



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

REPORT

**THE BASELINE SURVEY OF SHORT MACKEREL AND FISH LARVAE
COLLECTION IN KOH KONG PROVINCE IN OCTOBER 2019**

**KOH KONG, CAMBODIA
7-12 October 2019**

Prepared by
FISHERIES ADMINISTRATION, CAMBODIA

**SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
TRAINING DEPARTMENT**



First published in Phrasamutchedi, Samut Prakan, Thailand in October 2019 by the SEAFDEC-UNEP-GEF Fisheries Refugia Project, Training Department of the Southeast Asian Fisheries Development Center

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For citation purposes this document may be cited as:

FIA/Cambodia, 2019. Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand, Report of the Baseline Survey of Short Mackerel and Fish Larvae Collection in Koh Kong Province in October 2019. Southeast Asian Fisheries Development Center, Training Department, Samut Prakan, Thailand; FR/REP/CAM56, 11p.

1. Field Trip Objective

- 1) To monitor the development of short mackerel gonad and collect sampling fish larvae in Koh Kong province, funded by SEAFDEC/UNEP/GEF from 7 to 12 October 2019.

2. Involved Person

- 2) There are four leaders and officers from Department of Fisheries Conservation and two officers from Fisheries Administration Cantonment in Koh Kong, participating in doing a research of baseline survey short mackerel in Koh Kong province naming as following (see Annex 1):
 - Mr. Leng Sy Vann, Deputy Director of the Department of Fisheries Conservation and NSTFP
 - Ms. Ly Sokta, Officer of Department of Fisheries Conservation/FiA
 - Mr. Rous Saret, Officer of Department of Fisheries Conservation
 - Mr. Lieng Saroeun, Vice chief of Crocodile Industrial development and conservation, Department of Fisheries Conservation
 - Ms. Mab Chenda, 3rd Student of Fisheries Science Faculty, Royal University of Agriculture
 - Mr. Nou Ngoy, Vice Chief of Fisheries Administration Division, Koh Kong FiAC
 - Mr. Seng Bunna, Vice Chief of Fisheries Administration Division, Koh Kong FiAC

3. Field Trip Activities (Annex 2 and 3)

A. Collection of fish samples at landing sites and markets

- 3) Teamwork from FiA and FiAC went down to collect the fish sampling at the local markets such as Village 4 market and Dorng Tung market. 5kg of fish was bought at Dorng Tung market and other 4kg of fish at Village 4 market to monitor the development of its gonad (see annex 2).

B. Operate fish to monitor its gonad development

- 4) 100 fish sampling is operated to monitor its gonad development, including 51 females, 47 males, and the rest of them for non sex (**Annex 4**).
- 5) According to data analysis for female, its average body weight is 58.19g and the body length is 17.21cm. For its gonad stage, it varies from 1st stage to 4th stage, including one fish in 1st stage, 20 fish in 3rd stage, and 30 fish in 4th stage. For its average gonad weight, it is 1.84.
- 6) As for data analysis for male, its average body weight is 55.03g and average body length is 16.83cm. For its gonad stage, it varies from 2nd stage to 5th stage, including 3 fish in 2nd stage, 28 fish in 3rd stage, 15 fish in 4th stage, and one fish in 5th stage. For its average gonad weight, it is 1.32

C. Preparing and storing DNA

- 7) Teamwork prepared and cut the part of 30 fish body that are stored in small plastic tubes with ethanol of 99.7% to study and analyze its DNA.

D. Sampling fish larvae collection

- 8) Teamwork from FiA and FiAC went down to collect sampling fish larvae at Koh Yor, Chroy Pros, and Peam Krasob sites that are 8 stations including 4 sites at Peam Krasob, 2 sites at Chroy Pros, other 2 sites at Koh Yor near border Thailand. The bongo net with the size of 1 m diameter and 5 m length was applied to collect sampling fish larvae and two times/station was applied to collect fish larvae. All sampling fish larvae were stored and kept in plastic tube with ethanol of 99.7%.

ANNEX 1**List of participants attending the baseline survey of short mackerel gonad development from 07 to 12 October 2019 in Koh Kong province**

No.	Name	Sex	Title	Organization	Telephone
1	Leng Sy Vann	M	Deputy Director	DFC/FiA	017446373
2	Ly Sokta	F	Officer	DFC/FiA	092653427
3	Lieng Saroeun	M	Vice chief of Crocodile industrial and conservation division	DFC/FiA	092660267
4	Mab Chenda	F	3 rd year-student	Fisheries Faculty/RUA	077511674
5	Rous Saret	M	Officer	DFC/FiA	011664696
6	Seng Bunna	M	Vice chief of Fisheries Administration Division	Koh Kong FiAC	016885709
7	Nou Ngoy	M	Vice chief of Fisheries Administration Division	Koh Kong FiAC	016933192

ANNEX 2**Schedule for baseline survey of short mackerel gonad development from 07 to 12 October 2019 in Koh Kong province**

Date/Time	Description	Responsible person
07 October 2019		
9:00am-4:00pm	Leaving Phnom Penh for Koh Kong	<ul style="list-style-type: none"> • Mr. Lieng Saroeun, • Mr. Leng Sy Vann, • Ms. Ly Sokta, and • Mr. Rous Saret • Ms. Mab Chenda
08 October 2019		
9:00am- 12:00pm	Collect sampling short mackerel at Dorng Tung market in Koh Kong province	All
12:00pm-2:00pm	Lunch break	All
2:00pm-5:00pm	Operate fish to monitor fish gonad and collect its NDA	All
09 October 2019		
8:00am-1:00pm	Sample fish larvae collection at station 2, 4, 1 and 7	All
1:00pm -3:00pm	Lunch break	All
3:00pm -5:00pm	Interview fishermen of mackerel at Village 4, Koh Kong province	All
10 October 2019		
8:00-1:00pm	Sample fish larvae collection at station 6 and 8	All
1:00pm-3:00pm	Lunch break	All
3:00pm -5:00pm	Interview fishermen of mackerel at Village 4, Koh Kong province	All
11 October 2019		
8:00-12:00pm	Sample fish larvae collection at station 3 and 5	All
12:00pm-2:00pm	Lunch break	All
2:00pm-4:00pm	Interview fishermen of mackerel at Village 4, Koh Kong province	All
12 October 2019		
9:00am-4:00pm	Leaving Phnom Penh for Koh Kong	All

ANNEX 3

Participants' Photos attending the baseline survey of short mackerel gonad development from 07 to 12 October 2019 in Koh Kong province





ANNEX 4
Database of short mackerel collected from local market in Koh Kong on 08 October 2019

Code No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKDT0001	17.3	15.4	3.8	60.6	F	3	1.80	2.97	DT Market	SM	8/10/19	4.05
KKDT0002	17.0	15.0	3.7	59.2	F	3	1.50	2.53	DT Market	SM	8/10/19	4.05
KKDT0003	17.1	15.1	3.6	57.7	M	3	1.40	2.43	DT Market	SM	8/10/19	4.19
KKDT0004	17.3	15.1	3.8	57.8	F	4	3.60	6.23	DT Market	SM	8/10/19	3.97
KKDT0005	16.9	15.0	3.5	51.8	M	3	1.50	2.90	DT Market	SM	8/10/19	4.29
KKDT0006	17.0	15.0	3.7	54.4	F	4	1.80	3.31	DT Market	SM	8/10/19	4.05
KKDT0007	16.7	14.9	3.6	53.2	F	3	0.70	1.32	DT Market	SM	8/10/19	4.14
KKDT0008	17.0	15.5	3.8	56.8	F	4	1.90	3.35	DT Market	SM	8/10/19	4.08
KKDT0009	17.3	15.4	3.8	60.3	M	4	1.80	2.99	DT Market	SM	8/10/19	4.05
KKDT0010	16.5	14.9	3.4	52.4	M	3	0.60	1.15	DT Market	LM	8/10/19	4.38
KKDT0011	17.4	15.5	3.7	60.3	F	4	1.80	2.99	DT Market	SM	8/10/19	4.19
KKDT0012	15.5	13.8	3.4	43.7	M	3	0.50	1.14	DT Market	SM	8/10/19	4.06
KKDT0013	16.8	15.0	3.6	54.4	M	3	1.20	2.21	DT Market	SM	8/10/19	4.17
KKDT0014	18.0	16.0	3.7	62.1	F	3	1.30	2.09	DT Market	LM	8/10/19	4.32
KKDT0015	17.0	15.1	3.8	56.7	M	3	1.70	3.00	DT Market	SM	8/10/19	3.97
KKDT0016	15.6	14.0	3.8	48.0	M	3	0.30	0.63	DT Market	SM	8/10/19	3.68
KKDT0017	16.8	14.8	3.7	51.8	M	3	0.30	0.58	DT Market	SM	8/10/19	4.00
KKDT0018	15.6	14.0	3.6	42.8	M	2	0.20	0.47	DT Market	SM	8/10/19	3.89
KKDT0019	18.0	16.2	4.0	63.5	M	3	1.20	1.89	DT Market	SM	8/10/19	4.05
KKDT0020	16.7	14.9	3.9	51.9	M	4	1.60	3.08	DT Market	SM	8/10/19	3.82
KKDT0021	17.6	15.5	3.7	58.9	F	4	2.10	3.57	DT Market	SM	8/10/19	4.19
KKDT0022	16.2	14.4	3.7	53.1	F	4	1.30	2.45	DT Market	SM	8/10/19	3.89
KKDT0023	17.0	15.2	3.6	55.2	F	3	1.80	3.26	DT Market	SM	8/10/19	4.22

¹ Fork Length (FL)/Body Deep(BD): less than or equal to 4.30 is short mackerel (SM), *Rastrelliger brachysoma*
more than 4.30 is long mackerel (LM), *Rastrelliger kanagurta*.

Code No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKDT0024	16.8	15.0	3.6	54.5	M	3	1.30	2.39	DT Market	SM	8/10/19	4.17
KKDT0025	17.8	15.8	3.9	66.9	M	4	2.50	3.74	DT Market	SM	8/10/19	4.05
KKDT0026	17.2	15.3	3.8	58.0	F	4	3.20	5.52	DT Market	SM	8/10/19	4.03
KKDT0027	17.8	15.8	3.8	64.8	F	4	1.50	2.31	DT Market	SM	8/10/19	4.16
KKDT0028	17.0	15.2	3.6	54.9	F	4	2.40	4.37	DT Market	SM	8/10/19	4.22
KKDT0029	16.0	14.2	3.5	48.9	M	3	0.60	1.23	DT Market	SM	8/10/19	4.06
KKDT0030	15.8	14.3	3.3	45.0	M	2	0.30	0.67	DT Market	LM	8/10/19	4.33
KKDT0031	18.0	16.0	3.8	64.1	F	4	2.30	3.59	DT Market	SM	8/10/19	4.21
KKDT0032	16.8	14.8	3.6	52.0	F	3	2.00	3.85	DT Market	SM	8/10/19	4.11
KKDT0033	16.8	15.0	3.6	53.3	F	3	1.30	2.44	DT Market	SM	8/10/19	4.17
KKDT0034	17.6	15.8	3.6	62.4	ND	ND	ND	ND	DT Market	LM	8/10/19	4.39
KKDT0035	17.0	15.1	3.7	34.7	F	4	1.80	5.19	DT Market	SM	8/10/19	4.08
KKDT0036	17.5	15.4	3.6	59.4	ND	ND	ND	ND	DT Market	SM	8/10/19	4.28
KKDT0037	16.2	14.4	3.5	49.0	M	4	2.00	4.08	DT Market	SM	8/10/19	4.11
KKDT0038	16.0	14.2	3.5	47.1	M	3	ND	ND	DT Market	SM	8/10/19	4.06
KKDT0039	16.5	14.6	3.5	49.7	M	3	2.10	4.23	DT Market	SM	8/10/19	4.17
KKDT0040	16.5	14.7	3.5	53.5	F	4	1.50	2.80	DT Market	SM	8/10/19	4.20
KKDT0041	16.3	14.7	3.5	52.7	F	3	0.80	1.52	DT Market	SM	8/10/19	4.20
KKDT0042	16.0	14.2	3.5	46.7	M	2	0.30	0.64	DT Market	SM	8/10/19	4.06
KKDT0043	17.6	15.7	3.9	66.1	F	4	3.60	5.45	DT Market	SM	8/10/19	4.03
KKDT0044	17.1	15.3	3.8	59.8	F	4	1.40	2.34	DT Market	SM	8/10/19	4.03
KKDT0045	17.0	15.2	3.7	57.2	F	4	1.00	1.75	DT Market	SM	8/10/19	4.11
KKDT0046	17.1	15.4	3.8	60.8	F	4	2.10	3.45	DT Market	SM	8/10/19	4.05
KKDT0047	17.1	15.5	3.8	59.1	M	3	0.90	1.52	DT Market	SM	8/10/19	4.08
KKDT0048	16.1	14.3	3.5	46.7	M	3	0.70	1.50	DT Market	SM	8/10/19	4.09
KKDT0049	17.0	15.2	3.6	55.5	M	3	1.00	1.80	DT Market	SM	8/10/19	4.22
KKDT0050	16.2	14.5	3.6	48.7	M	3	0.90	1.85	DT Market	SM	8/10/19	4.03
KKV40001	17.2	15.2	3.7	55.6	F	4	1.70	3.06	Village 4 Market	SM	8/10/19	4.11

Code No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKV40002	17.9	16.0	3.9	68.2	F	4	2.50	3.67	Village 4 Market	SM	8/10/19	4.10
KKV40003	17.1	15.1	3.7	57.9	F	3	1.50	2.59	Village 4 Market	SM	8/10/19	4.08
KKV40004	17.8	15.8	3.8	63.3	M	4	2.30	3.63	Village 4 Market	SM	8/10/19	4.16
KKV40005	16.5	14.9	3.6	54.6	M	3	1.60	2.93	Village 4 Market	SM	8/10/19	4.14
KKV40006	17.1	15.3	3.6	57.9	M	3	1.40	2.42	Village 4 Market	SM	8/10/19	4.25
KKV40007	17.5	15.6	3.8	64.8	F	4	2.90	4.48	Village 4 Market	SM	8/10/19	4.11
KKV40008	17.1	15.5	3.6	56.8	F	4	1.80	3.17	Village 4 Market	LM	8/10/19	4.31
KKV40009	17.2	15.5	3.7	58.1	F	4	1.50	2.58	Village 4 Market	SM	8/10/19	4.19
KKV40010	18.0	16.0	3.8	66.0	F	3	1.40	2.12	Village 4 Market	SM	8/10/19	4.21
KKV40011	17.3	15.4	3.8	61.6	M	3	1.00	1.62	Village 4 Market	SM	8/10/19	4.05
KKV40012	17.0	15.1	3.6	57.6	M	4	1.80	3.13	Village 4 Market	SM	8/10/19	4.19
KKV40013	16.4	14.9	3.6	50.2	M	3	1.30	2.59	Village 4 Market	SM	8/10/19	4.14
KKV40014	17.6	15.9	3.7	60.6	M	4	1.50	2.48	Village 4 Market	SM	8/10/19	4.30
KKV40015	18.6	16.4	4.1	75.8	F	4	2.90	3.83	Village 4 Market	SM	8/10/19	4.00
KKV40016	16.4	14.8	3.6	53.6	F	3	0.80	1.49	Village 4 Market	SM	8/10/19	4.11
KKV40017	17.2	15.3	3.6	56.6	F	4	2.00	3.53	Village 4 Market	SM	8/10/19	4.25
KKV40018	17.8	15.9	3.7	61.2	M	5	2.20	3.59	Village 4 Market	SM	8/10/19	4.30
KKV40019	16.3	14.8	3.6	52.7	F	1	0.00	0.00	Village 4 Market	SM	8/10/19	4.11
KKV40020	16.7	14.8	3.6	52.1	F	3	1.40	2.69	Village 4 Market	SM	8/10/19	4.11
KKV40021	17.5	15.5	3.8	61.2	F	3	1.50	2.45	Village 4 Market	SM	8/10/19	4.08
KKV40022	17.5	15.6	3.8	62.0	F	3	1.50	2.42	Village 4 Market	SM	8/10/19	4.11
KKV40023	17.3	15.6	3.7	59.2	F	3	0.80	1.35	Village 4 Market	SM	8/10/19	4.22
KKV40024	17.5	15.7	3.8	59.8	M	3	1.30	2.17	Village 4 Market	SM	8/10/19	4.13
KKV40025	18.1	16.1	3.7	52.5	F	4	1.90	3.62	Village 4 Market	SM	8/10/19	4.35

Code No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKV40026	17.0	15.0	3.7	54.8	F	3	1.80	3.28	Village 4 Market	SM	8/10/19	4.05
KKV40027	17.2	15.1	3.7	60.3	M	4	1.40	2.32	Village 4 Market	SM	8/10/19	4.08
KKV40028	17.0	15.1	3.7	59.2	M	3	1.10	1.86	Village 4 Market	SM	8/10/19	4.08
KKV40029	16.2	14.6	3.5	49.0	M	4	1.20	2.45	Village 4 Market	SM	8/10/19	4.17
KKV40030	18.0	16.0	3.8	65.5	M	4	1.60	2.44	Village 4 Market	SM	8/10/19	4.21
KKV40031	16.3	15.0	3.5	51.5	M	4	1.80	3.50	Village 4 Market	SM	8/10/19	4.29
KKV40032	17.4	15.5	3.8	60.7	M	4	2.40	3.95	Village 4 Market	SM	8/10/19	4.08
KKV40033	17.5	15.3	3.8	58.1	F	4	2.00	3.44	Village 4 Market	SM	8/10/19	4.03
KKV40034	17.8	15.8	3.7	61.2	M	4	1.70	2.78	Village 4 Market	SM	8/10/19	4.27
KKV40035	18.0	15.8	3.8	63.3	M	3	1.00	1.58	Village 4 Market	SM	8/10/19	4.16
KKV40036	16.4	14.5	3.6	53.2	M	4	2.70	5.08	Village 4 Market	SM	8/10/19	4.03
KKV40037	17.0	15.3	3.8	68.9	F	4	2.50	3.63	Village 4 Market	SM	8/10/19	4.03
KKV40038	16.8	15.0	3.7	53.9	M	4	1.50	2.78	Village 4 Market	SM	8/10/19	4.05
KKV40039	18.0	16.1	3.7	64.3	F	4	1.80	2.80	Village 4 Market	LM	8/10/19	4.35
KKV40040	17.5	15.8	3.7	60.0	F	4	1.30	2.17	Village 4 Market	SM	8/10/19	4.27
KKV40041	18.0	16.0	3.8	66.5	F	3	2.10	3.16	Village 4 Market	SM	8/10/19	4.21
KKV40042	17.0	15.0	3.7	55.1	F	3	2.40	4.36	Village 4 Market	SM	8/10/19	4.05
KKV40043	17.3	15.4	3.7	60.6	F	4	2.10	3.47	Village 4 Market	SM	8/10/19	4.16
KKV40044	16.0	14.4	3.4	48.9	F	3	ND	ND	Village 4 Market	SM	8/10/19	4.24
KKV40045	17.0	15.2	3.7	58.4	F	3	2.30	3.94	Village 4 Market	SM	8/10/19	4.11
KKV40046	16.3	14.5	3.5	52.1	M	3	1.10	2.11	Village 4 Market	SM	8/10/19	4.14
KKV40047	16.7	14.7	3.5	56.7	M	3	1.00	1.76	Village 4 Market	SM	8/10/19	4.20
KKV40048	16.7	15.0	3.6	56.0	M	3	1.50	2.68	Village 4 Market	SM	8/10/19	4.17
KKV40049	17.0	15.1	3.7	55.4	F	4	1.30	2.35	Village 4 Market	SM	8/10/19	4.08
KKV40050	16.6	15.0	3.6	52.5	M	3	1.40	2.67	Village 4 Market	SM	8/10/19	4.17