



# **National Progress Report in Cambodia**

**ESTABLISHMENT AND OPERATION OF A REGIONAL SYSTEM OF FISHERIES REFUGIA IN THE SOUTH CHINA SEA  
AND GULF OF THAILAND**

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**Supported by Fisheries *Refugia* SEAFDEC/UNEP/GEF**

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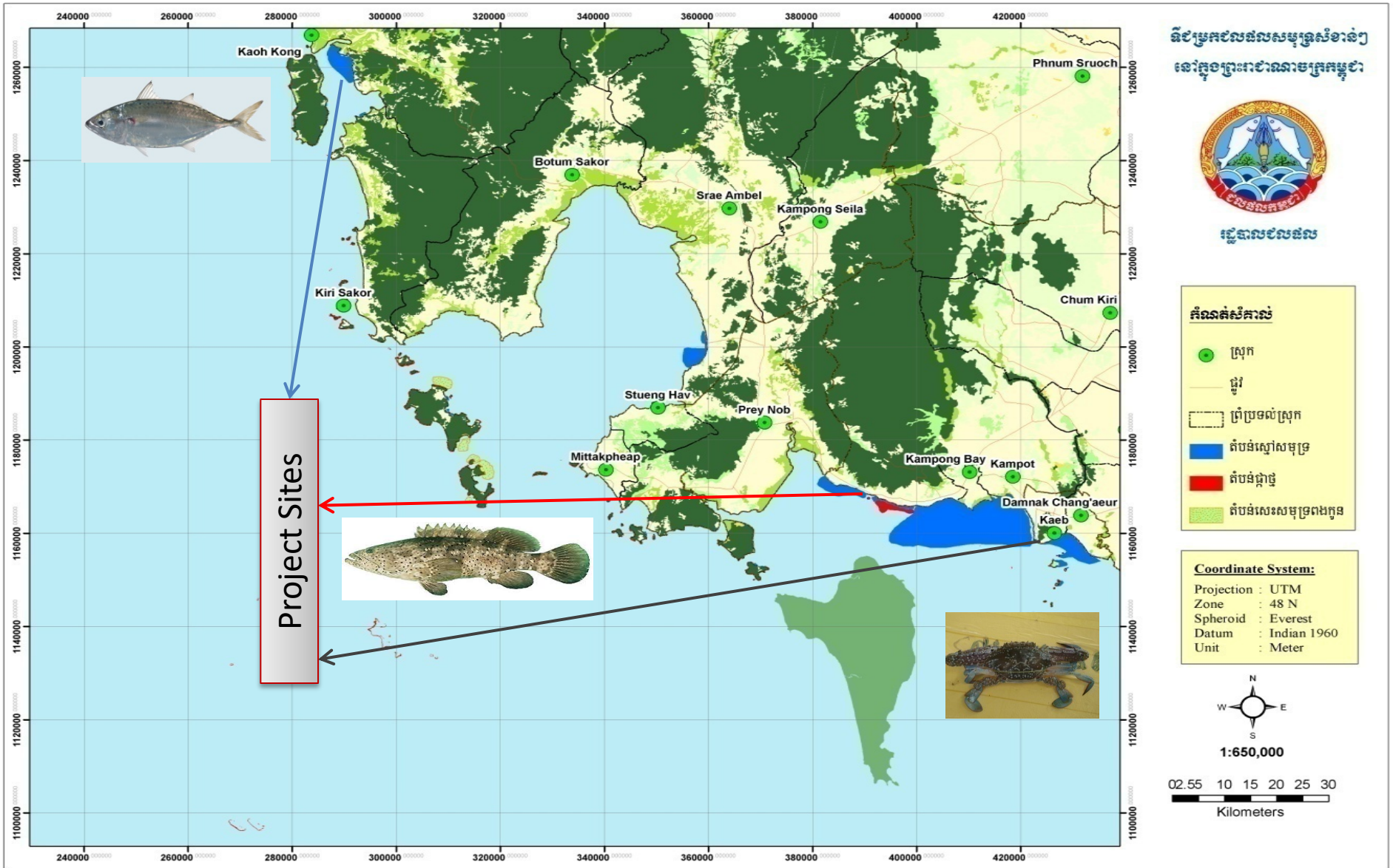
**Classic Hoang Long Hotel, Hai Phong, Vietnam**



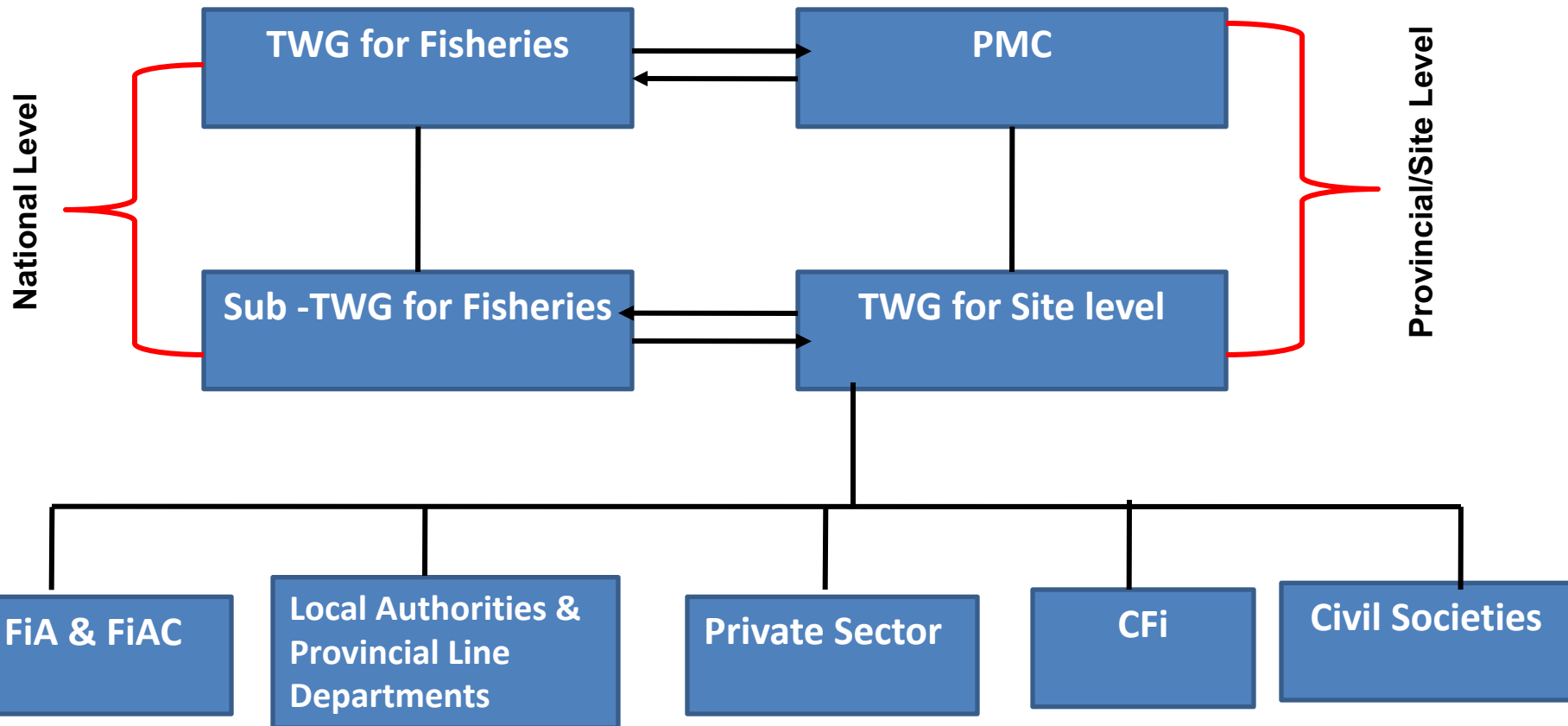
## **Content of Presentation**

1. Project Sites for Fisheries Refugia in Cambodia
2. Project Management and Coordination Structure
3. Policy and Legal Basic for the Development of Fisheries Refugia
4. Management and Operation of Fisheries Refugia
5. Baseline Survey of Short Mackerel in Koh Kong

# 1. PROJECT SITES



## 2. MANAGEMENT AND COORDINATION STRUCTURE



*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.*

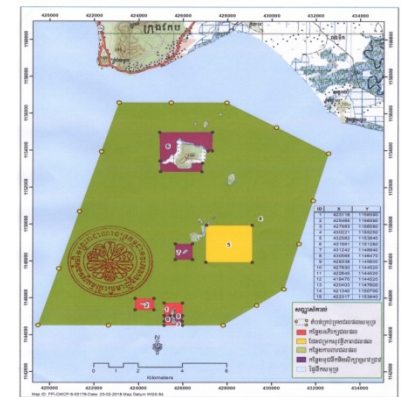




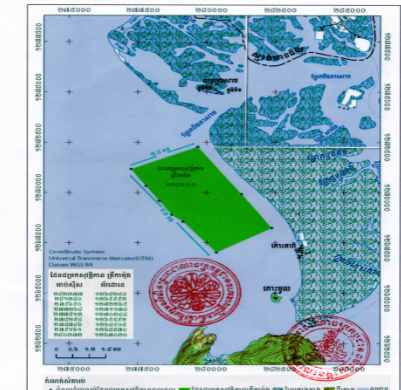
# 3. Policy and Legal Basic for the Development of Fisheries Refugia

- ✓ The concept of fisheries *refugia* has been integrated into national fisheries policy and legal basic including the Law of Fisheries, National Plan for Action, Plan on Combating IUU Fishing, 10 year strategy plan for fisheries conservation, and 5 year management plan for fisheries conservation, to ensure fisheries refugia management effectively.
- ✓ Blue swimming crab Fisheries Refugia in Kep is officially promulgated by the Minister of MAFF on 12 April 2018 , which is the total area of 417ha.
- ✓ Mackerel Fisheries Refugia is officially promulgated by the Minister of MAFF on 16 September 2019, which is the total area of 1283ha.
- ✓ Fisheries Refugia sites in Kampot province is not created officially yet due to overlapping some parts of project target and development areas. it is still discussing and consulting with provincial administration to address that issue.

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## 4. Management and Operation of Fisheries Refugia

- Two management committee for blue swimming fisheries refugia in Kep established naming Provincial Management Committee for BWC for FR chaired Provincial Governor and TWG for BSC for FR chaired by Provincial Deputy Governor
- Planed to set up one management committee in Koh Kong named as TWG for Management of Mackerel FR at Peam Krasob
- FiA collaborating with MCC to deploy 160 concrete boxes in Marine Fisheries Management Area and Blue swimming Crab Fisheries Refugia





Continued



- ✓ Preparing 5 year management plan for marine fisheries management area and blue swimming crab in Cambodia language approved by Director General of FiA and Kep Governor
- ✓ FiA collaborating with FiAC to install 15 mooring buoys at the boundary of fisheries refugia area
- ✓ Patrolling illegal fishing at MFMA and Fisheries Refugia site.



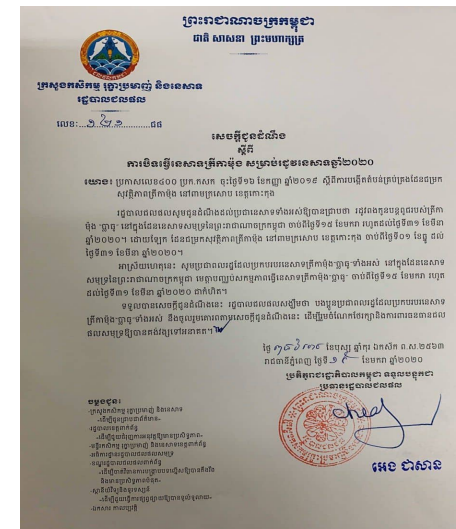
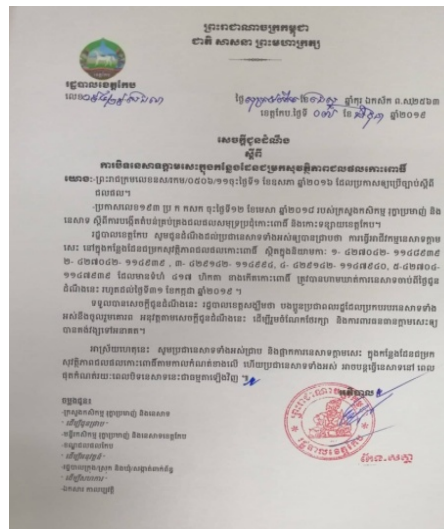


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Disseminating and distributing posters to fishermen, community fisheries, and local authorities

Broadcasting closed fishing season of blue swimming crab by local media system



# 5. BASELINE SURVEY OF SHORT MACKEREL (*Rastrelliger brachysoma*) IN KOH KONG

## 1. PURPOSE

To provide scientific data to support the establishment and management of mackerel fisheries *refugia* in Koh Kong province

## 2. METHODOLOGY

*There are several methods to be conducted such as*

- Collecting fish sampling from local market, landing site, and fishing ground
- Operating fish to check its gonad development
- Collecting its DNA
- Harvesting sampling of fish larvae using bongo net with the size of less 500micron





Collecting fish sample at local market in Koh Kong



Collecting DNA



Collecting sample of fish larvae



Operating fish to check its gonad



### 3. RESULTS

**Table1: Monthly distribution of short mackerel by sex**

Month/Year	Male		Female	
	N=	%	N=	%
Feb-19	21	25.61	61	74.39
Mar-19	58	67.44	28	32.56
Apr-19	12	13.79	75	86.21
May-19	22	34.38	42	65.63
Aug-19	34	44.74	42	55.26
Sep-19	40	54.79	33	45.21
Oct-19	45	48.39	48	51.61
Nov-19	42	47.73	46	52.27
Dec-19	61	66.30	31	33.70
Jan-20	57	58.76	40	41.24
<b>Total</b>	<b>392</b>	<b>46.78</b>	<b>446</b>	<b>53.22</b>

*Table 1 showed 838 fish sampling were collected from local market, fishing ground, and landing site, 54.18% (446 fish individual) is female and 45.82% (392 fish individual) is male.*

**Table 2: Monthly distribution of mean total length and body weight of short mackerel by sex**

Month/Year	Male		Female	
	TL(cm)	BW(g)	TL(cm)	BW(g)
Feb-19	17.09	58.15	17.70	67.89
Mar-19	16.69	53.87	17.03	58.7
Apr-19	16.09	49.94	16.25	52.24
May-19	16.64	50.54	17.59	57.8
Aug-19	15.76	41.07	16.33	44.92
Sep-19	16.93	50.53	16.23	44.63
Oct-19	16.83	55.05	17.18	58.01
Nov-19	16.92	53.67	17.50	60.73
Dec-19	16.84	57.18	17.32	61.96
Jan-20	17.15	61.65	17.54	66.57

*Table 2 showed the total length of male fish increase from 15.76 cm in August to 17.15 in January meanwhile its body weight also increase from 41.07 in August to 61.65 cm in January. Total length of female increase from 16.33 cm in August to 17.79 cm in February meanwhile its body weight of female also increase from 44.92 in August to 67.89cm in February .*



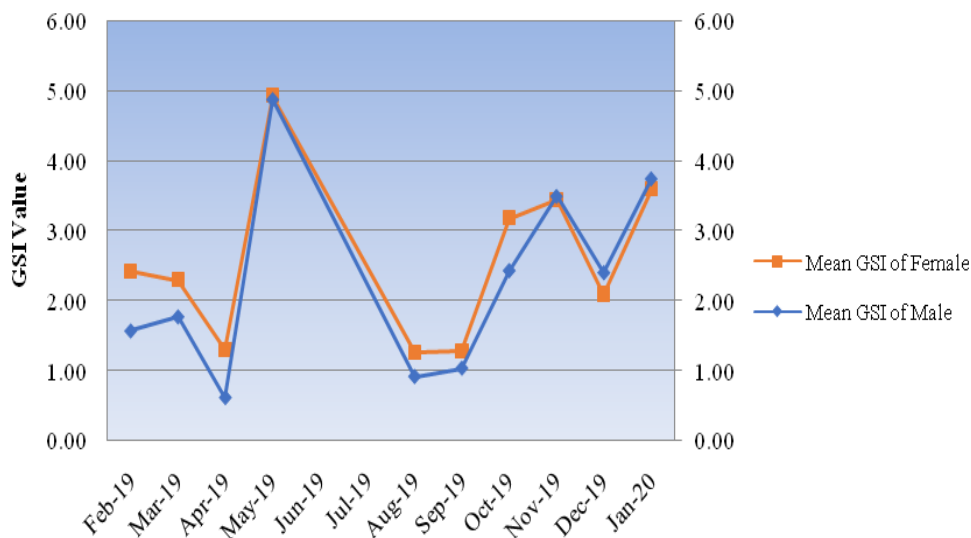
Table3: gonad somatic index value of male and female

Month/Year	Mean GSI of Male	Mean GSI of Female
Feb-19	1.57	2.42
Mar-19	1.77	2.30
Apr-19	0.62	1.30
May-19	4.87	4.92
Aug-19	0.92	1.27
Sep-19	1.04	1.29
Oct-19	2.43	3.18
Nov-19	3.49	3.44
Dec-19	2.40	2.10
Jan-20	3.74	3.59

Mean GSI value of short mackerel for male was estimated monthly from 0.92 in August to 1.04 in September in Figure 6, indicating immaturity period, after which the GSI value gradually increase from 2.43 in October to 3.49 in November, indicating the peak period of maturity. There is gradually decline in GSI value (2.40) in December, indicating the onset of spawning. GSI value (3.74) gradually increases in January, indicating pre-spawning period in January. There is abruptly decrease in GSI value from 3.74 in January to 1.77 in March, indicating the spawning period from February to March. There is abruptly decline in GSI value from 1.77 in March to 0.62 in April, indicating post spawning in April. There is abruptly increase from 0.62 in April to 4.87 in May, indicating pre-spawning period in May.

Mean GSI value of short mackerel for female was estimated monthly from 1.27 in August to 1.29 in September in Figure 6, indicating the preparatory period from August to September. There is abrupt increase in GSI value from 1.29 in September to 3.44 in November, indicating pre-spawning from October to November. But there is a gradual decrease in GSI value from 3.44 in October to 2.10 in December, indicating spawning period in December. GSI value gradually increases from 2.10 in December to 3.59 in January, indicating pre-spawning period in January. There is gradual decrease in GSI value from 3.59 in January to 2.30 in March, indicating spawning period from February to March. After that GSI value abruptly decline from 2.30 in March to 1.30 in April, indicating post spawning period in April. GSI value abruptly increases from 1.30 in April to 4.92 in May, indicating pre-spawning period in May.

GSI Value in Different Month of the Year for Short mackerel



**Table 4: Monthly identification of specie composition by families and by station**

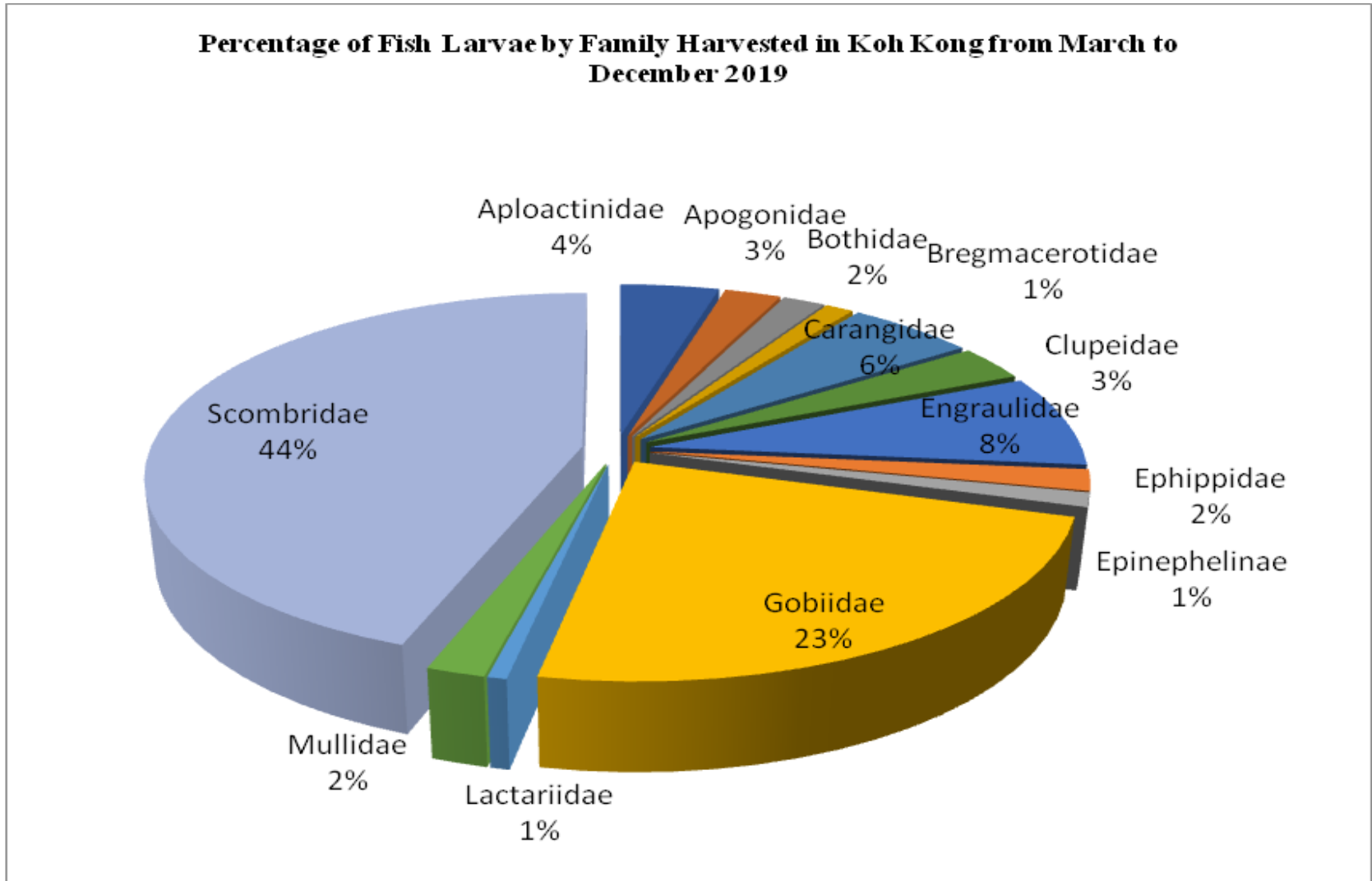
Family	Station1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Total
Aploactinidae			4					3	7
Apogonidae			2		1			1	4
Bothidae			1		2				3
Bregmacerotidae					2				2
Carangidae					6			3	9
Clupeidae	1			2		1	1		5
Engraulidae	1	5					3	4	13
Ephippidae		3							3
Epinephelinae					2				2
Gobiidae	1	4			26		5	2	38
Lactariidae			1						1
Mullidae			1				1	1	3
Scombridae	2	30	27	3	4		4	2	72

*Table 4 showed that 13 families were harvested with 8 stations from March to December 2019. 72 fish individual of Scombridae in 7 sstaions. 30 fish individual of Scombridae was collected in station 2, following is staion 3 (27 fish individual), and staion 5 and station 7 ( 4 each fish individual) . Staion1, Station 4, and Station 8 catching 2 fish individual, 3 fish individual, and 2 2 fish individual, respectively.*





**Figure 2: Percentage of specie composition by families and station**



*Figure 1 showed that 44% is Scobridae, following is Gobiidae (23%), and Carangidae (6%). However less percentage harvested, including Lactariidae (1%), Bregmacerotidae (1%), and Epinephelinae (1%).*

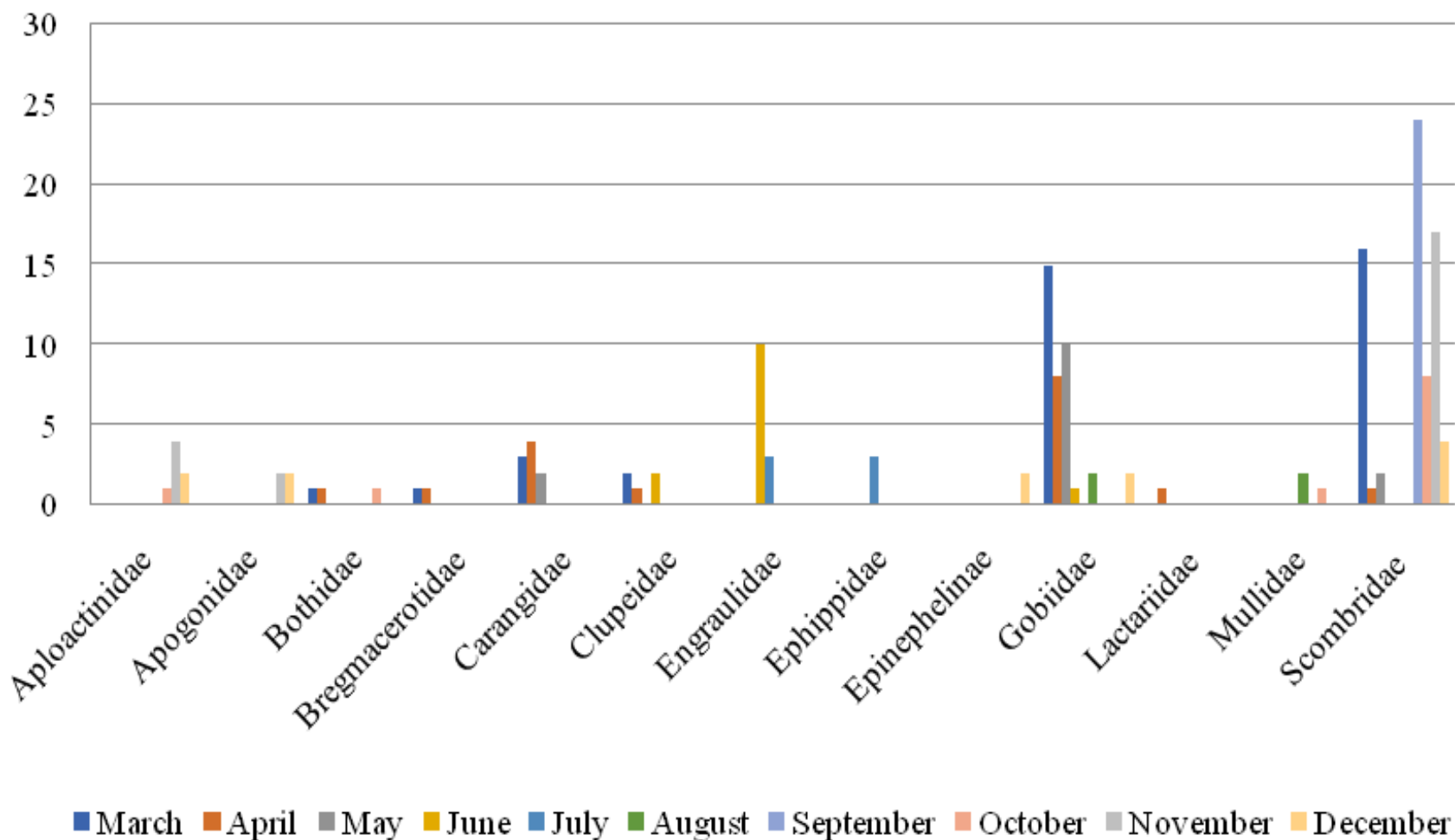


Table 5: Distribution of fish composition by family and month

Family	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Aploactinidae								1	4	2	7
Apogonidae									2	2	4
Bothidae	1	1						1			3
Bregmacerotidae	1	1									2
Carangidae	3	4	2								9
Clupeidae	2	1		2							5
Engraulidae				10	3						13
Ephippidae					3						3
Epinephelinae										2	2
Gobiidae	15	8	10	1		2				2	38
Lactariidae		1									1
Mullidae						2		1			3
Scombridae	16	1	2				24	8	17	4	72

Table 5 showed that Scombridae can catch in March, April, May, September, October, November, and December, exception for the month of June, July, and August. In particular, 24 fish individual of Scombridae was collected in September, following November (17 fish individual), and March (16 fish individual), October (8 fish individual), December (4 fish individual), April (1 fish individual), and May (2 fish individual), respectively.

### Monthly Distribution of Fish Larvae by Family in Koh Kong province





**Thank you very much for your attention**