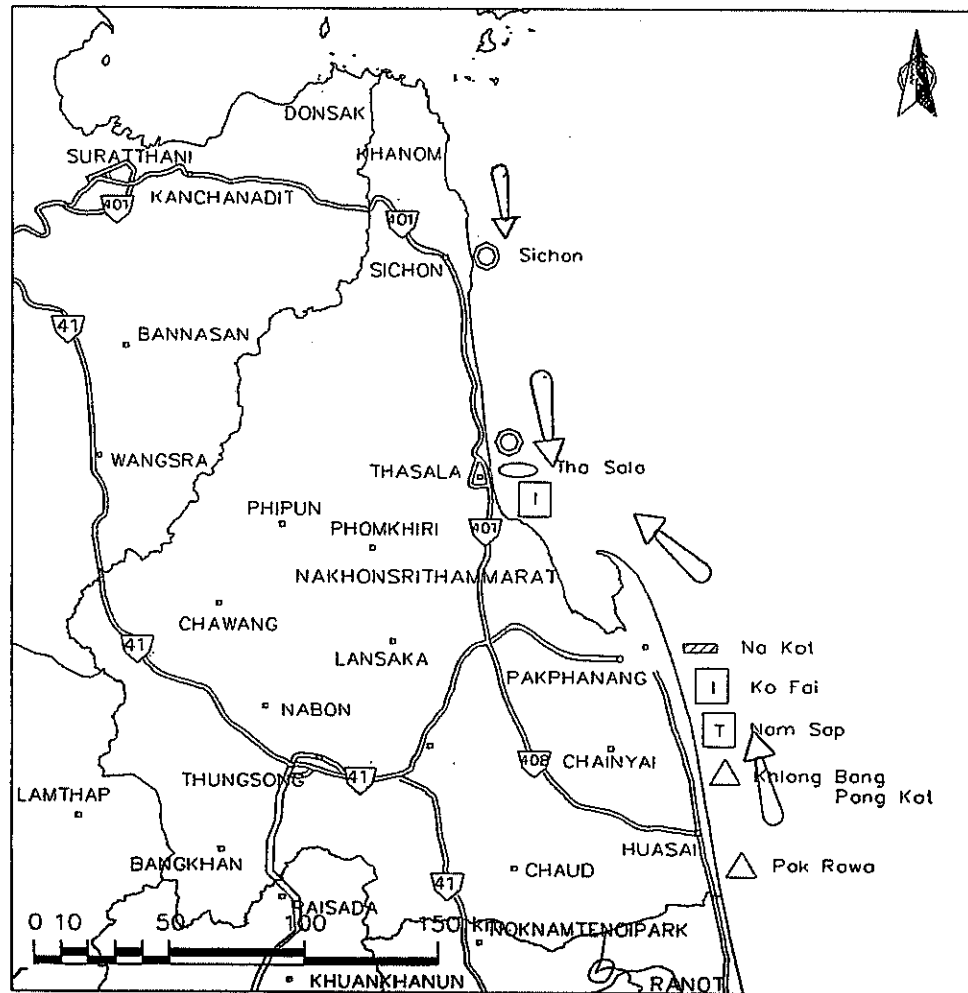


Chapter 3 Coastal Conditions in Study Area

3. Coastal Conditions in Study Area

3.1 Nakhon Si Thammarat Province

Structures for the coastal protection and structures related to the littoral drift in this province are shown in Figure 3.1-1.



[Legend]

- Jetty
- △ Training Jetty
- Groin (I-type & T-type)
- Detached Breakwater
- ▨ Revetment
- ← Longshore Transport

Figure 3.1-1 Coastal Protection Structures in Nakhon Si Thammarat Province

In Figure 3.1-1, the direction of longshore drift (which was estimated by the observation of the deposition and/or erosion states around coastal structures and of the present shoreline situation on the sites) is indicated by arrows.

3.1.1 Khanom District

Most of the coastal line in this district is composed of rocky capes and some sandy beaches. These sandy beaches are located between the capes. Therefore, the shoreline in this district is rather stable.

Khanom port is located at the river mouth of Khlong Ban Tha Chan between Khao Chai Son and Khao Phi Hai.

In the north part of the river mouth to the Khanom port, small parts of sandy beach are reported to be slightly eroded.

3.1.2 Sichon District

Sichon port with single jetty at the left side of the river mouth is located at the north of Laem Khao Kho Kwang and the right side of the river mouth is composed of rocks.

The littoral drift in this area is not seen to be serious except for the beach erosion in the north part of the existing jetty.

In the south part of Laem Khao Kho Kwang, there are several small fishing ports which are located at river mouths without jetty, such as Khlong Tung Ca (Thepha), Tha Mak in Sichon district and Pak Duat, Bang San in Tha Sala district.

The river mouths of these fishing ports are characterized by river-mouth closure. The channels to these fishing ports cannot be maintained without periodic dredging.

3.1.3 Tha Sala District

Pak Duat (at the boundary of Sichon district and Bang San) is located in this district as mentioned above.

Tha Sala port with long dual jetties is situated at the southern part of this district. Four detached breakwaters and ten groins (I-type) are constructed in the south part of the jetties to protect the shoreline. The area further south is not protected by groin and is seriously eroded.

This area is specially noted as one of the most seriously eroded areas in the study area. The predominant observed direction of longshore sand drift is to the south.

Coastal sediments in the southern area from Ban Sa Bua (2) village are composed of mud.

3.1.4 Muang Nakhon Si Thammarat District

There is no coastal structure in this district except Pak Nakhon fishing port.

The distribution of coastal sand is limited to the left side of Khlong Tha Pha (Pak Phun) river-mouth judging from the aerial photos taken during this study. The south part of this point is covered with mangroves.

3.1.5 Pak Phanang District

The coastal area of this district is characterized by mangrove area in Pak Phanang bay and long sandy beach in the outer sea, Gulf of Thailand.

From view point of littoral drift, Laem Talumphuk area at the end of the cape and Ko Fai to Nam Sap area in the southern part of this district are of great interest.

Laem Talumphuk area is observed to be eroded to a fair extent.

Ko Fai to Nam Sap area is one of the most seriously eroded areas in the Study area. Many kinds of shore protection facilities such as revetment, four I-type groins, 19 T-type groins and training jetty are constructed over five km in this area. However, the beach north of the extreme northern groin is seriously eroded.

The predominant direction of longshore sand drift is observed to the north in this area.

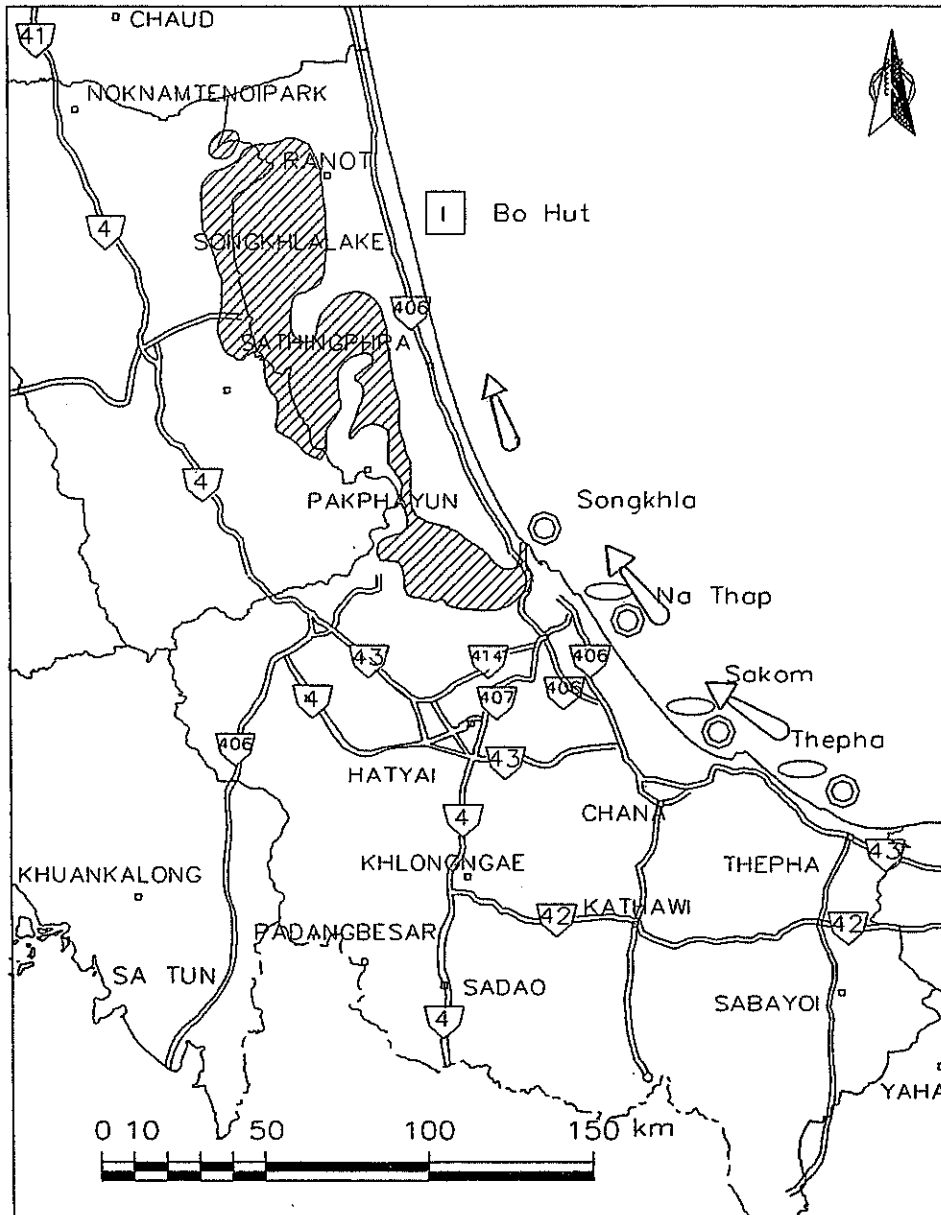
3.1.6 Hua Sai District

As shoreline protection facility, only a small training jetty is seen at Pak Rawa in the southern part of this district.

This area was also observed to be eroded to a fair extent during the site survey.

3.2 Songkhla Province

Structures for the coastal protection and structures related to the littoral drift in this province are shown in Figure 3.2-1, where the estimated direction of longshore drift is also shown.



[Legend]

- Jetty
- Groin (I-type)
- ◌ Detached Breakwater
- ← Longshore Transport

Figure 3.2-1 Coastal Protection Structures in Songkhla Province

3.2.1 Ranot District and Sathing Phra District

No shoreline protection facility is seen in this area extending over 70 km except a small training jetty at Phang Sai in Ranot district. There are many pumping station jetties for seawater and fishing port jetties.

The tendency of littoral drift was observed to the north in this area.

3.2.2 Singha Nakhon District

In this district, Thammasathan Hat Sai Kaeo located at the north part of the left side jetty (breakwater) of Songkhla port is particularly noted as one of the most seriously eroded area in the Study area.

The predominant direction of longshore sand drift in this area is observed to the north.

3.2.3 Muang Songkhla District

Songkhla port with dual jetties is located in this district. From viewpoint of littoral drift, Two famous and attractive beaches of Hat Samilla and Hat Kao Seng are situated in this area.

The Samilla beach seems rather stable. On the other hand, Kao Seng beach is slightly eroded especially at the southern extreme end near Ban Kao Seng.

3.2.4 Chana District

The two ports of Na Thap and Sakom are situated in this district. Na Thap port with dual jetties is accompanied by four detached breakwaters in the north side of the jetties. While tombolo phenomena were seen in the detached breakwaters, erosion was recognized in the northern part after detached breakwaters.

Sakom port has also dual jetties and is accompanied by four detached breakwaters in the west side of the jetties. Detached breakwaters in this area show slight effects of erosion. Erosion area extends to the western part after detached breakwaters.

The predominant direction of longshore sand drift in this area was clearly observed to the northwest.

3.2.5 Thepha District

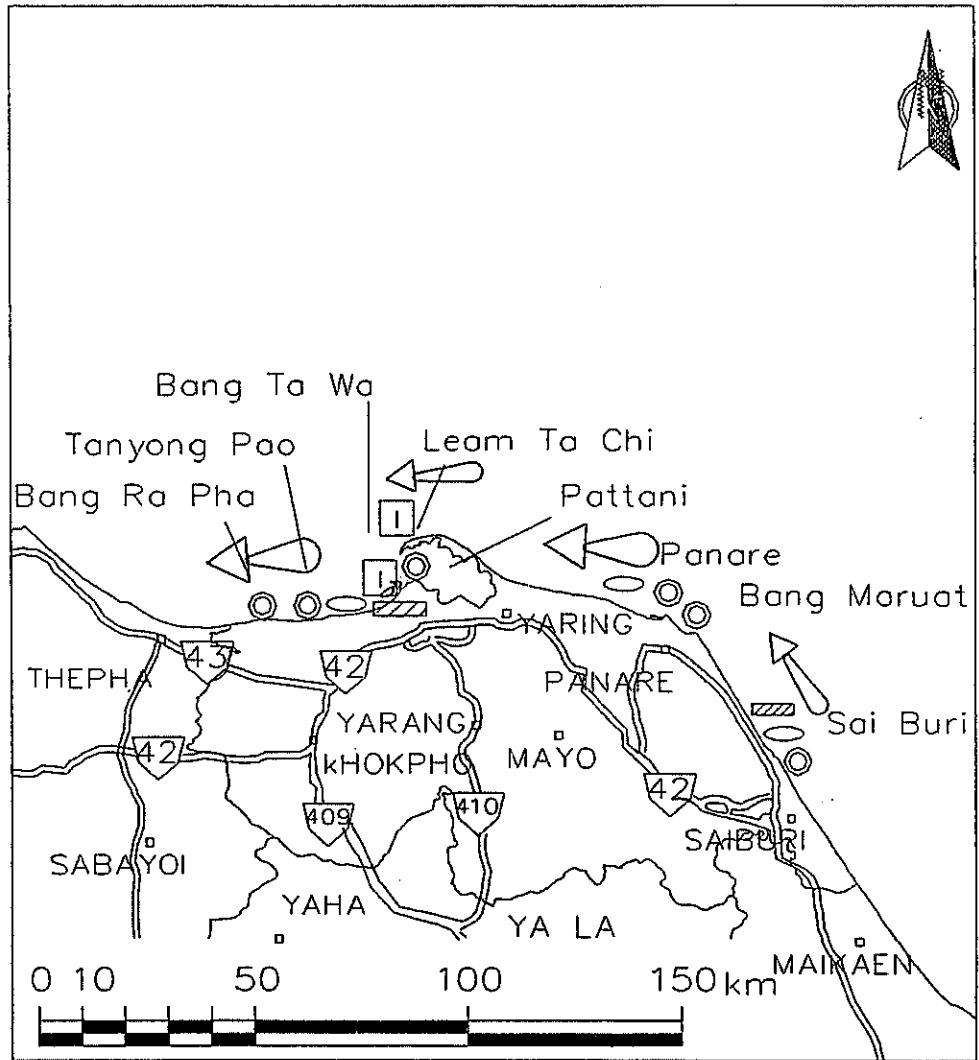
Thepha port in this district has dual jetties being accompanied by five detached breakwaters in the west side of the jetties. Detached breakwaters are effective and make tombolo.

The erosion area extended to the western part after detached breakwaters, the same erosion pattern as described on Na Thap and Sakom ports.

The predominant direction of longshore sand drift in this area was also observed to the west.

3.3 Pattani Province

Structures for the coastal protection and structures related to the littoral drift as well as estimated direction of longshore drift in this province are shown in Figure 3.3-1.



[Legend]

- Jetty
- Groin (I-type)
- Detached Breakwater
- ▨ Revetment
- ← Longshore Transport

Figure 3.3-1 Coastal Protection Structures in Pattani Province

3.3.1 Nong Chik District

Bang Ra Pha, Tanyong Pao and Bang Ta Wa ports are located in this district. Among these ports, Bang Ra Pha port and Tanyong Pao port have dual jetties. Bang Ta Wa port is protected by revetment and groins.

Bang Ra Pha port and Tanyong Pao port were newly constructed in 1999 by HD. However, on the beach right of the jetties, drift sand is deposited, almost to the extreme end of the east jetty in Bang Ra Pha. This means that the rate of littoral transport is very high and the predominant direction of littoral drift is clearly to the west.

On the other hand, a large amount of erosion is observed on both sides of Bang Ta Wa port, which does not have any jetty. In addition, the river-mouth area of Khlong Sai Mo at a distance of 4 km to the west from Bang Ta Wa is seriously eroded.

From view point of littoral drift, the extreme eastern end of sandy shore on the Pattani Bay is of great interest. The limit of sandy shore was found at the most eastern groin located near the irrigation canal.

3.3.2 Muang Pattani District

Pattani port with single jetty, accompanied by port facilities, is located on the river-mouth of Mae Nam Pattani in this district.

Seabed materials in this area are composed of mud, and the sea conditions are calm because of the sheltered area of a big cape, Laem Ta Chi.

The bottom materials in the river-mouth of Ban Ru Sa Mi Lae was mud as determined by site survey.

3.3.3 Yaring District

The coastal area of this district is divided into two areas: one is a mangrove area in the interior part of Pattani bay and the other is a large sand bank in offshore Pattani. Laem Ta Chi is located at the end of the sand bank.

Throughout the cape, the tendency of erosion is recognized and the predominant direction of longshore sand drift in this area is observed toward the west.

3.3.4 Panare District

Panare port and Bang Maruat port are located in this district. Both ports have dual jetties and were newly completed in July 2001. Panare and Bang Maruat ports are accompanied by four and three detached breakwaters, respectively. These two ports exist only 4 km apart.

As seen at many places, erosion area in Panare port extends to the western part beyond detached breakwaters. On the beach right of the southeast jetty, drift sand was deposited almost to the extreme end of the southeast jetty, when the port was under construction in May 2001. This means that the rate of littoral transport is very big and the predominant direction of littoral drift is clearly to the west in this area.

3.3.5 Sai Buri District

The erosion pattern in Sai Buri port, having dual jetties and three detached breakwaters (headlands) in the left side of the jetties, shows the same tendency as mentioned for Panare port.

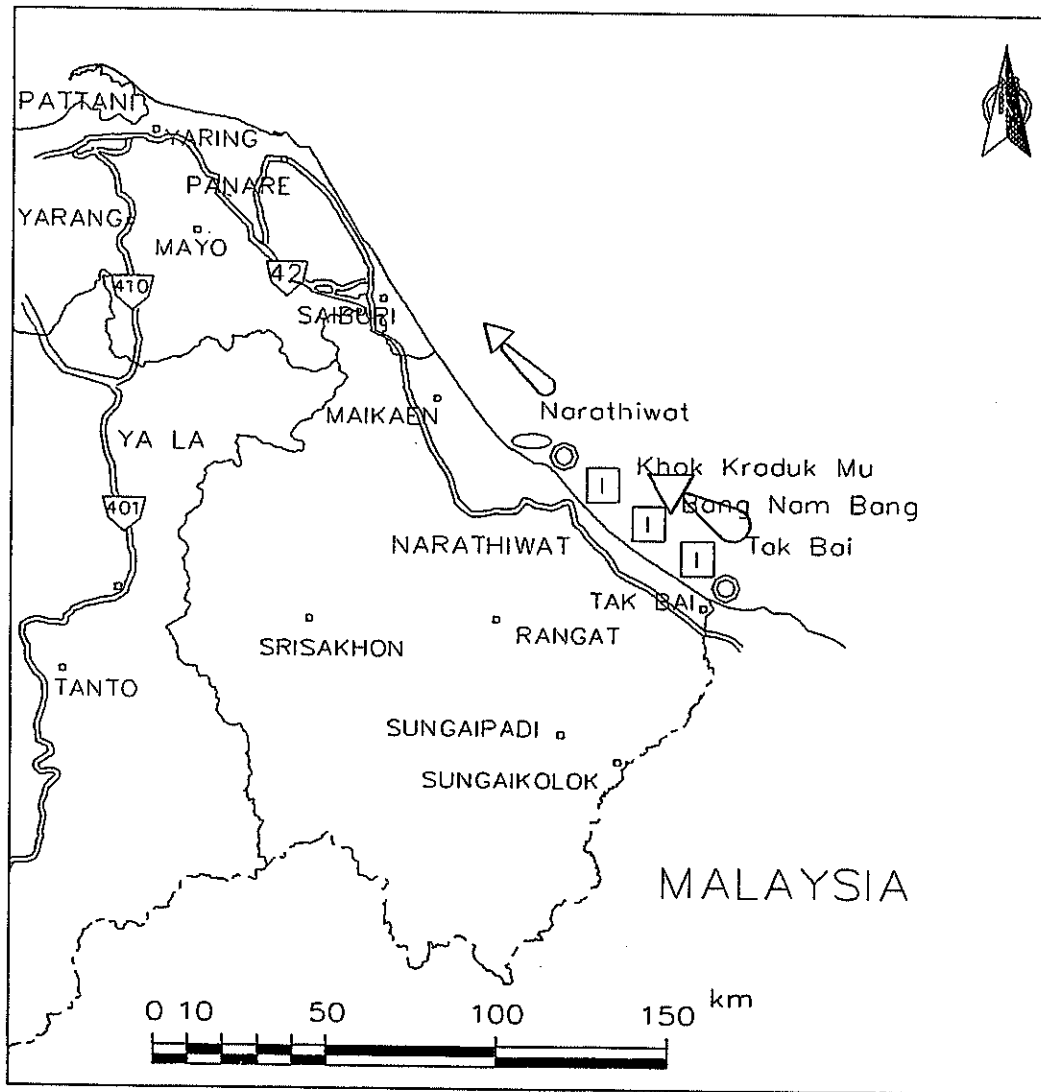
In Sai Buri port, the beach is protected with revetment where detached breakwaters are not provided. Further to the northwest, where no revetment is provided, the beach extensively eroded.

On the other hand, the deposition at the beach southeast to the southeast jetty is not much when compared with Panare port.

The predominant direction of littoral drift is to the west in this area.

3.4 Narathiwat Province

Structures for the coastal protection, structures related to the littoral drift and estimated direction of longshore drift in this province are shown in Figure 3.4-1.



【Legend】

- ⊙ Jetty
- Groin (I-type)
- Headlands
- ← Longshore Transport

Figure 3.4-1 Coastal Protection Structures in Narathiwat Province

3.4.1 Muang Narathiwat District

Narathiwat port with dual jetties being accompanied by four headlands (T-type groins) in the left side, i.e. northwest side, is situated in this district.

The pattern of deposition and erosion area in Narathiwat coast is the same as at Sai Buri. The eroded area extends to the northwestern part beyond headlands, and drift sand is deposited on the beach to the right of the jetties. However, the amount of erosion and deposition is not significant when compared with other ports. This is due to the location of the port which is situated north close to the cape, Khao Tanyong.

The predominant direction of littoral drift is clearly to the west in this area.

3.4.2 Tak Bai District

Tak Bai district is in the extreme south of the Study area and adjoins Malaysia through Mae Nam Kolok. At the river-mouth of Mae Nam Kolok, there are two large jetties: one is in the Thai side and the other in the Malaysian side.

In this district, a series of I-type groins protects the coastal line extending over about 20 km. The groins start from the jetty at the river-mouth of Mae Nam Kolok extending to the northwest and end at almost Khlong Nam Beng.

On the coast where groins are provided, more deposition of sands is observed at the right (east) side of the groin than at the left (west) side. This means that the predominant direction of littoral drift is to the west in this area.

3.5 Summary of Coastal Structure

Coastal structures such as training jetty, jetty, groin and detached breakwater along the Study area are summarized in Table 3-1 and Figure 3-1. These coastal structures can be divided into five types as follows:

- (1) Port/Harbor Facility
- (2) Fishing Port Jetty
- (3) Transportation Jetty (private company)
- (4) Seawater Pumping Station (Jetty)
- (5) Shore Protection Facility (Groin, Detached Breakwater)

Table 3.5-1 Coastal Structures in the Study Area

Province	District	Name of Port/Area	Type of Structure	Remarks	
1. Nakhon Si Thammarat	1) Khanom	1. Khanom Port	Port Facility	2	
		2. Laem Kho Khao	Transport Jetties		
	2) Sichon	3. Sichon Port	Single Jetty	Pumping Station	
		4. Laem Khao Kho Kwang			
	3) Tha Sala	5. Khian Dam	Transport Jetty	Dual Jetties Detached Breakwaters Groins	old
		6. Tha Sala Port			4 10-I-type
4) Muang Nakhon Si Thammarat		7. Pak Nakhon Port	Port Facility	fishing	
5) Pak Phanang		8. Pak Phanang Port	Port Facility	Fishing	
		9. W. Chai Thale	Fishing Jetty		
		10. Na Kot	Revetment		
11. Ko Fai	Nam Sap		Groins	4-I-type	
			Groins	19-T-type	
12. Khlong Bang Pang Kat			Training Jetty		
6) Hua Sai		13. Na San	Fishing Jetty		
		14. Phraek Muang	Pumping Station		
		15. Pak Rawa	Training Jetty		

Province	District	Name of Port/Area	Type of Structure	Remarks	
2. Songkhla	1) Ranot	16. Hua Khung	Pumping Stations	2	
		17. Samrong Chae	Pumping Stations	3	
		18. Bo Hut	Fishing Jetty Groin	small	
	2) Sathing Phra	19. Sanam Chai 20. Phang Sai	Fishing Jetty Fishing Jetty		
	3) Singha Nakhon	21. Su Rao	Fishing Jetty		
	4) Muang Songkhla	22. Songkhla Port 23. Ok Khao 24. Thung Yai	Dual Jetties (Jetty & Breakwater) Pumping Stations Transport Jetty	3	
5) Chana	25. Na Thap Port 26. Sakom Port	Dual Jetties Detached Breakwaters	4		
		Dual Jetties Detached Breakwaters	4		
6) Thepha	27. Thepha Port	Dual Jetties Detached Breakwaters	5		
3. Pattani	1) Nong Chik	28. Bang Ra Pha 29. Tanyong Pao 30. Bang Ta Wa	Dual Jetties Dual Jetties Revetment Groins	8-I-type	
		2) Muang Pattani	31. Pattani Port 32. Tanyong Lu Lo	Dual Jetties Fishing Jetty	
		3) Yaring	33. Laem Ta Chi 34. Da To	Jetty Pumping Stations	2
	4) Panare	35. Panare Port	Dual Jetties Detached Breakwaters	4	
		36. Bang Maruat	Dual Jetties Detached Breakwaters	3	
5) Sai Buri	37. Sai Buri Port	Dual Jetties Detached Breakwaters Revetment	3		
4. Narathiwat	1) Muang Narathiwat	38. Narathiwat Port	Dual Jetties Headlands (T-type Groins)	4	
	2) Tak Bai	39. Tak Bai Beach	Groins	22-I-type	
		40. Mae Nam Kolok	Jetties		

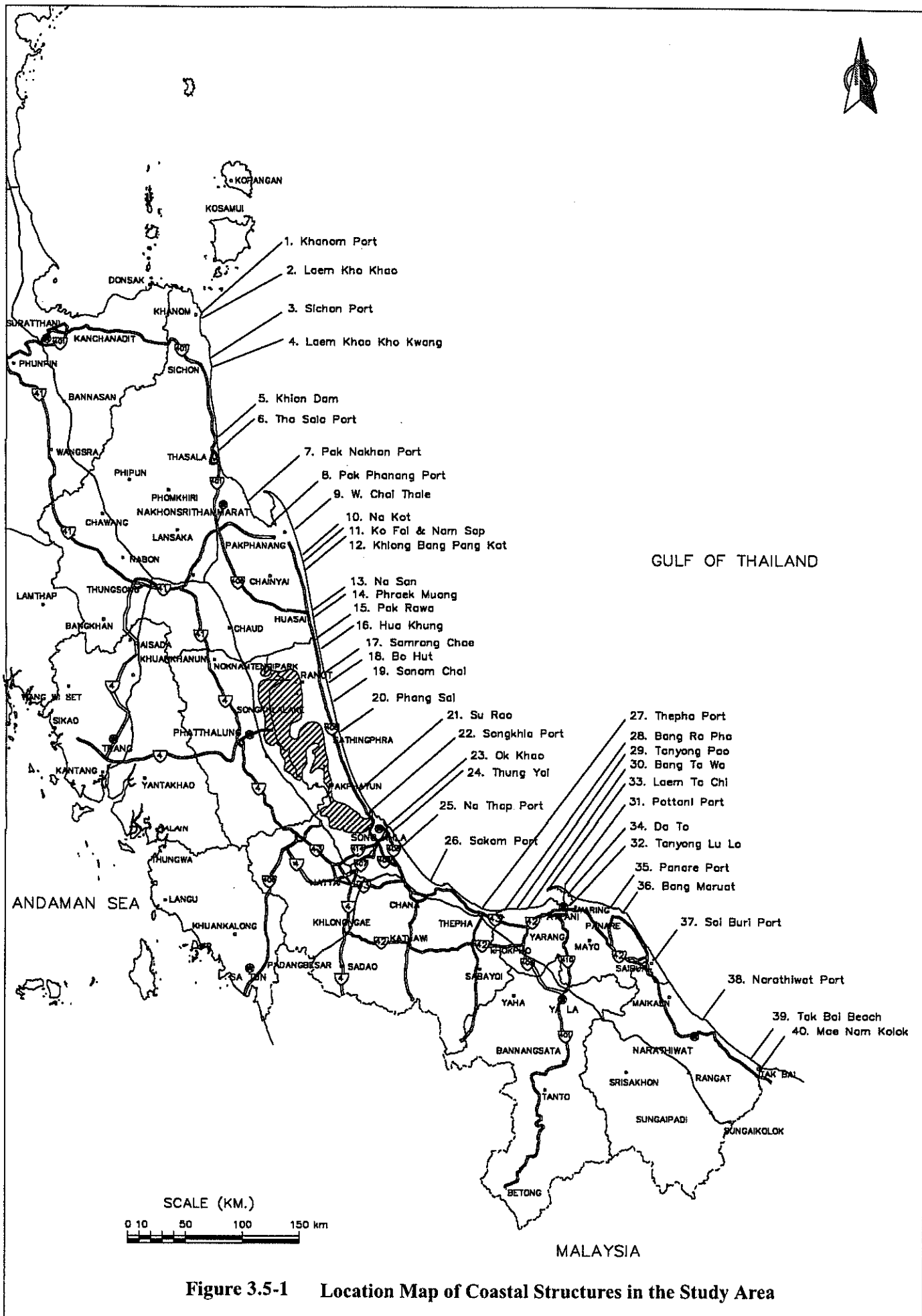


Figure 3.5-1 Location Map of Coastal Structures in the Study Area