As described by Chuenpagdee et al. (2001), the Phangnga Bay survey instrument consisted of four parts. Part 1 asked respondents to choose the more important loss from pairs of losses, and is reproduced here. Part 2 asked respondents to select the greater losses given pairs each consisting of a resource loss and a personal economic loss. Part 3 asked respondents to choose the more severe activity from pairs of resource damaging activities. Part 4 asked for gender, age, education, and occupation, and asked several agree/disagree attitudinal questions. Parts 2-4 are not reproduced here.

Questionnaire

Relative importance of resource losses in Phangnga Bay

(Research project in cooperation with the Faculty of Fisheries, Kasetsart University)

This questionnaire consists of pairs of losses or damages to resources in Phangnga Bay. For each of these pairs, we want you to choose the one that you think is more important, not only to you and your family, but to the environment, the economic and social values of the community and the future of the area.

> For example, a pair of losses might be: **(1)** ***loss of 20% of sea turtles*** or **(2)** ***loss of 50% of sea turtles***. In this case, nearly all people would choose the 50% loss as being more important or more severe than the 20% loss.
>
> However, another pair might be: **(1)** ***loss of 50% of sea turtles*** or **(2)** ***loss of 50% of dugongs***. In this case, some people might feel that the loss of 50% of sea turtles is more important and others might feel that the loss of 50% of dugongs is more important.

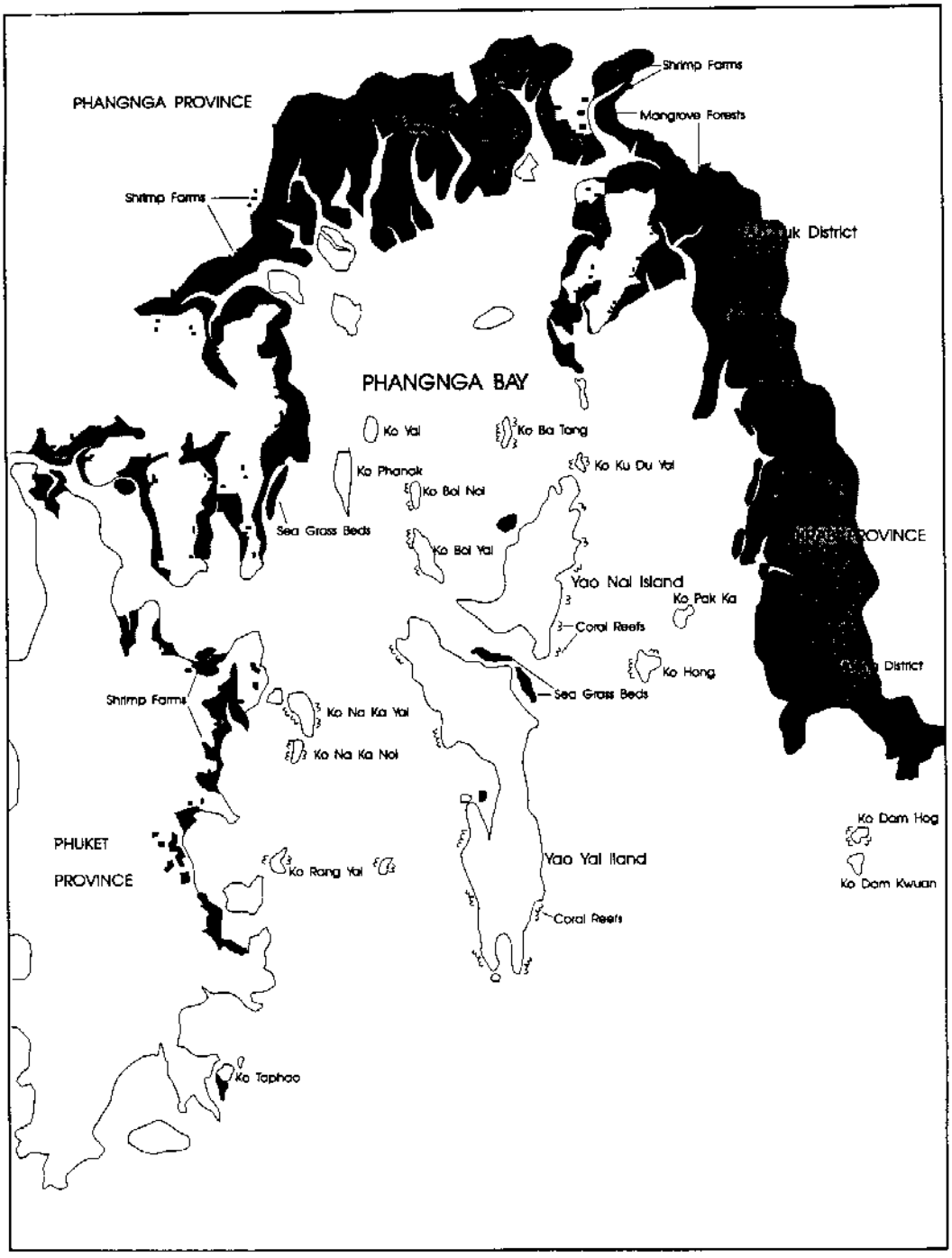
There are no right or wrong answers, the choices that you make should depend entirely on your own personal judgment of what you feel is more important.

Because the sampling design takes into account the level of familiarity with the resources of Phangnga Bay of every person we survey, it is important that you complete this questionnaire personally. Please do not ask others to complete the questionnaire even if you feel they may be more knowledgeable.

The questionnaire consists of FOUR parts which should be done in order from 1 to 4.

Boundary of study area

In this study, Phangnga Bay refers to the coastal areas in the east of Phuket Province, the inner bay area adjacent to Phangnga and Krabi Provinces. The coastal areas cover the land area to about 5 km from shoreline (landward direction), the interface between land and sea, and extend seaward to about 5 km.



Part 1

In **Part 1**, you will be given several pairs of specific losses. For each pair, you will select the loss you feel is more important. (Select one loss as more important even if you feel they are almost equally important.) All of these different losses would be the result of human activities, not natural causes. The affected resources would gradually recover, reaching their prior level, in a specified period of time.

In this part, you will compare different losses of:

1) Sandy beaches

Sandy beaches of Phangnga Bay provide recreational opportunities and natural beauty. Losses could result from pollution and coastal development.

2) Mangrove forests

There are 178,000 rai of mangrove forests in Krabi Province. About 3,500 rai are in economic zone B where tree cutting may be allowed. Mangrove forests of Phangnga Bay serve as nursery and feeding grounds for marine organisms including fish, shellfish, and crabs. They also help prevent coastal soil erosion and provide protection from storms. Damage to mangrove forests could be caused by pollution and coastal development, while loss to mangrove forests are a result of clear-cutting.

3) Seagrass beds

Seagrass beds of Phangnga Bay provide habitats for marine organisms including fish, shellfish, sea cucumber, shrimps and dugongs. Dugongs also depend on seagrass for food. Seagrass beds in Phangnga Bay are found around Ko Yao Yai, and along the northern coast of Muang Distrcit, Krabi Province, for example. Losses could result from pollution and sedimentation from coastal development.

4) Coral reefs

Coral reefs of Phangnga Bay provide habitats for marine organisms including fish and shellfish. They also provide recreational opportunities and natural beauty. Coral reefs in Phangnga Bay are found around Ko Hong, Ko Dam Hok and Ko Yao Noi, for example. Losses could result from pollution, sedimentation, boat anchoring, discarded fishing nets and tourists activities.

Table 1. Resources of Phangnga Bay and different levels of losses for comparisons in Part I

Resource	Level of losses	Level of productivity	Recovery period
Nopparat Thara Beach	1) partial damage 2) severe damage	1) number of visitors is reduced by half 2) no more visitors	1) 6 mo - 1 yr 2) 1 - 2 yrs
Mangrove forests	1) severe damage 2) loss (clear-cut)	1) reduced to almost nothing 2) no longer productive	1) 10 - 15 yrs 2) no recovery
Seagrass beds	1) partial damage 2) severe damage	1) reduced by half 2) reduced to almost nothing	1) 6 mo - 1 yr 2) 1 - 2 yrs
Coral reefs	1) partial damage 2) severe damage	1) reduced by half 2) reduced to almost nothing	1) 6 - 10 yrs 2) 12 - 15 yrs

Part 2

In **Part 2**, you will be given several pairs of specific losses. For each pair, you will select the loss you feel is more important. In each pair, one loss would be a resource loss, the other would be a one-time loss of money from you and every household in Ao Luk District and Muang District of Krabi Province, which are adjacent to Phangnga Bay.

The money lost to you and all of the other households would not be used to eliminate or reduce the resource loss and it would not be used for any purpose in Krabi Province or in Phangnga Bay area.

Table 2. Loss of resources and loss of money for comparisons in Part II

Resource	Level of losses	Amount of money (Baht)
Nopparat Thara Beach	1) Partial damage 2) Severe damage	1) 300 Baht 2) 700 Baht 3) 1,500 Baht 4) 3,000 Baht
Mangrove forests	1) Severe damage 2) Loss	1) 300 Baht 2) 700 Baht 3) 1,500 Baht 4) 3,000 Baht

Part 3

In **Part 3**, you will be given several pairs of specific activities that may take place in the coastal area of Krabi Province and may result in resource losses in Phangnga Bay. For each pair, first select the activity you feel is more important in terms of potential impacts on coastal resources of Phangnga Bay. Second, indicate the level of importance you attach to the selected activity.

The activities you will compare in this part are:

1) Black tiger shrimp farming

Black tiger shrimp farming in Phangnga Bay often takes place in the coastal area, involving conversion of deteriorated farm land and damaged forest areas, old rubber plantations and paddy fields. Shrimp farming is often in conflict with other coastal activities in terms of land use and freshwater consumption, and possible saltwater seepage from shrimp farms into surrounding land. Because of the lack of waste water treatment systems, effluent from the farms that is released to the sea might contain organic matters and chemicals that could have negative impacts on coastal water and coastal environments.

2) Hotel development

Many new hotels are being built along the shoreline in Krabi Province to support the rapid growth in tourism. Although hotels of more than 80 rooms are required to install waste water treatment systems, more hotels often result in greater pollution to the coastal water. Related tourist development may have further impacts on coastal resources.

3) Oil spills

The oil loading activity at the proposed deep sea port in Krabi Province could increase the chance of crude oil spills. About 10% of any spilled oil could be washed up on shore and damage mangrove forests, fish and shellfish habitats and pollute the beaches in Phangnga Bay.

Table 3. Coastal activity scenarios in Phangnga Bay for comparisons in Part III.

Activity	Size of operation	Waste water treatment	Clear-cutting of mangrove
Shrimp farming	1) 25 rai 2) 50 rai 3) 50 rai	1) No 2) No 3) No	1) No 2) No 3) Yes, 20 rai
Hotel development	1) 75 rooms 2) 75 room 3) 75 room	1) Yes 2) No 3) No	1) No 2) No 3) Yes, 20 rai
Crude oil spills	1) 20,000 litre 2) 200,000 litre	- -	- -

PB _____

Sample Only
(Actual total 29 pairs)

Set 1

Comparisons of loss or damage of coastal resources

Phangnga Bay

Which of the following losses or damages is greater? Answer by circling the letter A or B.

A	B
Partial damage to 4 sq. km. of coral reefs in Krabi Province, from the total area of 20 sq. km, causing a loss of about half of the live corals. Coral reefs can still serve as habitats for marine organisms, but their recreation opportunities and natural beauty are greatly reduced.	Partial damage to Had Nopparat Thara of Krabi Province, which is 3 km long, to the extent that visitors still come to the beach, but no longer walk around or swim in the water.

Which of the following losses or damages is greater? Answer by circling the letter A or B.

A	B
Partial damage to Had Nopparat Thara of Krabi Province, which is 3 km long, to the extent that visitors still come to the beach, but no longer walk around or swim in the water.	Damage to 50 rais, from the total of 3,500 rais of mangrove forests in economic zone B, in Krabi Province (mangrove forests are no longer suitable as nursery and feeding grounds, but still available for wood and forest products collection).

Which of the following losses or damages is greater? Answer by circling the letter A or B.

A	B
Severe damage to 2 sq. km. of seagrass beds in Phangnga Bay, from the total area of 10 sq.km., to the extent that they are no longer suitable as food or habitat, until they are recovered.	Severe damage to 4 sq. km. of coral reefs in Krabi Province, from the total area of 20 sq. km, causing a loss of almost all live corals. Coral reefs are no longer suitable as habitat for marine organisms and they also loss their recreational opportunities and natural beauty.