APPENDIX -4

DETERMINATION OF SCALE

4-1 PROJECT FACILITIES

4-2 PROJECT EQUIPMENT

APPENDIX - 4. SCALE ESTIMATION OF FACILITIES & EQUIPMENT

4-1. Scale Estimation of Building and Civil Facilities

Required scale of Building & Civil facilities mentioned below table estimate for each model site. Original Unit Rate and Ground using for estimation are based on Attached data 1 and results of site hearing.

Scale of facilities provided in this clause are estimated by using this unit rate taking into consideration of existing situation coming from the results of site hearing. Therefore, when results of this scale estimation adopt to each model site, necessity of facility, easiness of land occupation for facility, limitation of arrangement due to natural/geographical condition and possibility of multi purpose facility, etc shall be considered for planning.

Objective Building and Civil Facilities

No.	Facility Name	Required content of Scale estimation
1	Basic Data	Basic data for estimation of required scale
2	Mooring Facility	Length of unloading wharf/Jetty and facility for small fisher boat
3	Handling Facility	Building/ground area of Handling shed & ancillary facilities
4	Ice Making & Storage	Building/Ground area of Ice plant and Ice storage facilities
5	Fuel Storage Facility	Fuel storage house/Ground area. Ground area of fuel tank
6	Water Supply Facility	Supplied volume of fishery water. Storage capacity, Discharge volume
7	Model Processing shed	Building scale, facility/ground area of Model processing room
8	Simplified Workshop	Building/Ground area of Mini workshop
9	Dry area/Open space	Area of Fishing Gear drying yard. Area of Open pile yard
10	Unloading Facility	Length of unloading facility. Ground area of ancillary facilities
11	Administration Office	Building/Ground area of Management Office and ancillary facilities
12	Multi Purpose Facility	Building/Ground area of small scale multi purpose facilities
13	Market Facility	Building/Ground area of Retail market, Wholesale space, Office, Parking Lot and other necessary facilities
14	Transportation facility	Ground area of Parking Lot. Width of Road
15	Ancillary Facility	Facility/Ground area of Power supply, Water supply, Sewage treatment facility and Garbage
16	Environmental Improvement Facility for Fishing Village	Living water supply volume. Scale of relevant facilities

4-1. SCALE DETERMINATION OF FACILITIES

Table 4-1-1 BASE LINE DATA (FISHING BOATS AND LANDING VOLUME DURING PEAK SEASON AT EACH PROJECT SITE)

(1) WAWORADA Season: May-July

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Bagan	42	15-40	30	06:00-09:00	3	1.8	0.6	0.12	0.04	by sampan	(No change)
- Purse Seine	44	11-12	12	17:00-20:00	3	38.7	12.9	12.91	4.30	by sampan	on wharf
- Gill Net	14	7-12	10	Anytime	6	10.1	1.7	0.30	0.05	by sampan or beach landing	on wharf or beach landing
- Handline	4	4-5	5								
- Collecting Boats	25	8-9	9	02:00-07:00	5	21.3	4.3	8.57	1.71	beach landing	on wharf
Total (Peak time)				17:00-20:00	3	38.7	12.9	12.91	4.30		
Total	129				10	71.9	7.2	21.90	2.19		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	on wharf
- Transportation boats	32	12	12	-	-	-	-	-	-	beach landing	on wharf

(2) KEMPO Peak Season: July-Aug.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Bagan	33	17-23	20	04:00-07:00	3	31.3	10.4	2.61	0.87	by sampan	(No change)
- Purse Seine	10	12-15	14	04:00-07:00	3	10.0	3.3	0.83	0.28	by sampan	on jetty
- Gill Net	14	11-12	12	Anytime	6	10.1	1.7	1.51	0.25	by sampan or beach landing	on jetty or beach landing
- Handline		5-6	6								
- Collecting Boats	80	8-9	9	02:00-07:00	5	40.0	8.0	17.22	3.44	beach landing	on jetty
Total (Peak time)				04:00-07:00	3	65.3	21.8	13.77	4.59	beach landing	on jetty
Total	137				10	91.4	9.1	22.17	2.22		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	on jetty

(3) HU'U Peak Season: May-June

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Purse Seine	14	12-13	13	12:00-15:00	3	12.0	4.0	2.63	0.88	by sampan	(No change)
- Gill Net	3	10-12	11	06:00-12:00	6	3.0	0.5	0.30	0.05	by sampan or beach landing	(No change)
- Handline	6	4-6	5			6.0	1.0	0.21	0.04		
Total (Peak time)				12:00-15:00	3	12.0	4.0	2.63	0.88		
Total	23				9	21.0	2.3	3.14	0.35		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan

(4) LARANTUKA Peak Season: Oct.-Nov.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Bagan	26	10-12	11	06:00-09:00	3	21.0	7.0	0.90	0.30	by sampan	(No change)
- Purse Seine	10	9-13	12	06:00-09:00	3	28.3	9.4	8.48	2.83	by sampan	on wharf
- Gill Net - Handline	30	3.5-9	6	Anytime	6	2.8	0.5	0.08	0.01	by sampan or beach landing	on wharf or beach landing
Total (Peak time)				06:00-09:00	3	50.7	16.9	9.42	3.14		
Total	66				6	52.1	8.7	9.46	1.58		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	on wharf
- Transportation boats *1	5	3-10GT	15	-	-	-	-	-	-	-	by sampan

Note: *1: Lamahara Jaya (5GT), Sagu (3GT), Lewoleba (10GT), Balauring (3GT) & Lamalera (4GT)

(5) LAMAHALA JAYA Peak Season: Oct.-Nov.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Bagan	2	12	12	06:00-09:00	3	1.0	0.3	0.16	0.05	by sampan	(No change)
- Purse Seine	82	11-13	12	06:00-09:00	3	26.7	8.9	8.41	2.80	by sampan	(No change)
				15:00-18:00	3	13.3	4.4	4.21	1.40		
- Gill Net - Handline	10	6-8	7	Anytime	6	7.0	1.2	0.16	0.03	by sampan or beach landing	(No change)
Total					6	41.0	13.7	12.78	4.26		
Direct selling to Sinjai boats at sea								4.67	1.56		
Balance								8.11	2.70		
Total (Peak time)				06:00-09:00	3	31.2	10.4	5.54	1.85		
Total	94				6	41.0	6.8	8.11	1.35		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan
- Transportation boat	1	5GT	12	-	-	-		-	-	-	by sampan

(6) SAGU Peak Season: Oct.-Feb.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Bagan	5	5GT		06:00-09:00	3	4.4	1.5	0.88	0.29	by sampan	(No change)
- Purse Seine	6	10-12	11	06:00-09:00	3	2.5	0.8	0.76	0.25	by sampan	(No change)
			11	15:00-18:00	3	1.3	0.4	0.33	0.11		
- Gill Net	10	5-12	8	06:00-09:00	3	6.3	2.1	0.19	0.06	by sampan or beach landing	(No change)
- Handline	11	4-5	5	Anytime	6	6.8	1.1	0.05	0.01		
Total (Peak time)				06:00-09:00	3	16.6	5.5	1.86	0.62		
Total	32				6	21.3	3.6	2.21	0.37		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan
- Transportation boat	1	3GT	11	-	-	-	-	-	-	-	by sampan

(7) LEWOLEBA Peak Season: Jan.-Mar.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Bagan	47	12-15	14	06:00-09:00	3	46.3	15.4	6.95	2.32	by sampan	(No change)
- Purse Seine	7	9-12	11	06:00-09:00	3	1.3	0.4	4.00	1.33	by sampan	on wharf
			11	15:00-18:00	3	0.7	0.2	2.00	0.67		
- Gill Net	10	4-6	5	06:00-09:00	3	10.0	3.3	0.10	0.03	by sampan or beach landing	on wharf or beach landing
- Handline	2	4-6	5	12:00-15:00	3	2.0	0.7	0.05	0.02		
Total (Peak time)				06:00-09:00	3	57.6	19.2	11.05	3.68		
Total	66				9	60.3	6.7	13.10	1.46		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan
- Transportation boat	1	10GT	15	-	-	-	-	-	-	-	by sampan

(8) BALAURING Peak Season: Oct.-Nov. (Peak season of transport of fresh fish: Jan.-Feb.)

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Purse Seine	3	12-13	13	15:00-18:00	3	1.9	0.6	0.38	0.13	by sampan	(No change)
- Gill Net	7	5-7	6	05:00-08:00	3	4.4	1.5	0.29	0.10	by sampan or beach landing	(No change)
- Handline	14	5-7	6	05:00-08:00	3	8.8	2.9	0.71	0.24		
- Non-motor	80	5-7	6								
Total (Peak time)				05:00-08:00	3	13.2	4.4	1.00	0.33		
Total	104				6	15.1	2.5	1.38	0.23		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan
- Transportation boat	1	6GT	11	-	-	-	-	-	-	-	by sampan

(9) LAMALERA Peak Season: June-Sep. (Jan.-Feb. exp. whaler)

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Whaler	20	10-12	11	12:00-15:00	3	0.7	0.2	2.50	0.83	beach landing	(No change)
- Gill Net	11	8-11	10	09:00-12:00	3	5.5	1.8	0.48	0.16		
- Handline (non-motor)	40	3-4	4	12:00-15:00	3	20.0	6.7	0.88	0.29		
Total (Peak time)				12:00-15:00	3	20.7	6.9	3.38	1.13		
Total	71				6	26.2	4.4	3.86	0.64		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan
- Transportation boat	1	4GT	12	-	-	-	-	-	-	-	by sampan

(10) MAUMERE/WURING Peak Season: Oct.-Nov.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Purse Seine	54	10-14	12	05:00-08:00	3	28.9	9.6	8.67	2.89	by sampan	on wharf
- Gill Net	24	5-7	6	05:00-08:00	3	3.1	1.0	0.08	0.03	by sampan or	on wharf or beach
- Handline	47	5-7	6	12:00-18:00	6	2.7	0.5	0.01	0.00	beach landing	landing
- Collecting boat	19		9	05:00-08:00	3	8.3	2.8	2.50	0.83	beach landing	on wharf
Total (Peak time)				05:00-08:00	3	40.3	13.4	11.25	3.75		
Total	144				6	43.0	7.2	11.26	1.88		
- Model fishing boat	1	-	16	-	-	-		-	-	-	on wharf

(11) PAGA/MAULOO Peak Season: Oct.-Nov.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Purse Seine	21	10	10	15:00-18:00	3	14.4	4.8	4.32	1.44	by sampan	(No change)
- Gill Net	3	2.5-3	3	06:00-09:00	3	3.0	1.0	0.15	0.05	by sampan or	(No change)
- Gill Net (with FAD)	6	4-6	5	06:00-09:00	3	6.0	2.0	0.15	0.05	beach landing	
- Trolling	2	4-6	5	06:00-09:00	3	2.0	0.7	0.02	0.01		
Total (Peak time)				15:00-18:00	3	14.4	4.8	4.32	1.44		
Total	32				6	25.4	4.2	4.64	0.77		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	by sampan

(12) ENDE (PAUPANDA : Ende Selatan + Plau Ende) Peak Season: May-Aug.

Type of boat	Fishing boats			Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach	
	No. of boats	Length (m)	Average (m)	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project
- Purse Seine	33	12-17	15	15:00-18:00	3	22.6	7.5	6.79	2.26	by sampan	on jetty
- Lampala	12	16	16	06:00-09:00	3	8.2	2.7	2.47	0.82	by sampan	on jetty
- Gill Net	97	4-7	6	06:00-09:00	3	32.3	10.8	1.61	0.54	by sampan or	on jetty or beach
- Handline	20	2.5-3	3							beach landing	landing
Total (Peak time)				15:00-18:00	3	22.6	7.5	6.79	2.26		
Total	162				6	63.1	10.5	10.87	1.81		
- Model fishing boat	1	-	16	-	-	-	-	-	-	-	on jetty

Table 4-1-2 MOORING FACILITY

Type of Mooring Facilities and Development Plan

Mooring Facilities	Application	Improvement concept
Landing wharf	landing by fishing vessels	Jetty type or Wharf type facilities to cope with Tidal level After unloading and preparation, move to Anchoring area
	transportation by sampan beach landing by sampan	Mooring facilities to cope with Tidal level or Sandy landing beach
Preparing wharf	Fuel/Water supply, Loading & unloading of Fishing Gear, etc	After unloading fish catch, Fuel & Material are loaded --> Wharf is used both as Landing and Preparing
Resting wharf	For Model Fishing Boats only	Existing fishing boats are anchored at offshore area as before
Particular purpose wharf	For Passenger Boat purpose (Rompo-Waworada route only)	Secure the safety travel of passengers

(1) No. of FISHING BOATS - Peak time -

District	Model Site	Landing at peak time				Landing facilities		No. of boats entry (unit/day)	Fish landing volume (t/day)	a Average boat length (m)	a*1.15 Required berth length (m)
		Type of Boat	Time zone	Hours	Landing from boat to beach	Wharf / Jetty	for sampan or beach				
Bima	Rompo (Waworada)	Purse sein	17:00-20:00	3	on wharf	Yes	-	38.7	12.91	12	13.8
		Transportation boats	Anytime	-	on wharf	Yes	-	32.0	-	12	13.8
Dompu	Soro (Kempo)	Bagan	04:00-07:00	3	by sampan	-	Yes	31.3	2.61	-	-
		Purse sein	04:00-07:00	3	on jetty	Yes	-	10.0	0.83	14	16.1
		Collecting boats	02:00-07:00	5	on jetty	Yes	-	40.0	17.22	9	10.4
	Hu'u	Purse sein	12:00-15:00	3	by sampan	-	Yes	12.0	2.63	-	-
Flores Timur	Oka (Larantuka)	Bagan	06:00-09:00	3	by sampan	-	Yes	21.0	0.90	-	-
		Purse sein	06:00-09:00	3	on wharf	Yes	-	28.3	8.48	12	13.8
		Gill net/Handline	Anytime	6	on wharf or beach landing	Yes	-	2.8	0.08	6	6.9
Lembata	Lewoleba	Bagan	06:00-09:00	3	by sampan	-	Yes	46.3	6.95	-	-
		Purse sein	06:00-09:00	3	on wharf	Yes	-	1.3	4.00	11	12.7
		Gill net	06:00-09:00	3	on wharf or beach landing	Yes	-	10.0	0.10	5	5.8
Sikka	Kalimati (Maumere)	Purse Seine	05:00-08:00	3	on wharf	Yes	Yes	28.9	8.67	12	13.8
		Gill Net	05:00-08:00	3	on wharf or beach landing	Yes	-	3.1	0.08	6	6.9
		Collecting boat	05:00-08:00	3	on wharf	Yes	-	8.3	2.50	9	10.4
	Wuring	Handline	12:00-18:00	6	on wharf or beach landing	Yes	-	2.7	0.01	6	6.9
Ende	Paupanda (Ende)	Purse Seine	15:00-18:00	3	on jetty	Yes	-	22.6	6.79	15	17.3
Others		Model fishing boat	-	-	on wharf	Yes	-	-	-	16	18.4
		Transportation boat	-	-	on wharf	Yes	-	-	-	15	17.3

(2) LANDING FACILITIES - Peak time -

District	Model Site	Type of Boat	Time zone	Landing time (hr)	No. of boats (units/day)	Landing time per boat (min)	Berth length per boat (m)	Required No. of berth	Required No. of berth (round)	Required wharf length (m)	Required depth (m)	Note
Bima	Rompo (Waworada)	Purse sein	17:00-20:00	3	38.7	30	13.8	6.5	7	97	-2	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	Secure 1 berth for full time mooring
		Transportation boats	Anytime	12	32.0	60	13.8	2.7	3	42	-2	For outskirts passenger boat use
		Total								160		Round up by every 10m unit
Dompu	Soro (Kempo)	Purse sein	04:00-07:00	3	10.0	30	16.1	1.7	2	33	-2	
		Collecting boats	02:00-07:00	5	40.0	45	10.4	6.0	6	63	-2	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	Secure 1 berth for full time mooring
		Total								120		Round up by every 10m unit
Flores Timur	Oka (Larantuka)	Purse sein	06:00-09:00	3	28.3	30	13.8	4.7	5	69	-2	
		Gill net/Handline	Anytime	6	2.8	20	6.9	0.2	1	7	-1.5	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	Secure 1 berth for full time mooring
		Multi-purpose boats	-	-	-	-	17.3	1.0	2	2	-2	Utilize for Lamahara Jaya, Sagu,
		Total								100		Lewoleba, Balauring & Lamalera' boat
Lembata	Lewoleba	Purse sein	06:00-09:00	3	1.3	30	12.7	0.2	1	13	-2	
		Gill net	06:00-09:00	3	10.0	20	5.8	1.1	2	12	-1.5	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	
		Multi-purpose boats	-	-	-	-	17.3	2.0	1	18	-3	
		Total								70		
Sikka	Kalimati (Maumere)	Purse sein	05:00-08:00	3	28.9	30	13.8	4.8	5	69	-2	
		Gill net	05:00-08:00	3	3.1	20	6.9	0.3	1	7	-1.5	
		Collecting boat	05:00-08:00	3	8.3	30	10.4	1.4	2	21	-2	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	Secure 1 berth for full time mooring
		Total								120		Round up by every 10m unit
	Wuring	Handline	12:00-18:00	6	2.7	20	6.9	0.2	1	7	-1.5	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	Secure 1 berth for full time mooring
		Total										
Ende	Paupanda (Ende)	Purse sein	15:00-18:00	3	22.6	45	17.3	5.7	6	104	-2	
		Model fishing boat	-	-	-	-	18.4	1.0	1	19	-3	Secure 1 berth for full time mooring
		Total								130		Round up by every 10m unit

Note: Number of Berth required Number of Berth required=Number of Unloading fishing boat per day / (Unloading hours/Unloading hour per fishing boat)

・Provide and secure 1 private berth for Model fishing boat(15GT)

(3) LANDING FACILITIES for SAMPAN or BEACH LANDING -Peak time-

District	Model Site	Type of Boat	Time zone	Landing time (hr)	No. of boats (units/day)	Landing time per boat (min)	No/ of sampan per boat	Average width (m)	Required berth length (m)	Required No. of berth	Required No. of berth (round)	Required length (m)	Note
Bima	Rompo (Waworada)	Bagan	06:00-09:00	3	1.8	80	1	0.8	2.8	0.8	1	3	
		Gill net	Anytime	6	10.1	20	-	1.2	3.2	0.6	1	4	
		Handline											
		Total										7	
Dompu	Soro (Kempo)	Bagan	04:00-07:00	3	31.3	80	1	4.0	6	13.9	14	84	Outrigger on both side
	Hu'u	Purse sein	12:00-15:00	3	12.0	80	2	2.5	4.5	10.7	11	50	Outrigger on one side
Flores Timur	Oka (Larantuka)	Bagan	06:00-09:00	3	21.0	80	1	0.8	2.8	9.3	10	28	
		Gill net/Handline	Anytime	6	2.8	20	-	1.2	3.2	0.2	1	4	
		Total										32	
Lembata	Lewoleba	Bagan	06:00-09:00	3	46.3	80	1	0.8	2.8	20.6	21	59	
		Gill net	06:00-09:00	3	10.0	30	-	1.0	3	1.7	2	6	
		Total										65	
Sikka	Kalimati (Maumere)	Purse Seine	05:00-08:00	3	28.9	80	2	0.8	2.8	12.8	13	37	
		Gill Net	05:00-08:00	3	3.1	30	-	3.5	5.5	0.5	1	6	Outrigger on one side
		Handline	12:00-18:00	6	2.7	30	-	3.5	5.5	0.2	1	6	Outrigger on one side
		Total										49	
	Wuring	Handline	12:00-18:00	6	23.5	30	-	3.5	5.5	2.0	2	11	Outrigger on one side
	Paga	Purse Seine	15:00-18:00	3	14.4	80	2	1.0	3	12.8	13	39	
Ende	Paupanda (Ende)	Purse Seine	15:00-18:00	3	22.6	80	2	1.0	3	20.1	21	63	

Note: Number of Berth required Number of Berth required=Number of Unloading fishing boat per day x Number of Sampan per 1 fishing boat /(Unloading hours/Unloading hour per fishing boat)

- Average berth length is Average boat breadth + working space (each 1m on both side)
- In case of Purse sein at Kalimati, 50% of unloading fishing boat per day are using Sampan.
- At Wuring, Number of handline fishing boat is 50% of Total unloading fishing boat per day.
- Average boat breadth at each area are based on the result of site investigation.

Table 4-1-3 HANDLING FACILITY

District	Model Site	Fish Handling Volume				Equipment for Fish Unloading			Fresh treated & soled by fresh fish			Fish processed	
		Total		Landing time	Landing volume	Container 60L	Hand cart	Balance	(day)	(peak time)		(day)	(Peak time)
		(day) (ton/day)	(peak time) (ton/day)	(hours)	(ton/hr.)	(50kg)	(200kg)	(0-100kg)	(ton/day)	(ton/day)	(ton/hr.)	(ton/day)	(ton/day)
Bima	Rompo (Waworada)	21.90	12.91	3	4.30	43	11	3	9.19	5.41	1.80	12.72	7.50
Dompu	Soro (Kempo)	22.17	13.77	3	4.59	11	11	3	8.87	5.51	1.84	13.30	8.26
	Hu'u	3.14	2.63	3	0.88	9	-	1	1.25	1.05	0.35	1.88	1.58
Flores Timur	Oka (Larantuka)	9.46	9.42	3	3.14	31	8	2	6.33	6.30	2.10	3.13	3.12
	Lamahla Jaya	8.11	5.54	3	1.85	-	-	-	4.07	2.78	0.93	4.04	2.76
	Sagu	2.21	1.86	3	0.62	-	-	-	1.48	1.24	0.41	0.73	0.61
Lembata	Lewoleba	13.10	11.05	3	3.68	37	9	2	10.69	9.02	3.01	2.41	2.03
	Balauring	1.38	1.00	3	0.33	-	-	-	0.69	0.50	0.17	0.69	0.50
	Lamalera	3.86	3.38	3	1.13	-	-	-	0.88	0.57	0.19	2.98	2.81
Sikka	Kalimati (Maumere)	11.26	11.25	3	3.75	37	9	2	7.52	7.52	2.51	3.74	3.73
	Wuring	0.01	0.01	6	0.00	-	-	-	-	-	-		
	Paga	4.64	4.32	3	1.44	28	0	1	2.37	2.21	0.74	2.27	2.11
Ende	Paupanda (Ende)	10.87	6.79	3	2.26	23	6	2	7.39	4.61	1.54	3.49	2.18

District	Model Site	Max. No. of Fish Buyers					No. of Cool Box					Fish treatment (ton/day)	
		0-50kg	50-100kg	100-200kg	over 200kg	Total	Fish Buyers			Fishers	Ice stock	For treatment	For overnight
							45L(30kg)	80L(50kg)	150L(100kg)	300L(150kg)			
Bima	Rompo (Waworada)	31	24	13	14	82	78	27	28	19	0	21.90	5.48
Dompu	Soro (Kempo)	95	34	11	4	144	163	23	7	2	0	22.17	0.30
	Hu'u	21	6	0	0	27	33	0	0	4	0	3.14	1.05
Flores Timur	Oka (Larantuka)	69	8	4	9	90	85	7	17	0	0	9.46	0.03
	Lamahla Jaya	38	35	0	0	73	108	0	0	5	6	8.11	1.36
	Sagu	39	0	0	0	39	39	0	0	1	4	2.21	0.24
Lembata	Lewoleba	57	65	25	0	147	142	37	0	6	0	13.10	1.67
	Balauring	12	3	0	0	15	18	0	0	1	2	1.38	0.19
	Lamalera	50	0	0	0	50	23	0	0	1	3	3.86	0.28
Sikka	Kalimati (Maumere)	31	23	17	7	78	78	34	13	0	0	11.26	0.10
	Wuring	-	-	-	-	-	-	-	-	-	-	0.01	0.00
	Paga	12	25	0	0	37	61	1	0	6	0	4.64	1.76
Ende	Paupanda (Ende)	56	38	11	3	108	133	21	6	16	0	10.87	4.71

District	Model Site	Handling Shed					Storage & Forwarding					Shed area	Ground area
		N Landing volume (ton/hr.)	P Handling volume (kg/m2)	R shed turnover	S1 Handling area (m2)	S2 Auxiliary facilities (m2)	Cool box storage area (m2)	Packing area (m2)	Cool box stocking area (m2)	Pre-processing workshop (m2)	Loading space for forwarding (m2)	(m2)	(m2)
Bima	Rompo (Waworada)	4.30	60	1	240	80	30	120	40	330	120	960	1,600
Dompu	Soro (Kempo)	4.59	60	1	260	80	30	130	20	340	120	980	1,640
	Hu'u	0.88	60	1	50	20	10	30	10	40	60	220	370
Flores Timu	Oka (Larantuka)	3.14	60	1	180	60	20	90	0	10	120	480	800
Lembata	Lewoleba	3.68	60	1	210	70	30	110	20	0	120	560	940
Sikka	Kalimati (Maumere)	3.75	60	1	210	70	20	110	20	0	120	550	920
	Paga	1.44	60	1	80	30	10	40	20	40	60	280	470
Ende	Paupanda (Ende)	2.26	60	1	130	40	30	70	40	50	120	480	800

Note mark: building are roof and floor only. Others are with room wall building. *Building structure shall be designed firm and rigid to protect from the damage by sea air.

Formula **Handling area:** S1=Q/(R*a*P)

(Auction and handling shed)) Q: Landing Volume (ton/hr.) per peak time during on-season.

P: Handling volume (=60kg/m2、by basket) per unit area.

R: Rotating rate of shed (1hr/cycle=3cycle/day=1cycle/hr)

a: Occupation rate of fish catch (=30%、by basket)

Auxiliary facilities : S2=S1*30%

(Mechanical room, Waiting room, Auction room, etc)

Cool box storage area:

S3=(A1*n1+A2*n2+A3*n3)/N/a

(Cool box for storage, forwardin A1-A3: Area of Cool box per each

n1-n3: Number of Cool box

N: No. of stacking layer = 3 layer,

300L box are provided permanently at storage room

a: Occupation rate of Cool box (=40%)

Cool box size

	B(m)	L(m)	H(m)	A(m2)
45L	0.30	0.50	0.30	0.15
80L	0.40	0.50	0.40	0.20
150L	0.50	0.75	0.40	0.38
300L	0.60	0.85	0.60	0.51

Packing area: S4=Q1/(R*a*p)

(Forwarding, Ice packing, etc) Q1: handling volume = Ice packing volume (ton/day) = Volume per peak time (ton/hr.)

P: Fish catch handling volume per unit area (=60kg/m2、same as Handling shed)

R: Rotating rate of shed (0.5hr/cycle=6cycle/day=2cycle/hr)

a: Occupation rate of fish catch (=30%、by box)

Work style : Cool box laid flat and packed ice

Cool box stocking area:

S5=(A*n)/N/a

Cool box laid flat. Kind and No. are shown table at right side

A: Area per Cool box

n: Number of Cool box

N: Stacking layer = 1 layer (All box laid flatly)

a: Occupation rate of Cool box (=30%, by box 1 layer)

	80L	150L	300L
Rompo (Waworada)	0	0	19
Soro (Kempo)	5	7	0
Hu'u	0	0	4
Oka (Larantuka)	0	0	0
Lewoleba	0	0	6
Kalimati (Maumere)	0	13	0
Paga	0	0	6
Paupanda (Ende)	0	6	16

Loading space for forwarding :

S6=n*A/a

(Loading work to transportation vehicle)

Q3: Forwarding volume = handling volume per peak time (ton/hr.)

n: Number of truck less than 1.0 ton/hr = 1 No.

over 1.0 ton/hr = 2 Nos.

A: Occupation rate of transportation vehicle per No.(m2)

a: Occupation rate of vehicle (=50%、including loading space)

Vehicle	Vehicle size		Parking area		
	L(m)	B(m)	L(m)	B(m)	A(m2)
Bus	7.2	2.5	8.0	3.5	28.0
Large truck	6.3	2.0	7.0	3.0	21.0
Small truck	3.8	1.8	4.5	3.0	13.5

For calculation purpose, Bus(A=28m2) is adopted as transportation vehicle.

Loading space (length of vehicle+work space=12m) for forwarding shall be located along the public road which area are calculated by above formula.

S6 = Roadside handling shed building width x above length (12m)

Pre-processing workshop:

S7

(S7*3/8+(S7+S1)*5/8)=Q4*L S7=(Q4*L)-(S1*5/8)

Work contents: Work on the table such as washing, opening, intestines removal

Within 8 working hour, 3 hour(handling shed operation hour) are used only pre-processing workshop : 5hr = (S7+S1) operation

After handling shed operation, Pre-processing space and handling shed space are used(5 hour) : 3hr = S7 operation only

Q4: Pre-processing volume (ton/hr.) = Processing volume (ton/day) / Working hour(8hr.)

L : Required area of raw fish (=300m2/ton)

Kalimati (Maumere) site has no processing operation. Processing work carry out at fishing village.

Ground area: Required Area A = Area of Building / Floor space ratio(60%)

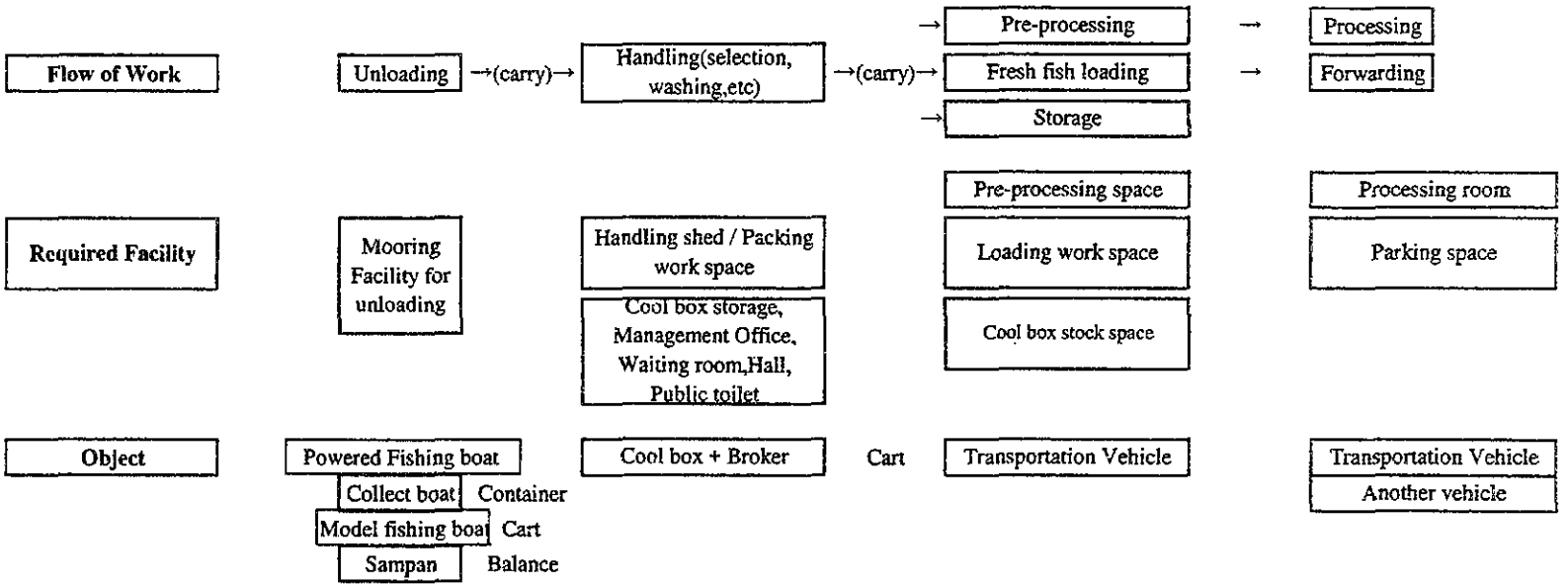

Flow of Work
Unloading
→(carry)→
Handling(selection, washing,etc)
→(carry)→
→ Pre-processing
Fresh fish loading
→ Storage
→ Processing
→ Forwarding
Required Facility
Mooring Facility for unloading
Handling shed / Packing work space
Cool box storage, Management Office, Waiting room,Hall, Public toilet
Pre-processing space
Loading work space
Cool box stock space
Processing room
Parking space
Object
Powered Fishing boat
Collect boat
Model fishing boat
Sampan
Container
Cart
Balance
Cool box + Broker
Cart
Transportation Vehicle
Transportation Vehicle
Another vehicle

Table 4-1-4 ICE MAKING & STORAGE FACILITY

District	Model Site	Ice Plant & Ice Storage						Note
		Ice Plant (ton/day)	Ice storage (m3)	Total area (m2)	Floor space ratio (%)	Crush, Sell, Take out space(m2)	Ground area (m2)	
Bima	Rompo (Waworada)	6.0	12	350	50	30	730	
Dompu	Soro (Kempo)	3.5	7	210	50	30	450	
	Hu'u	1.0	2	60	50	30	150	
Flores Timur	Oka (Larantuka)	6.0	12	350	50	30	730	*including supply to* Lamahara Jaya, Sagu, Barauring & Lamalera
	Lamahala Jaya	(1.45)	-	-	-	-	-	
	Sagu	(0.82)	-	-	-	-	-	
Lembata	Lewoleba	3.0	6	180	50	30	390	
	Balauring	(0.53)	-	-	-	-	-	
	Lamarela	(0.69)	-	-	-	-	-	
Sikka	Kalimati (Maumere)	3.0	6	180	50	30	390	
	Wuring	-	-	-	-	-	-	
	Paga	2.0	4	120	50	30	270	
Ende	Paupanda (Ende)	5.0	10	290	50	30	610	

Note Ice Plant

Ice Plant: Capacity of Ice plant at each site are shown in attached data.

Ice storage: Capacity is 2 days volume of Ice plant capacity.

Total area: A1 = Ice manufacturing room + temporary stock room + Ice storage room + Mechanical room + Working space (40% of Total area)

Ground area: A = *Area of Building / Floor space ratio* (50%) + Crush,Sell, Take out space incl vehicle space (in,out), etc

Table 4-1-5 FUEL DEPOT

District	Model Site	Fuel storage capacity		Ware house	Fuel storage tank		Ground area			Note
		Tank (kl)	Drum can (No.)	(for Drum) (m2)	Diameter (m)	Length (m)	(for Drum) (m2)	(for Tank) (m2)	Total (m2)	
Bima	Rompo (Waworada)	5.0	-	-	1.5	3.0	-	80	80	Dispenser
Dompu	Soro (Kempo)	6.0	2	5	1.6	3.2	20	90	110	Dispenser & hand pump
	Hu'u	-	4	9	-	-	30	-	30	Hand pump
Flores Timur	Oka (Larantuka)	6.0	2	5	1.6	3.2	20	90	110	Dispenser & hand pump
	Lamahala Jaya	-	8	18	-	-	60	-	60	Hand pump
	Sagu	-	2	5	-	-	20	-	20	Hand pump
Lembata	Lewoleba	-	5	12	-	-	40	-	40	Hand pump
	Balauring	-	2	5	-	-	20	-	20	Hand pump
	Lamarela	-	-	-	-	-	-	-	-	
Sikka	Kalimati (Maumere)	2.0	3	7	1.1	2.2	30	40	70	Dispenser & hand pump
	Wuring			0			0			
	Paga	-	6	14	-	-	50	-	50	Hand pump
Ende	Paupanda (Ende)	3.0	5	12	1.3	2.6	40	60	100	Dispenser & hand pump

Note Fuel Depot

Required fuel volume, Type of facility, Number of Drum can, Fuel tank capacity are extracted from attached data.

Area of ware house for drum = Area of drum (200l) x 9 times(Allowance : 3 times per side)

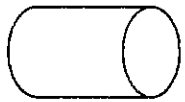
Ground Area for drum = Ware house / floor space ratio(30%)

Ground Area for fuel tank = (Diameter of tank x 4.2)x(Length of tank x 4.2)

Tank capacity(Q) = (D x D x 3.14/4) x L = (D x D x 3.14/4) x 2 x D

D : Diameter

L : Length (=2*D)



Dimension of Fuel storage tank

Q(kl)	D(m)	L(m)
1.57	1.0	2.0
2.09	1.1	2.2
2.71	1.2	2.4
3.45	1.3	2.6
4.31	1.4	2.8
5.30	1.5	3.0
6.43	1.6	3.2
7.71	1.7	3.4
9.16	1.8	3.6
10.77	1.9	3.8
12.56	2.0	4.0

Table 4-1-6 WATER SUPPLY FACILITY

District	Model Site	Unloading Volume(t/day)	Raw fish for process(t/day)	No. of fishing boat(Nos/day)	Ice plant capacity(t/day)	Ice storage capacity(t/day)	Handling shed(m2)	fish box (No)	Area of Market (m2)	Number of User (person)
Bima	Rompo (Waworada)	21.90	12.72	104.9	6.0	12	960	86	-	132
	Pasar Bima	-	-	-	-	-	-	-	1,280	214
Dompu	Soro (Kempo)	22.17	13.30	92.4	3.5	7	980	92	-	97
	Hu'u	3.14	1.88	22.0	1.0	2	220	18	-	34
	Pasar Dompu	-	-	-	-	-	-	-	640	115
Flores Timur	Oka (Larantuka)	9.46	3.13	53.1	6.0	12	480	63	-	82
	Lamahala Jaya	8.11	4.04	43.0	-	-	-	-	-	39
	Sagu	2.21	0.73	23.3	-	-	-	-	-	37
Lembata	Lewoleba	13.10	2.41	62.3	3.0	6	560	74	-	99
	Balauring	1.38	0.69	17.1	-	-	-	-	-	26
	Lamarela	3.86	2.98	28.2	-	-	-	-	-	20
Sikka	Kalimati (Maumere)	11.26	-	-	3.0	6	550	75	480	157
	Wuring	0.01	3.74	44.0	-	-	-	-	-	38
	Paga	4.64	2.27	26.4	2.0	4	280	29	-	39
Ende	Paupanda (Ende)	10.87	3.49	64.1	5.0	10	480	45	-	79

District	Model Site	Washing water for fish catch (sea water) Q1 (m3/day)	Fresh water for process and pre-processing Q2 (m3/day)	Fresh water for fishing boat Q3 (m3/day)	Fresh water for Ice plant Q4 (m3/day)	Washing water for facilities, equipment(sea) Q5 (m3/day)	Sanitary water Q6 (m3/day)	Required volume of fresh water per day Q (m3/day)	Capacity of Water tank/ reservoir (m3)	Discharge volume per day (m3/day)
Bima	Rompo (Waworada)	6.6	5.1	4.2	7.2	5.2	4.0	20.4	20	21
	Pasar Bima	-	-	-	-	2.6	6.4	9.0	9	9
Dompu	Soro (Kempo)	6.7	5.3	3.7	4.2	5.4	2.9	16.1	16	20
	Hu'u	0.9	0.8	0.9	1.2	1.2	1.0	3.9	4	4
	Pasar Dompu	-	-	-	-	1.3	3.5	4.7	5	5
Flores Timur	Oka (Larantuka)	2.8	1.3	2.1	7.2	2.7	2.5	13.0	13	9
	Lamahala Jaya	2.4	1.6	1.7	-	-	1.2	4.5	5	5
	Sagu	0.7	0.3	0.9	-	-	1.1	2.3	2	2
Lembata	Lewoleba	3.9	1.0	2.5	3.6	3.2	3.0	10.0	10	11
	Balauring	0.4	0.3	0.7	-	-	0.8	1.7	2	1
	Lamarela	1.2	1.2	1.1	-	-	0.6	2.9	3	3
Sikka	Kalimati (Maumere)	3.4	-	-	3.6	4.1	4.7	8.3	8	12
	Wuring	0.0	1.5	1.8	-	-	1.1	4.4	4	3
	Paga	1.4	0.9	1.1	2.4	1.5	1.2	5.5	6	5
Ende	Paupanda (Ende)	3.3	1.4	2.6	6.0	2.6	2.4	12.3	12	10

Formula

①Washing water for fish catch: Planned consumed volume (Q1) = Unloading volume of fish catch x Unit consumption rate of washing water (0.3m3/ton)
※utilize sea water

②Water for process, pre-processing: Planned consumed volume (Q2) = planned raw fish for process (kg/day) x Unit consumption rate of water for process (l/kg)
Due to fish treatment at Model processing room, unit consumption rate of water for process is determined as 0.4 l/kg
※utilize sea water for washing fish at Handling shed

③Water for fishing boat: Planned supply volume per day (Q3) = Total fishing boat number per day x Unit supply rate of water per boat (l/day)
Fishing boat less than 5ton : Planned supply rate per day = 40 l/day

④Water for Ice plant: Planned supply volume per day (Q4) = Planned Ice plant capacity + 20%

⑤Washing water for facilities, equipment: Handling shed: Planned consumed volume per day (Q5)= Floor area of Shed x 5 l/m2 + Number of fish box x 5 l/No.
Number of fish box = Unloading volume per hour at peak time (ton/hr) / fish box capacity (50kg)
Market : Planned consumed volume per day (Q5) = Floor area of Market x 2 l/m2.
※utilize sea water for washing Market. Market at Bima and Dompu use fresh water.
Washing water is utilized only for floor of handling shed and fish box.

⑥Sanitary water: Planned consumed volume per day (Q6) = No. of User x 0.03 l/person.
For office, toilet, shower room.
Number of user = (50% of broker) + (Office employee) + (User of model processing room)
No. of office employee are 10 person for large scale and 5 person for small scale.
User of model processing room are 15 person.
In case of Market, office employee (15 person), retailer and customer are considered as user.
No. of user of retailer and customer are same as No. of retail booth.
At Lamahara Jaya, Sagu, Balauring, Wuring, utilization by villager of fishing village (5% of fisherman's house No.) are considered.
At Rompo (Waworada), utilization by villager (5% of Fisherman's house No.), customer of Sunday market and passenger of ferry route (50 person) are considered.
At Oka (Larantuka), utilization by passenger using multi purpose transport ship are considered.

Water consumption volume per day: In general, consumed volume of fisheries water summed up of max hourly consumption volume of each category. At this, to minimize facility scale, construction cost and maintenance/operation cost, water supply rate are controlled by using water tank/reservoir. Therefore, required volume per day summed up of daily consumption volume of each category.

Water tank/reservoir capacity: Required water volume mentioned above are maximum requirement per day. But using time of fisheries water of each category are differ and supply pattern show big hourly fluctuation within a day. To avoid lack of sufficient water during peak time and to ensure enough water supply constantly, water tank/reservoir capacity are determined same as fresh water consumed volume of one day and figure are round up every 1 m3.

Discharge volume per day: Discharge volume is total of sea water and fresh water daily volume.
System of Sewage Treatment (Discharge water) is simple system using settling pond, screen and sediment/separation tank. Tanks shall be plural line and No. of room (more than 2) will be determined by inflow water volume and BOD concentration.

Category and kinds of water

Category	Planned water	Water to be used
Washing water of fish catch	Fresh, Sea	Sea water
Water for processing	Fresh, Sea	Sea water.Process is fresh water
Fresh water for ship	Fresh water	Fresh water
Fresh water for Ice plant	Fresh water	Fresh water
Washing water of facility,equipme	Fresh, Sea	Sea water.Market is Fresh water
Sanitary water	Fresh water	Fresh water

Table 4-1-7 MODEL PROCESSING FACILITY

District	Model Site	Fish processed (day) (ton/day)	Fish processed (Peak time) (ton/day)	Pre-process work space (Cut & wash of fish) (m2)	Kitchen Unit	Kitchen Area (m2)	Improved fish dry shed Wooden rack (台)	Improved fish dry shed Mesh panel (枚)	Improved fish dry shed shed (m2)	Indoor Processing room (m2)	Total area of building (m2)	Ground area (m2)
Bima	Rompo (Waworada)	12.72	7.50	Use handling shed	12	140	10	120	500	100	870	2,180
Dompu	Soro (Kempo)	13.30	8.26	Use handling shed	3	50	12	288	670	100	1,120	2,800
	Hu'u	1.88	1.58	Use handling shed	9	110	1	24	60	100	300	750
Flores Timur	Oka (Larantuka)	3.13	3.12	Use handling shed	2	40	3	96	180	100	420	1,050
Lembata	Lewoleba	2.41	ut $	Use handling shed	2	40	3	96	180	100	420	1,050
Sikka	Wuring	3.74	3.73	150	2	40	4	96	230	100	620	1,550
	Paga	2.27	2.11	Use handling shed	Function add to H.shed		Ditto(left)			Ditto(left)	0	0
Ende	Paupanda (Ende)	3.49	2.18	Use handling shed	2	40	3	72	170	100	390	980

Note: mark: building are roof and floor only. Others are with room wall building.

Formula

Pre-processing space: Because of using handling shed, no consideration. Only Wuring site, work space is considered.

Kitchen: Work space (10m2/unit+20m2) is provided.

Dry shed: Wooden rack (0.6m*4.0m、3layer/rack) and wooden frame mesh panel (1.2m*0.8m/panel) are considered for area of shed.

Area of dry shed (A1) = Area of wooden rack(N1)+Work space (handling mesh panel)+Mesh panel keeping space(N2)+Allowance

Rack and work space: Surrounding wooden rack, 2m work space are provided (=8.0m*4.6m/rack=36.8m2/rack)

mesh panel keeping space: Space for keeping mesh panel (1.2m*0.8m) and work

Allowance: 20% of above area.

A1 =36.8*N1+4.0*N2/10+20%

Dry shed building is only floor and roof.

Indoor processing room: Facility is provided as model facility to enlighten women of fishing village around 10 to15 person.

Work space is utilized for washing, cutting, opening, mincing, pressing, cooking of fish and vacuum packing and storage of products.

Area of building is 100m2.

Pre-processing space: *S7=Q4*L (For Wuring)*

Work contents: Work on the table such as washing, opening, intestines removal

Q4: Pre-processing volume (ton/hr.) = Processing volume (ton/day) / Working hour(8hr.)

L : Required area per fresh fish 1 ton (=300m2/ton)

Ground area: Required Area A = Area of Building / Floor space ratio(40%)

At Lamahara jaya, Sagu, Balauring, Lamalera, space of multi purpose office is utilized

Table 4-1-8 SIMPLIFIED WORKSHOP

District	Model Site	No. of Fishing Boats	Max. No of Fish Buyers	No. of Cool Box	Mini Workshop		Remarks
					Area of Building(m2)	Ground area (m2)	
Bima	Rompo (Waworada)	162	82	152	150	300	
Dompu	Soro (Kempo)	138	144	195	150	300	
	Hu'u	24	27	37	50	100	
Flores Timur	Oka (Larantuka)	72	90	109	100	200	
Lembata	Lewoleba	68	147	185	100	200	
Sikka	Kalimati (Maumere)	145	78	125	0	0	Not necessary. Function of kalimati is mainly unloading, fowarding and selling of fish.
	Wuring	145	-	-	0	0	Not necessary. Space is considered in the multi purpose office.
	Paga	33	37	68	50	100	
Ende	Paupanda (Ende)	163	108	176	150	300	

Formula : Mini Workshop

Function is maintenance of engine, making, repairing, strengthening of cool box and training, spreading of these technical skill.

No. of fishing boat, fish buyer, retailer and cool box are considered for determination of building area.

Large scale : 150m2、Medium scale : 100m2、Small scale : 50m2、25m2 is indoor work space/store.

Required ground area = Area of Building / Floor space ratio(50%)

At Lamahara jaya, Sagu, Balauring, Lamalera, Wuring, space of multi purpose office is utilized

Function of kalimati is mainly unloading, forwarding and selling of fish. So, workshop is not necessary.

Table 4-1-9 FISHING GEAR DRYING YARD & OPEN PILE YARD

District	Model Site	Total No. of Fishing boat	Fishing gear drying and repair yard									Open pile yyard		
			No. of roundhaul netter	Box No.	Converted Box No.	ground area(m2)	No. of gill netter	Box No.	Converted Box No.	Ground area (m2)	Total ground area(m2)	Objective Box No.	Box No.	Ground area (m2)
Bima	Rompo (Waworada)	162	44	7.3	8	2,640	14	1.4	2	150	2,790	162	27	270
Dompu	Soro (Kempo)	138	10	1.7	2	660	14	1.4	2	150	810	138	23	230
	Hu'u	24	14	1.2	2	660	3	0.3	1	80	740	24	4	40
Flores Timur	Oka (Larantuka)	72	10	1.7	2	660	30	3.0	3	230	890	72	12	120
Lembata	Lewoleba	68	7	1.2	2	660	10	1.0	1	80	740	68	12	120
Sikka	Wuring	145	54	4.5	5	1,650	24	2.4	3	230	1,880	145	25	250
	Paga	33	21	1.8	2	660	6	0.6	1	80	740	33	6	60
Ende	Paupanda (Ende)	163	33	5.5	6	1,980	97	9.7	10	750	2,730	163	28	280

Formula :

Fishing gear drying and repair yard:

Roundhaul net

No. of operation group = No. of round haul netter. (based figure)One net per group, unload every 30days and
Occupied area per net = 25m x 8m = 200m2 5days repair work per time
Required area per net = Occupied area per net / Occupation ratio(0.6) = 200m2/0.6 = 330m2
Required area = Total operation group(total fishing boat No.) x 5day/30day x 330m2
At Hu'u, half of box will bring back to fisherman's house.
At Wuring, half of box will be kept and maintain on the fishing boat.
At Paga, half of box will bring back to fisherman's house(Maulo).

Gill net

No. of operation group = No. of gill netter. (based figure)One net per group, unload every 30days and
Occupied area per net = 10m x 5m = 50m2 3days repair and drying work per time.
Required area per net = Occupied area per net / Occupation ratio(0.5) = 50m2/0.5 = 75m2
Required area = Total operation group(total fishing boat No.) x 3day/30day x 75m2

Open pile yard:

Function is multipurpose area for temporary storage of fishing gear/material and other fishing activities.
Fishermen use area every monthly work off day(5days/month)
Required area = Total box No. x (5/30) x required area per box(10m2)

Table 4-1-10 SLIPWAY

District	Model Site	Total No. of fishing boat(No.)	Slipway			Boat landing place		Boat repairing facility area			Total required area (m2)
			Objective fishing boat No.	Fishing boat used per day	Required Length (m)	Av. powered boat length (m)	Required area (m2)	Objective fishing boat No.	Occupied area per boat(m2)	Required area(m2)	
Bima	Rompo (Waworada)	120	120	20	80	12	1,160	20	24	960	2,120
Dompu	Soro (Kempo)	105	105	11	40	12	580	11	24	530	1,110
Flores Timur	Oka (Larantuka)	46	46	5	20	12	290	5	24	240	530
Lembata	Lewoleba	21	21	3	20	11	270	3	22	140	410
Sikka	Kalimati (Maumere)	-	-	-	-	-	-	-	-	-	-
	Wuring	145	145	15	60	12	870	15	24	720	1,590
Ende	Paupanda (Ende)	143	143	15	60	15	1,080	15	30	900	1,980

Formula : Slipway : For repairing, periodical check and maintenance of powered boat(exclude outrigger-boat, dug-out boat and bagan type boat), passenger boat and transportation boat.

Each boat use once a month(12 times a year). Use 3 days per time.

Occupied area per boat is Average boat breadth(2.5m) + allowance(1.0m between boats).

Required length = $\Sigma B + b(n \div 1)$

At Waworada, slipway size provide for repair and check of 12 boats and shipbuilding of 8 boats.

Maumere site require no slipway because function are unloading, preparation and market activities.

Boat landing place : Required area = Objective boat No. x maximum length of user boat(including allowance).

Boat repairing facility area: Required area = Objective boat No. x Occupied area per boat(boat breadth x length) / Occupation ratio(0.5)

Table 4-1-11 OFFICE

District	Model Site	Unloading powered fishing boat No. per day	Maximum No. of Fish Buyer	Management Office(m2)									
				Manage-ment room	Administr-ation room	Shop, Store room	Mechanical/Electrical room	Training/ Meeting room	Public toilet	others,etc	Utility Space	Area of Building(m2)	Ground area (m2)
Bima	Rompo (Waworada)	104	82	20	40	0	20	80	36	50	49	300	750
Dompu	Soro (Kempo)	57	144	20	30	0	20	60	36	-	33	200	500
	Hu'u	23	27	20	20	20	20	40	18	-	28	170	430
Flores Timur	Oka (Larantuka)	66	90	20	40	30	20	60	36	-	41	250	630
Lembata	Lewoleba	66	147	20	30	30	20	60	36	-	39	240	600
Sikka	Kalimati (Maumere)	144	78	20	30	50	20	80	36	-	47	290	730
	Paga	32	37	20	20	20	20	40	18	-	28	170	430
Ende	Paupanda (Ende)	162	108	20	30	50	20	80	36	-	47	290	730

Formula : Administration Office

Management room : Manager's room (20m2)

Administration room : Office room for staff and wireless radio room. Dimension of room depend on Site scale. 40m2, 30m2, 20m2

Kiosk, Store room : Store room of office supply and fishing gear plus selling space of fishing gear/material,etc.
Excluding Rompo and Soro where existing Fishery Union has selling facility of daily goods and fishing gear/material.

Mechanical/electrical room : 20m2

Training/Meeting room : Also use as villager's hall. Area depend on unloading powered fishing boat No. Less than 50 boat : 40m2, 50-100 boat : 60m2, more than 100 boat : 80m2

Public toilet : User are office staffs, user of facilities and fishermen. Shower room attached. Area depend on buyer's No. 2mx3m/unit.

Others,etc : Waiting room of sea transport passenger provide at Waworada site.

Utility Space : Space for passage, corridor, etc. 20% of building area.

Ground area = Area of building / Floor space ratio(40%)

Waiting room of sea transport passenger.

(Waworada)

Passenger boat No.	n =	3 boat	(at same time)
Passenger No. per boat	N1 =	8 person	(Average No. of passenger is 40% of capacity(20 person))
Area per passenger	a =	2 m2	(including space allowance)
Area of waiting room	A =	50 m2	(A=n*N1*a)

Table 4-1-12 Small scale multi purpose facility

District	Model Site	Unloading powered fishing boat No. per day	Max. No of Fish Buyers	No. of Cool box (300 L)	Multi purpose office(m2)								Remarks
					Administr-ation room	Multi purpose space	Cool box stockpile store room	Shop and store room	Public toilet	Utility Space	Area of Building (m2)	Ground area (m2)	
Flores Timur	Lamahala Jaya -1	94	73	11	15	100	10	20	12	27	190	320	Due to long shore line, provide 3Nos
	Lamahala Jaya -2				15	100	10	20	12	27	190	320	
	Lamahala Jaya -3				15	100	10	20	12	27	190	320	
	Sagu	32	39	5	15	100	10	20	18	29	200	340	
Lembata	Balauring	104	15	3	15	100	10	20	18	29	200	340	
	Lamalera	71	50	4	15	100	10	20	12	27	190	320	
Sikka	Wuring	-	-	-	15	100	10	20	24	30	200	340	

Formula : Multi purpose office

Administration room : Office room for management with wireless radio room.(15m2)

Multi purpose space : For mini workshop, Store room, Meeting/training space for fisherman. (100m2)

Cool box stockpile room 10m2

Shop and store room : Store room of office supply and fishing gear plus selling space of fishing gear/material,etc.(20m2)

Public toilet : User are office staffs, user of facilities and fishermen. Shower room attached. 2mx3m=6m2/unit.

Utility Space : Space for passage, corridor, etc. 20% of building area.

Ground area = Area of building / Floor space ratio(40%)

Water tank : Water supply to office and public toilet.

At Lamahara Jaya, 3 facilities provide due to long shore line.

Table 4-1-13 MARKET FACILITY

(1) Original Unit

District	Model Site	Function	No. of Retailers					Fresh fish dealing capacity				
			less than 50kg	50-100kg	100-200kg	over 200kg	Total	less than 50kg	50-100kg	100-200kg	over 200kg	Total (kg)
Bima	Pasar Bima	Consumed area market	79	94	26	0	199	2,960	7,066	3,878	0	13,904
Dompu	Pasar Dompu	Consumed area market/Collection and wholesale center	71	23	6	0	100	2,668	1,689	947	0	5,304
Sikka	Kalimati (Maumere)	Production area market	31	23	17	7	78	1,177	1,753	2,579	2,016	7,525

(2) Area of Shop

District	Model Site	Shop space(small)			Shop space(large)			Kiosk			Total Area	Allowance for passage		Area of Building
		No. of unit	Area/Unit (m2)	Area (m2)	No. of unit	Area/Unit (m2)	Area (m2)	No. of unit	Area/Unit (m2)	Area (m2)	(m2)	Allowance (%)	Area (m2)	A1:(m2)
Bima	Pasar Bima	173	2.3	390	26	4.5	120	20	6.3	130	640	100	640	1,280
Dompu	Pasar Dompu	94	2.3	220	6	4.5	30	10	6.3	70	320	100	320	640
Sikka	Kalimati (Maumere)	54	2.3	130	24	4.5	110	0	-	0	240	100	240	480

Kiosk= 1unit for 10 retailer (Dompu already has Kiosk)

(3) Office and others

District	Model Site	Management office, others									Area of Building A=A1+A2 (m2)	Floor space ratio		Ground Aarea (m2)
		Manage-ment room	Administr-ation room	Wholesaler /retailer's room	Store room	Mechanical/Electrical room	Fresh fish storage	Public toilet	Utility Space	Area of Building A2(m2)		A1 (%)	A2 (%)	
Bima	Pasar Bima	20	30	200	50	20	35	24	76	460	1,740	60	40	3,290
Dompu	Pasar Dompu	20	30	100	20	20	13	16	44	270	910	60	40	1,750
Sikka	Kalimati (Maumere)	20	30	80	30	20	19	0	40	240	720	60	40	1,400

Area of management office,etc	Management room :	Manager's room (20m2)
	Administration room :	Office room for staff.(30m2)
	Wholesaler/Retailer's room :	1.0m2/retailer.
	Store room :	Store room of office supply. Area ranging 50m2, 30m2, 20m2 depend on fish handling volume per day.
	Mechanical/electrical room :	20m2
	Fresh fish storage :	*Temporary storage.* Cool box storage for fowarding(fish storage capacity is 20% of fresh fish handling volume per day). Cool box storage capacity=80% of 45l/35kg box x Box No./Occupation ratio(50%)
	Public toilet :	User are office staffs, user of facilities and visitor to market(town people). Shower room attached. 2mx2m/unit.
	Utility Space :	*Space for passage, corridor, etc. 20% of building area.*
	Floor space ratio :	Market (60%), Office (40%)

(4) Parking lot, others

(5) Loading/Unloading work space

District	Model Site	Vehicle	Area per one vehicle (m2)	No. of Vehicle					Area of parking lot (m2)	Ground area (m2)	Area for unloading/ wholesale (m2)	Area for loading (m2)	Area for work space (m2)	Ground area (m2)
				Bring in	Take out	Office/ Retailer	Visitor	合計						
Bima	Pasar Bima	Bus	28	2	-	1	1	4	112		336	-		
		Large truck	21	1	1	-	-	2	42		126	42		
		Small truck	14	2	-	-	-	2	27		162	-		
		Kijang	15	-	-	2	-	2	30		-	-		
		Bemo	14	-	-	7	10	17	225		-	-		
		Benhur	13	3	-	-	10	13	163		225	-		
		Motor cycle	2	-	-	10	40	50	100		-	-		
		Total							698	1,400	849	42	900	1,800
Dompu	Pasar Dompu	Bus	28	2	-	1	-	3	84		336	-		
		Large truck	21	1	1	-	-	2	42		126	42		
		Small truck	14	1	-	-	-	1	14		81	-		
		Kijang	15	-	-	2	-	2	30		-	-		
		Bemo	14	-	-	3	5	8	113		-	-		
		Benhur	13	-	-	-	5	5	63		-	-		
		Motor cycle	2	-	-	10	20	30	60		-	-		
		Total							405	810	543	42	590	1,180
Sikka	Kalimati (Maumere)	Bus	28	-	1	1	-	2	56		-	56		
		Large truck	21	3	1	-	-	4	84		378	42		
		Small truck	14	1	-	-	-	1	14		81	-		
		Kijang	15	-	-	2	-	2	30		-	-		
		Bemo	14	-	-	3	5	8	103		-	-		
		Motor cycle	2	-	-	10	16	26	51		-	-		
		Total							337	680	459	98	560	1,120

Formula : Parking lot :

Parking lot provide for bring in/take out transportation vehicle, vehicle related market and visitor's vehicle.

Occupation area per vehicle provide in the table herein-after.

Average daily unloading volume during peak season(No. of cool box for transportation) and No. of retailer are referred for No. of vehicle.

No. of transportation vehicle refer to fish bring in market and take out to another consumed area market.

Pasar Bima : Fish bring in from Rompo (Waworada), Sape, Tanjung (Bima), Soro (Kempo).

Pasar Dompu : Fish bring in from Soro (Kempo), Hu'u.

Kalimati (Maumere) : Fish unload at frontal wharf, bring in from Sagu, Larantuka and take out to Ende.

Bus : using by small scale retailer.

Large truck : transport cool box(300l). Loading capacity 10m3/No. Space for one truck provide in every market.

Small truck : transport cool box(300l). Loading capacity 4m3/No.

For retailer, Bemo is considered. No. of Bemo(6 person/No.) is 20% of total retailer No.

2 Nos of Kijang space for each market provide as office vehicle.

Bus is for small scale forwarding.

No. of Bemo for visitor calculated based on No. of retail booth. Less than 100 booth,5 Nos. More than 100 booth, 10Nos.

Bima & Dompu include wagon. No. of wagon calculated based on No. of retail booth. Less than 100 booth,5 Nos. More than 100 booth, 10Nos.

No. of motorcycle is 10 Nos for management office plus 20% of retail booth No. for visitor.

Unloading / Wholesale / Loading work space

3 times(300%) of vehicle occupation area use for area of unloading/wholesale work space after consideration of coolbox space and auction space.

Loading work space is 2 times of vehicle occupation area

Ground area(A)=Area of parking lot/Occupation ratio (50%)

Vehicle	Vehicle size		Parking area			Work space	Purpose		
	L(m)	B(m)	L(m)	B(m)	A(m2)	A(m2)	Transport	Market	Visitor
Bus	7.2	2.5	8.0	3.5	28.0	56	Yes	-	-
Large truck	6.3	2.0	7.0	3.0	21.0	42	Yes	-	-
Small truck	3.8	1.8	4.5	3.0	13.5	27	Yes	-	-
Kijang	4.2	1.9	5.0	3.0	15.0	-	-	Yes	-
Bemo	3.8	1.8	4.5	3.0	13.5	-	Yes	Yes	Yes
Benhur	4.0	1.4	5.0	2.5	12.5	25	Yes	Yes	Yes
Motorcycle	2.0	0.7	2.5	1.2	3.0	-	-	Yes	Yes

Unloading/Loading work space is 2 times of vehicle occupation area

Wholesale space

Kind	Existing		New booth size			User
	B(m)	D(m)	B(m)	D(m)	A(m2)	
Small scale retailer	1.2	1.2	1.5	1.5	2.3	less than 100kg
Big scale retailer	2.5	2.1	3.0	1.5	4.5	over 100kg
Kiosk	2.3	2.3	2.5	2.5	6.3	-

(6) Other ancillary facilities

District	Model Site	Garbage			Power supply		Water supply			Sewage treatment system			Ground area sub-total(m2)	Total ground area of Market (m2)
		A1 (m2)	A2 (m2)	Ground area (m2)	Area of facility (m2)	Ground area (m2)	Water tank (m3)	Area of facility (m2)	Ground area (m2)	Discharge volume (m3/day)	Area of facility (m2)	Ground area (m2)		
Bima	Pasar Bima	40	60	160	0	0	9	10	20	9	20	50	230	6,720
Dompu	Pasar Dompu	30	60	150	0	0	5	10	20	5	10	30	200	3,940
Sikka	Kalimati (Maumere)	30	60	150	0	0	8	10	20	12	30	80	250	3,450

*Market of Kalimati (Maumere) adjoin to Fish landing facilities. Therefore, both facilities are considered to determine scale.

Formula : Area of garbage A =(A1＋A2)/a

A1 : Area of trash collecting space = User 0-50person : 10m2, 50-100person : 20m2, 100-200person : 30m2, more than 200person : 40m2

No. of user refer to Water supply/storage facilities.

A2 : Area of trash loading space = occupation area of trash collecting vehicle(21m2, same as large truck)＋Loading work space (42m2)

a : Allowance = 60%

Power supply : In the management office, electrical/mechanical room provide.

Sewage treatment system : Sedimental pond(simple treatment) + screen system.

Total ground area for Market : Area = Shop area + Office area + Parking lot area + Loading/Unloading work space + Ancillary facilities area

Total ground area add road area and drainage to above figure.

Work at Market :

Flow of work	Bring in	→ Unloading/wholesale	→ (Carry)	→ Retail shop	→ Retail	
Facilities	Parking lot for vehicle	Unloading/wholesale work space		Retail shop	Passage	
Object	Vehicle	Cool Box + Retailers	Hand cart	Retailer	Retailer + people	

Component of Market

Parking lot : For bring in, for member of market, for visitor.

Working space : Unloading, wholesale, retail.

Storage space : Fresh fish storage.

Retail shop : Small scale retail shop, large scale retail shop, kiosk.

Office space : For management, for person concerned, toilet, shower room, etc.

Ancillary facilities : Garbage, power supply, water supply, sewage treatment system.

Table 4-1-14 TRANSPORTATION FACILITY

District	Model Site	Max. No. of Fish Buyers					No. of Cool Box				
							Fish Buyers			Fishers	Ice stock
		0-50kg	50-100kg	100-200kg	over 200kg	Total	45L(30kg)	80L(50kg)	150L(100kg)	300L(150kg)	
Bima	Rompo (Waworada)	31	24	13	14	82	78	27	28	19	0
Dompu	Soro (Kempo)	95	34	11	4	144	163	23	7	2	0
	Hu'u	21	6	0	0	27	33	0	0	4	0
Flores Timur	Oka (Larantuka)	69	8	4	9	90	85	7	17	0	0
	Lamahara Jaya	38	35	0	0	73	108	0	0	5	6
	Sagu	39	0	0	0	39	39	0	0	1	4
Lembata	Lewoleba	57	65	25	0	147	142	37	0	6	0
	Barauring	12	3	0	0	15	18	0	0	1	2
	Lamalera	50	0	0	0	50	23	0	0	1	3
Sikka	Kalimati (Maumere)	31	23	17	7	78	78	34	13	0	0
	Wuring	-	-	-	-	-	-	-	-	-	-
	Paga	12	25	0	0	37	61	1	0	6	0
Ende	Paupanda (Ende)	56	38	11	3	108	133	21	6	16	0

District	Model Site	Transportation Vehicle		Buyer/retailer's vehicle	Office vehicle	Bus	Bemo	Benhur (wagon)	total No. of vehicle	Area(m2) of parking lot	Ground area (m2)
		3ton Truck	1ton Truck								
Bima	Rompo (Waworada)	2	3	9	3	2	4	5	28	496	1,000
Dompu	Soro (Kempo) Total	1	3	5	3	1	6	5	24	413	830
	Hu'u	1	1	1	1	1	2	3	10	223	450
Flores Timur	Oka (Larantuka)	3	2	4	3	1	6	-	19	379	760
	Lamahara Jaya	3	0	1	0	0	4	-	8	212	430
	Sagu	0	0	1	0	0	2	-	3	101	210
Lembata	Lewoleba	1	3	8	3	1	6	-	22	391	790
	Balauring	0	1	1	0	1	2	-	5	142	290
	Lamalera	1	0	0	0	1	0	-	2	116	240
Sikka	Kalimati (Maumere)	1	3	8	3	1	4	-	20	304	610
	Wuring	0	0	0	1	0	2	-	3	72	150
	Paga	1	1	1	1	1	2	-	7	185	370
Ende	Paupanda (Ende)	2	3	5	3	1	6	-	20	318	640

Formula :

Parking lot :

Parking lot provide for transportation vehicle, office use, fisherman, fish buyer, bemo, motorcycle, bycicle,etc.
Occupation area per vehicle provide in the table herein-after.
Average daily unloading volume during peak season(No. of cool box for transportation) and No. of buyer are referred for No. of vehicle.
Large truck(3 ton truck) : transport cool box(300l). Loading capacity 10m3/No.
Small truck(1 ton truck) : transport cool box(300l). Loading capacity 4m3/No.
Vehicle for fish buyer : In case buyer handle more than 100kg/day, 20% of buyer's No.. If no buyer handle more than 100kg/day, vehicle is 0.
Office vehicle : Consider daily unloading volume during peak season, more than 5m3 by cool box volume, vehicle is 3 Nos. Less than 5m3, 1 No.
Bus is for small scale forwarding、 Rompe (Waworada) site consider for passenger of sea transportation.
No. of Bemo refer to No. of fish buyer.0-50person : 2 Nos, 50-100person : 4 Nos, more than 100person : 6 Nos.
At Larantuka, user of multi purpose transport ship use Bemo. Therefore, add 2 Nos's space.
Benhur(wagon) is only for Bima & Dompu.
Every site provide space of 20 motorcycle excluding Wuring(10 Nos).
At Dompu & Bima, parking lot is included in scale estimate of Market.
Ground area(A)=Area of parking lot/Occupation ratio(50%)
Lamahara Jaya, Sagu, Balauring, Lamalera, Wuring are estimated based on actual utilization + No. of new introduction of vehicle.

New introduction of Fish catch transportation vehicle:

Lamahala Jaya:	3ton truck - 1 No.
Balauring:	1ton truck - 1 No.
Lamalera:	3ton truck - 1 No.

Kind of vehicle and purpose:

Vehicle	Vehicle size		Parking area			Purpose			
	L(m)	B(m)	L(m)	B(m)	A(m2)	Transport	Office	Fish buyer	Others
Bus	7.2	2.5	8.0	3.5	28.0	Yes	-	Yes	Yes
3ton Truck	6.3	2.0	7.0	3.0	21.0	Yes	-	-	-
1ton Truck	3.8	1.8	4.5	3.0	13.5	Yes	-	-	-
Kijang	4.2	1.9	5.0	3.0	15.0	-	Yes	Yes	-
Bemo	3.8	1.8	4.5	3.0	13.5	Yes	Yes	Yes	Yes
Benhur	4.0	1.4	5.0	2.5	12.5	-	-	Yes	Yes
Motorcycle	2.0	0.7	2.5	1.2	3.0	-	Yes	Yes	Yes

Road width :

Road adjoin to handling facility, Market(Width B1)

Following 3 spaces considered due to concession of relevant vehicles such as bring in, take out, others within limited time.

① Space for vehicle during moving, preparation for running after loading fish products. (=10-11m)

② Space for ruining (3m*2 lane=6m)

③ Space for waiting (3m)

Width (B1) : B1 = 10-11m + 6m + 3m = 20m

Access road connect to main road(Width B2)

Width allowance considered to maintain smooth traffic from/to facilities and main road.

Pedestrian considered for fisherman and persons concerned.

Width (B2) : B2 = Running space (3m*2 lane=6m) + Green belt (1.5m*both side) + Pedestrian (1.5m*both side) = 12m

Inner road (Width B3) :

Add walking space for fisherman and others to running lane.

Width (B3) : B3 = Running space (3m*2 lane=6m) + Walking space (1.5m* both side) = 9m

*Above figure apply when certain traffic volume achieved.

*Application to each site will be determined after considering running vehicle No.,easiness of land possession, etc.

Table 4-1-15 ANCILLARY FACILITY

District	Model Site	Garbage				Power supply		Water supply			Sewage treatment system			Ground area
		A1 (m2)	A2 (m2)	Area of facility(m2)	ground area (m2)	Area of facility(m2)	ground area (m2)	Water tank (m3)	Area of facility(m2)	ground area (m2)	Discharge volume (m3)	Area of facility(m2)	ground area (m2)	Sub-total (m2)
Bima	Rompo (Waworada)	30	60	90	150	0	0	20	30	60	21	50	130	340
	Pasar Bima	40	60	100	160	0	0	9	10	20	9	20	50	230
Dompu	Soro (Kempo)	30	60	90	150	0	0	16	20	40	20	50	130	320
	Hu'u	10	40	50	80	0	0	4	10	20	4	10	30	130
	Pasar Dompu	30	60	90	150	0	0	5	10	20	5	10	30	200
Flores Timur	Oka (Larantuka)	20	60	80	130	0	0	13	20	40	9	20	50	220
	Lamahala Jaya	-	-	20	30	0	0	2	10	20	2	10	30	80
	Sagu	-	-	20	30	0	0	2	10	20	2	10	30	80
Lembata	Lewoleba	20	60	80	130	0	0	10	20	40	11	30	80	250
	Balauring	-	-	20	30	0	0	2	10	20	1	10	30	80
	Lamarela	-	-	20	30	0	0	3	10	20	3	10	30	80
Sikka	Kalimati (Maumere)	30	60	90	150	0	0	8	10	20	12	30	80	250
	Wuring	-	-	20	30	0	0	4	10	20	3	10	30	80
	Paga	10	40	50	80	0	0	6	10	20	5	20	50	150
Ende	Paupanda (Ende)	20	60	80	130	0	0	12	20	40	10	20	50	220

Formula : Area of garbage : A =(A1＋A2)/a

A1 : Area of trash collecting space = User 0-50person : 10m2, 50-100person : 20m2, 100-200person : 30m2, more than 200person : 40m2
No. of user refer to Water supply/storage facilities.

A2 : Area of trash loading space
= occupied area of trash collect vehicle(21m2, same as large truck)＋Loading work space (42m2) =Approx.60m2
Hu'u, Paga site are small truck(13.5m2) + Loading work space(27m2)= Approx.40m2

a : Allowance = 60%

Structure of collecting apace is 3 concrete side wall type and loading space is paving only.

In case of Lamahara Jaya, Sagu, Balauring, Lamalera and Wring, space are 20m2 as for small scale multi purpose facilities.

Power supply : In the management office, electrical/mechanical room provide.

In case of Lamahara Jaya, Sagu, Balauring, Lamalera, no facility provide because of multi purpose office.

Water supply : Area of water supply facility : In case water tank capacity 0-10m3, 10m2, 10-20m3, 20m2, more than 20m3, 30m2.

Ground area = Area of facility / Allowance(100%)

Sewage treatment system Sedimental pond(simple treatment) + screen system. Septic separation tank are provided plural line system with more than 2rooms and

: treatment time shall be more than 20hours.

At Lamahara Jaya, 3 facilities provide due to long shore line. Above figure is for one location.

PASAR MINGGU site

Objective area	Rompo (Waworada)	
Expected shop No.	N =	100 shop
Unit area per shop	2m*2m =	4 m2
Total area of shop	A 1 =	400 m2
Allowance	a =	150 %
Ground area	A =	1000 m2

(Floor space ratio 50% + Passage + Bring in/take out work space, etc)

Table 4-1-16 FISHING VILLAGE FACILITIES

Formula : **Water supply**	Objective area :	Dusun Rompo (Desa Waworada)				
	Objective household No. :	311 households.				
	Objective population :	1,358 person.				
	Existing supply results :	Daily average consumption(hearing results of fishing village) 1tank = 20L				
		Average purchase/day/household=3 to 6 tank/day/household (large scale house is 10-15tank/day/houshold)				
		Q=4.5tank/day/houshold*20L*311households			=	28.0 m3/day/household
		Average consumption/person=28.0m3/1,358person			=	20.6 L/day/person
	Planned volume : (Living water)	Original unit ratio of village by PDAM Personal		90 L/day/person		
		Public area		30 L/day/person		
		Reference supply volume (personal) (90L/day*1,358person =		122.2 m3/day)		
		Only for drinking/cooking water are considered for object of water supply.				
		Considering supply results & PDAM's ratio, 30l/day/person is adopted as unit ratio of supply.				
		Supply volume =30L/day*1,358person			=	40.7 m3/day
	(Fishery water)	①Washing water of fish catch	Q1=	6.6 m3/日	Sea water	
		②Processing/Pre-processing water	Q2=	5.1 m3/日		
		③Water for ship supply	Q3=	4.2 m3/日		
		④Water for Ice plant	Q4=	7.2 m3/日		
		⑤Washing water for facilities/equipment	Q5=	5.2 m3/日	Sea water	
		⑥Sanitary water	Q6=	4.0 m3/日		
		Sub-total		20.5 m3/日	Fresh water	20.5 m3/day
	(Total)	Planned water supply volume = (Living water) + (Fishery water)			=	61.2 m3/day
	Water resource : Location	Fountain water at Oinari (Dusun Purazma, Desa Waworada)	S: 08°41′ 50.1″ E: 118°47′ 35.5″			
	Existing TPI		S: 08°42′ 21.1″ E: 118°48′ 06.0″			
	In-take facility :					1 Lump.sum
	Conveyance facility :	(Channel, headrace, conveyance pipe, ancillary facilities)			L=	1,800 m
	Water treatment facility :	(Receiving well, sediment/filtation pond, treatment/sterilization facilities)				1 Lump.sum
	Distribution facility :	(Distribution pipe, ancillary facilities)				1 Lump.sum
	Water supply facility :	(Supply pond, supply tank, supply pipe, etc)				1 Lump.sum

ANNEX 4-2 SCALE DETERMINATION FOR EQUIPMENTS

TABLE4-2-1 FISHING BOATS AND LANDING VOLUME DURING PEAK SEASON AT EACH PROJECT SITE

(1) WAWORADA

Peak Season: May-July

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Bagan	06:00-09:00	3	1.8	0.6	0.12	0.04	by sampan	(No change)	0.05	0.02	0.07
- Purse Seine	17:00-20:00	3	38.7	12.9	12.91	4.30	by sampan	on wharf	5.41	1.80	7.50
- Gill Net - Handline	Anytime	6	10.1	1.7	0.30	0.05	by sampan or beach	on wharf or beach	0.13	0.02	0.18
- Collecting Boats	02:00-07:00	5	21.3	4.3	8.57	1.71	beach landing	on wharf	3.59	0.72	4.98
Total (Peak time)	17:00-20:00	3	38.7	12.9	12.91	4.30			5.41	1.80	7.50
Total		10	71.9	7.2	21.90	2.19			9.19	0.92	12.72

(2) KEMPO

Peak Season: July-Aug.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Bagan	04:00-07:00	3	31.3	10.4	2.61	0.87	by sampan	(No change)	1.04	0.35	1.57
- Purse Seine	04:00-07:00	3	10.0	3.3	0.83	0.28	by sampan	on jetty	0.33	0.11	0.50
- Gill Net - Handline	Anytime	6	10.1	1.7	1.51	0.25	by sampan or beach	on jetty or beach	0.60	0.10	0.91
- Collecting Boats	02:00-07:00	5	40.0	8.0	17.22	3.44	beach landing	on jetty	6.89	1.38	10.33
Total (Peak time)	04:00-07:00	3	65.3	21.8	13.77	4.59	beach landing	on jetty	5.51	1.84	8.26
Total		10	91.4	9.1	22.17	2.22			8.87	0.89	13.30

(3) HU'U

Peak Season: May-June

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Purse Seine	12:00-15:00	3	12.0	4.0	2.63	0.88	by sampan	(No change)	1.05	0.35	1.58
- Gill Net	06:00-12:00	6	3.0	0.5	0.30	0.05	by sampan or beach	(No change)	0.12	0.02	0.18
- Handline			6.0	1.0	0.21	0.04			0.08	0.01	0.13
Total (Peak time)	12:00-15:00	3	12.0	4.0	2.63	0.88			1.05	0.35	1.58
Total		9	21.0	2.3	3.14	0.35			1.25	0.14	1.88

(4) LARANTUKA

Peak Season: Oct.-Nov.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Bagan	06:00-09:00	3	21.0	7.0	0.90	0.30	by sampan	(No change)	0.60	0.20	0.30
- Purse Seine	06:00-09:00	3	28.3	9.4	8.48	2.83	by sampan	on whraf	5.67	1.89	2.81
- Gill Net	Anytime	6	2.8	0.5	0.08	0.01	by sampan or beach	on wharf or beach	0.06	0.01	0.03
- Handline											
Total (Peak time)	06:00-09:00	3	50.6	16.9	9.42	3.14			6.30	2.10	3.12
Total		6	52.0	8.7	9.46	1.58			6.33	1.05	3.13

(5) LAMAHALA JAYA

Peak Season: Oct.-Nov.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Bagan	06:00-09:00	3	1.0	0.3	0.16	0.05	by sampan	(No change)	0.08	0.03	0.08
- Purse Seine	06:00-09:00	3	26.7	8.9	8.41	2.80	by sampan	(No change)	4.22	1.41	4.19
	15:00-18:00	3	13.3	4.4	4.21	1.40			2.11	0.70	2.10
- Gill Net	Anytime	6	7.0	1.2	0.16	0.03	by sampan or beach	(No change)	0.08	0.01	0.08
- Handline											
Total		6	41.1	13.7	12.78	4.26			6.41	1.07	6.37
Direct selling to Sinjai boats at sea					4.67	1.56					
Balance					8.11	2.70					
Total (Peak time)	06:00-09:00	3	31.2	10.4	5.54	1.85			2.78	0.93	2.76
Total		6	41.1	6.8	8.11	1.35			4.07	0.68	4.04

(6) SAGU

Peak Season: Oct.-Feb.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Bagan	06:00-09:00	3	4.4	1.5	0.88	0.29	by sampan	(No change)	0.59	0.20	0.29
- Purse Seine	06:00-09:00	3	2.5	0.8	0.76	0.25	by sampan	(No change)	0.51	0.17	0.25
	15:00-18:00	3	1.3	0.4	0.33	0.11			0.22	0.07	0.11
- Gill Net	06:00-09:00	3	6.3	2.1	0.19	0.06	by sampan or beach	(No change)	0.13	0.04	0.06
- Handline	Anytime	6	6.8	1.1	0.05	0.01			0.03	0.01	0.02
Total (Peak time)	06:00-09:00	3	16.6	5.5	1.85	0.62			1.24	0.41	0.61
Total		6	21.3	3.6	2.21	0.37			1.48	0.25	0.73

(7) LEWOLEBA

Peak Season: Jan.-Mar.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Bagan	06:00-09:00	3	46.3	15.4	6.95	2.32	by sampan	(No change)	5.67	1.89	1.28
- Purse Seine	06:00-09:00	3	1.3	0.4	4.00	1.33	by sampan	on wharf	3.27	1.09	0.73
	15:00-18:00	3	0.7	0.2	2.00	0.67			1.63	0.54	0.37
- Gill Net	06:00-09:00	3	10.0	3.3	0.10	0.03	by sampan or beach	on wharf or beach	0.08	0.03	0.02
- Handline	12:00-15:00	3	2.0	0.7	0.05	0.02			0.04	0.01	0.01
Total (Peak time)	06:00-09:00	3	57.6	19.2	11.05	3.68			9.02	3.01	2.03
Total		9	60.3	6.7	13.09	1.45			10.69	1.19	2.41

(8) BALAURING

Peak Season: Oct.-Nov. (Peak season of transport of resh fish: Jan.-Feb.)

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Purse Seine	15:00-18:00	3	1.9	0.6	0.38	0.13	by sampan	(No change)	0.19	0.06	0.19
- Gill Net	05:00-08:00	3	4.4	1.5	0.29	0.10	by sampan or beach	(No change)	0.15	0.05	0.15
- Handline	05:00-08:00	3	8.8	2.9	0.71	0.24			0.35	0.12	0.35
Total (Peak time)	05:00-08:00	3	13.2	4.4	1.00	0.33			0.50	0.17	0.50
Total		6	15.1	2.5	1.38	0.23			0.69	0.11	0.69

(9) LAMALERA

Peak Season: June-Sep. (Jan.-Feb. exp. whaler)

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Whaler	12:00-15:00	3	0.7	0.2	2.50	0.83	beach landing	(No change)	0.00	0.00	2.50
- Gill Net	09:00-12:00	3	5.5	1.8	0.48	0.16			0.31	0.10	0.17
- Handline	12:00-15:00	3	20.0	6.7	0.88	0.29			0.57	0.19	0.31
Total (Peak time)	12:00-15:00	3	20.7	6.9	3.38	1.13			0.57	0.19	2.81
Total		6	26.2	4.4	3.86	0.64			0.88	0.15	2.98

(10) MAUMERE/WURING

Peak Season: Oct.-Nov.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Purse Seine	05:00-08:00	3	28.9	9.6	8.67	2.89	by sampan	on wharf	5.79	1.93	2.88
- Gill Net	05:00-08:00	3	3.1	1.0	0.08	0.03	by sampan or	on wharf or	0.05	0.02	0.03
- Handline	12:00-18:00	6	2.7	0.5	0.01	0.00	beach	beach	0.01	0.00	0.00
- Collecting boat	05:00-08:00	3	8.3	2.8	2.50	0.83	beach landing	on wharf	1.67	0.56	0.83
Total (Peak time)	05:00-08:00	3	40.3	13.4	11.25	3.75			7.52	2.51	3.73
Total		6	43.0	7.2	11.26	1.88			7.52	1.25	3.74

(11) PAGA/MAULOO

Peak Season: Oct.-Nov.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Purse Seine	15:00-18:00	3	14.4	4.8	4.32	1.44	by sampan	(No change)	2.21	0.74	2.11
- Gill Net	06:00-09:00	3	3.0	1.0	0.15	0.05	by sampan or beach landing	(No change)	0.08	0.03	0.07
- Gill Net (with FAD)	06:00-09:00	3	6.0	2.0	0.15	0.05			0.08	0.03	0.07
- Trolling	06:00-09:00	3	2.0	0.7	0.02	0.01			0.01	0.00	0.01
Total (Peak time)	15:00-18:00	3	14.4	4.8	4.32	1.44			2.21	0.74	2.11
Total		6	25.4	4.2	4.64	0.77			2.37	0.40	2.27

(12) ENDE (PAUPANDA)

Peak Season: May-Aug.

Type of boat	Landing Time		No. of boats entry		Fish landing volume		Landing from boat to beach		Fish treated & sold by fresh		Fish processed
	Time zone	Hours	(units/day)	(units/hour)	(ton/day)	(ton/hr.)	at present	with project	(ton/day)	(ton/hr.)	(ton/day)
- Purse Seine	15:00-18:00	3	22.6	7.5	6.79	2.26	by sampan	on jetty	4.61	1.54	2.18
- Lampala	06:00-09:00	3	8.2	2.7	2.47	0.82	by sampan	on jetty	1.68	0.56	0.79
- Gill Net - Handline	06:00-09:00	3	32.3	10.8	1.61	0.54	by sampan or beach	on jetty or beach	1.10	0.37	0.52
Total (Peak time)	15:00-18:00	3	22.6	7.5	6.79	2.26			4.61	1.54	2.18
Total		6	63.1	10.5	10.87	1.81			7.39	1.23	3.49

Note: Time needed for fish landing per boat (min.)

	Without project (At present)				With Project (Landing wharf)			
	for mooring	for unloading	for selling	Total	for mooring	for unloading	for selling	Total
Bagan	5	60	15	80	5	60	15	80
Purse Seine	5	60	15	80	5	10	15	30
Gill Net/Handline (large)	5	15	10	30	5	5	10	20
Gill Net/Handline (small)	5	5	10	20	5	5	10	20
Collect Boat	5	20	15	40	5	10	15	30

TABLE 4-2-2. SCALE OF ICE PLANT

(1) WAWORADA

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	3.71	25%	0.93
For overnight	5.48	75%	4.11
For transport	0.00	75%	0.00
For processing	12.72	10%	1.27
Total	21.90		6.31
Capacity of ice plant (ton/day)			6.0

(2) KEMPO

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	8.57	25%	2.14
For overnight	0.30	75%	0.23
For transport	0.00	75%	0.00
For processing	13.30	10%	1.33
Total	22.17		3.70
Capacity of ice plant (ton/day)			3.5

(3) HUU

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	0.20	25%	0.05
For overnight	1.05	75%	0.79
For transport	0.00	75%	0.00
For processing	1.88	10%	0.19
Total	3.14		1.03
Capacity of ice plant (ton/day)			1.0

(4) LARANTUKA

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	4.70	25%	1.17
For overnight	0.03	75%	0.02
For transport	1.57	75%	1.18
For processing	3.13	10%	0.31
Total	9.43		2.69
Ice supplied to Lamahala Jaya and Sagu			2.39
Ice supplied to Balauring & Lamalera			1.27
Total			6.34
Capacity of ice plant (ton/day)			6.0

(5) LAMAHALA JAYA

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	1.88	25%	0.47
For overnight	1.36	75%	1.02
For transport	0.82	75%	0.62
For processing	4.04	10%	0.40
Total	8.11		2.52
Existing mini ice plant			1.00
Ice demand (supplied from Larantuka)			1.52

(6) SAGU

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	0.62	25%	0.16
For overnight	0.24	75%	0.18
For transport	0.62	75%	0.46
For processing	0.73	10%	0.07
Total	2.21		0.87
Ice demand (supplied from Larantuka)			0.87

(7) LEWOLEBA

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	5.95	25%	1.49
For overnight	1.67	75%	1.25
For transport	3.06	75%	2.30
For processing	2.41	10%	0.24
Total	13.09		5.28
Ice necessary during Apr.-Dec.			2.98
Capacity of ice plant (ton/day)			3.0

(8) BALAURING

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	0.03	25%	0.01
For overnight	0.19	75%	0.14
For transport	0.47	75%	0.36
For processing	0.69	10%	0.07
Total	1.38		0.57

(9) LAMALERA

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	0.52	25%	0.13
For overnight	0.28	75%	0.21
For transport	0.08	75%	0.06
For processing	2.98	10%	0.30
Total	3.86		0.70
Ice demand (supplied from Larantuka)			0.70

(10) MAUMERE/WURING

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	5.82	25%	1.45
For overnight	0.01	75%	0.01
For transport	1.70	75%	1.27
For processing	3.74	10%	0.37
Total	11.26		3.11
Capacity of ice plant (ton/day)			3.0

(11) PAGA/MAULOO

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	0.16	25%	0.04
For overnight	1.67	75%	1.25
For transport	0.54	75%	0.41
For processing	2.27	10%	0.23
Total	4.64		1.92
Capacity of ice plant (ton/day)			2.0

(12) ENDE (PAUPANDA)

Fish treatment (ton/day)		Ice ratio (%)	Ice (ton/day)
For 1-day sale	2.77	25%	0.69
For overnight	2.95	75%	2.22
For transport	1.66	75%	1.24
For processing	3.49	10%	0.35
Total	10.87		4.50
Capacity of ice plant (ton/day)			5.0

Note: LEWOLEBA: The lack of ice during high season in Lewoleba (Jan.-Mar.) would be able to supply from Larantuka where it is low fishing season.
BALAURING: Ice demand would be increased for transport of fresh fish to Larantuka during Jan.-Feb. The increment of ice (0.25 ton/day) would be covered by supply from Larantuka.
MAUMERE: Existing ice plant (2.5 ton/day) in Kalimati mainly supplies ice to skipjack pole-and-line fishing boats.

TABLE 4-2-3. CAPACITY OF EQUIPMENT FOR FISH HANDLING & STORAGE

EQUIPMENT FOR FISH HANDLING & STORAGE

(1) Equipment for Fish Unloading

Project Site	Name	Capacity	Handling volume (kg/30min.)	Quantity	Remarks
Waworada	Container	60L (50kg)	2,152	43	
	Hand cart	200kg	2,152	0	
	Balance	0-100kg	2,152	3	
Kempo	Container	60L (50kg)	574	11	
	Hand cart	200kg	2,295	0	
	Balance	0-100kg	2,295	3	
Hu'u	Container	60L (50kg)	875	18	Per 60 min.
	Balance	0-100kg	875	1	Per 60 min.
Larantuka	Container	60L (50kg)	1,570	31	
	Hand cart	200kg	1,570	0	
	Balance	0-100kg	1,570	2	
Lewoleba	Container	60L (50kg)	1,841	37	
	Hand cart	200kg	1,841	0	
	Balance	0-100kg	1,841	2	
Maumere	Container	60L (50kg)	1,875	37	
	Hand cart	200kg	1,875	0	
	Balance	0-100kg	1,875	2	
Paga	Container	60L (50kg)	1,440	29	Per 60 min.
	Balance	0-100kg	1,440	2	Per 60 min.
Ende	Container	60L (50kg)	1,697	34	Per 45 min.
	Hand cart	200kg	1,697	0	
	Balance	0-100kg	1,697	2	Per 45 min.

(2) Equipment for Fresh Fish Storage

Project Site	Fish dealing capacity	Max. No. of fish buyers	No. of fish buyers (fresh	No. of cool box				
				Fish buyers			Fishers	Ice stock
				45L(30kg)	80L(50kg)	150L(100kg)	300L(150kg)	300L(250kg)
Waworada	0-50kg	31	31	31				
	50-100kg	24	24	47				
	100-200kg	13	13		27			
	over 200kg	14	14			28	19	0
Kempo	0-50kg	95	95	95				
	50-100kg	34	34	68				
	100-200kg	11	11		23			
	over 200kg	4	4			7	0	0
Hu'u	0-50kg	21	21	21				
	50-100kg	6	6	12				
	100-200kg	0	0		0			
	over 200kg	0	0			0	4	0
Larantuka	0-50kg	69	69	69				
	50-100kg	8	8	16				
	100-200kg	4	4		7			
	over 200kg	9	9			17	0	0
Lamahala Jaya	0-50kg	38	38	38				
	50-100kg	35	35	70				
	100-200kg	0	0		0			
	over 200kg	0	0			0	5	7
Sagu	0-50kg	39	39	39				
	50-100kg	0	0	0				
	100-200kg	0	0		0			
	over 200kg	0	0			0	1	4
Lewoleba	0-50kg	57	41	41				
	50-100kg	65	46	92				
	100-200kg	25	18		35			
	over 200kg	0	0			0	6	0
Balauring	0-50kg	12	12	12				
	50-100kg	3	3	6				
	100-200kg	0	0		0			
	over 200kg	0	0			0	1	3
Lamalera	0-50kg	50	23	23				
	50-100kg	0	0	0				
	100-200kg	0	0		0			
	over 200kg	0	0			0	1	3
Maumere	0-50kg	31	31	31				
	50-100kg	23	23	47				
	100-200kg	17	17		34			
	over 200kg	7	7			13	0	0
Paga	0-50kg	12	12	12				
	50-100kg	25	25	49				
	100-200kg	0	0		1			
	over 200kg	0	0			0	6	0
Ende	0-50kg	56	56	56				
	50-100kg	38	38	77				
	100-200kg	11	11		21			
	over 200kg	3	3			6	10	0
Total		890	821	954	148	72	53	17

TABLE 4-2-4 CAPACITY OF FUEL DEPOT

(1) WAWORADA

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
40	0	0	72	0	0
30	0	0	1,162	0	0
20	5	0	101	25	0
10	0	0	213	0	0
Total			1,548	25	0
			Tank (5 kl)	-	-
			Dispenser	-	-
			Contract with PURTAMINA		

(2) KEMPO

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
40	0	0	1,253	0	0
15	0	20	150	0	200
10	0	0	101	0	0
10	0	0	400	0	0
Total			1,903	0	200
			Tank (5 kl)	-	3 Drum can
			Dispenser	-	Hand pump
			Contract with PURTAMINA		

(3) HU'U

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
15	0	0	180	0	0
10	0	2	30	0	6
5	0	3	30	0	18
Total			240	0	24
			4 Drum can	-	-
			Hand pump	-	-
			Tenante to private sector		

(4) LARANTUKA

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
10	0	5	210	0	105
20	0	2	565	0	57
2	0	1	6	0	3
Total			781	0	164
			Tank (5 kl)	-	6 Drum can
			Dispenser	-	Hand pump
			Contract with PURTAMINA		

(5) LAMAHALA JAYA

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
20	0	10	21	0	10
30	0	10	800	0	267
30	0	0	400	0	0
5	0	0	35	0	0
Total			1,256	0	277
			6 Drum can	-	2 Drum can
			Hand pump	-	Hand pump
			Tenante to private sector		

(6) SAGU

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
10	0	5	44	0	22
10	0	5	25	0	13
10	0	0	13	0	0
5	0	0	32	0	0
0	4	3	0	27	21
Total			113	27	55
			2 Drum can	-	-
			Hand pump	-	-
			Transport by multi-purpose boats		

(7) LEWOLEBA

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
5	0	10	232	0	463
15	0	10	20	0	13
15	0	0	10	0	0
0	5	0	0	50	0
0	5	0	0	10	0
Total			261	60	476
			4 Drum can	1 Drum can	7 Drum can
			Hand pump	Hand pump	Hand pump
			Tenante to private sector		

(8) BALAURING

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
20	0	0	38	0	0
5	0	3	22	0	13
3	0	2	26	0	18
Total			86	0	31
			1 Drum can	-	1 Drum can
			Hand pump	-	Hand pump
			Transport by multi-purpose boats		

(9) LAMALERA

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
0	0	0	0	0	0
0	5	0	0	28	0
0	0	0	0	0	0
Total			0	28	0
			-	1 Drum ca	-
			-	Hand pum	-

(10) MAUMERE

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
20	0	10	578	0	289
10	0	0	31	0	0
0	5	0	0	14	0
10	0	0	83	0	0
Total			692	14	289
			Tank (5 kl)	-	10 Drum can
			Dispenser	-	Hand pump
			Contract with PURTAMINA		

(11) PAGA

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
20	0	0	288	0	0
0	5	3	0	15	9
0	5	3	0	30	18
0	5	2	0	10	4
Total			288	55	31
			4 Drum can	1 Drum can	1 Drum can
			Hand pump	Hand pump	Hand pump
			Tenante to private sector		

(12) ENDE

Fuel input per boat (liter/day)			Max. required fuel (liter/day)		
Diesel	Gasoline	Light oil	Diesel	Gasoline	Light oil
20	0	0	453	0	0
20	0	10	165	0	82
10	5	2	323	161	65
Total			940	161	147
			Tank (5 kl)	4 Drum ca	4 Drum can
			Dispenser	Hand pum	Hand pump
			Contract with PURTAMINA		

TABLE 4-2-5. CAPACITY OF TRANSPORTATION EQUIPMENT

(1) Multi-purpose boat (from/to Larantuka)

Project Sit	Destinatior	Periods	Onward	Return trip			No. of days	Volume to be transport per trip				Required specs. for boar				No. of boat	Annual op.
			Fish in ice	Ice	Fuel	Materials	per trip	Fish in ice	Ice	Fuel	Materials	Fish hold	Drum can	Passenger	Total	(5 ton)	days
			(ton/day)	(ton/day)	(kl/day)	(ton/day)		(ton)	(ton)	(kl)	(ton)	(m3)	(pcs.)	(persons)	load (ton)		
Lamahala	Larantuka	Oct.-Nov.	1.44	1.52	1.53	0.20	1.0	1.44	1.52	1.53	0.20	1.60	8	12	4.2	1	300
		Dec.-Sep.	1.47	1.02	1.53	0.20	1.0	1.47	1.02	1.53	0.20	1.50	8	12	4.1		
Sagu	Larantuka	Oct.-Feb.	1.08	0.87	0.20	0.20	3.0	3.23	2.61	0.59	0.60	3.30	3	12	5.3	1	100
		Mar.-Sep.	0.06	0.41	0.20	0.20	3.0	0.17	1.22	0.59	0.60	1.30	3	12	3.3		
Lewoleba	Larantuka	Jan.-Mar.	5.36	2.30	0.80	0.20	1.0	5.36	2.30	0.80	0.20	5.40	4	12	7.2	1	200
		Apr.-Dec.	0.24	0.00	0.80	0.20	3.0	0.72	0.00	2.39	0.60	0.80	12	12	4.6		
Balauring	Larantuka	Jan.-Feb.	0.83	0.57	0.12	0.20	3.0	2.49	1.72	0.35	0.60	2.50	2	12	4.3	1	100
		Mar.-Dec.	0.12	0.82	0.12	0.20	3.0	0.36	2.47	0.35	0.60	2.50	2	12	4.3		
Lamalera	Larantuka	Aug.-Apr.	0.14	0.70	0.03	0.20	3.0	0.42	2.10	0.08	0.60	2.10	1	12	3.7	1	100
		May-July	0.00	0.64	0.03	0.20	3.0	0.00	1.92	0.08	0.60	2.00	1	12	3.6		
														Average	4.5	ton	
														Max. load	5.0	ton	

(2) Fish transport truck to inland areas

Project Sit	Destinatior	Fish	Ice	Venders	Fish/vende	Total	Size of	No. of 3-to	Existing	Under
		(ton/day)	(ton/day)	(persons)	(kg/day)	weight(ton	truck (ton)	trucks		project
Lamahala	Inland	2.13	0.53	90	24	8.1	3	3	2	1
Sagu	Inland	0.77	0.19	15	51	1.9	2	1	0	1
Balauring	Inland	0.18	0.05	5	37	0.5	1	0	0	0
Lamalera	Inland	0.72	0.18	20	36	2.1	2	1	0	1
Larantuka	Maumere	1.57	0.79	3	524	2.5	3	1	0	1
Maumere	Ende	2.24	1.12	3	746	3.5	4	1	0	1
Ende	Bajawa	1.66	0.83	3	552	2.7	3	1	0	1

Reference: Fish vendering within Adonara Island

	Waiwerang	Waiwadan	Lite	Senadau	Lagoloe	Baniona	Watanpao	Sagu	Total
Mon.	50	10	10	10	30	10	10	-	130
Tue.	50	10	30	10	10	10	10	-	130
Wed.	50	30	10	30	30	10	30	-	190
Thu.	50	10	10	10	10	10	10	-	110
Fri.	50	10	30	10	30	10	10	10	160
Sat.	50	30	10	30	10	30	10	-	170
Sun.	50	10	10	10	30	10	10	-	130
Total	350	110	110	110	150	90	90	10	1,020
Transport	Bemo	Truck	Truck	Truck	Truck	Truck	Truck	Bemo	

Reference: Weekly market within Lembata

	Lewoleba	Balauring	Walansama	Peimole	Roho	Wairing	Lewayan
Mon.							
Tue.				X			X
Wed.		X					
Thu.						X	
Fri.							
Sat.		X			X		
Sun.			X				
Total							
Transport	Bemo	Bemo	Bemo	Bemo	Bemo	Bemo	Bemo
Cost (Rp)	20,000	-	8,000	8,000	8,000	10,000	8,000

Reference: Weekly market within Sikka

	Maumere	Nita	Nangabulo	Paga	Lekebau	Gelitung	Bola	Lela
Mon.							X	
Tue.	X							
Wed.			X					X
Thu.		X		X				
Fri.						X		
Sat.					X			
Sun.								
Total								
Transport								