Hill on a large-scale with entertainment centers, hotels and shopping complexes in the 1990's elicited strong opposition. The local community was concerned that large-scale commercialization of Penang Hill will alter its natural character and threaten its ecology. Domestic visitors were concerned that large-scale development and accompanying privatization will cater more to high-income international tourists at their expense. Apart from the funicular railway, access is also provided by a laterite road (the jeep track from Penang Botanical Gardens) and several hiking trails such as those from the 'moon gate' and the City Park. Field observations reveal that the hiking trails are popular among domestic visitors many of whom are regular and repeat visitors. Some even voluntarily contribute back by building and maintaining various rest stations along the hiking trails such as 'No. 39' and 'No. 45'. These rest stations provide drinks and snacks to the public free of charge funded by public donations. These voluntary and civic behavior suggest a strong relationship with the Protected Area and the presence of considerable social capital. In terms of type, bonding, bridging and linking social capital are inferred as will be elaborated in the discussions section.

Teluk Bahang Recreational Forest hosts Teluk Bahang Forest Park. Tourism facilities such as visitor center, road access and basic amenities are provided. There was an attempt to build a mini zoo in the 2000's but the plan did not come to fruition and what remains are abandoned semi-completed animal enclosures (Chong, 2004). Bukit Mertajam Recreational Forest hosts Bukit Mertajam Forest Park and have basic facilities and amenities. Entrance to both these Protected Areas are free of charge and not recorded, thus there are no statistics on visitations. Field observations on both these Protected Areas reveal many domestic visitors hiking and having family picnics, but hardly any international tourists. In terms of type, bonding social capital appears to dominate.

Bukit Panchor State Park was formed in 2008 by upgrading the then Bukit Panchor Recreational Forest of 155 hectares and enlarging it to its present size (Jabatan Perhutanan Negeri Pulau Pinang, 2019). Unlike the formation of the Penang National Park, there was limited publicity and public engagement. Approximately 8 hectares within it is developed with tourist facilities and amenities. Entrance is free of charge and not recorded, but it is reported to be not popular among domestic tourists let alone international tourists (Lo, 2019a). Field observations reveal very few domestic visitors and no international tourists.

Air Hitam Dalam Educational Forest (*Hutan Pelajaran Air Hitam Dalam*) is situated in a freshwater wetland that supports a wide variety of avian species. Various facilities and amenities for tourists were developed including a comprehensive 1,000m boardwalk. It was originally 11 hectares, but shrank to 10 hectares when part of it was de-gazetted for flood mitigation infrastructure in 2006 (Ang & Chan, 2010). It is not popular among domestic visitors and international tourists, and the partial de-gazettement went unnoticed by the public. Illegal adjacent land clearing activities are further threatening it as lamented by a Penang State councilor, "It is disappointing that all efforts to protect the country's second largest bird watching site has gone down the drain. The Land Office accepted that the place is to be gazetted for ecotourism and the neighbouring land was to be preserved as a buffer zone. But nothing much was done to stop the development taking place there now" (Lo, 2019b). Field observations reveal that there is an

entrance building for visitor registration, but it was unmanned and appears abandoned. There were no domestic visitors and international tourists present during the field observation.

The relative popularity of these Protected Areas in Penang provide an inference of the amounts of social capital present as summarized in the table below:

Table 2: Social Capital in Protected Areas in Penang

Protected Area	Inferred Amount of Social Capital
1 Penang National Park	High – popular with domestic visitors and international tourists
2 Penang Hill (part of Government Hill Recreational Forest)	High – popular with domestic visitors and international tourists
3 Teluk Bahang Recreational Forest inclusive of Teluk Bahang Forest Park	Moderate – popular with domestic visitors
4 Bukit Mertajam Recreational Forest inclusive of Bukit Mertajam Forest Park	Moderate – popular with domestic visitors
5 Bukit Panchor State Park	Low – not popular
6 Air Hitam Dalam Education Forest	Low – not popular

4. ANALYSIS AND DISCUSSION

The presence of social capital in Protected Areas in this research is inferred based on their relative popularity as a proxy. An additional avenue to detect the presence of social capital occurs when Protected Areas are threatened by downgrading, downsizing and de-gazettement. Theoretically, if all other biological and social considerations remain relatively constant, differences in the amounts of social capital will lead to different responses towards these threats. All the Protected Areas studied are located within the State of Penang that is geographically small (all the Protected Areas are within approximately 1.5 hours reach from each other) and relatively stable economically and socially. There are inevitably some local and communal differences, but they are minimized in comparison to larger and more socio-economically diverse States and regions.

Penang National Park was previously Pantai Acheh Forest Reserve with less protection. As a forest reserve, commercial uses such as logging and conversion of land use are permitted with conditions. It was popular as a hiking, camping and fishing site as it had several beaches and a rare meromictic lake (PERHILITAN, 2021). Logging activities were only stopped in 1996 (Hong & Chan, 2010) and there were public concerns that it might resume. The Malaysian Nature Society (MNS), a non-governmental organization, launched expeditions in 1999 (Malaysian Nature Society, 2017) that gathered scientific data and lobbied to convert it into a National Park with more protections from commercial interests. The lobbying and public engagement process garnered sufficient support from the people and it succeeded as the first Protected Area legally gazetted under the National Park Act of 1980 (Hong & Chan, 2010). The success can be attributed to the presence of considerable social capital. In terms of overall social considerations, commercial forces were acting against its upgrade to a National Park, as Penang is a small, densely populated State with limited development land. In terms of biological considerations, supporting factors were modest at

best, as it had no iconic megafauna like the endangered tiger and orang utan. Bonding social capital is inferred amongst individuals sharing common interests in hiking, camping and fishing; bridging social capital amongst the different groups brought together by the common cause of lobbying for a National Park; and linking social capital amongst individuals and groups in different positions of power.

Penang Hill faced a threat to its natural character in the 1990's from plans for a large-scale entertainment and commercial development. These plans aroused unprecedented public opposition led by the Consumers Association of Penang (CAP). A 'Save Penang Hill' postcard campaign was launched that succeeded in halting the project. "It was a concerted civil society postcard campaign around 1990 that pressured the state government to stop any development on Penang Hill" (Netto, 2011). Currently, there are ongoing percolating concerns of business interests taking precedence over other social considerations and any proposal that affects (actual or perceived) the natural characteristics of Penang Hill invites considerable public scrutiny and debate, as in the case of the proposed cable car (Dermawan, 2017; Bashir, 2020). This public sensitivity towards any proposed development can be attributed to the presence of considerable social capital. Penang Hill is a popular hiking and recreation area. It is easily accessible and free of charge to enter. Individual and groups voluntarily develop and maintain its hiking trails, construct rest stations, and even provide free food and drinks. This collective interaction, experience and enjoyment of visitors form the basis of social capital at both individual and the aggregate or community level as described by Coleman (1988). Similar to the case of Penang National Park, all three bonding, bridging and linking social capital are inferred present.

Teluk Bahang Recreational Forest and Bukit Mertajam Recreational Forest are both moderate in social capital. They are popular among domestic visitors and the local community for hiking, picnics, recreation, exercise and sight-seeing. They are not well-known outside of Penang and international tourists are uncommon. Teluk Bahang Recreational Forest is observed to attract more family groups for picnics and recreation. Bukit Mertajam Recreational Forest is observed to attract more hikers and sports enthusiasts. Bonding social capital is inferred prevalent amongst the domestic visitors in both these places.

Bukit Panchor State Park has low social capital. Field observations reveal considerable physical infrastructure but not many visitors. Some of the infrastructure, such as a boardwalk across a freshwater swamp, are damaged and there appears to be no attempt to repair it. Some littering was observed. This is in contrast to observations of 'plogging' by international tourists in Penang National Park. It is inferred that only low levels of bonding social capital is present amongst the few visitors.

Air Hitam Dalam Educational Forest also has low social capital, and within the framework of Social Capital Theory, its partial de-gazettement going unnoticed is not surprising. Field observations reveal that although ample physical infrastructure such as a visitor center, boardwalks, canopy walks and observation towers are available, there were hardly any visitors. This is a sharp contrast to the many rest stations built and maintained voluntarily by visitors and the local community in Penang Hill. The fact that its partial de-gazettement elicited hardly any notice infers minimal social capital present.

The varying levels of social capital among Protected Areas, even in a relatively small state like Penang, is instructive. Penang National Park and Penang Hill are both high in social capital. All bonding, bridging and linking social capital are inferred present. Bonding and bridging social capital are reflected in the readily observable civic and voluntary participation to build and maintain its various amenities. Linking social capital is inferred from the considerable and organized social scrutiny and debate whenever any proposal that erodes (actual or perceived) their protected status is present. Their rich social capital can even translate into additional protection as in the upgrade of Penang National Park from its previous forest reserve status.

Teluk Bahang Recreational Forest and Bukit Mertajam Recreational Forest are both considered moderate in social capital. They are popular amongst domestic visitors and their social capital consists primarily of bonding social capital. Their status as a Protected Area is deemed stable in the current situation and near future. In contrast, Air Hitam Dalam Educational Forest and Bukit Panchor State Park are both low in social capital and their future is less stable. Visitations are low and there appears to be no civic and voluntary activities to maintain their facilities. Air Hitam Dalam Educational Forest has already been partially de-gazetted and Bukit Panchor State Park may also face this threat in the near future.

Applying Social Capital Theory towards Protected Areas in the case study of Penang highlights the importance of social capital. Social capital is important for the establishment, maintenance and enhancement of Protected Areas. It is constantly changing and varies even amongst Protected Areas located relatively close to each other, thus constant monitoring is required. Underestimating or overlooking social capital increases the risks of downsizing, downgrading and de-gazettement, and rolls back environmental conservation efforts.

5. CONCLUSION AND RECOMMENDATION

Having applied Social Capital Theory towards conservation policies of Protected Areas and establishing its importance and tangible effects, the next logical step is to explore ways of generating and developing social capital. The social capital of Protected Areas predominantly reside amongst the local community, domestic visitors and international tourists. Individual and group experiences are diverse, and it is important to understand the factors that support their positive relationship with Protected Areas. Positive experiences and relationships lead to affection and emotional attachment, which in turn creates bonding, bridging and linking social capital.

Identifying and investigating the individual factors that generate and increase social capital among diverse individuals and groups is important, but beyond the scope of this current research. Nonetheless, this research has generated pertinent findings to inform conservation policies of Protected Areas and environmental conservation, and the following public policy recommendations are proposed:

1. Social capital considerations should be given appropriate weightage alongside biological considerations and other social considerations in the conservation policies of Protected Areas. Biologists mostly drive the current narrative on environmental conservation, and voices from the social sciences are not prominent. As important as biological considerations rightly are, environmental conservation is fundamentally a social

phenomenon that hinges on appropriate social considerations. As such, a balanced approach driven by both biological and social considerations is called for.

2. Given the identified importance of social capital, its generation and growth needs to be incorporated into the management and development of Protected Areas. Facilities and amenities should be designed to promote visitor interaction, togetherness and cohesion. For example, communal dining tables, common seating arrangements, accommodation designs that facilitate neighborliness, and plentiful public interactive spaces like courtyards and communal halls needs to be present and increased as is appropriate.
3. The development of social capital hinges on individuals' personal experiences of Protected Areas. To understand individuals' experiences in a more comprehensive and holistic manner, further research to identify and investigate the factors that generate and increase social capital amongst various types of individuals is proposed. Further research utilizing the phenomenological method is envisaged to be promising in identifying and understanding the "lived experience" of individuals, and typologies of individuals' personal experiences. The variety and frequency of typologies, once identified, can guide the management and development of Protected Areas to optimize social capital and hereby promote their long-term sustainability.

These recommendations, if implemented accordingly, will promote the overall sustainability of Protected Areas and mitigate the risks of downsizing, downgrading and de-gazettement. Consequently, the interests of environment conservation will be promoted accordingly.

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