

# Environmental Management in Phuket: A Systemic and Participatory Approach for Solving Wicked Problem

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## Abstract

Effective environmental management in Phuket is a great challenge. Phuket's rapid changes in terms of bio-physical, economic and, socio-cultural characteristics render an attempt to manage environmental impacts through traditional planning and regulation using top-down management approaches ineffective. Phuket's environmental issues are classic example of a wicked problem where there are multiple stakeholders whose understanding of the environmental problems and demand solutions that vary with their interests and knowledge. It is essential that the complexity and dynamic nature of environmental problems are not viewed in isolation from the socio-political, economic and cultural context. Maintaining the ecological health of the island will require not only the technological knowledge but also the deep understanding of both the natural and cultural heritage of the area and how society perceives and interacts with their environments. This paper utilises a system approach for analysing Phuket's environmental problems and deriving effective solutions using systemic investigation of mixed methods and transdisciplinary knowledge. It highlights the potential of partnership building through innovative use of multiple knowledge sources in the community which can be recruited by a change agent such as a university or learning hub that already exist in the area.

**Keywords:** Phuket, Environmental Management, Public Participation, System Approach, Knowledge Management

## 1. Introduction

Phuket is a world-famous destination and a major source of employment, trade, and investment for both local and international business. In 2007, approximately 5 million tourists travelled to the area generating tourism incomes of 94 billion baht (TAT 2007). Phuket's Gross Provincial Product (GPP) per capita was 190,421 baht which was 1.6 time higher than the national average of 120,037 baht (NESDB 2007). Hotel and restaurant accounted for 23.6 billion baht (38.5%) of Phuket's GPP, a growth of 77.6% compared to 1999. In addition, Phuket has a significant role in bringing development to the region by linking tourists to other destinations such as Phangnga, and Krabi and boosting their tourism and economic growth.

However, the rapid growth coupled with ineffective management has led to several environmental and social problems including accumulation of solid waste, wastewater, air pollution, increased crime, urban sprawl, loss of local traditions, and the degrading of cultural values. Despite the risks to the environment and society brought by current development, there is continuing pressure to maintain and grow Phuket's economic productivity. The provincial development plan reflects this demand as it envisions the island as the tourism centre for Andaman region [1]. This creates tensions between environmental management and the developmental directions influenced by multiple interest groups which leads to the need to look beyond traditional top-down management regime in order to effectively address the problems.

It is the objective of this paper to improve the way environmental problems are addressed and resolved in the areas that are subjected to great developmental pressure such as Phuket. The paper proposes the use of soft system methodology [2] and participatory approach [3, 4] for analysing a wicked environmental problem through the use of mixed methods. We assert that the success of the solutions requires not only the integration of technical expertise and local knowledge but

also a deep understanding of the context surrounding the problems to allow the identification of enabling or hindering factors. This paper provides an example of how research can systemically investigate a complex environmental problem and explore practical solutions through the process of a learning society which recruits knowledge and experiences from the stakeholder participation [5]. It summarizes the initial findings of a larger study in the area of sustainable development interpretation and knowledge management [6].

The paper also discusses how an environmental research can benefit from theories such as social capital [7] and psychological capital [8], empowerment [4, 9, 10], and applies such concepts into practice by influencing changes in people values and social culture in the way that will enhance the resiliency [11] of Phuket's social and ecological systems.

## 2. Phuket's Wicked Problems

A wicked problem has multiple causes and consequences, involves multiple stakeholders and processes in the solution and is not static [12]. Several environmental issues in Phuket are wicked as they cannot be viewed separately from the broader impacts of the area's tourism development. Phuket's environment is at end of all kinds of social, economic and political issues. In Phuket, the biophysical structure and ecosystems have been disturbed for centuries. More recently this disturbance intensifies where there are holiday resorts for tourists, shanty towns for construction workers, urban sprawl by domestic migrants, monoculture of para rubber and palm oil plantation, and fishing villages.

Environmental conservation actions become difficult when social problems also exists. Loss of trust and community connectedness can hamper the collective action towards the safeguarding of common resource while the inequality of wealth distribution can promote further exploitation of the environment as all classes seek to increase their living standards.

Usually environmental problems are interrelated to the socio-economic, political and cultural contexts. For example, natural degradation as a result of high visitation and the lack of enforcement of environmental regulations can be attributable to mass tourism marketing, the lack of training and efficiency of governing authorities, and community understanding of contemporary issues such as carrying capacity and tourist expectations where the environment is concerned. Similarly air pollution can come from heavy traffic, dust from construction sites and smoke and toxic particles from rubbish burning. Furthermore, such problems become interrelated especially in terms of causes. This can be demonstrated by the analysis of air pollution from waste incineration caused by the limited capacity of the incinerator, high waste volume and water content in a naturally wet environment which leads to resulting problem of dangerous dioxin level being produced during the incineration process [13].

It is important that the complexity of a problem is fully understood before a solution is proposed. This is to avoid the perverse outcomes frequently associated with inappropriate management [14]. A holistic approach to problem analysis that does not overly simplify the reality into an isolated 'hard' system but rather interrelated systems of complexity that can be understood through a system inquiry is the preferred model [2]. To achieve a realistic understanding of a problem, participation from the stakeholders and the communities is an imperative. Intrusive, top-down management driven by the policy maker without adequate engagement of the community often produce poor outcomes [15]. Understanding the community perceptions on the state of the environment, cultural values and priorities, strategic networks, capacities and weaknesses, and societal framework is essential in identifying factors affecting their decision-making and deriving solutions that will be acceptable [16].

### **3. Methodology**

With the intention of capturing the complexity of the real problems in Phuket, the research design follows a pragmatic approach using mixed methods [17] including the soft system methodology [2], grounded theory [18, 19], action research [20, 21], adaptive management [22], and the concept of continuous improvement and innovation (CI&I) [23]. The multi-step process allows the research methods to be adjusted to best suite the dynamic context and cultural setting of the study area. The research comprises 3 major stages of problem conceptualization, reality checks and collective vision.

#### **3.1 Problem conceptualisation**

The stage of problem conceptualization consists of preliminary investigation to build a conceptual model of how the environmental problems of Phuket are situated in the broad developmental and governance framework. This was done through document analysis, mind mapping and direct observation. The model was then used to scope the question and identify stakeholders for the next cycle of the research. During this step, problems are formulated and bounded in clusters. Initial key questions were also asked to guide the systemic investigation.

- 1) What are the understandings of the problems by the stakeholders?
- 2) What are the drivers or causal relationships of these problems?
- 3) What is the common priority or goals?
- 4) What actors have the interest and capacity to contribute to the problem solution?
- 5) What interactions or networks are needed to influence action?
- 6) What do the stakeholders see as an appropriate indicator of success?

#### **3.2 Reality check**

The reality check encompasses interviews and attendance at public seminars in Phuket on the topics relating to the environment. Random and snowball sampling was used for selecting informants from various occupations and socio-economic backgrounds. Each interview lasted between one to two hours

using semi-structure, open-ended questions. Data saturation was reached when there were no more new information or themes being raised. There were 31 interviews producing more than 60 hours of transcribed and analysed data. The analysis utilized Nvivo8 software [24] to facilitate the contextual coding described by cluster analysis and grounded theory technique [19]. Notes from over 20 public seminars were also analysed to validate the data from the interviews. The deliverables from this step of the study are the understanding of how Phuket communities perceive the state of the environment and the drivers of the problems which were presented back to the community in the next step.

### 3.3 Collective vision

The third step of the study aimed to provide frameworks for the community to derive a collective vision for the desired outcomes of management and key strategies to achieve them. This was conducted in a form of visioning workshops with selected stakeholders. Workshops were conducted with participants from the public sector, the private sector, active community members, and master students who have enrolled at Prince of Songkla University Phuket Campus. The majority of these master students held middle level management positions in the public and private sectors. There were 35 attendants in total with the variation of 6 to 12 people for each workshop. At this stage the participants were asked to share their insights of probably

and preferred future for Phuket and the strategies to achieve such goals.

The data from all stages were used in a triangulation to describe Phuket's environmental problems from the participatory process (Figure 1).

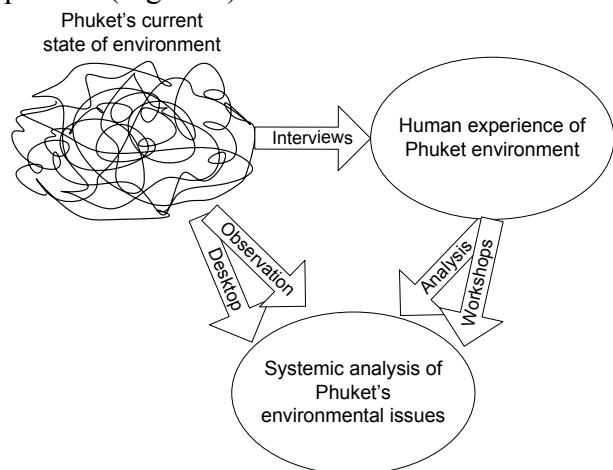


Figure 1. Triangulation of mixed methods for systemic analysis of Phuket's environmental problem

## 4. Evolving Knowledge

The findings from different stage of the study are presented in this section. Table 1 provides the information on the state of the environment extracted from different sources. This allows comparison of what is available in the official document and what the stakeholders perceived as the major problems and identify the area where the gap or conflicts in the problems conceptions may exist.

Table 1. Comparison between the understanding of environmental problems as stated in official document and from the stakeholder perspectives. ( ) indicate priority ranking 1 = most important

Phuket Developmental Plan (2009)[25]	Stakeholder perceptions from interviews (N=31)
Degraded marine resources due to depletion, overexploitation and conflicts of usage	Degraded corals from tourism activity (6)
Degraded coastal water quality and resources from inappropriate infrastructure, coastal erosion, and wastewater from tourism facilities	Wastewater from tourism, sedimentation from land developmental projects (2)
Deforestation from illegal logging, illegal land hold and encroachment driven by tourism growth and conflicts in land ownership	Encroachment of public land through corruption by governmental officials, politicians, wealthy family and developers. (1)

Phuket Developmental Plan (2009)[25]	Stakeholder perceptions from interviews (N=31)
Land use problems caused by erosion, coastal erosion, encroachment, inappropriate land use, land slides and impacts from developmental projects	Inappropriate constructions and land use due to the lack of enforcement in town planning (3) Flood and landslip risk from open landscape (4)
Solid waste and pollution exacerbated by high tourist numbers and migrant workers	High volume of solid waste beyond the capacity of the incinerator (2) Water shortage, wastewater and flooding (2) Traffic congestion (5)

#### 4.1 Drivers of the problems

Majority of the participants from across all occupations see governance and political factors as underlining causes of many environmental management. The pro-growth policies which “...look at the development that is about construction...” contribute greatly to uncontrolled growth in tourism. The lack of enforcement and development “...that has no direction and the government that does not keep up with the private sector” were also seen as obstacle for Phuket’s environmental management. Furthermore, issues of corruptions, inefficient decentralized administration systems with centralized budget allocation, incompetence in the public sectors and a weak civil society were raised as contributing factors to environmental degradation.

The next most mentioned as influential factors for depleting natural resources is the economic mechanism. Bad practice by the private sector and capitalism were stated most frequently. Meanwhile market demand, marketing strategy, and employment opportunity lead to rising population and urbanization which increases the consumption of natural resources. High land price also makes accommodation expensive and provide incentives for illegal squatter, unsafe structure, encroachment on public space and substandard service in several areas in Phuket.

Many participants attributed irresponsible environmental behaviour to the inherent attitude of freedom without discipline in Thai nature as well as materialism and consumerism which are partly influenced by the media and societal trend. The weak civil

society and reluctance to enforce regulations due to fear of conflicts with the community members and political figure were also part of the reason that drives the lack of environmental monitoring and regulation enforcement.

The lack of public awareness and critical thinking in formal education was seen as one of the key causes for low environmental awareness in the local people and young generation. This can also be seen as partly attributable to technological advancement such as the motorboat which makes many natural attractions more easily accessible and communication technology which expand people’s expectation of living quality.

#### 4.2 Required Change

The informants stated several changes that were required to improve the state of the environment in Phuket. Most importantly, they believed that the governing structure and budgeting allocation should be improved as well as the knowledge in management by those who lead the public sector if it is to operate more efficiently. Cultural change was also needed as several informant highlighted that environmental improvement will require “*Thai people to be more disciplined.*”

The building of human capacity and knowledge through education and family interaction was raised as fundamental change that is urgently required to help produce new generation with higher environmental awareness. The relationship between people in the community was also seen to be important in strengthening the capacity and increase willingness to participate in conservation initiatives as one informant stated that “... we

have to make community love each other and still live with each other and have mutual benefits.”

Several of these suggestions overlap and are linked to one another which can be demonstrated in Figure 2 which was discussed in detail in the Boonchai *et al.* [6].

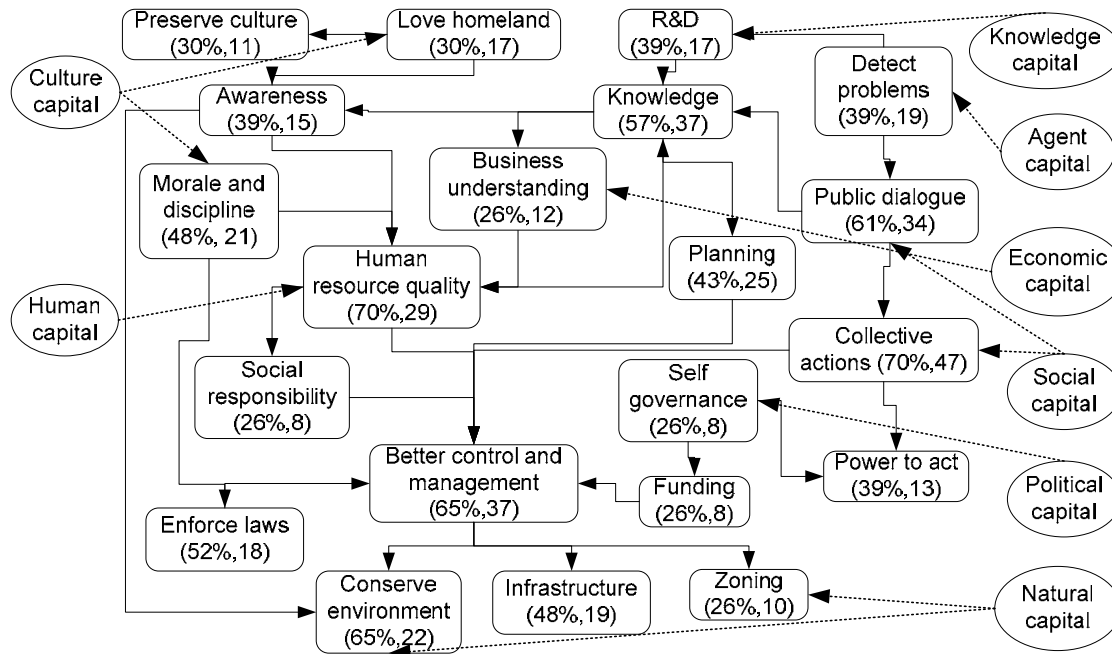


Figure 2. The key themes of the desired changes for sustainable Phuket obtained from 31 residents and the demand for knowledge from different capital systems. The numbers inside the bracket indicate respectively the percentage of informants who expressed the ideas and the frequency of mentioning. [6]

### 4.3 Common vision

The convergence was evident in the visions of Phuket articulated by all groups. Phuket future as a “Green City” or “Green Destination” was aspired by all groups but with varying descriptions. The community group described mangrove and forest protection and control of pollution and buildings on hillsides as the way to achieve the goal of being the model city where tourism is compatible to environmental conservation. For the private sector group, this simply meant stopping developmental activities that are damaging to the environment. From the public sector’s perspective safe food products, clean water, promoting commercial use of clean energy, and mass public transportation were the characteristics of a green Phuket. The Master student group, saw a green Phuket being achieved by increasing green space in the man-made environment.

### 4.4 Strategic action

Despite the similar vision for the environment, all the stakeholder groups have considerably different approaches in the way they see strategic actions being taken. The community believed that increased community rights in land management and more robust population accounting are the key actions to be initiated first. The private sector group highlighted the importance of public dialogues for common goals and adaptive governance that allows a creative generation to manage using innovative methods. The public sector generally focused on the improvement of governance structures and the cultivation of green culture through the training of the young generation. And the master students emphasised having management system that create incentives for desirable behaviours and foster attitude changes in the society.

Nevertheless, some common suggestions are present in terms of human development in moral and knowledge that focus on creativity, critical thinking and a collaborative learning culture. Education institutes such as the university were also suggested as a catalyst for a learning society to lead practices towards environmental sustainability. Furthermore, several participants suggested the use of media to promote social movement towards environmentalism. This suggestion reflects the increasing recognition of the power of the civil society in delivering conservation outcome through the mobilization of social change.

## 5. Discussion

Phuket represents a modern Thai society which is integrated into global community via tourism. Therefore the attempt to effectively manage the environment in the area requires an adaptive approach that can incorporate the diversity of interests, needs and beliefs of the relevant stakeholder. As the decisions that determine what is done and what is not done in the community depends on key individual or group referred to as “gate keepers” [26] it is vital to identify the key actors within that system. Identifying such key players and understanding their roles, interests and values are essential.

To assist the systemic exploration of the problem, the results are discussed against the initial research questions identified in section 3.1.

1) What are the understandings of the problems by the stakeholders?

The perception of environmental problems by the stakeholders largely overlaps those identified by the governing authorities (Table1). However, the frequency of issues raised by the informants can imply the priority of issues for the stakeholders and in some cases, they differ from the official view. The problem of land use and encroachment of public areas such as beach and mangroves are regarded as high priority for the stakeholders

followed by the issues of water supply and wastewater, town planning, flooding and land slip risk, traffic congestion and coral degradation respectively. The lack of trust between the state and civil society is evident and will need to be taken into account when generating solution options.

2) What are the drivers or causal relationships of these problems?

As described in section 4.1 the main causes of several environmental problems are related to governing effectiveness and management capacity of the public sector. This suggests that the traditional top-down management is likely to fail when the state agencies are weak in enforcement and are not trusted by the other sectors.

3) What is the common priority or goals?

The prominent response from Phuket’s stakeholders can be summarized as “Green Phuket where tourists and local are safe and happy”. Tourism is still seen as imperative to Phuket’s development however, there has been a greater push by the stakeholders to have more high quality tourists and environmental friendly activities. Although there was no consensus on the desirable scale of tourism operations, the emerging ideas that can be applicable to all size of the business and across all sectors is better environmental education and standard through a community of practice. Because tourism is tied to several factors, it is hopeful that key ingredient towards sustainability in Phuket can be found through strategic mobilisation of positive social change and public environmentalism.

4) What actors have the interest and capacity to contribute to the problem solution?

Different types of capital reside in different groups of stakeholders as partly demonstrated by Figure 2. While the public sector may have the political capital in terms of authority to regulate and control, much of that power is not exercised effectively in environmental management due to the lack of economic and knowledge capital. In Phuket,

these capitals were observed to be superior in the private sector. Meanwhile, the social, culture and human capital which are dispersed in the civil society can improve its influence and power if there is an organisation which can act as an agent to provide linkage to other sources of capitals.

5) What interactions or networks are needed to influence action?

The results in Phuket show evident demand for a public dialogue to exchange knowledge and ideas across the community, the public sector, the private sector and young people. This is not to say that a mere organization of public forums can induce actions. Changes in people behaviours do not come naturally and will require a catalyst that can bring the community together through shared concern and problems and desire to make a difference [7]. This implies that there is a need for a host that can provide mechanism for knowledge exchange and interaction that are continuing and producing outcomes that feed back into the partnership.

In order to create participatory process, it is important to recognize the social, cultural and political constructs of the stakeholders and governance systems [27, 28] they are in. The success of such collaboration will depend on the understanding of factors that influence the way local stakeholders operate and work with them to find better environmental practice that exist within their capability. According to Putnam and Feldstein [7], the process of social learning that empowers the stakeholders through making them realise potential capacity and connection within their capacity can result in collective action at larger scale. Strategic interventions should derive from engaging with key stakeholders in various form to find culturally, politically, as well as environmentally appropriate actions

6) What do the stakeholders see as an appropriate indicator of success?

Technical-based indicators and scientific explanations may be useful for governmental sectors to measure and display

its environmental performance but they do not necessarily improve the ecological health in a sustained manner. The findings from the Phuket case study shows that more people talked about the happiness index than the numerical or monetary measurements. Quality of life was seen as an important indicator of good environment as reflected through a resident's statement that "*I want Phuket to be sustainable with people having enough to eat and use and raise their family with happiness.*"

## 6. Conclusion

This paper suggests that systemic investigation and participatory approach can be applied to the analysis of a complex problem using the steps of problems conceptualisation, community validation and strategic visioning through a process of social learning with various key stakeholders. It proposed that sustained environmental management is a process that requires collective action through participatory engagement that empowers stakeholders to move towards a shared goal. Environmental initiative cannot sustain without recognition of value constructs that underline people's perception of the environment.

As humans are an important agent for changes [29], local communities participation in the form of empowering partnership for environmental problem solving is a key towards more sustainable environment [4]. The knowledge of such change process draws on the concepts of agent-based theory [30], social capital [31]; [32], traditional ecological knowledge [33], human values [34] and the diverse aspects of empowerment [3, 9, 10, 35]. A quick fix approach without addressing these interrelated key elements is unlikely to achieve a meaningful outcome.

While disciplinary knowledge and technological expertise remains vital to the solution to many environmental problems, it is as important to recognize and optimise the implicit knowledge and insights of those who understand the context surrounding wicked problems to ensure the legitimacy of the solutions and prevent perverse outcomes.



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