



**Establishment and Operation of a Regional System of  
Fisheries *Refugia* in the South China Sea and Gulf of Thailand**

## **FISHERIES REFUGIA PROFILE AND LANDING SITE IN KEP PROVINCE**



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Environment



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## ABBREVIATION

ADB	Asian Development Bank
ADB GMS	Asian Development Bank Great Mekong Subregion
BSC	Blue Swimming Crab
CFi	Community Fisheries
CORIN	Coastal Resource Institute
DANIDA	Danish Agency for International Development
DFC	Department of Fisheries Conservation
DOE	Department of Environment
DOT	Department of Tourism
EEZ	Exclusive Economic Zones
FAO	Food and Agriculture Organization of United Nations
FFI	Fauna and Flora International
FiA	Fisheries Administration
FiAC	Fisheries Administration Cantonment
GDP	Gross Domestic Products
GEF	Global Environment Facility
HP	Horsepower
IUCN	International Union for Conservation of Nature
IUU	Illegal Unreported and Unregistered
ICM	Integrated Coastal Management
MAFF	Ministry of Agriculture, Forestry and Fisheries
MCC	Marine Conservation Cambodia
MFF	Mangroves for the Future
MFMA	Marine Fisheries Management Area
MOE	Ministry of Environment
MOP	Ministry of Planning
MOWA	Ministry of Women's Affairs
NCDM	National Committee for Coastal Development and Management
NGOs	Non-Government Organizations
NSDP	National Strategic Development Plan
SEAFDEC	Southeast Asian Fisheries Development Center
SPF	Strategic Plan for Fisheries
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme

## 1. Background of Fisheries Refugia Sites

### 1.1 Geographical Features in Kep province

Kep province is a province in southern part of Cambodia and is bordering to north with Kampot and South with Gulf of Thailand and Vietnam. This province is the distant of 175km from Phnom Penh with total land areas of 158.63km<sup>2</sup>, in which has 2 districts, 5 communes, and 18 villages. The province covers the coastline area of 26km and has 13 islands such as Koh Po, Koh Svay Prey, Koh Hal Trey, Koh Mac Prang, Koh Ach Ses, Koh Ang Krong, Koh Snguath, Koh Ton Say, Koh Kok, Koh Mtes, Koh kbal, and Koh Karang based on 5 year-provincial development plan (See Figure 1).

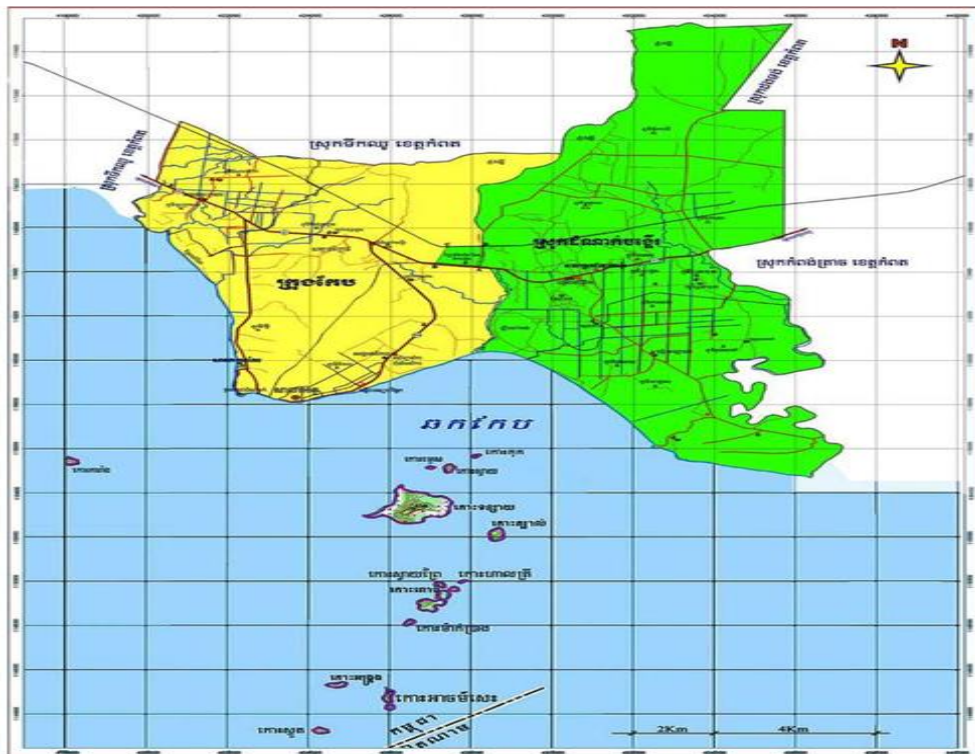


Figure 1: Administration Map of Kep province

Kep province is also abundant of biodiversity such as coral reef, sea grass and mangrove forest, providing a main home of marine animal and fish species living and spawning. For example, some species are found in Kep province such as Dolphin, Dugong, Sea Horse, Marine Turtle, Giant Mussel, and Giant Claim. According to MCC's research, 30-40 Dolphins are occurring in Koh Po and Koh Ton Say Archipelago.

The coastline of Kep province consist predominantly of rocky outcrop and short steep sandy beaches that show sign of mild erosion and in several stretches are protected by seawalls or natural protection in the form of rocky shoreline (MoE, 2014). The sea water depth in Kep is shallow, no more than 10 meters, providing the presence of mangroves, seagrass, and coral (FiA, 2019)

Moreover, the Kep is productive province of marine fish, contributing about 4% to the total marine fish production in the whole country in 2019.

### 1.2 Population

According to the population census report in 2019, the total population of Cambodia in 2019 is 15,288,489 individual (3,341,770 household) including the population living in coastal areas have a population of 1,061,148 which equals to 6.9% (Ministry of Planning, 2019). Annual population growth rate in the whole country over this period comes to 1.2% meanwhile people living in the coastal area are in the growth rate of 0.9%. In contrast, the annual population growth rate in Kep province is higher than in coastal area and the whole country, that account for 1.4% (Table 1).

As for Kep province, it is the total people of 41798 in 2019 which equals to 0.27% of the total people in the whole country according to population census report, 2019, and the province is 41798 households including 21,183 females and 20,615 males. Moreover, population census in 2019 showed that the size of household in average in Kep province is 4.5 when the average size of household in the whole country is around 4.6 (Table 1).

Table 1: Population Statistic in Kep province in 2019

No.	Description	Number of People
1	The number of Households	9,347 household
2	The number of Total People	41798 individual
3	The number of Female	21183 individual
4	The number of Male	20615 individual
5	The size of Household	4.5 individual/household
6	Annual population grow rate	1.4%

Source: the Ministry of Planning, 2019

### 1.3 Socio economic Aspect

#### 1.3.1 Economic Aspect:

Kep is a province that is a potential for tourism and agriculture sectors contributing to provincial economic development, especially enhancing to local livelihood in the province. In the present, the most of people made their business depending on natural resources such as fishing, providing services, producing salt farm, and rice field. 85.20% of people are dependent on the agriculture sector according 5-year provincial development plan.

##### 1.3.1.1 Tourism Sector

Tourism field in Kep province become natural tourism area and is attractive national and international tourists to visit green sea water along beach and islands. This sector contributed to providing more jobs, increasing incomes, and promoting the living of people. In 2014, the province received the national and international visitors of 761,206 based on the 5 year-provincial development plan. In addition, the Royal Government of Cambodia supported and approved some development companies to invest islands and beach such as Tonsay Island, Ang Kor beach, and Pon Mountain, to promote tourism sector and attract more and more visitors.

##### 1.3.1.2 Agriculture Sector

The province paid attention for agriculture field that is catalysis assisting the provincial economic growth, through doing rice field, crops, aquaculture, raising livestock, fishing, collecting Non Timber Forest Product. According to 5 year- Provincial Development Plan, majority of people occupied doing rice field (76.31%), followed fishing (3.23%) and the rest of them are cropping (3%), vegetable (0.22%), livestock (1.9%), and Non Timber Forest Product collecting (0.51%).

##### 1.3.1.3 Business and Service Sector

Business plays main roles in providing additional jobs, increasing incomes, and reducing poverty of people in the province, especially promoting the provincial economic growth. At the

present, investment on the business and service sectors are increasing and remarkable such as the construction of resorts, hotels, quest houses, restaurant, transport, and so on.

#### **1.3.1.4 Industrial and Handcraft Sector**

This sector greatly contributed to the provincial economic growth, especially creating more jobs to people and enhancing living standard of people in the province. According to 5 year-provincial development plan, salt farm in the province has 22 sodality groups occupying the total land areas of 1032ha in 2014, which can produce salts in 24,709 ton/year. This yield can deteriorate if there is rainfall and wet season prolong.

#### **1.3.2 Social Aspect**

The province paid attention for social affairs that are core jobs of the province in compliance with the Royal Government of Cambodia. The poverty situation in the province declined gradually from 18.53% in 2011 to 15.66% in 2014 based on 5-year provincial development plan.

##### **1.3.2.1 Education Situation**

Educational sector is prime jobs for the province that is needed to attend and find all ways to enhance educational quality and effectiveness in order to achieve the national plan on education for all. According to 5 year provincial development plan, the Kep province has 28 schools in the whole province, including two high schools (total students of 1604-842 female students), 4 secondary primary schools (total students of 1045-520 female students), and 22 primary schools (total students of 4906- 2314 female students). Regarding teachers, the province is limited. In 2014, 290 teachers taught students at primary school, 108 teachers at secondary primary school, and 144 teachers at high school.

##### **1.3.2.2 Health Situation**

Kep province has the health department, center, clinic, state and private pharmacies, which contributing to maintaining human health in the province, however these are limited to serve health services to people, both materials, budgets, and human resources. In 2014, there were four health centers and one health department.

##### **1.3.2.3 Gender and Vulnerability**

In the Kep province, gender was enhanced and mainstreamed into provincial structure at district, commune, and village level in term of gender equity. The province paid attention in promoting women and participated in making decision at their entity. At the present, woman is promoted as district governor as well. Besides, women also participated actively in building the development plan at local level, curbing family violation, women and child traffics. Although, women capacity in the province was limited in extension related to new crime code, the law on women and child traffics and on family violation curbing, as well as protection affaires of vulnerable people and other legislations to be limited, the province organized many training courses related to above mentioned subjects to upgrade women knowledge.

## **2. Importance of Coastal Fisheries Habitats**

Coastal and marine habitats in the Kep province are considered as marine ecological system, providing the refuge of animal and fish species for feeding, nursing, and spawning, and leading the plenty of biodiversity species such as green turtles, dolphins, sharks, coral reefs and seagrasses, mangroves, groupers, shrimps, tortoises (endangered and rare species) and dugongs (UNEP, 2005). The coastal and marine ecosystems including mangrove forests, coral reefs, seagrass beds, salt marshes and estuaries are extremely important to provincial economic development as well as local people.







## 2.2 Coral Reef

Monica Reed *et al*, 2015 showed that coral reefs are complex, highly productive and biologically diverse ecosystems. UNEP, 2008 cited that coral reefs are an important marine ecosystem and habitat that provide nurseries and breeding grounds for coral reef associated species and some pelagic and migratory species. In term of coral reef species, Jan-Willem van Bochove *et al*, 2011 showed survey report in Koh Rong, Koh Kon, and Koh Touch, Preah Sihanouk province that the majority species are *Porites massive* (56.1%), followed *Diploastrea heliopora* 13.2%, *Pavona decussate* 4%.

Jan-Willem van Bochove *et al*, 2011 reported that the reef areas of 28 km<sup>2</sup> were estimated by the Government of Cambodia and 150km<sup>2</sup> estimated by global. Total area of coral reef in coastal sites was observed to cover 2800ha (FiA, 2010), including Kep province covered 52.5 ha and those areas of coral in Kep were found in kep archipelago, especially at Koh Po, Koh Ses, Koh Kbal, and Koh Svay Prey (FiA, 2005). Generally, coral reef in Kep province is covered with dusts mixed with sand because of shallow water caused by trawler activities.

According to UNEP, 2008, threats and damage to coral reefs were seen due to overfishing, destruction fishing, sedimentation, population (Eutrophication), coral breaching.

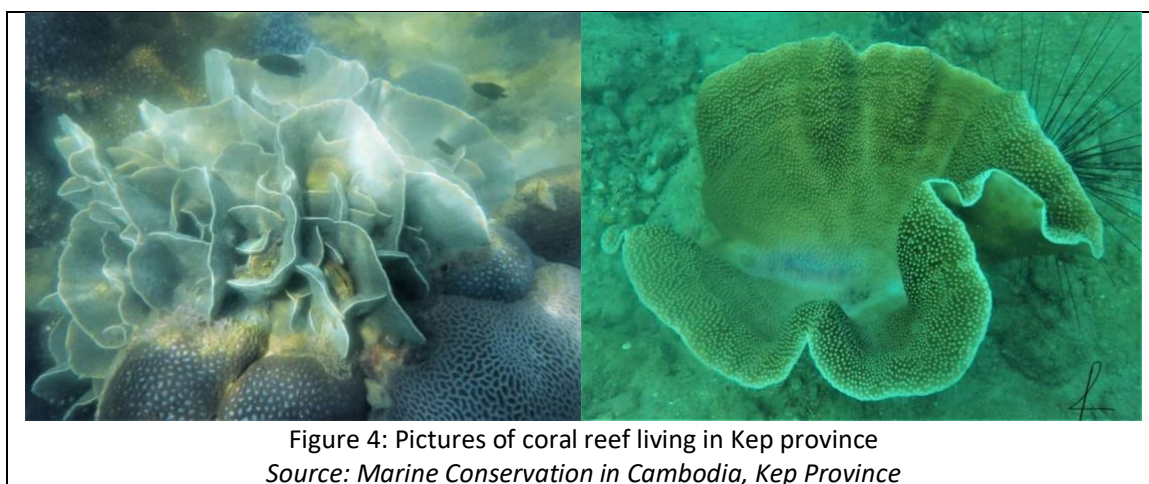


Figure 4: Pictures of coral reef living in Kep province  
Source: *Marine Conservation in Cambodia, Kep Province*

## 2.3 Seagrass

Sea grass meadows are among the most diverse and highly productive coastal ecosystems in the world (Duarte *et al*. 2004). Monica Reed *et al*, 2015 cited sea grasses play an important role in the general health of the surrounding sea, and function as a habitat for many different species due to their ability to produce a huge amount of biomass out of solar energy. Seagrass beds are a crucial habitat for the larval stage of the blue swimmer crab, and are also consumed as director food source by a few species such as fish, dugongs, sea turtles and marine birds (Monica Reed *et al*, 2015).

According to Ouk Vibol, 2008, seagrass beds typically occur in water depths of 3 to 4m, with salinity ranging from 25ppt to 30ppt, and most seagrass areas have been damaged by trawl and push net fishing. The nine species of seagrass were found in Cambodia, including *Thalassia hemprichii*, *Halodule uninervis*, *Enhalus acoroides*, *Halophila decipiens*, *Cymodocea serrulata*, *Halodule pinifolia*, *Cymodocea rotundata*, *Syringodium isoetifolium*, and *Halophila ovalis*.

Total area of seagrass was estimated to cover 30000ha (10 year- Strategy Plan for Fisheries Conservation, 2019), including Kep province covered 2790ha. Those areas of seagrass in Kep province are mostly located around the islands of Koh Tonsay, Koh Ses, Koh Por and Koh Kbal. Chab Sophana, 2019 reported 1005 ha of seagrass are under managed by O Krasar community fisheries (170 ha), Kep community fisheries (120 ha), Angkoal community fisheries (115 ha), and

Seagrass Protected Area in Kep (600 ha), which supported budgets from UNDP and DANIDA. However, some areas of sea grass are not estimated in Marine Fisheries Management Area in Kep province, Department of Fisheries Conservation/FiA collaborating with MCC and Kep Fisheries Administration Cantonment will plan to assess the areas of seagrass in this place and other sites.



Figure 5: Picture of sea grass living in Kep province  
Source: Marine Conservation in Cambodia, Kep Province

### 3. Capacity of Fishing Operation in Kep Province

#### 3.1 Fishing vessels

Figure 6 showed that the number of fishing vessel in Kep province are observed to increase nearly treble from 2015 to 2020 (FiA, 2015-2020), including 213 vessels in 2015 to 594 vessels in 2020. Although the quantity of fishing vessel in Kep is observed to be lower than two times if compared with Kampot province (1038 vessels) and six times if compared with Koh Kong province (3396 vessels) in 2020 (FiA, 2020) because Kep province cover the coastlines area of 26km meanwhile Kampot province cover 67km and Koh Kong province cover 237km.

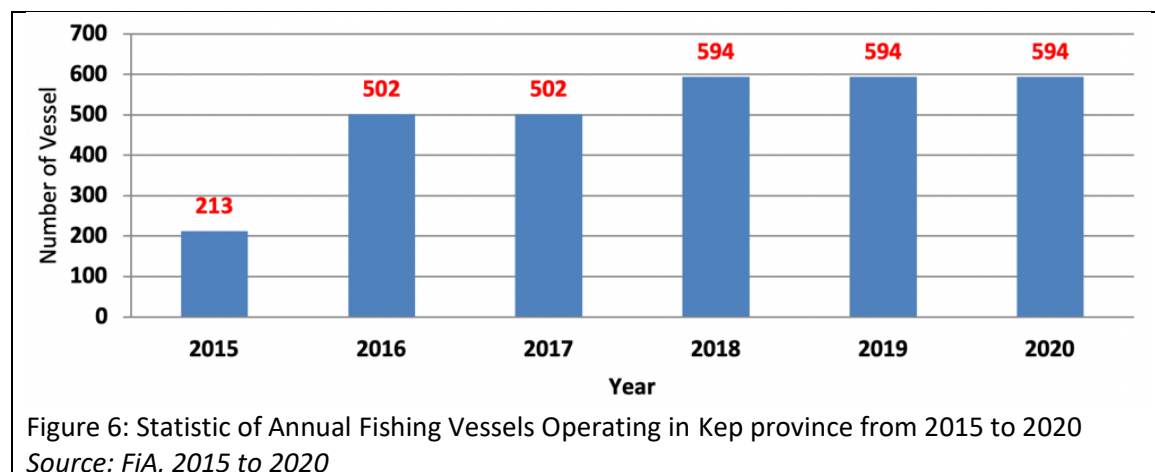


Figure 6: Statistic of Annual Fishing Vessels Operating in Kep province from 2015 to 2020  
Source: FiA, 2015 to 2020

#### 3.2 Length of Fishing Vessel

Fishing vessel length in Kep province was classified into two categories, including 12m - <18 (304 vessel) and 6 - <12 m (290 vessel) as showed in Table 2

Table 2: Classification of Fishing Vessel by the Length Operating in Kep province in 2018

No.	Classification of the Length of Fishing Vessel	Number of Vessels (N=594)	Percentage (%)
1	6- <12	290	48.82
2	12- <18	304	51.18

Total	594	100
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Source: FiA, 2020

### 3.3 Engine Power of Fishing Vessel

Table 3 showed the fishing vessel engine power in Kep province was classified into two categories, including less than 50hp and 50-90hp. The nearly 100% of fishing vessels operated in the range of <50hp (589 vessel) and 0.84% of vessel practiced in the range of 50-90hp (5 vessel). This figure showed that fishing activities in Kep province is mostly observed to fish inshore areas.

Table 3: Classification of Fishing Vessel by the Engine Power Operating in Kep province in 2018

No.	Classification of the Engine Power of Fishing Vessel	Number of Vessels (N=594)	Percentage (%)
1	< 50 hp	589	99.16
2	50 - 90 hp	5	0.84
Total		594	100

Source: FiA, 2020

### 3.4 Number of Fishermen Per Fishing Vessel

Table 4 showed the number of fishermen operating in fishing vessels ranged from one person to 10 people, the highest percentage (88.721%) of fishing vessel practiced in ranged of 2-5 persons (527 person) meanwhile 10.94% of fishing vessel operated in one person. However, the lowest percentage of fishing vessels practiced in the range of 6-10people and more than 10 people in each 0.17%, respectively.

Table 4: Distribution of Fishermen Number Operating/Fishing Vessel in Kep province in 2018

No.	Number of Fishermen Operating/Fishing Vessel	Number of Fishing Vessel	Percentage (%)
1	1	65	10.94
2	2-5	527	88.72
3	6-10	1	0.17
4	>10	1	0.17
Total		594	100

Source: FiA, 2020

### 3.5 Types of Principal Fishing Gear Used

Fishing gears used in Cambodian's sea water has been divided into small scale and middle scale based on the MAFF's proclamation on setting the types of fishing gears operated in Cambodia dated 29 June 2015. Middle scale fisheries refer to those fishing activities, which have high efficient fishing gears and have capacity to fish offshore and inshore using varieties of gear types, with exception of trawling in inshore water (Seafdec, 2007). Those fishing gears required to pay tax. After the government declared to reform fisheries sector in 2000, middle scale fishing gears did not pay tax for inland fisheries, but marine capture fisheries are required to pay tax as usual (SEAFDEC/UNEP/GEF, 2014).

Small-scale fisheries are those utilizing traditional and/or passive fishing gear, non-power boats, or power boats with a capacity lower than 5 HP. Generally, these fisheries operate in anywhere except in conservation areas and small-scale fishers are not required to pay tax (SEAFDEC/UNEP/GEF, 2014).

15 types of fishing gears are observed to operate in Kep province (FiA, 2020). Table 5 showed the most percentage of fishermen are observed to practice Elongated Collapsible Trap (25.93%), followed by each 19.53% for crab gillnet and trap, trawl (10.61%), and the less is Beach seine

(0.84%), Purse seine net (0.34%), Bottom Ray Horizontal Long Line (0.34%), Fish Trap (0.84%), and Fishing by Hand (0.34%).

Generally, Elongated Collapsible Trap, Crab Trap, and Crab Gillnet are the types of gears used actively in the Kep province while Beach Seine and Purse Seine Net have never been seen up to now. Trawl is also seen to fish offshore area for the most of fishers, but still fish inshore area for a small number of fishers.

Table 5: Types of Fishing Gears Operating in Kep province in 2018

No.	English Name	Khmer Name	Number of Fishing Gear (N=594)	Percentage (%)
1	Trawl	Uon Os	63	10.61
2	Beach Seine	Uon Khov	5	0.84
3	Purse Seine Net	Uon Tit	2	0.34
4	Crab Trap	Lop Kdam	116	19.53
5	Small Winged Set Bag	Pong Pang	11	1.85
6	Fish Trap	Lop Trey	5	0.84
7	Elongated Collapsible Trap	Lop Kon Tuy Kondol	154	25.93
8	Crab Gillnet	Mong Kdam	116	19.53
9	Fish Gillnet	Mong Peak	37	6.23
10	Shrimp Gillnet	Mong Bang Kear	4	0.67
11	Squid Hook	Santouch Meuk	51	8.59
12	Bottom Fish Hook	Santouch Trey Sro Tob Bat	3	0.51
13	Squid Horizontal Long Line Hook	Santouch Meuk RoNong	23	3.87
14	Bottom Ray Horizontal Long Line	Santouch Ro Nong Bobel	2	0.34
15	Fishing by Hand	Ka Nesart DoDay	2	0.34
Total			594	100

Source: FiA, 2020

### 3.6 Fishing Vessel Length with Fishing Gears

Table 6 showed the relation between fishing gears and fishing vessel length. Generally, two types of fishing vessel length in Kep province are observed to practice from 6-<12m and 12-<18m with 14 types of fishing gears operating in the province.

Over 50% of fishing gears operated with fishing vessel length from 12-<18m and more than 40% used with fishing vessel length from 6-<12m.

The fishing vessel length from 12-<18m, it was observed that the highest percentage of fishing vessel operated with Elongated Collapsible Trap (41.12%), followed by Crab Gillnet (23.68%), Crab Trap (20.72), and the lowest percentage practiced with Squid Horizontal Long Line Hook (6.58%), Small Winged Set Bag (3.29%), Fish Gillnet (2.63), Beach Seine (0.99), Purse Seine Net (0.99%).

For fishing vessel length of 6-<12m, the most percentage of fishing vessel was recorded in trawl (21.72%), followed by Crab Trap (18.28%), Squid Hook (17.59%), Crab Gillnet (15.17%), Elongated Fish Gillnet (10.69%), and Collapsible Trap (10%). The less percentage operated with Shrimp Gillnet (1.38%), Bottom Fish Hook (1.03%), Squid Horizontal Long Line Hook (1.03%), Bottom Ray Horizontal Long Line (0.69%), and Small Winged Set Bag (0.34%).



Table 6: Distribution of Fishing Gear Types by Fishing Vessel Length in Kep province in 2018

No.	Types of Fishing Gear	Types of Fishing Vessel Length (m)			
		12- <18 (N=304)	Percentage (%)	6- <12 (N=290)	Parentage (%)
1	Trawl	0	0	63	21.72
2	Beach Seine	3	0.99	2	0.69
3	Purse Seine Net	3	0.99	2	0.69
4	Crab Trap	63	20.72	53	18.28
5	Small Winged Set Bag	10	3.29	1	0.34
6	Elongated Collapsible Trap	125	41.12	29	10.00
7	Crab Gillnet	72	23.68	44	15.17
8	Fish Gillnet	8	2.63	31	10.69
9	Shrimp Gillnet	0	0.00	4	1.38
10	Squid Hook	0	0.00	51	17.59
11	Bottom Fish Hook	0	0.00	3	1.03
12	Squid Horizontal Long Line Hook	20	6.58	3	1.03
13	Bottom Ray Horizontal Long Line	0	0	2	0.69
14	Fishing by Hand	0	0	2	0.69
Total		304	100	290	100

Source: Fisheries Administration, 2020

#### 4. Role of fisheries refugia in Production in Kep province

##### 4.1 Annual Marine Capture Fisheries Production in Kep province

Annual marine capture fisheries production in Kep province were presented in Figure 7 that the marine capture fisheries production in the province increased from 2,237ton in 2015 to 5,253 ton in 2020.

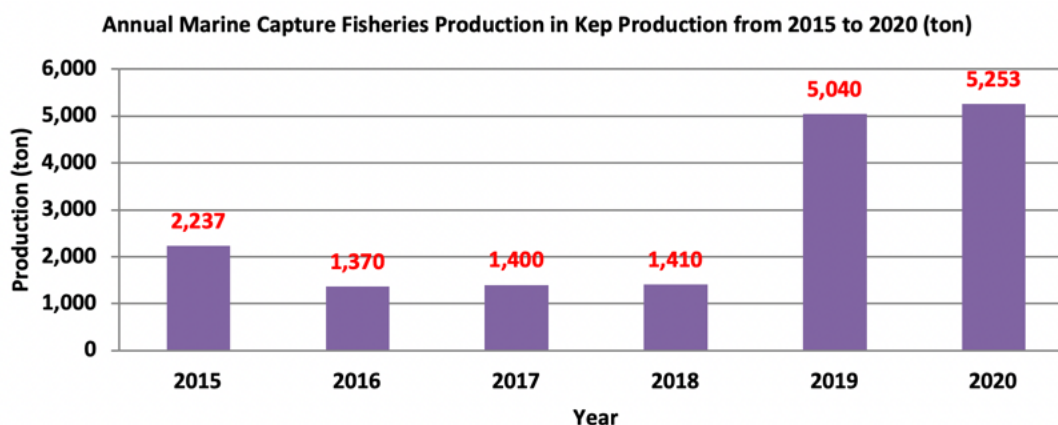


Figure 7: Annual Marine Capture Fisheries Production in Kep province from 2015 to 2020

Source: FiA from 2015 to 2020

##### 4.2 Annual Blue Swimming Crab Production in Kep province

Figure 8 showed that production of the Blue Swimming Crab increased from 500 ton in 2015 to 828 ton in 2020 because Kep province manages fisheries resources well during breaking from Kampot province in 2015. Kep province establishes conservation area of the crab in Ang Kol CFI and Marine Fisheries Management Area in Koh Po and Koh Tonsay Archipelago.

Moreover, Kep Fisheries Administration Cantonment collaborates with national and international organization to help manage fisheries resources. At the present, MCC supported

budgets to deploy concrete box in MFMA sites to prevent illegal fishing and restore artificial reef for marine animal and fish species. In addition, SEAFDE/UNEP/GEF supported budget to implement MFMA including BSC refugia, through raising awareness, patrolling and cracking down illegal fishing.

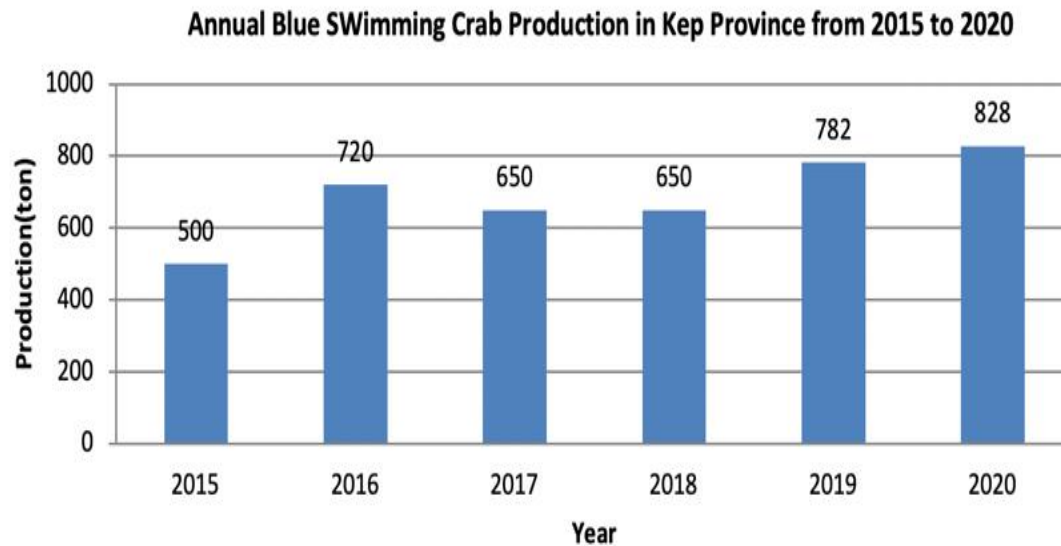


Figure 8: Annual Production of Blue Swimming Crab in Kep province from 2015 to 2020.  
 Source Fisheries Administration, 2015 to 2020

#### 4.3 Annual Marine Capture Fisheries Production with Fishing Gears in Kep province

According to field survey, 2019, 6 types of fishing gears are observed to operate and harvest marine capture fisheries in Kep province at fishing ground such as near Vietnam border, Koh Por, Koh Ses, Koh Angkrong, Koh Bal, Koh Kok, Stung Hav, Tropaing Ropov, Koh Reusey, and Koh Svay. Those fishing gears are 1) fish gillnet, 2) Small winged set bag, 3) Hook long line, 4) Crab gillnet, 5) Crab trap, and 6) Elongated Collapsible Trap (Table 7).

Table 7 showed three types of fishing gears are observed to catch the big quantity of fisheries products, including Elongated Collapsible Trap, Crab Trap, and Crab Gillnet. Elongated Collapsible Trap are the type of fishing gears, which enable catch the total fisheries products of 574,364 kg, followed by Crab trap can catch capture fisheries of 564,469 kg, and then Crab gillnet of 373,330 kg.

In contrast, three other fishing gears are observed to catch a small number of fish such as Fish gillnet, Small winged set bag, and Hook long line. Fish gillnet can harvest fish production of 61050kg, Small winged set bag can catch 23100 kg, and Hook long line can catch 16,875 kg of fish.

Generally, in Kep province, it is observed that Elongated Collapsible Trap is such fishing gear that has capacity to harvest capture fisheries in huge quantity and some of fishermen like to use the kind of this gear, however this gear is banned to fish according to regulation or law.



Table 7: Distribution of Annual Capture Fisheries by Fishing Gear in Kep province 2019.

No.	Types of Fishing Gears	Yields (kg)	Percentage (%)
1	Fish gillnet	61050	3.78
2	Small winged set bag	23100	1.43
3	Hook long line	16,875	1.05
4	Crab gillnet	373,330	23.14
5	Crab trap	564,469	34.99
6	Elongated Collapsible Trap	574,364	35.60
<b>Total</b>		<b>1,613,188</b>	<b>100</b>

Source: Field survey, 2019

Figure 9 showed percentage of fishing gears sharing annual marine capture fisheries in Kep province in 2019. Over 35% of marine capture fisheries production was shared by Elongated Collapsible Trap, followed by Crab trap (34.99%), and Crab gillnets (23.14%). The rest of them shared by Fish gillnet Small Winged Set Bag, and Hook long line, 3.78%, 1.43%, and 1.05%, respectively



Figure 9: Percentage of Annual Capture Fisheries in Kep province in 2019

Source: Field survey, 2019

#### 4.4. Calculation of CPUE in Kep province

The calculation of CPUE based on six types of fishing gears was presented in Table 8. The catch rate of each fishing gear was different based on vessel length and Horsepower, and size/length of fishing gear used as well as fishing periods.

Crab gillnet, practicing mean crab gillnet length in 4529m, was recorded in 15.66kg/day and 1.44kg/hour of crab with mean fishing period in 10.90hours, mean vessel length in 13.58m, and mean Horsepower in 26.31hp.

Fish gillnet, using mean vessel length in 6.63m and mean Horsepower in 7.88hp, mean gillnet length in 378.75m, was recorded in 7.5kg/day and 1.11kg/hour of fish with mean fishing period of 6.75hours.

Crab trap, practicing mean vessel length in 13.15m and mean Horsepower in 27.8hp, and 2590 crab traps in average, was recorded in 21.82kg/day and 2.61kg/hour of crab with mean fishing periods of 8.63 hours.

Elongated Collapsible Trap, operating mean vessel length of 13.52 m, mean Horsepower of 25.45hp, and mean net length in 1872m (312 traps), can be caught in 23.64kg/day and 2.05kg/hr of fisheries with mean fishing periods of 11.55hr.

Small Winged Set Bag was recorded in 12kg/day and 0.86kg/hr of fisheries with fishing period of 14hours, mean vessel length in 13m, mean Horsepower in 23hp, the mouth of mean gillnet in 1600m.

Table 8: Identification of CPUE Indicator per Used Fishing Gear Types in Kep province in 2019

Type of Fishing Gears	Status of Fishing Vessel (m)		Mean Size/Length of used fishing gears	Mean Duration of Fishing /day (hr)	Number of Day/Trip (day)	Total Catch /Trip (kg)	CPUE Indicator	
	Mean Length (m)	Mean Horsepower (hp)					Per day (kg)	Per hour (kg)
Crab Gillnet	13.58	26.31	4529m	10.90	1	15.66	15.66	1.44
Fish Gillnet	6.63	7.88	378.75m	6.75	1	7.5	7.5	1.11
Crab Trap	13.15	27.8	2590 trap	8.36	1	21.82	21.82	2.61
Elongated Collapsible Trap	13.52	25.45	312 trap (1872m)	11.55	1	23.64	23.64	2.05
Hook Long Line	12	26	8000 piece	10	1	25	25	2.50
Small Winged Set Bag	13	23	1600m	14	1	12	12	0.86

Source: Field survey, 2019

## 5. Number of fisheries communities in Kep province

According to Department of Community Fisheries Development of FiA, 2019, there are 5 existing community fisheries in Kep province, including Okrasar CFi, Phum Thmey CFI, Kep CFi, Kampong Tralach CFi, and Angkoal CFi, which cover the coastline areas in 3031 ha and 1025 members of CFis. Those CFis are set up by Department of Community Fisheries Development of FiA and Kampot\* Fisheries Administration Cantonment since 2005 (Table 9).

Table 9: Number of fisheries communities in Kep province

No.	Name of Community Fisheries	Location	CFi's Area (Ha)	CFi's Member (person)	Date of CFi Establishment
1	Okrasar CFi	Okrasar commune, Kep district	446	281	2005
2	Phum Thmey CFI	Prey Thom commune, Kep district	198	163	2007
3	Kep CFi	Kep commune, Kep district	270	152	2005
4	Kampong Tralach CFi	Prey Thom commune, Kep district	422	182	2005
5	Angkoal CFi	Angkoal commune, Dom Nakchorng Oeur district	1695	247	2005
Total			3031	1025	

Source: Department of Community Fisheries Development of FiA, 2019

Note: \* Kep province is separated from Kampot province in 2015 until now

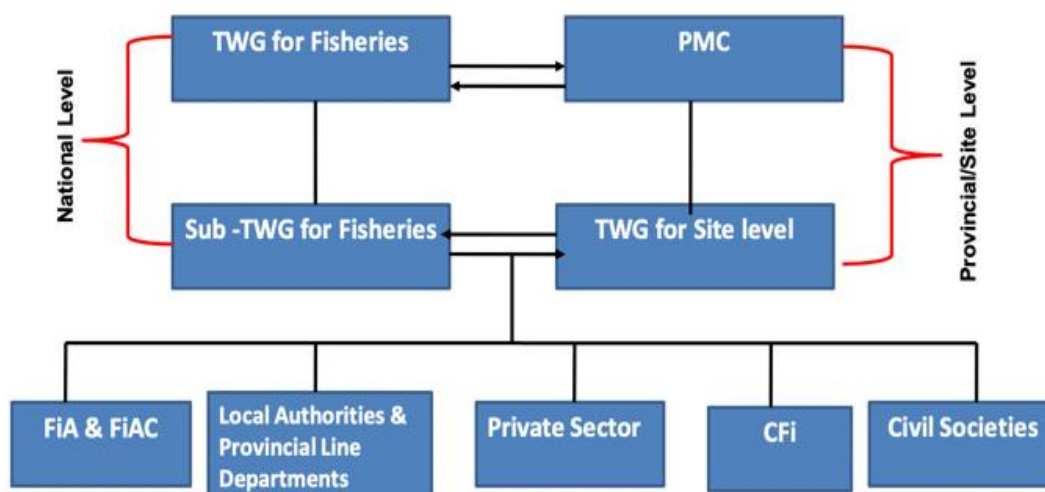
## 6. Existing Fisheries Management Measure in Fisheries Refugia Sites

Currently, the measures of blue swimming crab management in Kep province were made based on the closing season and size limitations of nets. The notice letter of closed fishing season of BSC are made and issued by Kep provincial Administration Hall starting from the month of May to July every year according to MAFF's proclamation on Establishment of Marine Fisheries Management Area in Koh Po and Koh Tonsay Archipelago, Kep province on 12 April 2018.

To ensure and restore the stock of fisheries resources, 100ha conservation area in Ang Kol CFI has been installed to protect and restore fisheries resources, including the crab, sea grass beds, and other supported budgets from SEAFDEC/Trus Fund. Marine Fisheries Management Area including BSC refugia in Koh Po and Koh Tonsay Archipelago cover 11,307 ha supported budgets from SEAFDEC/UNEP/GEF. These areas are main habitats for spawning, nursing, and feeding for endangered animal species Irrawaddy dolphin, dugong, sea turtles and sea horses, as well as containing coastal habitats such as coral reefs, seagrass beds and mangrove forests.

Department of Fisheries Conservation/FiA collaborating with Kep Fisheries Administration Cantonment as well as working partner with Marine Conservation in Cambodia ( MCC base in Kep) have implemented some activities including 1) conducting a series of public awareness-raising events regarding the establishment of Kep MFMA along with detailing the roles and functions of this area to wider audiences and demarcate the boundary of the area for more effective patrol and management, 2) deploying 983 concrete blocks into MFMA site to protect coral reefs, sea grass and spawning ground from illegal trawling and to serve as the artificial habitats for some key fish species and crab as well, and 3) patrolling and cracking down illegal fishing into MFMA.

At present, two committees at provincial level are established to facilitate and address all issues happening in MFMA in order to ensure management and utility of sustainable fisheries resources. Those committees consist of 1) Provincial Management Committee for MFMA (Chaired by Provincial Governor) and 2) Technical Working Group for MFMA (Chaired by Provincial Deputy Governor), as the following structure (Figure 10) and Decision (Annex 1 and Annex 2).



*At national level it, Technical Working Group (TWG) for Fisheries is chaired by Director General of FiA. Fisheries Refugia in sub-group of socio economic and conversation chaired by DDG of FiA.*

*At provincial level, Provincial Management Committee (PMC) is chaired by Provincial Governor. Technical Working Group for Site chaired by Provincial Deputy Governor.*

Figure 10: Structure of Management of Marine Fisheries Management Area in Kep province

## 7. Habitats for Endangered Marine Species

Kep is a province to be rich of marine biodiversity and ecosystem, providing spawning, feeding, and nursing habitat for endangered animal and fish species such as green turtles, dolphins, sharks, tortoises and dugongs and so on. According to MCC research, Dolphins populations (*Orcaella brevirostris*) are observed occurring in Koh Po and Koh Ton Say Archipelago about 30-40 head.

The Royal Government of Cambodia issues sub-decree on endangered animal species management dated on 12 August 2009 in order to ensure the population and stock of endangered species. The sub-decree catching from wild and distribution including selling, buying, transporting, processing, and stocking is banned. These endangered animal species described in Table 10 as follow:

Table 10: Endangered fish and other aquatic species in Cambodia.

No.	Local name	Scientific name	Common name
1	Krapeu Samot	<i>Crocodylus porosus</i>	Estuarine crocodile
2	Chruk Toek or Poyung	<i>Dugong dugon</i>	Dugong
3	Trey Sekbok	<i>Cheilinus undulates</i>	Humphead Wrasse
4	Balen Krabei	<i>Pseudorca crassidens</i>	False killer whale
5	Belen Kbalthom	<i>Globicephala macrorhynchus</i>	Short-finned pilot whale
6	Psoat Chramos Dorb Champus Khlei	<i>Tursiops aduncus</i>	Indo-Pacific bottlenose dolphin
7	Psoat Kbal Traloak	<i>Orcaella brevirostris</i>	Irrawaddy dolphin
8	Psoat Chramos Dorb Champus Veng	<i>Tursiops truncatus</i>	Common bottlenose dolphin
9	Psoat Khleach	<i>Sousa chinensis</i>	Indo-Pacific hump-backed dolphin
10	Psoat Chhnoat Pnek	<i>Stenella longirostris roseiventris</i>	Dwarf spinner dolphin
11	Psaot Ouch	<i>Stenella attenuata</i>	Pantropical spotted dolphin
12	Psoat Et Pruy Knong	<i>Neophocaena phocaenoides</i>	Finless porpoise
13	Psoat Kmao Leung	<i>Dolphinus capensis tropicalis</i>	Long-beaked common dolphin
14	Lmich	<i>Chelonia mydas</i>	Green turtle
15	Krass	<i>Eretmochelys imbricata</i>	Hawksbill turtle
16	Lmich Pruy Bei or Lmich Speu	<i>Dermochelys coriacea</i>	Leatherback turtle
17	Lmich Kbal Thom	<i>Caretta caretta</i>	Loggerhead turtle
18	Lmich Praphes	<i>Lepidochelys olivacea</i>	Olive ridley turtle
19	Krum Yeak	<i>Tridacna squamosa</i>	Fluted giant clam
20	Krum Yeak	<i>Tridacna maxima</i>	Elongate giant clam
21	Krum Yeak	<i>Tridacna crocea</i>	Crocus giant clam
22	Krum Yeak	<i>Tridacna gigas</i>	Giant clam
23	Kyong Koad	<i>Trochus niloticus</i>	Commercial top
24	Kyong Kuch or Kyong Prak	<i>Turbo marmoratus</i>	Green turbo or green snail
25	Ses Samut (fish)	<i>Hippocampus spp.</i>	Sea horse
26	Pkar Thmor	<i>Anthozoa spp.</i>	Corals and sea anemones
27	Pralaing Kas	<i>Tachypleus gigas</i>	Traingular-tail horseshoe crab
28	Kachoar	<i>Carcinoscorpius rotundicauda</i>	Mangrove horseshoe crab
29	Trey Banon Kingkork	<i>Rhincodon typus</i>	Whale shark

## 8. Biological Review of Blue Swimming Crab

### 8.1 Scientific, Common, and Local Name

Scientific name of blue swimming crab (common name) is *Portunus pelagicus* (Linnaeus, 1758) belong to the Phylum Arthropoda, Class Malacostraca, Order Decapoda, Family Portunidae, and Genus Portunus. Local name of this species is called as Kdam Ses (Figure 11).



Figure 11: Blue swimming crab, *Portunus pelagicus*

### 8.2 Morphology

*Portunus pelagicus* has 5 pairs of legs and its body is flat. The first pair of legs was modified to be claws, which are biggest legs, which perform the protection, attach and predation functions. The 5th pair of legs are swimming legs was modified as swimming legs with small furs on the edge. The legs 2, 3 and 4 are called crawl legs. The carapace is grey blue with the pear shape and there are many small bright spots on the carapace and on the legs (Vu Viet Ha et al, 2014).

### 8.3 Distribution

*Portunus pelagicus* is found in West Pacific Oceans including Japan, and Philippines throughout Southeast and East Asia, to Indonesia, the East of Australia, and Fiji Islands, and westward to the Red Sea and East Africa (Fish Base, 2004).

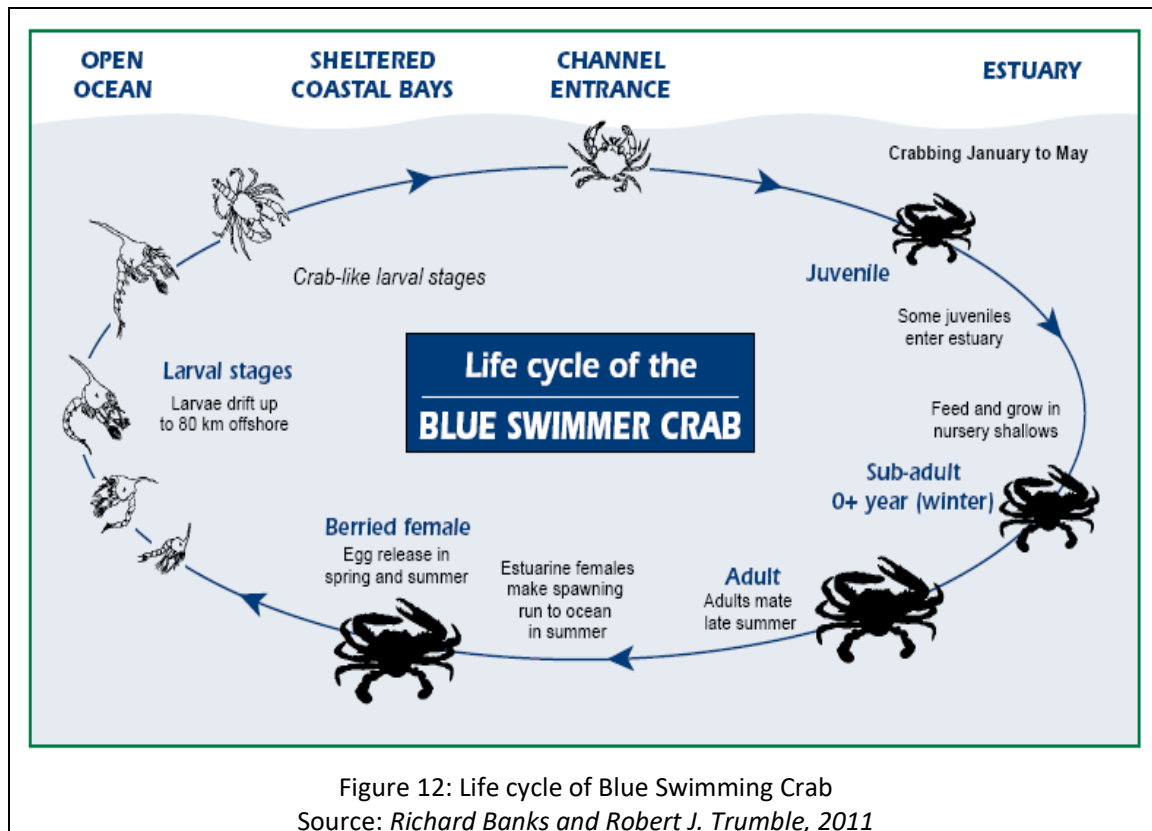
### 8.4 Life cycle and mating behavior

The life cycle of *Portunus pelagicus* is composed of five larval stages, which last for 15–45 days total, (Kangas 200, Richard Banks and Robert J. Trumble 2011), including eggs, zoea larvae, megalopa larvae, juvenile crab and adult crab (Figure 10). Prior to hatching, the female moves into shallow marine habitats, releases her eggs and the newly hatched zoea I larvae move into estuaries and stay in the habitat for growth (SEAFDEC/UNEP/GEF/FR-RSTC3-Factsheet-BSC)

Zoea larvae, hatching from eggs, have a length of about 0.04 mm. At this stage, zoea larvae are drifting freely in the surface water layer and can drift away 80 km from the spawning grounds (Williams, 1982, Vu Viet Ha et al. 2014). After 4-5 weeks, zoea develops to megalopa. At this stage, the entity has shape of crab head, shrimp body, small size, live passive and drifting. Megalopa larvae will undergo 5-7 times of metamorphosis (see Figure 12).



After about 1 week, the megalopas develop to juvenile crab. At this stage, the crabs live in the mud bottom and migration from the spawning ground in the coast to the sea, living mainly in the seagrass beds. After 12 to 18 months, phase 1 crabs grow into adult, sexually mature and enter the spawning stage to create the next generation (Vu Viet Ha *et al.* 2014).



### 8.5 Length at first maturity

*Portunus pelagicus* reached adult size in about one year old and the size at its first maturity is 9.92 cm in Vietnam (Smith, 1982, Vu Viet Ha *et al.* 2014). Case study in Thailand showed that the size at first maturity of BSC is 8.09 cm for female and 8.02 for male (Apirak Songrak *et al.* 2014) while in Philippines reported female (10.5cm) and male (9.6cm) (Chap Sopanha *et al.* 2012). Richard Banks and Robert J. Trumble 2011 conducted study in the Gulf of Thailand and Andaman Sea showed that the size at first maturity is 9.7cm for female and 8.4cm for male.

Zairion *et al.* 2015 reported all males and females are in the size below 81mm CW found in stage 1 of gonad development, while the size of 86-90.9 mm CW found in stage III. Full mature (stage IV) is in the size of 91-95.6mm CW. Stage IV of female is in the size of 111.1-115.9mm.

### 8.6 Gonado somatic index and size frequency

Table 15 showed that monthly mean of GSI value of female and male crab ranged between (2.60 to 9.24) and (1.34 to 3.25), respectively (Apirak Songrak, 2014). GSI of male is higher value in August, June and October (3.14, 3.25, and 2.85, respectively), meanwhile female is higher value during January, August and June (9.24, 7.98, and 7.09%, respectively) (Apirak Songrak, 2014). It is observed that spawning season of the crab was estimated by calculating the percentage of stage IV ovaries and ovigerous female and GSI in each month. The highest values of these parameters occur the month of maximum spawning (Litulo, 2005, Apirak Songrak, 2014). Apirak Songrak, 2014 found that two peak season of crab spawning is from April to June and October to November. Table 12: Relationship between the gonad index and maturity stages (Tan & Tan 1974).



Table 11: Number of ovigerous crab samples from Trang Seacoast from October 2010 to September 2011

Month	Number of blue swimming crab		Number of Oveigerous crab		% Oveigerous		% GSI	
	Male	Female	Male	Female	Male	Female	Male	Female
OCT	16	14	11	1	68.75	7.14	2.83	3.12
NOV	18	17	9	3	50.00	16.67	1.34	2.60
DEC	18	18	14	2	77.78	11.11	2.35	3.26
JAN	21	21	12	10	57.14	47.62	2.30	9.24
FEB	18	18	11	7	61.66	38.89	1.44	5.22
MAR	18	18	12	8	66.67	44.45	2.04	6.83
APR	18	18	12	9	66.67	50.00	2.02	6.76
MAY	18	18	9	6	50.00	16.67	2.13	6.09
JUN	18	18	9	6	50.00	33.33	3.14	7.09
AUG	18	18	11	6	61.11	33.34	2.07	5.57
SEP	18	18	11	10	61.11	55.56	3.25	7.98

Source: Apirak Songrak, 2014

Figure 13 showed that the highest value of GSI was 8.89% in October 2017 and gradually decreased in November 2017 and December 2017 by 6.08% and 5.32%, respectively. During oogenic production, the data showed that the high value of GSI was 5.53 again in February 2017 (Chutapa Kunsook and Pongchai Dumrongroj wathana, 2019). It is observed that three spawning periods of the crab is possible starting from 1) October to December, 2) February to March, and 3) June to August (Chutapa Kunsook and Pongchai Dumrongroj wathana, 2019).

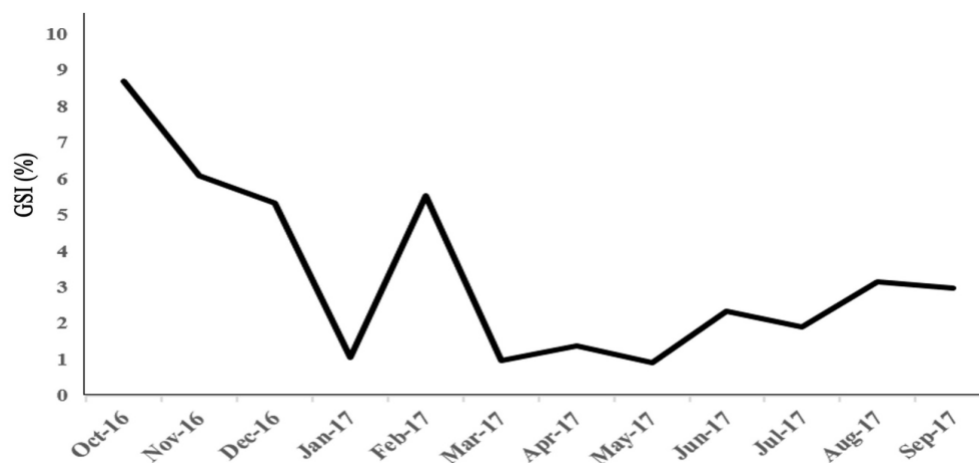


Figure 13: Annual variation in gonadosomatic index (GSI) of *Portunus pelagicus* during October 2016 (Oct-16)-September 2017 (Sep-17)

### 8.7 Area of habitat in each stage

Blue swimming crabs live in a wide range of inshore and continental shelf areas, including sandy, muddy or algal and seagrass habitats, from the intertidal zone to at least 50 m depth (Williams, 1982, Richard Banks and Robert J. Trumble 2011).

Small crabs prefer seagrass and near-shore areas as nursery grounds, and may use the shade of seagrass shoots as shelter area (Kenyon *et al.*, 1999, Richard Banks and Robert J. Trumble 2011).

Immature blue swimming crabs occupy near-shore areas, especially around seagrass meadows and river mouths (Richard Banks and Robert J. Trumble 2011). Thongchai Nitiratsuwan et al. 2010 reported small crabs (carapace width < 10 cm) were most often found inshore and associated with seagrass beds, especially between April and September, whereas large crabs (carapace width > 10 cm) were farther offshore.

Generally, blue swimming crab adults spawn either in the entrance channels of estuaries or in adjacent coastal waters. In that time, the crab moved in and out of estuaries into the open ocean occurs in response to lower salinities. Lower levels of salinity may cause females to leave inshore estuarine areas and move offshore to spawn (Kangas, 2000, Richard Banks and Robert J. Trumble 2011). Oviparous females are mostly found during October to December (from the end of the wet season), (Tanasomwang et al, 2005), but may also be found further offshore in the rainy season (August and September) (Richard Banks and Robert J. Trumble 2011).

## 9. Reference

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## Annex 1:

**Decision on Establishment of Provincial Management Committee of Marine Fisheries  
Management Area in Kep Province**

**KINGDOM OF CAMBODIA  
NATIONA RELIGION KING**



Kep Provincial Hall Administration  
No. 035/18 SorSorRo

**Decision  
On**

**The Establishment of Provincial Management Committee of Marine Fisheries Management Area in Kep  
Province**

**Governor of Kep Province**

- Having seen the Constitution of Royal Kingdom of Cambodia
- Having seen the Royal Decree No. No Sor/RoKoMo/0508/2017 dated on 24<sup>th</sup> May 2008 declaring to use the law on the Administrative Management of Municipal, Provinces, Capital, District, and Khan
- Having Seen the Royal Decree No. No Sor/RoKoMo/0506/011 dated on 21<sup>st</sup> May 2006 declaring to use the law on fisheries
- Having Seen Decree Royal No. No Sor/RoKoMo 0916/832 dated on 27<sup>th</sup> September 2016 declaring to nominate Kep Governor for 2<sup>nd</sup> term by the King of Royal Kingdom of Cambodia
- Having seen Sub-Decree No.216 Or No.KroBoKo dated on 14<sup>th</sup> December 2009 on the roles, duties, and communication of council of governor, municipal, and district
- Refer to Decision No. 010/17 SorSorRo dated on 04<sup>th</sup> April 2017 by Kep Governor on the division of roles, duties, and ordering to work for governor based on No. 090 Bor dated on 22<sup>nd</sup> June 2017 by the Ministry of Interior
- Refer to Meeting Spirit dated on 31<sup>st</sup> January 2018 on the consultation of the establishment of Marine Fisheries Management Area at Kep Provincial Hall Administration
- Refer to proclamation No. 193 Brokor. KorSorKor dated on 12<sup>th</sup> April 2018 on the establishment of Marine Fisheries Management Area Koh Po and Koh Tonsay Archipelago, Kep province
- Based on the necessary of Kep Provincial Hall Administration

**Decision**

**Article 1.-**

The establishment of Management Committee of Marine Fisheries Management Area (MFMA) in Kep province, which have following composition:

1	H.E Som Piseth	Governor of Kep Province	Chair
2	Mr. Prom Kunti	Deputy Governor of Kep	Vice Chair
3	Mr. Ouk Vibol	Director of Department of Fisheries Conservation/FIA	Vice Chair
4	Mr. Theng Borin	Director of Department of Agriculture, Forestry, and Fisheries	Vice Chair
5	Mr. General Bong Sokheng	Vice Head of Provincial Police	Member
6	Mr. Seak Arng	Vice Commander of Provincial Military Police	Member
7	Mr. Penh Phearo	Commander of Maritime Police No.430	Member
8	Mr. Leng Sy Vann	Deputy Director of Fisheries Conservation/FiA	Member
9	Mr. Kao Monirith	Deputy Director of Marine Fisheries Administration	Member

		Cantonment	
10	<u>Mr. Vao Sokha</u>	Deputy of Department of Land and Construction	Member
11	<u>Mr. Keo Hong</u>	Deputy of Department of Economy and Finance	Member
12	<u>Mr. Kong Savath</u>	Deputy of Department of Planning	Member
13	<u>Mr. Im Panharith</u>	Director of Department of Environment	Member
14	<u>Mr. Sam Chenda</u>	Director of Department of Tourism	Member
15	<u>Mr. Mom Touch</u>	Director of Department of Public Works and Transports	Member
16	<u>Ms. Tith Sokha</u>	Governor of Kep district	Member
17	<u>Ms. Kim Channy</u>	Governor of Damnak Chong Ore district	Member
18	<u>Mr. Chhun Vanthorn</u>	Director of Inter Division/Kep Provincial Administration	Member
19	<u>Mr. Kim Sokha</u>	Head of Fisheries Conservation Division/DFC/FIA	Member
20	<u>Mr. Kuch Vireak</u>	Head of Kep Fisheries Administration Cantonment/DoA	Member

#### Article 2.-

The Management Committee has following duties:

- Coordinate management jobs, an fisheries ecological system protection, and solving other problems to ensure sustainable fisheries resources conservation;
- Monitor and advising a technical working group to prepare policy and action plans for management of Marine Fisheries Management Area at Kep province;
- Seek out supports from development partners and NGOs to implement action plans for Marine Fisheries Management Area at Kep;
- Promote and advise the conservation and development in Marine Fisheries Management Area in kep;
- Review and approve action plans proposed by Technical Working Group;
- Promote and advise Technical Working Group to implement action plans;
- Promote the extension of the action of marine fisheries management area to involving parties to increase participations and supports;
- Monitor, control, and crack down the activities of illegal fishing gears uses in marine fisheries management area in Kep;
- The committee must participate in meeting at the invitation of the committee head; and
- Organize every 3 or 6 months meeting to review and evaluate progressing and issues facing in the process of marine fisheries management area, and to submit a reports of activity results to the Provincial Governor and the Director General of Fisheries Administration, and make permission in necessary case, it is convened urgently.

#### Article 3.-

The committee has a right to request armed forces from other involved authorities/institutions

#### Article 4.-

The committee has a right to create and revise the technical working group as assistance, which is composition from Departments, Institutes, Involving authorities, Community Fisheries Representative, Organizations, and Development Partners.

#### Article 5.-

The committee has a right to use the stamp of Kep provincial hall administration.

#### Article 6.-

Any decision against this decision will be null and void.

#### Article 7.-

Director of provincial administration, directorate, the unit head under provincial structure, the director of provincial departments, involving institutes/authorities around the province-governor of city or district, and themselves as mentioned in Article 1, must follow that decision effectively starting to sing it from now.

Kep, Date: 30 December 2020  
Governor of Kep Province

Som Piseth

## Annex 2:

**Decision on Establishment of Technical Working Group for  
Marine Fisheries Management Area in Kep Province**

KINGDOM OF CAMBODIA  
NATIONAL RELIGION KING



Kep Provincial Hall Administration  
No. 036/18 SorSorRo

**Decision  
On  
The Establishment of Technical Working Group for Marine Fisheries Management Area  
in Kep Province**

**Governor of Kep Province**

- Having seen the Constitution of Royal Kingdom of Cambodia
- Having seen the Royal Decree No. No Sor/RoKoMo/0508/2017 dated on 24<sup>th</sup> May 2008 declaring to use the law on the Administrative Management of Municipal, Provinces, Capital, District, and Khan
- Having Seen the Royal Decree No. No Sor/RoKoMo/0506/011 dated on 21<sup>st</sup> May 2006 declaring to use the law on fisheries
- Having Seen Decree Royal No. No Sor/RoKoMo 0916/832 dated on 27<sup>th</sup> September 2016 declaring to nominate Kep Governor for 2<sup>nd</sup> term by the King of Royal Kingdom of Cambodia
- Having seen Sub-Decree No.216 Or No.KroBoKo dated on 14<sup>th</sup> December 2009 on the roles, duties, and communication of council of governor, municipal, and district
- Refer to Decision No. 010/17 SorSorRo dated on 04<sup>th</sup> April 2017 by Kep Governor on the division of roles, duties, and ordering to work for governor based on No. 090 Bor dated on 22<sup>nd</sup> June 2017 by the Ministry of Interior
- Refer to Meeting Spirit dated on 31<sup>st</sup> January 2018 on the consultation of the establishment of Marine Fisheries Management Area at Kep Provincial Hall Administration
- Refer to proclamation No. 193 Brokor. KorSorKor dated on 12<sup>th</sup> April 2018 on the establishment of Marine Fisheries Management Area Koh Po and Koh Tonsay Archipelago, Kep province
- Refer to decision No.035 dated on 18 September 2018 on the establishment of Management Committee of Marine Fisheries Management Area, Kep province
- Based on the necessary of Kep Provincial Hall Administration

**Decision**

**Article 1.-**

The establishment of Technical Working Group for Marine Fisheries Management Area (MFMA) in Kep province, which have following composition:

1	Mr. Prom Kunti	Deputy Governor of Kep	Chair
2	Mr. Ouk Vibol	Director of Department of Fisheries Conservation/FiA	Vice Chair
3	Mr. Chhun Chanvanthorn	Director of Inter Division/Kep Provincial Administration	Vice Chair
4	Mr. Kyng Sophanny	Deputy Director of Kep Fisheries Administration Cantonment/ Kep DoA	Vice Chair



5	Mr. Kim Sokha	Director of Fisheries Conservation Division /DFC/FiA	Secretary
6	Mr. You Chanpraseth	Deputy Director of Department of Fisheries Conservation/FiA	Member
7	Mr. Pa Kim Arng	Deputy Director of Department of Agriculture, Forestry, and Fisheries	Member
8	Mr. Chhang Thay	Deputy Governor of Kep district	Member
9	Mr. Leng Sokhum	Deputy Governor of Domnak Chhang Ore district	Member
10	Mr. Yong Pros	Deputy Director of Department of Planning	Member
11	Mr. Soth Puthimanin	Deputy Director of Department of Land and Construction	Member
12	Mr. Pok Trang	Deputy Director of Department of Tourism	Member
13	Mr. Va Koav	Deputy Director of Department of Environment	Member
14	Mr. Hou Phallavary	Deputy Director of Department of Public Works and Transports	Member
15	Mr. Pin Yorn	Vice Commander of Maritime Police No. 430	Member
16	Mr. Keut Sarom	Director of Foreigner Management Division	Member
17	Mr. Kao Monirith	Deputy Director of Marine Fisheries Administration Inspectorate	Member
18	Mr. Chhork Sineath	Head of Damnak Sdach Fisheries Administration Division	Member
19	Toun Bunthen	Head of Military Police Security Technical Division	Member
20	Head of 5 Commune Council	Commune Council Involved	Member
21	Miss. Thap Rachana	Representative of MCC	Member
22	Mr. Lou Vanny	Coordinator of IUCN in Cambodia	Member
23	Mr. Leng Sy Vann	Deputy Director of Department of Fisheries Conservation	Member
24	Chea Phallin	Representative of FFI	Member
25	Tuy Sereyathana	Director of WEA	Member
26	Chief of Ou Krosar Community Fisheries	Ou Krosar Community Fisheries	Member
27	Chief of Kampong Trolanch Community Fisheries	Kampong Trolanch Community Fisheries	Member
28	Chief of Phum Thmey Community Fisheries	Phum Thmey Community Fisheries	Member
29	Chief of Kep Community Fisheries	Kep Community Fisheries	Member
30	Chief of Ang Kol Community Fisheries	Ang Kol Community Fisheries	Member
31	Chief of Koh Tonsay Tourism Association	Koh Tonsay Tourism Association	Member

#### Article 2.-

The Technical Working Group has following duties:

- Protecting and conserving marine fishery resources and habitat in marine fisheries management area at Kep province;
- Preparing technical reports and maps to create the management processing of marine fisheries management area at Kep;
- Preparing legislative letters to make and manage marine fisheries management area at Kep;
- Making wider extension to local people, tourists, and other stakeholders about the management action of marine fisheries management area
- Preparing management plans for marine fisheries management area at Kep;

- Implementing action plans, follow up, and monitor and evaluation of project progressing ;
- Organizing a meeting every 3 month or needed to review and discuss every activity, and submitting reports to provincial management committee of marine fisheries management area at Kep; and
- Conducting other activities delivered by provincial management committee of marine fisheries management area at Kep province.

**Article 3.-**

The technical working group has a right to request intervention and recommendations from the provincial management committee of marine fisheries management area to perform their duties effectively.

**Article 4.-**

The technical working group member must participate in a meeting at invitation of the committee leader or representative approved by the head of provincial management committee of marine fisheries management area. For institutions or NGOs as members of the committee, they can request to join that meeting.

**Article 5.-**

Changing or requesting to join new member of technical working group must be agreed by the head of provincial management committee of marine fisheries management area at Kep province though the proposed by the chief of technical working group for marine fisheries management area.

**Article 6.-**

Director of provincial administration, directorate, the unit head under provincial structure, the director of provincial departments, involving institutes/authorities around the province-governor of city or district, and themselves as mentioned in Article 1, must follow that decision effectively starting to sing it from now.

Kep, Date: 29 December 2020

Governor of Kep Province

**SOM PISETH**