

Tat Lan Hydrological Masterplan

Volume III: Myebon Township

Yangon
April 2013



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5 MYEBON TOWNSHIP

5.1 OVERVIEW

In Myebon Township, a total of 81 villages were selected for the Tat Lan program. These are presented (with updated population figures and some additional comments) in the table below.

Sr	Township	Village Tract	Village Name	# HH	POP TOT	Ethnicity (Rakhine, Muslim, Chin)	Vill_Pcode	Comments
1	Myebon	Ah Lel Kyun	Ah Lel Kyun	240	1060	Rakhine	197257	
2	Myebon	Chaung Kya	Chaung Kya (Lower)	72	270	Rakhine	197264	
3	Myebon	Chaung Kya	Chaung Kya (Upper)	183	482	Rakhine	197265	
4	Myebon	Chaung Kya	Pin Khar	67	325	Chin	197266	
5	Myebon	Daing Bon	Daing Bon	171	890	Rakhine	197271	
6	Myebon	Daing Bon	Kyauk Moe	83	306	Chin	197275	
7	Myebon	Daing Bon	Kyauk Tan	89	461	Chin	197274	
8	Myebon	Daing Bon	Maung Shin	338	1578	Rakhine	197272	
9	Myebon	Daing Bon	Thar Yar Wa Di	38	187	Chin	197273	
10	Myebon	Hpa Lar Kya	Hpa Lar Kya	420	1950	Chin	197331	
11	Myebon	Kaw	Kaw	380	1404	Rakhine	197290	Village relocated. New coordinates 20.02627 N / 93.60836 E
12	Myebon	Kha Yan Pyin	In Daing Gyi	40	152	Rakhine	197285	
13	Myebon	Kha Yan Pyin	Kha Yan Pyin	40	179	Rakhine	197283	
14	Myebon	Kha Yan Pyin	La Har Gyi	83	369	Rakhine	197284	
15	Myebon	Kyauk Hpya Lar	Kyauk Hpya Lar	259	1208	Chin	197282	
16	Myebon	Kyauk Nga Nwar	Kyauk Nga Nwar	140	558	Rakhine	197286	
17	Myebon	Kyet Yae Gyi	Kyet Yae Gyi	735	3012	Rakhine	197281	This village has grown substantially
18	Myebon	Moe Thee Nat Taung	Kon Baung	202	807	Rakhine	197316	There is no upper and lower village.
19	Myebon	Moe Thee Nat Taung	Kyee Gaung Taung	263	1,090	Rakhine	197314	This village has grown substantially
20	Myebon	Moe Thee Nat Taung	Taung Gyi Yin (Moe Thee Nat Taung)	202	805	Rakhine	197318	This village has grown substantially
21	Myebon	Myauk Kyein	Myauk Kyein	45	184	Rakhine	197303	This village has shrunk substantially
22	Myebon	Myauk Kyein	Nyaung Taw	119	603	Rakhine	197305	
23	Myebon	Myauk Kyein	Ta Dar U	32	149	Rakhine	197304	
24	Myebon	Nga Man Ye Gyi	Kan Htaunt Gyi	0	0	Rakhine	197308	This village has been abandoned
25	Myebon	Nga Man Ye Gyi	Lwan Lone Paik (Htein Pin Myint)	348	2320	Rakhine	197307	
26	Myebon	Nga Man Ye Gyi	Nga Man Ye Gyi	71	322	Rakhine	197306	
27	Myebon	Nga Shwe Pyin	Lay Tu	80	310	Chin	197313	This village is Chin, not Rakhine
28	Myebon	Nga Shwe Pyin	Nga Shwe Pyin	145	439	Rakhine	197309	This village has many more people than on the earlier list

29	Myebon	Nga Pyin	Nga Shwe Pyin (North)	76	352	Chin	197310	This village has substantially more people.
30	Myebon	Nga Pyin	Taung Maw	78	276	Rakhine	197312	
31	Myebon	Nga Pyin	Taung Nyo	80	349	Rakhine	197311	
32	Myebon	Pin Chaung	Bar Wai	142	725	Chin	197338	
33	Myebon	Pin Chaung	Chaung Gyi	105	464	Rakhine	197336	
34	Myebon	Pin Chaung	Ka Paing Chaung	132	646	Rakhine	197335	
35	Myebon	Pin Chaung	Kant Kaw Chaung	144	715	Rakhine	197337	
36	Myebon	Pin Chaung	Nga Sin Pone	182	882	Chin	197339	
37	Myebon	Pin Chaung	Chaung Shey	43	218	Chin	197340	
38	Myebon	Pin Kat Maw	Kat Taung Swea	60	257	Chin	197334	
39	Myebon	Pin Kat Maw	Pin Kat Taung Auk	35	154	Rakhine	197333	
40	Myebon	Pin Kat Maw	Pin Kat Taung Maw	180	717	Rakhine	197332	
41	Myebon	Pyin Chaung	Pyin Chaung	135	641	Rakhine	197326	
42	Myebon	Pyin Chaung	Pyin Nga Khu Chaung	160	803	Rakhine	197328	
43	Myebon	Seik Ta Ra	Seik Ta Ra	613	2,652	Rakhine	197357	
44	Myebon	Shauk Chon	Kyant Hin Khar	103	492	Rakhine	197348	
45	Myebon	Shauk Chon	Kyar Inn Taung	240	1116	Rakhine	197349	
46	Myebon	Shauk Chon	Shauk Chon	94	455	Rakhine	197347	
47	Myebon	Yae Chaung	Kyoe Kyar Pyin	34	159	Chin	197384	
48	Myebon	Yae Chaung	Taung Zaing	56	280	Chin (Le Du)	197387	
49	Myebon	Yae Chaung	Toke La Har (La Bet Gyi)	34	135	Rakhine	197385	
50	Myebon	Yae Chaung	Yae Gaung Chaung	95	440	Chin	197381	This village has grown quite a lot
51	Myebon	Yae Chaung	Zee Pauk	102	405	Chin	197382	
52	Myebon	Yae Shin	Gant Gaw	195	795	Chin	197365	
53	Myebon	Yae Shin	Yae Shin	355	1,543	Rakhine	197364	This village has grown quite a lot.
54	Myebon	Yet Chaung	Lay Taung	155	661	Rakhine	197367	
55	Myebon	Yet Chaung	Mi Kyaung Tet	86	327	Rakhine	197368	This village has doubled in population
56	Myebon	Yet Chaung	Pya Thone	137	625	Rakhine	197371	
57	Myebon	Yet Chaung	Tha Pyay Taw	48	216	Rakhine	197369	
58	Myebon	Yet Chaung	War Khoke Chaung	90	380	Chin	197370	
59	Myebon	Yet Chaung	Yet Chaung	802	3,805	Rakhine	197366	This village has grown rapidly
60	Myebon	Yoe Sa Nwin	Din Gar Ya	67	270	Rakhine	197377	This village is Rakhine, not Chin
61	Myebon	Yoe Sa Nwin	Maung Chaung	20	• 90	Chin	197374	
62	Myebon	Yoe Sa Nwin	Nat Hla	72	360	Rakhine	197373	This village has almost doubled in size
63	Myebon	Yoe Sa Nwin	Oke Kan	250	870	Chin	197376	
64	Myebon	Yoe Sa Nwin	Taung Gyi	72	344	Chin	197380	
65	Myebon	Yoe Sa Nwin	Taung Pyin	25	108	Chin	197378	

66	Myebon	Yoe Sa Nwin	Taung Shey	6	29	Chin	197379	
67	Myebon	Yoe Sa Nwin	Wet Yu	159	650	Rakhine	197375	This village has almost doubled in population
68	Myebon	Yoe Sa Nwin	Yoe Sa Nwin	259	1151	Rakhine	197372	
69	Myebon	Kan Htaunt Gyi	Kan Htaunt Gyi	2,232	10,200	Rakhine	197297	
70	Myebon	Kyay Taw	Kyay Taw	332	1,299	Rakhine	197298	
71	Myebon	Ngan Taung	Ngan Taung	230	1,035	Rakhine	197322	
72	Myebon	Nyaung Khet Kan	Nyaung Khet Kan (Ywar Haung)	402	1,831	Rakhine	197321	P-code is 197321, not 197320
73	Myebon	Pauk Tu Taung	Pauk Tu Taung	820	3,480	Rakhine	197341	
74	Myebon	Pauk Tu Taung	Set Khway	172	676	Rakhine	197343	
75	Myebon	Sa Hnyin	Hin Kha Yaw	125	517	Rakhine	197351	
76	Myebon	Sa Hnyin	Sa Hnyin	390	1,590	Rakhine	197350	This village has grown quite a lot
77	Myebon	Sat Tet	Sat Tet	70	324	Rakhine	197356	
78	Myebon	Tha Yet Taung	Tha Yet Taung	1150	5550	Rakhine	197361	
79	Myebon	Yae Kaung Chein	Gaung Hpyu Taung	10	30	Rakhine	197393	This village is only inhabited by migrant fishermen, no longer a permanent village.
80	Myebon	Yae Kaung Chein	Kyauk Hpyar	245	971	Rakhine	197391	
81	Myebon	Yae Kaung Chein	Yae Kaung Chein	766	2,945	Rakhine	217982	

Some of the villages are found in clusters (see the Google Earth images on the following pages). These villages will be grouped together. Others are not near other Tat Lan villages. These villages will be treated separately. In the remainder of the chapter, the villages will be presented as they are found west to east, and north to south.

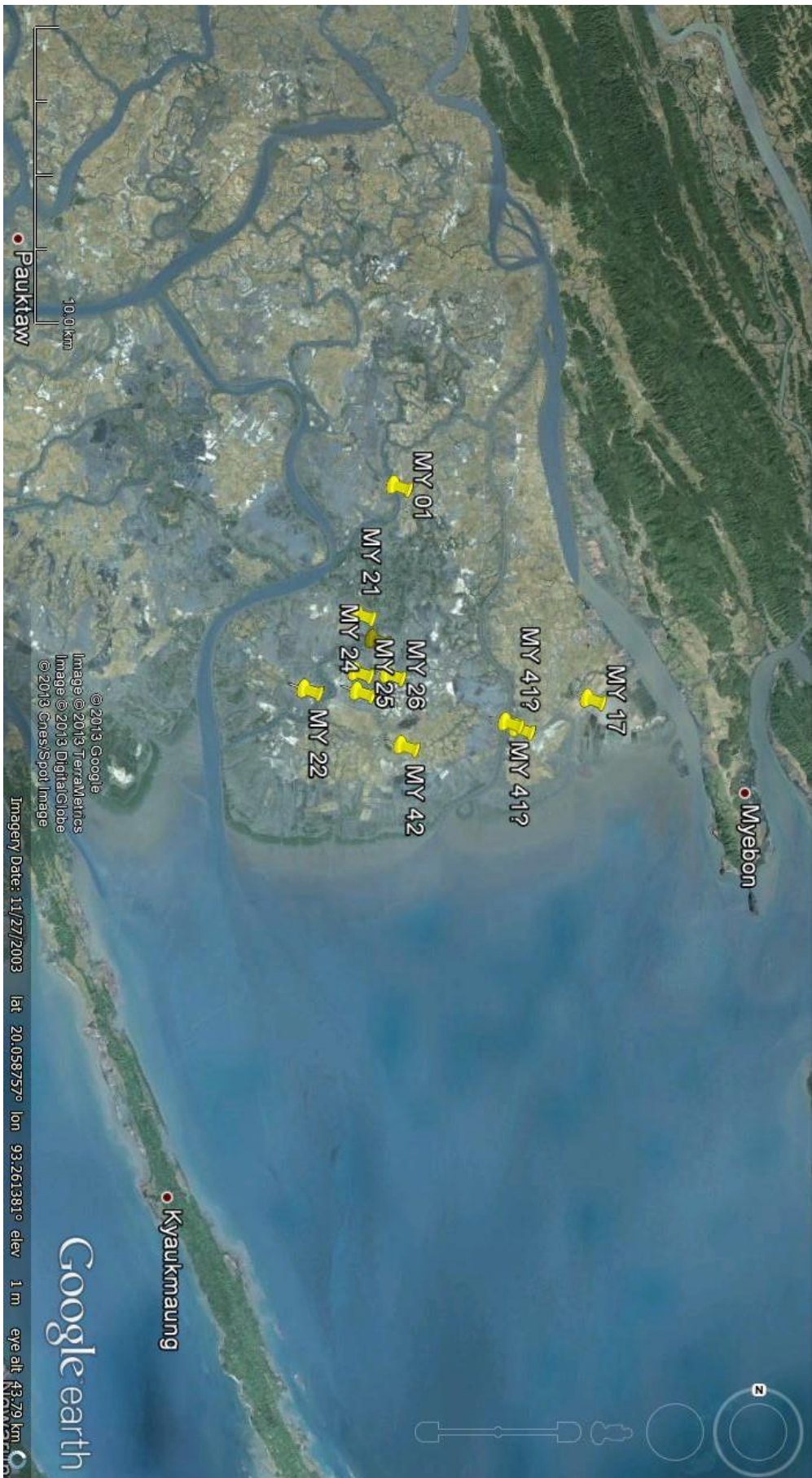


Figure 1. Tat Lan villages in northwestern Myebon

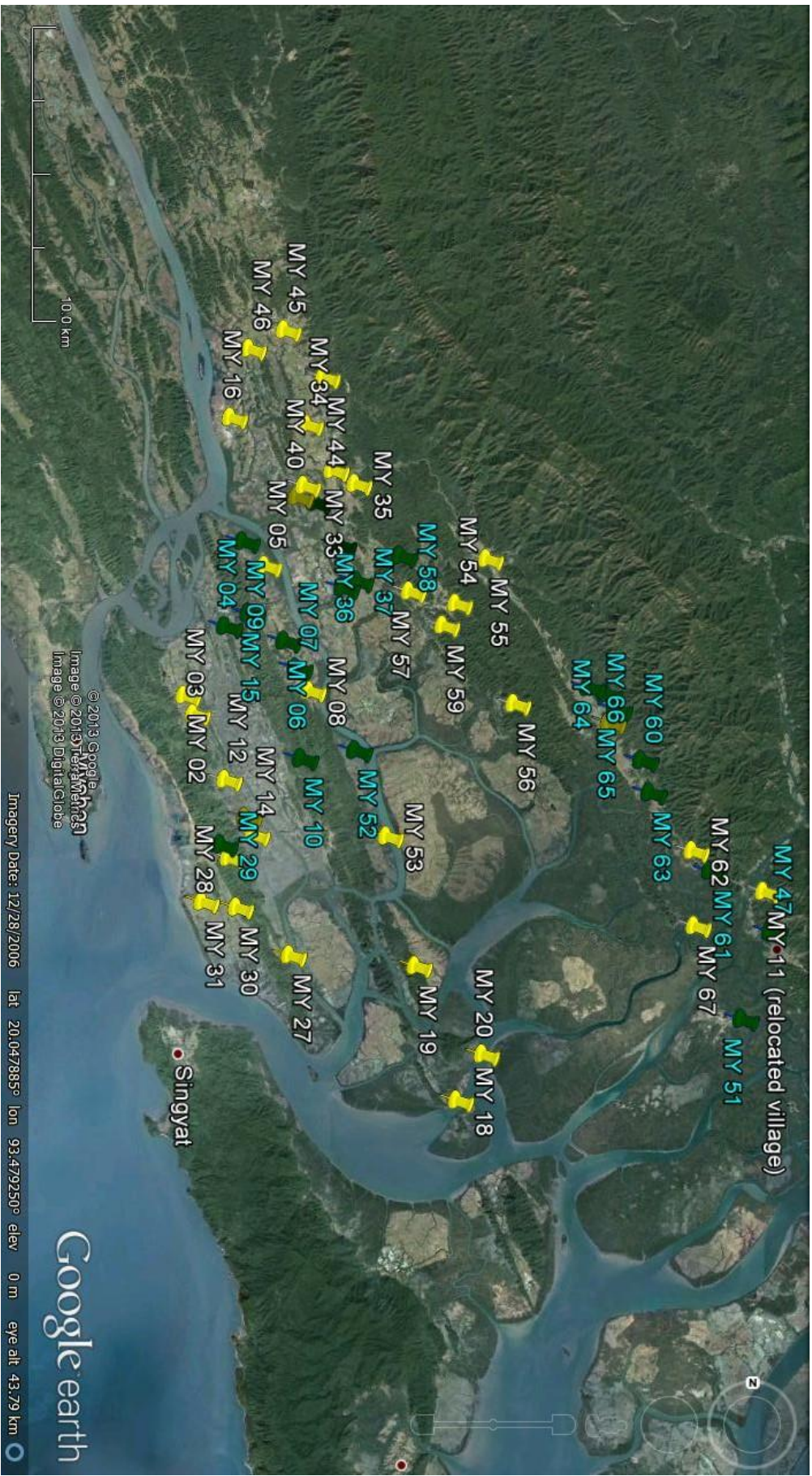


Figure 2. Tat Lan villages in north-eastern Myeobon

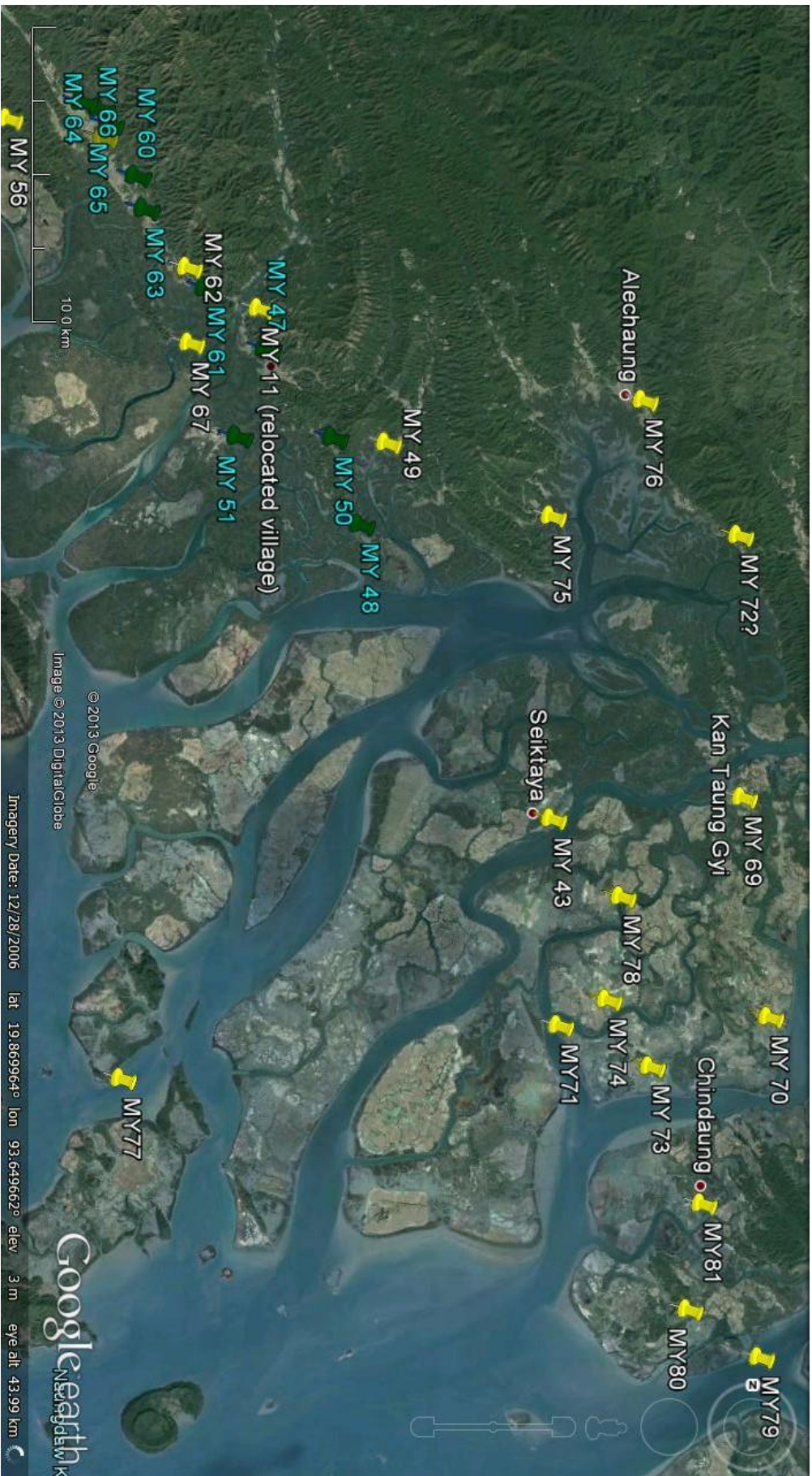


Figure 3. Tat Lan villages in south-eastern Myepon

5.2 NORTH-WESTERN MYEBON

In the area north-west of Myebon town, ten villages (of a total of about 15) have been included on the Tat Lan list. This area is characterised by large flat polders, which are frequently affected by cyclones and storms. The land in the polders is used for paddy cultivation, aquaculture and salt production.

Different from many other parts of the Tat Lan area, the embankments in this area were mostly damaged by overtopping from the sea side. Because of the area's relative affectedness, and because the area encompasses large acreages of paddy fields, the Irrigation Department has decided to take responsibility for the embankments in the three largest polders. This means that there is no need for the Tat Lan program to be involved in embankment construction in this area.

As the area is completely flat, there is no potential for irrigation other than small-scale irrigation from blocked creeks, using treadle pumps.

As there are no springs or fresh groundwater available, the villages in this area depend on ponds for their drinking water. Not all villages have enough freshwater storage capacity to make it through years with particularly long dry seasons. As inflow during the rainy season will always be enough, there are three options for increasing water availability:

- digging more ponds,
- deepening existing ponds (but there is a risk that ponds will become salty if a shallow salty aquifer is struck), and
- reducing evaporation losses by planting rows of trees around the ponds or covering the water surface.

As very little infrastructure needs to be included for these villages under the Tat Lan program, the tables below are only filled in as far as specific information is relevant.

5.2.1 AH LEL KYUN (MY 01)

Number	Township	Village Tract	Village
MY 01	Myebon	Ah Lel Kyun	Ah Lel Kyun
Introduction			
The village has 240 households. 18 farmers cultivate 130 acres of paddy, and the village has 17 fishermen. Besides, there are about 1,500 acres of prawn ponds owned by 60 farmers. The vast majority of households are dependent on casual labour.			
Embankments			
Constructed by the Irrigation Department. No further works needed. An embankment is being constructed around the lands of Ah Lel Kyun and the villages of Thin Ga Net and La Har Kyay of Pauktaw township. It is scheduled for completion around 2014-5.			
Sluices			
This falls under the responsibility of the Irrigation Department. Sluices should only be considered here if the Irrigation Department does not have the resources to construct an adequate number of sluices. In total, the embankment will protect about 4,100 acres of land in Tidal Zone II. This means that 15 sluice openings are needed. It is not entirely clear how many concrete or masonry sluice openings already exist, but there are at least two at La Har Kyay, which means that at most another 13 sluice openings need to be added.			
Drinking water			
The village has enough water throughout the year. Villagers requested for fencing around two ponds.			
Irrigation			
The only possibility may be small-scale irrigation from blocked creeks using treadle pumps.			
Other			
This village needs a cyclone shelter			

5.2.2 KAN HTAUNT GYI (MY 24), LWAN LONE PAIK (MY 25), NGA MAN YE GYI (MY 26), PYIN CHAUNG (MY 41), PYIN NGA KU CHAUNG (MY 42)

This cluster of villages is protected by a single embankment, constructed by the Irrigation Department in 2010. This embankment is however not high enough to protect the area against storm surges, and needs to be raised. The polder protected by this embankment mostly consists of paddy fields, with prawn ponds on the sea side of the embankment.

Note that Kan Htaunt Gyi village (MY 24) no longer exists. After a big storm about 40 years ago, the village was abandoned, and the people moved into neighbouring villages.

This area has been badly affected by storms and cyclones in 2004, 2007 and 2010. Because of the frequency of such disasters, villagers asked for support in the form of cyclone shelters.

Number	Township	Village Tract	Village
MY 25	Myebon	Nga Man Ye Gyi	Lwan Lone Paik
Introduction			
This village has 348 households. 80 are farmers, cultivating 1,500 acres. 30 are fishermen. The rest are landless. 25 people own 1,100 acres of prawn ponds.			
Embankments			
Constructed by the Irrigation Department. No further works needed.			
Sluices			
In the western half of the embankment around this polder, there is only one sluice structure (with five 6' wide openings). The structure was constructed in 1981, and is badly in need of repairs. In the eastern half of the polder (near MY 42), there is another structure with another five openings of 6' wide. Ten sluice openings with a width of 6' is equivalent to 12 standard 5' sluice openings. The total polder area is about 5,300 acres. Since this is in zone II, a total of 5,300 / 270 ~ 20 sluice openings will be needed. This means that another 8 sluice openings are required. It is not entirely clear if the Irrigation Department is planning to expand the number of sluices in the area.			
If this is not the case, then it would be good to construct the required additional sluice openings, and to repair the existing sluices.			
Drinking water			
The village has enough drinking water from five ponds. However, it would be good if one shallow pond could be deepened, if the embankment around another pond could be raised, and if all ponds could be fenced.			
Irrigation			
The only possibility may be small-scale irrigation from blocked creeks using treadle pumps.			
Other			
The people in this village asked for cyclone shelters. This area is very exposed and there are no hills that people can flee to during a cyclone. Therefore, people are in serious danger when a cyclone strikes the area.			

Number	Township	Village Tract	Village
MY 26	Myebon	Nga Man Ye Gyi	Nga Man Ye Gyi
Introduction			
The village has 71 households. 20 are farmers, cultivating 93 acres. 5 are fishermen. The rest are landless. 8 people own 240 acres of prawn ponds.			
Yields in this village are declining due to saltwater intrusion.			
Embankments			
Between Nga Man Ye Gyi and the adjoining village of Pyin Chaung, there is an embankment around the paddy fields that needs repairs. It has a length of around 5,400 feet. If the irrigation Department is planning to expand the current horseshoe embankment further north, then there is no need to renovate this embankment. Otherwise, the embankment will require about 273,000 ft ³ of work (7,700 m ³). This will cost about 15 million MMK (17,700 USD).			
Sluices			
See MY 25			
Drinking water			
The village has two ponds, and faces some shortage in the dry season. If that happens, they go to Lwan Lone Paik. People requested for extra ponds.			
Irrigation			
The only possibility may be small-scale irrigation from blocked creeks using treadle pumps.			
Other			
People in this village asked for cyclone shelters			

Number	Township	Village Tract	Village
MY 41	Myebon	Pyin Chaung	Pyin Chaung
Introduction			
The village has 132 households. 43 are farmers, cultivating 200 acres. 2 are fishermen. The rest is landless. 11 people own 300 acres of prawn ponds.			
Yields in this village are affected by saltwater intrusion.			
Embankments			
See MY 25			

Number	Township	Village Tract	Village
MY 41	Myebon	Pyin Chaung	Pyin Chaung
Sluices See MY 25			
Drinking water The village has enough drinking water in the dry season. Fencing of the three drinking water ponds is needed.			
Irrigation The only possibility may be small-scale irrigation from blocked creeks using treadle pumps.			
Other This village needs a cyclone shelter			

Number	Township	Village Tract	Village
MY 42	Myebon	Pyin Nga Khu Chaung	Pyin Nga Khu Chaung
Introduction This village has 215 households. 54 are farmers, cultivating 1,199 acres of paddy. 90 households are into fishing, and the rest is landless.			
Embankments Constructed by the Irrigation Department. No further works needed.			
Sluices One structure with five 6' wide openings has been constructed by the Irrigation Department. This sluice is in good condition. For the rest, see MY 25.			
Drinking water The village has enough drinking water in the dry season.			
Irrigation The only possibility may be small-scale irrigation from blocked creeks using treadle pumps.			
Other This village needs a cyclone shelter			

5.2.3 MYAUK KYEIN (MY 21), NYAUNG TAW (MY 22), TA DAR U (MY 23)

Number	Township	Village Tract	Village
MY 21	Myebon	Myauk Kyein	Myauk Kyein
Introduction Myauk Kyein is a village of landless people. Of the 45 households, only one leases 8 acres of paddy from an owner in Pon Nar Gyi. Three people own about 70 acres of prawn ponds, and there is one fisherman. Near the village, about 400 acres of paddy land was used by the Prisons department to generate income. This land has been leased out to a wealthy man who has converted it into prawn ponds.			
Embankments N/A			
Sluices N/A			
Drinking water The village has three ponds which give enough water throughout the year. People requested for strengthening of the bunds around the ponds, and fencing for protection.			
Irrigation N/A			
Other N/A			

Number	Township	Village Tract	Village
MY 22	Myebon	Myauk Kyein	Nyaung Taw
Introduction Nyaung Taw has 119 households. 20 farmers cultivate 120 acres of paddy. 13 people own 450 acres of prawn ponds. There are 6 fishermen. 93 households are landless.			

Number	Township	Village Tract	Village
MY 22	Myebon	Myauk Kyein	Nyaung Taw
Embankments There are two paddy areas near the village. One (of 85 acres) is protected by a bund constructed by UNDP. It is 9,000 feet long and reaches just up to spring high tide level. The other area (of about 45 acres) is protected by a village embankment of about 6,000 feet long, which has a crest just below spring high tide level. The UNDP embankment should be upgraded to have a freeboard of 2 feet and a crest width of 3 feet. Sideslopes must be 1:2 because the average height will be about 8 feet. This embankment will require about 996,000 ft ³ of work (28,200 m ³). This will cost about 47.6 million MMK (56,000 USD). The village embankment should be upgraded to a similar standard as the UNDP embankment. This embankment will require about 323,000 ft ³ of work (9,100 m ³). This will cost about 15.5 million MMK (18,200 USD).			
Sluices The UNDP embankment has two small wooden sluices. These need to be replaced by a single sluice of the design for Tidal Zone III. The village embankment has no sluices, and needs a single sluice of the design for Tidal Zone III.			
Drinking water Nyaung Taw has four ponds that provide enough water throughout the year. People requested for fencing to protect the ponds.			
Irrigation N/A			
Other N/A			

Number	Township	Village Tract	Village
MY 23	Myebon	Myauk Kyein	Ta Dar U
Introduction Ta Dar U is a small village with 32 households. Only one family is engaged in farming – they rented 10 acres from a wealthy landowner who lives elsewhere. There are 14 fishermen, and the other family are dependent on casual labour.			
Embankments N/A			
Sluices N/A			
Drinking water The village has enough drinking water from two ponds. Villagers requested for help to raise the bunds around the ponds to protect them against inflow of saltwater.			
Irrigation N/A			
Other There is one small embankment that was constructed by ADRA around the village, to protect it against floodwaters. This embankment is 2,100 feet long and reaches just up to spring high tide level. It should be raised by another two feet. That will require about 89,000 ft ³ of work (2,500 m ³). This will cost about 4.3 million MMK (5,000 USD)			

5.2.4 KYET YAE GYI (MY 17)

Number	Township	Village Tract	Village
MY 17	Myebon	Kyet Yae Gyi	Kyet Yae Gyi
Introduction Kyet Yae Gyi has 759 households, of whom 85 are farmers, 100 are fishermen and the remainder are landless. Many farmers from outside also come and cultivate on the island. Tat Lan interventions aimed at increasing paddy yields implemented on this island will benefit many farmer and labourer households from several surrounding villages.			

Number	Township	Village Tract	Village
MY 17	Myebon	Kyet Yae Gyi	Kyet Yae Gyi
Embankments			
Kyet Yae Gyi is located on a large island with several thousand acres of paddy fields and prawn ponds. The embankments around the island are being upgraded by the Irrigation Department, which is planning to create a large polder here, and which will assume responsibility for the embankments. There is no need for the Tat Lan program to engage in embankment works in this village.			
Sluices			
Constructed by the Irrigation Department. No further works needed, except when the Irrigation Department indicates that it does not have enough budget for sluice structures.			
Drinking water			
The village has enough drinking water. There are six ponds, of which two are used for drinking water. Fencing will be needed however for the two ponds that are used for drinking.			
Irrigation			
The island is entirely flat. The only possibility may be small-scale irrigation from the creeks using treadle pumps.			
Other			
This village needs a cyclone shelter			

5.3 EASTERN MYEBON, BOUNDARY BETWEEN POLDERS AND INTERIOR HILLS

The villages in this cluster are located on the mainland of Myebon township, between the eastern coastline and the hills that cover the interior landscape. The landscape in this area is characterised by paddy fields and small hills, intersected by larger streams that come from the interior hills. Because most of these streams have fairly large catchment areas, it is often not possible to block the streams. Most polders in this area have a horseshoe-shaped embankment: along a stream to the north, the sea to the west, and another stream to the south. To the east, embankments are often not necessary because the paddy fields are bordered by hills on that side.

In the sections below, clusters of villages are presented as they are found from north to south on the map.

5.3.1 KYANT HIN KHAR (MY 44), KYAR INN TAUNG (MY 45), SHAUK CHON (MY 46), KYAUK NGA WAR (MY 16), KA PAING CHAUNG (MY 34)

The seven villages in this cluster are located in the north-east of Myebon. The catchment that MY 44, MY 45 and MY 46 are located in drains into the same stream that also drains the catchment area in which MI 05, MI 06 and MI 07 are found (see the Minbya report). MY 16 and MY 34 are included in this section because the paddy fields of MY 16 and MY 46 are protected by one long embankment, and the paddy fields of MY 34 are located upstream of MY 16's paddy fields. The fields of MY 39 and MY 40 are currently in a separate polder, but the creek between MY 16 and MY 39/40 can be blocked. If that is done, the fields of all seven villages can be protected by a single embankment.

The villages are treated in anticlockwise order, starting with Kyant Hin Khar: MY 44, MY 45, MY 46, MY 16, MY 39, MY 38 and MY 34.

Number	Township	Village Tract	Village
MY 44	Myebon	Shauk Chon	Kyant Hin Khar
Introduction			
Of the 139 households, 64 are into farming (cultivating 293 acres), and the remainder are landless. Apart from the summer rice, 38 farmers also cultivate a total of 50 acres of winter crops.			
Embankments			
The village does not need any embankment works.			
Sluices			
The village does not need any sluice works.			
Drinking water			
This village has some shortage of drinking water in the dry season. People go to a spring near Kyar Inn Taung in that case. Kyant Hin Khar has no spring sources, but two small ponds and three wells are available. It might be possible to enlarge one or both ponds.			

Number	Township	Village Tract	Village
MY 44	Myebon	Shauk Chon	Kyant Hin Khar
Irrigation About 50 acres are irrigated in summer from small wells that are dug in the fields. There is no potential for constructing any reservoirs, but it may be possible to somewhat expand the number of irrigation wells.			
Other People in the village asked for a small (600 feet long) stretch of a stream west of the village to be widened and deepened. Currently, the branches of this stream come from the hills and carry a lot of coarse sediment (debris, pebbles) that fill up the streambed and cause flooding of the paddy fields. The affected stretch of stream is precisely there where its slope reduces a lot, and it changes from a stream into a creek. Because of that the flow velocity will reduce in this area, and coarse sediment will keep settling there. Enlarging the stream will provide a temporary solution, but for the long term the village will need to find a way for cleaning this stretch of the stream on a regular basis. This cut-off drain will require about 10-20,000 ft ³ of work (300-600 m ³). This will cost about 0.5-1.0 million MMK (500-1,000 USD).			

Number	Township	Village Tract	Village
MY 45	Myebon	Shauk Chon	Kyar Inn Taung
Introduction This village has 315 households, of whom 142 are into farming. 67 farmers cultivate 172 acres of paddy field within the village boundaries; the other farmers cultivate elsewhere (including about 70 acres near San Kyoe). 12 acres of nipa palm plantations is owned by 8 people. There are 14 fishermen. The rest are landless. About 10 acres of winter crops are cultivated using water from the Ye Gaung Creek.			
Embankments The fields of Kyar Inn Taung are currently not adequately protected by embankments, and get flooded regularly. In order to protect their fields against flash floods, villagers have asked for an embankment on the right bank of the Kyant Hin Khar Creek. However, this is not recommended due to the so-called 'double embanking problem'. There is already an existing embankment on the other bank of the creek, and if a second embankment would be added, the streambed of this creek would become very narrow. This would increase flood levels in the creek beyond the crest level of both embankments, which would destroy both embankments. It is likely that upgrading the embankments around the fields of Shauk Chon, and not constructing an embankment around the fields of Kyar Inn Taung will create a conflict between the two villages. It might be possible to avoid the 'double embanking problem' by keeping enough distance between the embankments, and by giving the embankments extra freeboard, but for this a detailed analysis needs to be made of the flow characteristics of the Kyant Hin Khar Creek, and the minimum distance that must be kept between the embankments on both sides to keep flood water levels in the creek within acceptable limits. It is quite likely that the minimum distance between embankments must be at least 80-100 metres. Apart from the flash flooding problem, infiltration of salt water is also a problem in the dry season. Currently, people construct a temporary blocking embankment of mud in the Kyant Hin Khar Creek at the beginning of every dry season. This small bund washes away again at the beginning of the rainy season. Because the peak flows in the creek are so high, there is no alternative to this seasonal structure. It might be possible to put a concrete foundation in place across the stream (at the same level as the streambed) to make it easier to stack mud or sand bags. If this foundation is dug into the gravel layer under the stream, that will increase the amount of fresh water that is retained in this layer, and increase the availability of shallow groundwater for drinking and irrigation.			
Sluices If no embankment is constructed, no sluices are needed.			
Drinking water In the dry season, the ponds and wells in the village do not have enough water. People then dig small wells in the streambed (upstream of the Ann-Sittwe road), which is filled with gravel and always carries enough water. Changing this into proper safe water points requires the construction of lined wells with raised aprons along the bank of the stream. Due to the size of the village, at least three or four wells will be needed. Kyar Inn Taung also has a large middle and high school, which serves surrounding villages. In order to provide water for this school, people have asked for the construction of a 100' x 100' pond.			
Irrigation N/A			

Number	Township	Village Tract	Village
MY 45	Myebon	Shauk Chon	Kyar Inn Taung
Other			
N/A			

Number	Township	Village Tract	Village
MY 46	Myebon	Shauk Chon	Shauk Chon

Introduction

The village has 117 households. 64 are engaged in cultivating 187 acres of paddy. Three households are into fishing. The other 47 are landless labourers.

Embankments

The fields of Shauk Chon and Kyauk Nga War (MY 16) share an embankment. The embankments around Shauk Chon's fields have been upgraded by UNDP and IRC in recent years, while CDN has upgraded a stretch of embankment near Kyauk Nga War. The combined length of these embankments is about 20,000 feet, plus 3,800 feet on the northern bank of the Shauk Chon Creek: in total 23,800 feet. These embankments are in good condition, but the cross-section is too small. In order to bring the embankments up to standard, the embankments must be raised by about 3'6" to an average height of 7-8 feet, the crest width must be increased to 5' (because this embankment also serves as a transport link between Shauk Chon, Kyauk Nga War and Kyant Hin Khar), and the side slopes must be increased from about 1:1 to 1:1.5.

This embankment will require about 2.7 million ft³ of work (75,600 m³). This will cost about 104 million MMK (123,000 USD).

South of Kyauk Nga War, the fields are protected by an embankment built by the Irrigation Department.

Sluices

The total catchment area within the proposed embankment (including the fields of MY 46 and the northern half of the fields of MY 16) is 1,350 acres. About 80% of this is flat land, but only about 50% is really low-lying. The area is located in Tidal Zone III. This means that about 1,350 / 125 ~ 11 five-foot wide sluice openings are needed. At the moment, only three sluice structures exist: one wooden sluice with two openings (in poor condition), one masonry sluice with one opening (in poor condition), and one masonry structure with four openings (in good condition). All these are in Kyauk Nga War. If the masonry sluice in poor condition is renovated, another 6 sluice openings are needed. It is probably best to spread these over the different creeks that are blocked:

- One structure with 2 sluice openings in the mouth of the creek between the fields of Kyauk Nga War and Shauk Chon (about 20.15987 N / 93.41755 E)
- One structure with 2 sluice openings at the northwestern end of the embankment of Shauk Chon that was repaired by IRC (about 20.16672 N / 93.43059 E)
- The remaining 2 sluice openings in appropriate locations along the embankment.

The embankment on the northern bank of the Shauk Chon Creek must be fitted with one sluice opening (Tidal Zone III design).

Drinking water

The village has only one pond, which is not enough. People asked for a second pond, and one person already offered land where it can be constructed. The groundwater is salty, so wells are not an option. There are no springs in the village.

Irrigation

At the moment, there is very little irrigation in Shauk Chon and Kyauk Nga War. The other villages in this cluster have better access to fresh groundwater, which makes small-scale irrigation from shallow wells possible. In order to increase the potential for irrigation, it might be possible to construct low (duckbill) weirs across the different creeks inside the polders, especially where higher paddy fields border low-lying fields. These weirs will hardly affect the capacity of the creeks, while increasing the volume of fresh water that is retained in the creeks (and in gravel aquifers near the creeks).

Other

N/A

Number	Township	Village Tract	Village
MY 16	Myebon	Kyauk Nga War	Kyauk Nga War

Introduction

This village has 140 households. The majority, 103 households, are engaged in farming. They cultivate about 420 acres.

Number	Township	Village Tract	Village
MY 16	Myebon	Kyauk Nga War	Kyauk Nga War
Embankments			
See MY 46. A second embankment, of about 17,000 feet long, is under construction by the Irrigation Department to the south of the village. This embankment will be up to standard. The paddy fields close to the village are at a higher elevation, and do not need an embankment.			
Sluices			
See MY 46			
Drinking water			
The village has some shortage in most dry seasons. If that happens, people go to neighbouring villages or across the Min Chaung River to collect water. The village is built on a rocky underground, which makes it hard to find groundwater. There is one well, but the water is sour (moderately saline). It might be possible to dig or deepen a pond.			
Irrigation			
See MY 46			
Other			
N/A			

Number	Township	Village Tract	Village
MY 34	Myebon	Pin Kat Chaung	Ka Paing Chaung
Introduction			
This village has 160 households, of whom 64 are farmers (cultivating 210 acres of paddy), and the remainder are landless. 50 farmers also cultivate 25.3 acres of winter crops.			
Embankments			
A short embankment is needed to the west of the village. This will block off a creek that flows through the paddy fields. Length: 3,000 feet Crest width: 3 feet Freeboard: 2 feet Average height: 6-8 feet Average base width: 20-25 feet Volume of work: 332,000 cu.ft (9,400 m ³) Cost: 15.9 million MMK (USD 18,700)			
An 800 feet long embankment across a branch of the creek mentioned above was also suggested by the villagers. This embankment will not be needed to prevent saltwater intrusion, but it will make it possible to store some water for irrigation of upstream fields. Length: 800 feet Crest width: 3 feet Freeboard: 2 feet Average height: 5 feet Average base width: 18-20 feet Volume of work: 42,300 cu.ft (1,200 m ³) Cost: 2.0 million MMK (USD 2,400)			
Sluices			
Together, the two embankments mentioned above have a catchment area of about 450 acres. About 50% is low-lying paddy fields (the other paddy fields are at a higher elevation, and do not contribute to the buffering capacity of the polder). As this area is in Tidal Zone III, a total of 450 / 120 ~ 4 sluice openings are needed. There is currently only one wooden sluice in the largest of the two embankments. This sluice needs to be replaced. In order to save costs, it might be cheaper to construct a structure with one or two openings in the largest embankment, and to construct a simple overflow weir across the creek in the smallest embankment. The crest level of this weir should be the same as the level of the surrounding paddy fields.			
Drinking water			
The village has enough drinking water throughout the year.			

Number	Township	Village Tract	Village
MY 34	Myebon	Pin Kat Chaung	Ka Paing Chaung
Irrigation			
<p>About 25 acres of winter crops are irrigated from small hand-dug wells. There may be some potential for increasing the number of wells, especially if the creek that flows through the village's paddy fields is blocked (if there is a permeable layer in the bed of the creek, sheetpiling or a clay-filled cut-off trench may be needed).</p> <p>East of the village, just east from the Ann-Sittwe road, there is a small irrigation reservoir that was constructed in 2001, but which has been damaged. If this dam is repaired and a proper spillway is constructed, an area of about 15-20 acres of winter crops can be cultivated with the water (and possibly a little more, if it is possible to take water across the road). The reservoir has a small catchment area of about 18-20 acres, but is fed by two springs. This means that the reservoir will have a reliable yield.</p>			
Other			
N/A			

5.3.2 PIN KAT TAUNG AUK (MY 39), PIN KAT TAUNG MAW (MY 40)

Number	Township	Village Tract	Village
MY 39	Myebon	Pin Kat Taung Maw	Pin Kat Taung Auk
Introduction			
<p>This village is linked to Pin Kat Taung Maw, but is poorer than the other village. The village has 34 households, of whom 12 cultivate 122 acres of paddy. 30 households together own about 100 acres of nipa palm plantations, and 6 households own prawn ponds (about 50 acres in total).</p>			
Embankments			
<p>There is an embankment around the fields of Pin Kat Taung Auk and most of the fields of Pin Kat Taung Maw (paddy fields and prawn ponds together), with a total length of a little over 22,000 feet.</p> <p>This embankment will have roughly the following dimensions: Length: 27,000 feet Crest width: 4 feet Freeboard: 2 feet Average height: 6-7 feet Average base width: 20-25 feet Volume of work: 1.9 million cu.ft (53,400 m³) Cost: 90.5 million MMK (USD 106,500)</p>			
Sluices			
<p>This area falls into Tidal Zone III. This embankment has a catchment area of about 780 acres, of which 90% is low-lying area. This means that 780 / 110 ~ 7 sluice openings are needed.</p>			
Drinking water			
<p>The village has some shortage during the dry season, but water is available in Pin Kat Taung Maw, several hundred metres away.</p>			
Irrigation			
<p>At the moment, there is very little irrigation in Pin Kat Taung Auk. Pin Kat Taung Maw has better access to fresh groundwater, which makes small-scale irrigation from shallow wells possible. In order to increase the potential for irrigation, it might be possible to construct low (duckbill) weirs across the different creeks inside the polders, especially where higher paddy fields border low-lying fields. These weirs will hardly affect the capacity of the creeks, while increasing the volume of fresh water that is retained in the creeks (and in gravel aquifers near the creeks).</p>			
Other			
N/A			

Number	Township	Village Tract	Village
MY 40	Myebon	Pin Kat Taung Maw	Pin Kat Taung Maw
Introduction			
<p>This village has 195 households. 80 households together cultivate 470 acres of paddy. 120 households together own about 100 acres of nipa palm. Two persons have prawn ponds (total 35 acres).</p>			

Number	Township	Village Tract	Village
MY 40	Myebon	Pin Kat Taung Maw	Pin Kat Taung Maw
Embankments See MY 39. Besides, a 1,750 foot long embankment between Pin Kat Taung Maw and Chaung Gyi (MY 33) needs to be upgraded. This embankment is in use by motorbikes, but it needs to be raised by 2'6". This embankment will have roughly the following dimensions: Length: 1,750 feet Crest width: 5 feet Freeboard: 2 feet Average height: 5 feet Average base width: 20 feet Volume of work: 98,000 cu.ft (2,800 m ³) Cost: 4.7 million MMK (USD 5,600)			
Sluices See MY 39.			
Drinking water The village generally has enough drinking water. However, people asked for an additional pond to be dug.			
Irrigation See MY 39.			
Other N/A			

5.3.3 CHAUNG GYI (MY 33), KANT KAW CHAUNG (MY 35) AND KAT TAUNG SWEA (MY 38)

The fields of Chaung Gyi and Kant Kaw Chaung are located in the middle catchments of two streams that come from the interior hills, then intertwine, and subsequently split up and flow to the north and south sides of the fields of Kat Taung Swea.

Number	Township	Village Tract	Village
MY 33	Myebon	Pin Kat Chaung	Chaung Gyi
Introduction This village has 105 households. 34 farmers cultivate paddy on about 175 acres. About 60 farmers cultivate winter crops (chillies, beans, maize). 10 farmers have 20 acres of nipa palm trees.			
Embankments Chaung Gyi has three short embankments. The first embankment is part of the access road to Pin Kat Taung Maw and Pin Kat Taung Auk. It runs for 400 feet, between a hill and a bridge on the edge of the village. This embankment must be raised by 2 feet. This embankment will require about 21,000 ft ³ of work (600 m ³). This will cost about 1.0 million MMK (1,200 USD). The second and third embankment block a creek and together create a small reservoir in which water is stored for winter crop irrigation. They have a combined length of 1,400 feet. An adequate spill structure must be designed here. This embankment will require about 42,000 ft ³ of work (1,200 m ³). This will cost about 2.0 million MMK (2,400 USD), excluding the spill structure.			
Sluices The first embankment has a small catchment area; any flow from higher up flows around the embankment, and into the creek. IRC has constructed a sluice with two openings of 5' wide that was constructed. This sluice is sufficient for the embankment. Unfortunately, it was somewhat damaged. The flap gates need to be replaced, and a wing wall needs to be rebuilt. The second embankment has one sluice of 5' wide that was constructed by IRC. Unfortunately, this sluice was damaged in 2012. The wing walls must be rebuilt, and a new flap gate must be fitted. The catchment area of this sluice is about 140 acres, of which 60% is low-lying. The existing sluice is enough, because it has a height of 6' rather than 4' in the suggested design.			
Drinking water This village has some water shortage during the rainy season, because water sources used during the dry season are not accessible. It might be good to add another pond in this village.			

Number	Township	Village Tract	Village
MY 33	Myebon	Pin Kat Chaung	Chaung Gyi
Irrigation			
Currently, about 60 acres of land are irrigated using water pumped from small wells and from the creeks.			
Other			
N/A			

Number	Township	Village Tract	Village
MY 35	Myebon	Pin Kat Chaung	Kant Kaw Chaung
Introduction			
This village has 144 households. 46 farmers cultivate 210 acres of paddy in the rainy season, and 37 of them cultivate 30 acres of winter crops. There is one fisherman.			
Embankments			
N/A. This village does not have embankments that protect fields against the sea.			
Sluices			
N/A.			
Drinking water			
This village has an unique problem in that it has a water shortage in the rainy season, rather than in the dry season. In the dry season, it is possible to collect ample water from handdug wells near the streambed, but during the rainy season these wells are not accessible, and only one well is available. People asked for the construction of a pond to have more water available in the rainy season.			
Irrigation			
An 800 feet long embankment blocks a creek and makes it possible to store water for about 30 acres of winter crop cultivation. In order to drain excess water, a drainage channel has been dug that takes water north towards another creek that flows past Pin Kat Taung Maw. Along this channel, a flood protection embankment of 1,500 feet has been constructed. Both these embankments need upgrading. A freeboard of 3' is needed.			
Together, these embankments will require about 160,000 ft ³ of work (4,500 m ³). This will cost about 7.6 million MMK (9,000 USD).			
Note that a proper spillway must be designed to allow peak runoff to drain away. A detailed analysis must be done of whether it is feasible to let excess water flow out through an existing sluice and through the undammed stretch between the northern end of the embankment and the village (in a situation where the flow in the stream will also be high). If this is not feasible, it might be necessary to construct concrete structures near these embankments, but also further downstream where there is another embankment that protects the fields of Kat Taung Swea.			
It might be possible to expand the area under irrigation if simple ring wells combined with treadle pumps can be introduced in areas with shallow groundwater.			
Other			
N/A			

Number	Township	Village Tract	Village
MY 38	Myebon	Pin Kat Taung Maw	Kat Taung Swea
Introduction			
This village has 60 households. 35 farmers cultivate 284 acres of paddy. Winter crops are only planted on 2 acres by 2 farmers. 40 households have 60 acres of nipa palm. There are 30 fishermen. Prawn ponds are operated by 2 people (total 75 acres).			
Embankments			
The fields of Kat Taung Swea need to be protected by a horse-shoe embankment with a total length of about 21,500 feet. This embankment begins northeast of the village, and ends at the point where it touches the horse-shoe embankment around the fields of Bar Wai, Nga Sin Pone and Chaung Shey (see below). This embankment will require about 1 million ft ³ of work (27,000 m ³). This will cost about 46 million MMK (54,000 USD)			
Sluices			
The embankment is in Tidal Zone III. It has a total catchment area of 530 acres, of which about 80% is low-lying land. This means that five sluice openings are needed. There are currently three masonry / concrete sluices (four openings, total width 18') and two wooden sluices. The masonry / concrete sluices must be fitted with flap gates, and one additional sluice opening must be constructed.			
Drinking water			
The village has enough drinking water. There is one well with a spring inside that should be lined and roofed.			

Number	Township	Village Tract	Village
MY 38	Myebon	Pin Kat Taung Maw	Kat Taung Swea
Irrigation			
There is hardly any cultivation of winter crops at the moment. Perhaps it might be possible to stimulate treadle pump irrigation near blocked creeks.			
Other			
N/A			

5.3.4 BAR WAI (MY 32), NGA SIN PONE (MY 36), CHAUNG SHEY (MY 37)

Number	Township	Village Tract	Village
MY 32	Myebon	Pin Kat Chaung	Bar Wai
Introduction			
Bar Wai has 142 households. 20 farmers cultivate 105 acres of paddy. 11 farmers cultivate 3 acres of winter crops. 10 farmers have 20 acres of nipa palms.			
Embankments			
The fields of Bar Wai, Nga Sin Pone and Chaung Shey can be protected by a single horseshoe embankment. At the moment, there are separate stretches that can be connected and in some places straightened. This embankment will enclose paddy fields and prawn ponds. If the outer embankment is brought up to standard, the existing inner embankments that separate paddy fields from prawn ponds can be kept as they are. This embankment was renovated by IRC, but the height and sideslopes do not meet the required standard..			
The total length of this embankment is about 24,300 feet. It will require about 1.7 million ft ³ of work (49,000 m ³). This will cost about 82.4 million MMK (97,000 USD)			
A substantial tract of land cultivated by farmers from Bar Wai is protected by a ring embankment around War Koke Chaung and Tha Pyay Taw (MY 58 and MY 57, see below). See MY 58.			
Sluices			
The total catchment area of the embankment is about 1,170 acres, of which about 60-70% is low-lying. It is located in Tidal Zone III, which means that 1,170 / 120 ~ 10 sluices are needed. There are already eight concrete, brick or rock sluices (with 10 openings and a total width of about 52 feet, equivalent to 10 sluices of the proposed standard design. These sluices need to be fitted with flap gates, but no additional sluices are needed. There are also six wooden sluices. These can be kept in place, but are not strictly necessary.			
Drinking water			
The village has enough drinking water throughout the year.			
Irrigation			
A limited acreage is irrigated with water from blocked creeks. If shallow groundwater is available, it might be possible to expand this acreage using treadle pumps.			
Other			
N/A			

Number	Township	Village Tract	Village
MY 36	Myebon	Pin Kat Chaung	Nga Sin Pone
Introduction			
This village has 182 households. 105 farmers cultivate 630 acres of paddy. 46 farmers cultivate 80 acres of nipa palm.			
Embankments			
See MY 32			
Sluices			
See MY 32			
Drinking water			
The village has enough drinking water throughout the year.			
Irrigation			
There is no irrigation in this village. It might be possible to develop small-scale irrigation using treadle pumps.			
Other			
N/A			

Number	Township	Village Tract	Village
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MY 37	Myebon	Pin Kat Chaung	Chaung Shey
Introduction			
This village has 218 households. 18 farmers cultivate 200 acres of paddy. 38 farmers cultivate 70 acres of nipa palm. 8 farmers grow 3 acres of winter crops. 10 people have 80 acres of prawn ponds.			
Embankments			
See MY 32			
Sluices			
See MY 32			
Drinking water			
The village has enough drinking water throughout the year.			
Irrigation			
There is no irrigation in this village. It might be possible to develop small-scale irrigation using treadle pumps.			
Other			
N/A			

5.3.5 WAR KOKE CHAUNG (MY 58), THA PYAY TAW (MY 57)

Number	Township	Village Tract	Village
MY 58	Myebon	Yet Chaung	War Koke Chaung
Introduction			
This village has 90 households. 40 farmers cultivate 260 acres of paddy. 30 farmers grow 10 acres of nipa palm. 15 farmers grow winter crops on 15 acres. There are two blocks of prawn ponds, with two owners. The acreage under prawns is slowly increasing.			
Embankments			
The fields of War Koke Chaung, Tha Pyay Taw and some fields of Bar Wai can be protected by a single horseshoe embankment of 32,000 feet long. There are also embankments separating the fields of the different villages. These do not need to be upgraded under Tat Lan as they do not protect fields from the sea. The embankment was renovated by IRC, and a small part was done by DRC earlier. However, the height and sideslopes are not up to the proposed design standard, and the embankment will need some strengthening. It will need an average height of 6', a freeboard of 2', and a crest width of 5'. This embankment will require about 2.1 million ft ³ of work (58,500 m ³). This will cost about 99.0 million MMK (117,000 USD)			
Sluices			
The embankment has a catchment area of about 1,600 acres, of which 60% is low-lying. As this area is in Tidal Zone III, this means that 1,600 / 120 ~ 13.5 sluice openings are needed. There are currently three concrete and masonry sluices with six openings and a total width of 28' (about 5.5 standard sluice openings). This means that eight additional sluices must be constructed. Also there are three wooden sluices of 4' wide and one of 3.5' wide. It is recommended to replace these by some of the new sluices that are to be constructed.			
Drinking water			
The village has enough water throughout the year.			
Irrigation			
There is currently no irrigation in the village. However, east of the village there is a valley with steep hillsides, in which it should be easy to construct a reservoir for irrigating more fields. This will require a detailed investigation and design.			
Other			
N/A			

Number	Township	Village Tract	Village
MY 57	Myebon	Yet Chaung	Tha Pyay Taw
Introduction			
The village has 48 households. 15 farmers grow 80 acres of paddy; no winter crops are cultivated. There are 10 fishermen. Five farmers grow nipa palms on 4 acres. Three persons own 20 acres of prawn ponds.			
Embankments			
See MY 58. Note that Tha Pyay Taw has a lot more fields than are cultivated by the people from the village. The Yet Thi Kwin polder, as it is known, has about 1,600 acres (see above), and is cultivated by farmers from eight villages.			

Number	Township	Village Tract	Village
MY 57	Myebon	Yet Chaung	Tha Pyay Taw
Sluices See MY 58.			
Drinking water The village has some shortage of water during the dry season. There are two wells and one pond. People have asked for another well to be constructed.			
Irrigation Irrigation is very limited in the area. It might be possible to increase winter crop cultivation by promoting treadle pumps near blocked creeks in the polder.			
Other N/A			

5.3.6 LAY TAUNG (MY 54), MI KYAUNG TET (MY 55), YET CHAUNG (MY 59)

Number	Township	Village Tract	Village
MY 54	Myebon	Yet Chaung	Lay Taung
Introduction This village has 155 households. 44 farmers cultivate 124 acres of paddy; 60 farmers (many of whom also grow paddy) cultivate 95 acres of winter crops. There are two fishermen. The remaining households are landless labourers.			
Embankments N/A			
Sluices N/A			
Drinking water The village has three wells, but faces some shortage at the end of the dry season. Villagers have asked for a fourth well to increase water supply. If the problem is one of limited water availability in the aquifer, a recharge basin might be a better idea.			
Irrigation 95 acres of land is irrigated from dug wells near the creek. There does not seem to be any possibility for expanding this area.			
Other This village is halfway between Mi Kyaung Tet (on the Ann-Sittwe road) and Yet Chaung (a large and growing village that is accessible by boat). Lay Taung is difficult to access in the rainy season. People from all three villages have requested for an access road between the three villages. This will greatly help the economic development of the three villages, which is hampered by lack of road access for Lay Taung and Yet Chaung, and by lack of boat access for Mi kyaung Tet and Lay Taung.			

Number	Township	Village Tract	Village
MY 55	Myebon	Yet Chaung	Mi Kyaung Tet
Introduction Mi Kyaung Tet has 86 households. 22 households cultivate 125 acres of rainfed paddy, of which 22.5 acres is planted with winter crops. There are no nipa palms or prawn ponds.			
Embankments N/A: this village has no embankments that protect fields against the sea.			
Sluices N/A			
Drinking water The village has enough water, but people asked for an additional drinking water pond.			

Number	Township	Village Tract	Village
MY 55	Myebon	Yet Chaung	Mi Kyaung Tet
<p>Irrigation About 22.5 acres of winter crops are currently being irrigated from hand-dug wells near the Yet Chaung creek. This village three embankments that are worth renovating for the purpose of storing water and expanding the irrigated area by up to 40 acres. The first embankment is southeast of the village. There is a natural lake in this location. A small embankment of 250' long will make it possible to store more water in the lake. This embankment will require about 13,500 ft³ of work (385 m³). This will cost about 650,000 MMK (800 USD). A second embankment of 700' long is located in the middle of a paddy area. This embankment will require about 28,000 ft³ of work (800 m³). This will cost about 1.3 million MMK (1,600 USD). The third embankment is a small irrigation dam that was damaged several years ago. This is a 200' long dam across a small valley. If it is rehabilitated, it will make irrigation possible for 20-25 acres of land. The cost of repairing this reservoir are estimated at 30 million MMK (35,000 USD). In all three structures, adequate spillway structures must be added.</p>			
<p>Other N/A</p>			

Number	Township	Village Tract	Village
MY 59	Myebon	Yet Chaung	Yet Chaung
<p>Introduction Yet Chaung is a large village with 802 households. It is growing in importance in the area, and as a consequence the population expands quite fast. 140 farmers from the village cultivate 692 acres of paddy (but no winter crop). There are 300 fishermen. 10 households grow a total of 5 acres of nipa palm. Prawn ponds are operated by five households from the village (total 44 acres). Apart from that, there is one large prawn pond (about 300 acres) that is operated by someone from Minbya.</p>			
<p>Embankments Yet Chaung has four clusters of paddy fields that are protected by embankments. The first cluster has about 55 acres, cultivated by ten farmers. This is protected by a short embankment of 370 feet. This embankment will require about 23,700 ft³ of work (670 m³). This will cost about 1.1 million MMK (1,350 USD) The second embankment is called the Kon Daung embankment. This embankment protects about 800 acres. This embankment is about 27,000 feet long, and will be renovated by the Irrigation Department over the coming two years. The third embankment is around the Kyauk Kha Mauk field. It is about 16,000 feet long, and protects a polder of about almost 600 acres. This embankment will require about 847,000 ft³ of work (24,000 m³). This will cost about 40.6 million MMK (48,000 USD). The fourth embankment protects the Set Pyin field. This embankment is 31,000 feet long and protects an area of about 1,100 acres. It needs to be given an average height of 6' and a crest width of 4'. This embankment will require about 1.8 million ft³ of work (52,500 m³). This will cost about 89 million MMK (105,000 USD).</p>			
<p>Sluices Yet Chaung's fields are located in Tidal Zone III. The first embankment has a catchment area of about 110 acres, of which 30% is low-lying. This means that two sluice openings are required. There currently are no sluices. The Kon Daung embankment has two wooden sluices (4' wide, single openings) that are no longer in use, and one brick sluice (two 4' wide openings, fitted with flap gates) that is functioning. With a catchment area of about 800 acres, 95% of which is low-lying, about seven sluice openings are needed, depending on how low the paddy fields are. This means that an additional five sluice openings must be constructed. If the Irrigation Department does not have resources to construct these, they should be included in Tat Lan. The third embankment has a single brick sluice with two 4' wide openings, one 5' wide wooden sluice in poor condition, and one structure with five hollow wooden logs (2'diameter) fitted with flap gates. With a catchment area of slightly over 600 acres of which 90% is low-lying, about five sluice openings are needed. This means that three more sluices must be constructed, and the existing brick sluice must be fitted with flap gates. The fourth embankment currently does not have any sluices. It will need 10 sluice openings.</p>			
<p>Drinking water The village has enough drinking water.</p>			

Number	Township	Village Tract	Village
MY 59	Myebon	Yet Chaung	Yet Chaung
Irrigation Yet Chaung currently gets its vegetables from Lay Taung and Mi Kyaung Tet. It might be possible to stimulate cultivation of winter crops by using treadle pumps near the blocked creeks. However, care must be taken not to undermine the livelihoods of farmers in the other two villages.			
Other N/A			

5.3.7 PYA THONE (MY 56)

Number	Township	Village Tract	Village
MY 56	Myebon	Yet Chaung	Pya Thone
Introduction Pya Thone has 137 households. Of these, 45 cultivate 295 acres of rainfed paddy. Winter crops are cultivated on 20 acres by 30 households. There are four fishermen in the village. Twelve households cultivate a total of 50 acres of nipa palms.			
Embankments The village has one polder of 235 acres. The embankment has a total length of 10,000 feet. This embankment will require about 679,000 ft ³ of work (19,200 m ³). This will cost about 32.4 million MMK (38,000 USD).			
Sluices The polder has a catchment area of 250 acres, 95% of which is flat land. It is located in Tidal Zone II. This means that a single sluice opening will be sufficient.			
Drinking water The village has enough drinking water			
Irrigation There may be a possibility for irrigation from blocked creeks using treadle pumps			
Other N/A			

5.3.8 TAUNG GYI (MY 64), TAUNG PYIN (MY 65), TAUNG SHEY (MY 66), YOE SA NWIN (MY 68)

Number	Township	Village Tract	Village
MY 64	Myebon	Yoe Sa Nwin	Taung Gyi
Introduction The village has 72 households. 24 households cultivate 77 acres of paddy. 15 farmers cultivate 5 acres of winter crops. Most people are engaged in shifting cultivation in the nearby hills.			
Embankments N/A			
Sluices N/A			
Drinking water The village has two wells. During the dry season, there is some shortage of drinking water. People then dig wells in the bed of the creek. People asked for another well near the school. That will accommodate the needs of the growing population.			
Irrigation N/A			
Other N/A			

Number	Township	Village Tract	Village
MY 65	Myebon	Yoe Sa Nwin	Taung Pyin
Introduction This village is located near the Ann-Sittwe highway. It has 25 households. 13 farmers cultivate 55 acres of paddy. Winter crops are grown on 4 acres. Most people engage in labour works during the dry season, and in shifting cultivation during the rainy season.			

Number	Township	Village Tract	Village
MY 65	Myebon	Yoe Sa Nwin	Taung Pyin
Embankments N/A			
Sluices N/A			
Drinking water This village has a drinking water shortage during the rainy season, because then only one well can be used. People have asked for another well – and a piece of land has already been made available for it.			
Irrigation N/A			
Other N/A			

Number	Township	Village Tract	Village
MY 66	Myebon	Yoe Sa Nwin	Taung Shey
Introduction Taung Shey has only 6 households. There is 12 acres of paddy fields. All households engage in shifting cultivation in the hills.			
Embankments N/A			
Sluices N/A			
Drinking water This village has only one pond, and faces a severe shortage during the dry season. People have requested for a well to the east of the village.			
Irrigation N/A			
Other N/A			

Number	Township	Village Tract	Village
MY 68	Myebon	Yoe Sa Nwin	Yoe Sa Nwin
Introduction Yoe Sa Nwin has 259 households. Of these, 150 farmers are reported to cultivate 600 acres of rainfed paddy, and 40 farmers cultivate a total of 50 acres of winter crops. Five households engage in fishing, and three households cultivate a total of 3 acres of nipa palms. No landless households are reported, but the totals do not add up.			
Embankments The village has two polders. The Zigaing polder has 1,180 acres, and an embankment of 27,000 feet. Increasingly land near the embankment is being converted into prawn ponds. About 40% of the farmers are from other villages, including MY 05, MY 56 and MY 59. The total embankment length is about 30,000 feet. This embankment will require about 2.3 million ft ³ of work (66,000 m ³). This will cost about 111 million MMK (130,000 USD). The Ayo Tike Kwin polder has 38 acres of paddy land cultivated by 16 farmers (but villagers reported this to be 80 acres). Increasingly, land near the embankment is being converted into prawn ponds. This embankment has a total length of about 5,000 feet. This embankment will require about 414,000 ft ³ of work (11,800 m ³). This will cost about 19.8 million MMK (23,000 USD).			
Sluices There are no sluices in both embankments at the moment. The Zigaing polder is located in Tidal Zone II. It has a catchment area of 1,380 acres, 85% of which is flat land. This polder will require 1,380 / 275 ~ 5 sluice openings. The Ayo Tike Kwin polder has a catchment area of 40 acres. For this, a single sluice as designed for Tidal Zone III will be sufficient. This can be constructed on the northeastern end of the embankment.			

Number	Township	Village Tract	Village
MY 68	Myebon	Yoe Sa Nwin	Yoe Sa Nwin
Drinking water The village has enough water throughout the year			
Irrigation About 50 acres of winter crops are irrigated with water from hand-dug wells near the creeks. There does not seem to be any potential for increasing this acreage (except perhaps with the introduction of treadle pumps)			
Other N/A			

5.3.9 DIN GAR YA (MY 60), OKE KAN (MY 63)

Number	Township	Village Tract	Village
MY 60	Myebon	Yoe Sa Nwin	Din Gar Ya
Introduction Din Gar Ya has 67 households. There is very little cultivation near the village (about 10 acres, cultivated by five farmers), but 34 farmers cultivate about 100 acres far away, near Gaung Hpyu Taung (MY 79).			
Embankments There are no embankments near the village.			
Sluices There are no sluices near the village.			
Drinking water During the dry season, there is not always enough water. People then dig hand-dug wells in the bed of the Din Gar Ya Creek. If there is a severe shortage, people go to Yoe Sa Nwin to collect water. It would be good to construct a pond here if possible.			
Irrigation There is a small natural lake about 300 metres south-east from the village. The water from this lake is used for irrigating a small area around it. There is no possibility for developing irrigation.			
Other N/A			

Number	Township	Village Tract	Village
MY 63	Myebon	Yoe Sa Nwin	Oke Kan
Introduction This village has 250 households. About 50 farmers cultivate 100 acres of paddy near the village. Besides, about 200 farmers cultivate about 800 acres of paddy in other areas. Besides, many farmers engage in shifting cultivation in the nearby hills in the rainy season. Three acres of winter crops are cultivated by about 20 farmers. Four households engage in fishing. 20 families also cultivate a total of 5 acres of Nipa palm. There are no landless families in this village.			

Number	Township	Village Tract	Village
MY 63	Myebon	Yoe Sa Nwin	Oke Kan
<p>Embankments</p> <p>North of the village, there is one cluster of paddy fields of about 88 acres, part of which is cultivated by Din Gar Ya farmers. A short embankment of 700 feet has been constructed along the Din Gar Ya creek. This embankment must be raised, and extended all the way to the Ann-Sittwe Road (a total length of 1,800 feet). This embankment will require about 172,000 ft³ of work (4,900 m³). This will cost about 8.2 million MMK (9,700 USD).</p> <p>In order to keep flood levels in the stream at acceptable levels and avoid damage to the embankments along the stream, the embankments along both sides of the stream (see the second embankment) must be at least 100 feet apart, preferably 150 feet. Blocking the stream and creating one large polder is not an option because of the size of the catchment area and the high runoff in the stream.</p> <p>On the northern side of the Din Gar Ya Creek is the Nat Taung field. About 70 acres of this field drain towards the Din Gar Ya Creek; the rest drains towards Yoe Sa Nwin. There is currently a broken embankment of 650 feet long. This embankment must be extended all the way to the Ann-Sittwe road, which will give it a length of about 1,700 feet. Besides, a short stretch of about 50 feet must be constructed across the creek that flows behind a small hill at the southwestern end of the existing embankment. This embankment will require about 67,000 ft³ of work (1,900 m³). This will cost about 3.2 million MMK (3,800 USD).</p> <p>A third (broken) embankment of 600 feet long is on the western edge of the village. This embankment crosses a stream that comes from the hills, and that has a substantial catchment area. For renovating this embankment, it will be best if it can be taken north along the bank of the stream, instead of crossing it. This will extend the embankment length to 1,600 feet, and it will protect an area of about 12 acres (together, the two first and second embankment protect about 100 acres). This embankment will require about 77,000 ft³ of work (2,200 m³). This will cost about 3.7 million MMK (4,300 USD).</p> <p>Southeast of the village, a fourth embankment of 10,000 feet long (actually, it consists of two separate stretches separated by a small higher area) surrounds two fields with a combined area of about 125 acres on the seaside of the Ann-Sittwe road, and about 10 acres on the landside of the road. The area protected against the sea is only about 70 acres; the rest of the paddy fields is at a higher elevation. This embankment will require about 851,000 ft³ of work (24,100 m³). This will cost about 40.7 million MMK (48,000 USD).</p> <p>South of the village, the Kyauk Maw field (15 acres) is protected by an embankment of 2,250 feet long. This embankment will require about 150,000 ft³ of work (4,200 m³). This will cost about 7.1 million MMK (8,400 USD).</p> <p>Finally, southwest of the village, the Kwin Taung field (28 acres) is protected by two embankments with a combined length of 1,700 feet. This embankment will require about 98,000 ft³ of work (2,800 m³). This will cost about 4.7 million MMK (5,500 USD).</p>			

Number	Township	Village Tract	Village
MY 63	Myebon	Yoe Sa Nwin	Oke Kan
Sluices			
The fields of Oke Kan are in Tidal Zone II.			
The northern embankment has a catchment area of about 250 acres. Of this, about 15% is low-lying (average 0.65 m +MSL), which means that two sluice openings will be needed. There is already a concrete structure with a single opening of 4' wide, but this has been covered by mud in a landslide and needs to be cleaned and fitted with a flap gate. An additional sluice opening must be added in a suitable location.			
The second embankment has a catchment area of about 230 acres. Of this, a little less than 10% is low-lying. This means that two sluice openings are required. There is currently a single wooden sluice in the embankment. It is recommended to construct a double sluice in the creek directly southwest of the end of the embankment.			
The third embankment has a catchment area of about 28 acres, of which about 20% is low-lying. In the case of this field, a single sluice of the design for Tidal Zone III will be enough.			
The fourth embankment has a catchment area of about 620 acres. Of this, about 10% is low-lying. This means that a total of 620 / 180 ~ 4 sluice openings will be needed.			
The Kyauk Maw field has a catchment area of about 22 acres, of which 60% is low-lying. This means that one concrete pipe (2' diameter) is enough.			
The Kwin Taung field has a catchment area of about 50 acres, of which 50% is low-lying land. This means that a single sluice of the design for Tidal Zone III is enough. There is already a wooden sluice in reasonable condition. It will probably be sufficient to replace the sliding gate with a flap gate.			
Drinking water			
The village has enough drinking water.			
Irrigation			
There is no potential for developing irrigation in this village.			
Other			
N/A			

5.3.10 MAUNG CHAUNG (MY 61), NAT HLA (MY 62)

Number	Township	Village Tract	Village
MY 61	Myebon	Yoe Sa Nwin	Maung Chaung
Introduction			
Maung Chaung has 20 households. All households are engaged in farming, but during the off-season they engage in casual labour. This village is among the more poor villages.			
Embankments			
Near the village, there is a small ring of paddy fields (about 20-25 acres). These fields can be protected by two short embankments with a combined total length of 3,600 feet. They must be upgraded to an average height of 6'6" (2' above spring high tide, and 3'6" above the current crest level). This will require about 281,000 ft ³ of work (8,000 m ³). This will cost about 13.5 million MMK (15,900 USD).			
Sluices			
Each of the embankments has a very small catchment area (about 30 and 20 acres, respectively). This means that the sluices can be made of concrete pipes			
Drinking water			
Maung Chaung has two unlined wells that give a very low yield towards the end of the dry season. People try to deepen the wells, and if this does not work, they go to other villages to collect water. villagers asked for a pond to be dug.			
Irrigation			
N/A			
Other			
N/A			

Number	Township	Village Tract	Village
MY 62	Myebon	Yoe Sa Nwin	Nat Hla
Introduction Nat Hla has 72 households. It is a very poor village. 37 farmers cultivate 240 acres of paddy. Three people grow a total of 2 acres of nipa palm. There is one fisherman. Most of the households engage in cutting firewood and other forms of casual labour.			
Embankments N/A: the village does not have low-lying fields			
Sluices N/A			
Drinking water The village has two ponds. That is not enough to take the villagers through the dry season. Both ponds must be enlarged and preferably deepened.			
Irrigation N/A			
Other N/A			

5.3.11 WET YU (MY 67)

Number	Township	Village Tract	Village
MY 67	Myebon	Yoe Sa Nwin	Wet Yu
Introduction Wet Yu has 159 households, and has grown substantially in recent years. 78 farmers cultivate 891 acres of paddy. 39 farmers grow winter crops on about 10 acres. A similar number of households grows nipa palms on a similar acreage.			
Embankments Wet Yu has two large polders that are cultivated by farmers from several different villages (including Moe thee Nat Taung, Kon Baung and Tha Yet Taung). The most effective way of protecting these polders is by constructing ring embankments around them. The northern polder (Nga Shwe Gyi polder) is surrounded on several sides by prawn ponds, and paddy farmers have been in conflict with prawn farmers over the management of water. Because of that, it is probably best to construct a ring embankment around the paddy fields only. This embankment will need to be 49,000 feet long, and on average about 6-7' high. This embankment will require about 3.5 million ft ³ of work (100,000 m ³). This will cost about 165 million MMK (193,000 USD). The southern polder (Myin Taw Mu island) needs to be protected by an embankment of about 72,000 feet long, and on average 6-7' high. This embankment will require about 5.0 million ft ³ of work (144,000 m ³). This will cost about 242 million MMK (284,000 USD)			
Sluices The polders only have wooden sluices at the moment. This area is on the border of Tidal Zones II and III, which means that one sluice is needed per 200 acres of polder surface. For the northern polder (1,800 acres), this means that 9 sluice openings are needed. For the southern polder (2,300 acres), this means that 12 sluice openings are needed.			
Drinking water This village faces a severe shortage of drinking water in the dry season. It would be good to add a pond or well.			
Irrigation The area is not suitable for irrigation.			
Other N/A			

5.3.12 KAW (MY 11), KYOE KYAR PYIN (MY 47)

5.3.13 KAW (MY 11)

Number	Township	Village Tract	Village
MY 11	Myebon	Kaw	Kaw
Introduction This village used to be located in the interior hills of Myebon, but was relocated to the Ann-Sittwe road for security reasons around the beginning of the century. It was renamed to Yar Tha Yar. Across the river, there is another settlement with which there are close connections. This village is Chon Chaung, in Chon Chaung VT. The two villages operate as one cluster village. This village has 380 households. Many households are into cultivation, but mostly they cultivate upland crops. Only about 18 farmers grow about 100 acres paddy in part of the Kyar Mu Daw 2 polder. Some winter crops are cultivated near the village.			
Embankments The Kyar Mu Daw 2 polder has an embankment of about 9,000 feet long. It needs to be raised to an average height of 7'6". That will require about 1.1 million ft ³ of work (31,500 m ³). This will cost about 53.4 million MMK (63,000 USD).			
Sluices The polder has a surface area of about 100 acres. It will need a single sluice structure. There currently are three wooden sluices of 2' wide and fitted with flap gates. That should be sufficient. It might be good however to replace one of the wooden sluices by a brick or concrete sluice.			
Drinking water The village has some shortage in the dry season because the yield of the available three wells is low then. There is also a spring that seems to give enough water (it is also used for a little bit of irrigation). It might be useful either to construct another well or to construct a storage tank near the spring to harvest the night flow.			
Irrigation About 10 acres of land is cultivated with winter crops on residual soil moisture, supplemented by some water from the spring. There does not seem to be any possibility for expanding irrigation here.			
Other N/A			

Number	Township	Village Tract	Village
MY 47	Myebon	Yae Gaung Chaung	Kyoe Kyar Pyin
Introduction This village has 42 households. 35 households cultivate 109 acres of paddy and about 3 acres of winter crops. 10 households have 30 acres of nipa palms.			
Embankments Kyoe Kyar Pyin has its paddy fields in two clusters adjoining the village and in one polder a little to the southwest. The two clusters near the village have a combined embankment length of about 5,000 feet. This embankment needs to be upgraded to an average height of 7'. This will require about 370,000 ft ³ of work (10,500 m ³). This will cost about 17.8 million MMK (20,900 USD). The polder has an embankment length of 3,800 feet and a surface area of about 18 acres. This embankment needs to be upgraded to an average height of 6'6". This will require about 306,000 ft ³ of work (8,700 m ³). This will cost about 14.7 million MMK (17,300 USD).			
Sluices The embankments near the village have a combined catchment area of 80 acres. It is best to construct three concrete pipes (2'diameter) here. The polder needs to be fitted with one concrete pipe (2'diameter)			
Drinking water The village has two ponds and a well. Towards the end of the dry season, the available water is not enough, and people ration their water consumption. It would be good if either the smallest pond can be expanded, or a new pond can be constructed.			
Irrigation N/A			
Other N/A			

5.3.14 YAE GAUNG CHAUNG (MY 50)

Number	Township	Village Tract	Village
MY 50	Myebon	Yae Gaung Chaung	Yae Gaung Chaung
Introduction			
This village has 95 households. 23 farmers cultivate about 300 acres of paddy – mostly in the Kha Bu Kwin 3 polder near Zee Pauk. There are also 30 fishermen.			
Embankments			
Near the village, there is one embankment of 600 feet long. This embankment protects about 5 acres of paddy. It should be upgraded to an average height of 6'6". It will require about 41,000 ft ³ of work (1,200 m ³). This will cost about 2.0 million MMK (2,300 USD). There are a few more small paddy areas with short embankments to the southeast of the village, which were not inspected. It should be possible to protect all these fields for less than 10,000 USD.			
Sluices			
The embankment has one wooden sluice of 1'6" wide, and one brick sluice of about 3' wide. Because the drainage from the upstream catchment is diverted into a stream, these sluices are sufficient and no additional sluices need to be constructed. For the other embankments, a the situation is expected to be similar, because all catchment areas are small.			
Drinking water			
The village has enough drinking water. There are three wells. It would be good if they could be lined and roofed.			
Irrigation			
N/A			
Other			
N/A			

5.3.15 ZEE PAUK (MY 51)

Number	Township	Village Tract	Village
MY 51	Myebon	Yae Gaung Chaung	Zee Pauk
Introduction			
Zee Pauk has 102 households. 66 farmers cultivate 406 acres of paddy. There are no winter crops.			
Embankments			
There are about 200 acres of paddy fields around the village, protected by an embankment of about 12,500 feet long. This embankment will require about 1.2 million ft ³ of work (34,000 m ³). This will cost about 58 million MMK (68,000 USD) The Kha Bu Kwin 3 polder is a little to the southeast. It is about 160 acres, and has an embankment of about 10,500 feet long. This embankment will require about 1 million ft ³ of work (30,000 m ³). This will cost about 50.5 million MMK (59,500 USD)			
Sluices			
The polders of Zee Pauk are in Tital Zone III. The embankment around the village has 7 sluices of 4' wide. For this area, two concrete or brick sluices are needed. The Kha Bu Kwin 3 polder has only one 2' wide wooden sluice. This polder also needs two sluices.			
Drinking water			
The village has enough drinking water.			
Irrigation			
N/A			
Other			
N/A			

5.3.16 TOKE LA HAR (LA BET GYI) (MY 49)

Number	Township	Village Tract	Village
MY 49	Myebon	Yae Gaung Chaung	Toke La Har (La Bet Gyi)
Introduction			
Toke La Har is a small, very poor and isolated village. Of the 34 households, 10 engage in cultivation of 30 acres of paddy. People are mostly engaged in firewood cutting, fishing, sawing and casual labour.			

Number	Township	Village Tract	Village
MY 49	Myebon	Yae Gaung Chaung	Toke La Har (La Bet Gyi)
<p>Embankments</p> <p>The low-lying paddy fields and some small prawn ponds of the village are protected by three small embankments.</p> <p>The first is 2,000 feet long and encloses an area of about 5 acres.</p> <p>This embankment will require about 131,000 ft³ of work (3,700 m³). This will cost about 6.3 million MMK (7,400 USD).</p> <p>The second is 1,500 feet long and protects about 10 acres.</p> <p>This embankment will require about 74,000 ft³ of work (2,100 m³). This will cost about 3.5 million MMK (4,100 USD).</p> <p>The third, lying just upstream from the second, is 150 feet long and protects a very small area. If the second embankment is upgraded, the third embankment will no longer be affected by sea water. This embankment does not need upgrading.</p>			
<p>Sluices</p> <p>The first embankment has a catchment area of about 5 acres. This is so small that a sluice structure is not worth the investment. A simple wooden box culvert or a hollow log will be enough. This must be fitted with a flap gate.</p> <p>The second embankment has a catchment area of about 120 acres, of which 8-10% is flat land. As this area is located in Tidal Zone II, one sluice opening is required.</p>			
<p>Drinking water</p> <p>The village has enough water throughout the year. There are two springs within ten minutes walking from the village. People have asked to provide a well in the middle of the village with roofing.</p>			
<p>Irrigation</p> <p>No possibilities</p>			
<p>Other</p> <p>N/A</p>			

5.3.17 TAUNG ZAING (MY 48)

Number	Township	Village Tract	Village
MY 48	Myebon	Yae Gaung Chaung	Taung Zaing
<p>Introduction</p> <p>Taung Zaing has 56 households. Of these, 26 are reported to engage in paddy cultivation on 190 acres. Near the village, there is about 90 acres of paddy land. The other farmers must cultivate further away.</p>			
<p>Embankments</p> <p>In order to protect the paddy fields close to the village, a single outer embankment around them all needs to be constructed. There are currently also embankments separating small areas from each other, but these embankments do not need to be rehabilitated to ensure protection from the sea.</p> <p>About 50 acres of low-lying fields will be protected by an embankment with a length of about 5,400 feet.</p> <p>This embankment will require about 500,000 ft³ of work (14,200 m³). This will cost about 23.9 million MMK (28,000 USD).</p>			
<p>Sluices</p> <p>The total catchment area of the embankment is about 155 acres. 30% is flat land. Being located in Tidal Zone II, a single sluice opening will be sufficient. There are currently at least four wooden sluices which should have enough capacity. Either a single concrete sluice must be built (there is a rock foundation about halfway the embankment), or the existing wooden sluices must be fitted with flap gates.</p>			
<p>Drinking water</p> <p>The village has enough water from two ponds and a well. Villagers have requested to upgrade an existing well to a brick well with roofing.</p>			
<p>Irrigation</p> <p>No possibilities</p>			
<p>Other</p> <p>N/A</p>			

5.3.18 HIN KHA YAW (MY 75)

Number	Township	Village Tract	Village
MY 75	Myebon	Sa Hnyin	Hin Kha Yaw
Introduction			
This village has 125 households. 32 farmers cultivate 143 acres of paddy in small clusters of fields. There are 10 fishermen. 83 households are landless.			
Embankments			
The village has paddy fields in small valleys that are blocked by low embankments. The two biggest clusters of paddy fields need are protected by embankments of 500' and 600' long. It would be good to raise the level to about 3.5 feet. That will require about 32,000 ft ³ of work (900 m ³). This will cost about 1.5 million MMK (1,800 USD)			
Sluices			
Drainage water from the upstream catchments flows to the sea through streams. Therefore, sluices are not necessary in these embankments.			
Drinking water			
The village has enough drinking water. People requested for lining the three wells and providing a roof.			
Irrigation			
N/A			
Other			
N/A			

5.3.19 SA HNYIN (MY 76)

Number	Township	Village Tract	Village
MY 76	Myebon	Sa Hnyin	Sa Hnyin
Introduction			
Sa Hnyin is a fairly large village with 390 households. 131 farmers cultivate a total of 614 acres of paddy. Five farmers cultivate 6 acres of winter crops. There are 254 landless households.			
Embankments			
Most of the fields of Sa Hnyin are located on a slightly higher elevation and are not affected by the sea. Two areas are protected by embankments. One embankment, close to the village, has a length of about 4,500 feet and protects 45 acres. This embankment was renovated not too long ago by NAG (?), but it is not up to the proposed design standard. Bringing it up to standard will require about 255,000 ft ³ of work (7,200 m ³). This will cost about 12.2 million MMK (14,500 USD). The other embankment protects the Sat Ya field of 32 acres. This embankment is 3,000 feet long. It needs to be upgraded to 6 feet high. This will require about 170,000 ft ³ of work (4,800 m ³). This will cost about 8.2 million MMK (9,600 USD).			
Sluices			
Both embankments have catchment areas below 50 acres. One sluice (design for Tidal Zone III) should be more than enough for each embankment. NAG has constructed a wooden sluice. If this can be replaced by a concrete sluice, that would be good.			
Drinking water			
The village has enough drinking water throughout the year. It would be good if all 7 wells can be fenced.			
Irrigation			
N/A			
Other			
N/A			

5.3.20 NYAUNG KHET KAN (YWAR HAUNG) (MY 72)

Number	Township	Village Tract	Village
MY 72	Myebon	Nyaung Khet Kan	Nyaung Khet Kan (Ywar Haung)
Introduction			
Nyaung Khet Kan has 402 households. 120 farmers cultivate about 608 acres of paddy. 6 farmers grow winter crops on 4 acres. There are 40 fishermen, and 212 landless households. About 30 people operate a total of 250 acres of prawn ponds.			

Number	Township	Village Tract	Village
MY 72	Myebon	Nyaung Khet Kan	Nyaung Khet Kan (Ywar Haung)
<p>Embankments This village has its fields spread out over seven polders, separated from each other by smaller and larger creeks. These polders were cleared not too long ago by landless farmers trying to become small farmers. They did not have the resources to construct proper embankments or sluices, and as a consequence the maintenance load is very high. The total length of the embankments around these polders is about 65,000 feet. Due to their geographical location, it is difficult to combine them into larger polders. One cluster of three polders (Nan Daung Pauk, Zee Pin Hla, and Ohn Taw) could possibly be grouped into one polder. That would not reduce the length of embankment needed, but it would expand the area under paddy by about 120 acres. Bringing all these embankments up to standard will require about 5.1 million ft³ of work (144,000 m³). This will cost about 244 million MMK (287,000 USD)</p>			
<p>Sluices There are currently only wooden sluices in the polders. This area falls in Tidal Zone II. The polders have between 50 and 90% low-lying land, which means that roughly one sluice is needed for every 280 acres. None of the polders are this large. Therefore, it is better to install sluices with the design for Tidal Zone III (one for every 100 acres). This means that a single sluice will be sufficient for the polders. In the Nga Zu Ya Chey field, the Ngan Dan Pauk field and the western and eastern half of the village field, the sluice should be 6' wide. In the other fields, the sluices can be 4' wide. If Nan Daung Pauk, Zee Pin Hla and Ohn Taw fields are combined into one large polder, this polder will need four sluice openings of 5' wide.</p>			
<p>Drinking water This village has two ponds and three wells. The wells have very little water in the second half of the dry season. People asked to repair the existing ponds, and to add one or two more ponds.</p>			
<p>Irrigation Very little irrigation is being done currently. It might be possible to promote winter crop cultivation using treadle pumps.</p>			
<p>Other N/A</p>			

5.4 ISLANDS IN SOUTHERN MYEBON

5.4.1 KAN HTAUNT GYI (MY 69)

Number	Township	Village Tract	Village
MY 69	Myebon	Kan Htaunt Gyi	Kan Htaunt Gyi
<p>Introduction Kan Htaunt Gyi is a small town with 2,232 households. 650 farmers cultivate about 3,250 acres of paddy, mostly in polders of other villages. There are 220 fishermen, and 977 landless labourers.</p>			
<p>Embankments Near the village, there are three polders with a combined area of about 530 acres, cultivated by about 75 farmers. These polders have a combined embankment length of about 33,500 feet. These embankments will require about 2.6 million ft³ of work (74,000 m³). This will cost about 125 million MMK (147,000 USD)</p>			
<p>Sluices There are currently only hollow wooden logs. This area is located on the border of Tidal Zones II and III. Because of the size of the polders, it is recommended to use the design for Tidal Zone III, and construct two, three and one sluice respectively for the western, middle and eastern polder.</p>			
<p>Drinking water The town has enough drinking water throughout the year, but two of the 7 ponds are in need of rehabilitation.</p>			
<p>Irrigation It might be possible to promote treadle pumps.</p>			
<p>Other N/A</p>			

5.4.2 SEIK TA RA (MY 43)

Number	Township	Village Tract	Village
MY 43	Myebon	Seik Ta Ra	Seik Ta Ra
Introduction Seik Ta Ra is a large village, with 613 households. Not only was the village affected by Giri, also about a quarter of the houses were lost in a large fire in 2012. There are 168 farmers who cultivate about 2,000 acres of paddy. There are also 60 fishermen, and 385 households are landless.			
Embankments Seik Ta Ra VT is located on a cluster of islands that are separated by creeks. The land is flat. Some areas are covered by mangroves, and the rest is in use for prawn ponds and paddy fields. The fields of Seik Ta Ra are concentrated on three islands: the island where the village itself is located (which also includes Thin Paung Chaung, Yae Ni Gyi and Taung Shey (lower)), a small island to the north-east of the village (with only about 30 acres of paddy), and an island to the north-west of the village (with three polders called Lay Tu I, II and III). There are currently 15 paddy polders in these three locations. The total length of the embankments is about 230,000 feet. Upgrading them will require about 27.4 million ft ³ of work (775,000 m ³). This will cost about 1,314 million MMK (1.5 million USD). In this area, low-intensity prawn cultivation is practiced: prawns are let into the polders from the sea, raised in the polders and harvested. Due to various factors, the productivity of these ponds reduces after a few seasons. In order to mitigate against this, the polders are alternately used for paddy cultivation and prawn cultivation (for 2-3 years at a stretch). This means that for protecting paddy cultivation in Seik Ta Ra in the long run, it is best to construct ring embankments around entire islands or around clusters of polders. Three ring embankments around the three areas where the paddy fields and prawn ponds of Seik Ta Ra are concentrated will have a total length of about 150,000 feet. This will require about 12 million ft ³ of work (345,000 m ³). This will cost about 590 million MMK (690,000 USD). An alternative is to negotiate with farmers about clustering paddy fields in a smaller area, and putting an embankment around that area.			
Sluices Seik Ta Ra is located near the boundary of Tidal Zone II and Tidal Zone III. This means that on average, one sluice opening is needed for every 200 acres. If three ring embankments are constructed, the total surface area will be With a total surface area of around 11,500 acres, the village will need about 45 sluice openings. There are currently only hollow wooden culverts, which means that all sluices must be newly constructed. That will cost anywhere between 600,000 and 1 million USD. If the 15 embankments are renovated separately, about 25 sluice openings will be needed. This will cost anywhere between 350,000 and 600,000 USD			
Drinking water Seik Ta Ra has five ponds and a well. The village has enough water throughout the year.			
Irrigation No irrigation is taking place. It might be useful to promote the use of treadle pumps near blocked creeks.			
Other N/A			

5.4.3 THA YET TAUNG (MY 78)

Number	Township	Village Tract	Village
MY 78	Myebon	Tha Yet Taung	Tha Yet Taung
Introduction Tha Yet Taung is a large village with 1,150 households. Of these, 450 cultivate 2,670 acres of paddy. Winter crops are only grown on 3 acres by 3 farmers. There are 2,400 acres of nipa palms. The village also has 200 fishermen, and about 500 landless households.			

Number	Township	Village Tract	Village
MY 78	Myebon	Tha Yet Taung	Tha Yet Taung
<p>Embankments As with Seik Ta Ra, the village has multiple paddy field polders spread out among a large area of prawn ponds – and regularly, the land use of polders shifts between prawns and paddy. There are currently six paddy polders, and the embankments around them have a total length of about 82,000 feet. The fields of Tha Yet Taung can be protected by three ring embankments (this includes one embankment on an adjoining island, between Seik Ta Ra and Thin Paung Chaung), with a combined length of about 110-130,000 feet. Bringing these embankments up to standard will require about 9-10.5 million ft³ of work (250-300,000 m³). This will cost about 430-500 million MMK (500-600,000 USD).</p>			
<p>Sluices The three ring embankments will protect a combined area of about 3,400 acres. This means that about 17 sluice openings are needed (half of the type for Tidal Zone II and half of the type for Tidal Zone III). This will cost about 220,000 USD.</p>			
<p>Drinking water The village has enough drinking water. People asked for renovation of the wells with roofing and fencing.</p>			
<p>Irrigation It might be possible to stimulate cultivation of winter crops near blocked creeks, using treadle pumps.</p>			
<p>Other N/A</p>			

5.4.4 SET KHWAY (MY 74)

Number	Township	Village Tract	Village
MY 74	Myebon	Pauk Tu Taung	Set Khway
<p>Introduction Set Khway has 172 households. 63 farmers cultivate 355 acres of paddy, and 26 farmers cultivate 32 acres of winter crops. 32 households have 67 acres of nipa palms. There are 18 fishermen, and 86 households are landless. Importantly, there are also 730 acres of prawn ponds, operated by 76 households.</p>			
<p>Embankments Set Khway has its paddy fields in two clusters: one around the village, and another cluster north of the village. The first cluster is protected by an embankment of about 13,000 feet long. This embankment needs to be raised to an average height of 5'. That will require about 617,000 ft³ of work (17,500 m³). This will cost about 29.6 million MMK (35,000 USD). The second cluster is protected by an embankment of about 14,000 feet long. This embankment needs to be raised to an average height of 7'. That will require about 1.3 million ft³ of work (37,000 m³). This will cost about 62.4 million MMK (73,500 USD). The prawn ponds form an outer ring around the paddy fields. Incorporating that embankment would be too expensive within the Tat Lan program.</p>			
<p>Sluices In both embankments, there are only hollow logs used as sluices at the moment, which all need to be replaced. The area is located in Tidal Zone II, and about 80-90% of both polders is low-lying area. The embankment around the village has a catchment area of about 130 acres. This means that a single sluice opening (4' wide) is enough. The embankment north of the village has a catchment area of about 150 acres. This means that a single sluice opening (4' wide) is enough.</p>			
<p>Drinking water The village has two ponds and four wells. During the dry season, there is some shortage of water. When that happens, people dig temporary wells near the creeks. People asked for support to renovate the existing ponds and wells. Particularly one pond is quite shallow (6' deep), and if there is no risk of hitting a layer of saline groundwater, it would be good to deepen this pond.</p>			
<p>Irrigation About 30 acres of winter crops are watered from temporary wells that are dug near blocked creeks. It is not clear if this acreage can be expanded.</p>			

Number	Township	Village Tract	Village
MY 74	Myebon	Pauk Tu Taung	Set Khway
Other			
N/A			

5.4.5 KYAY TAW (MY 70)

Number	Township	Village Tract	Village
MY 70	Myebon	Kyay Taw	Kyay Taw
Introduction			
<p>The village has 332 households. There are 66 farmers, who cultivate 265 acres of paddy. No winter crops are grown. There are also 67 fishermen, and 199 landless households.</p>			
Embankments			
<p>The village has three embankments.</p> <p>The first surrounds the paddy fields directly north of the village. This embankment is 7,500 feet long. It protects 35 acres of paddy land. Upgrading this embankment to an average height of 6' will require about 550,000 ft³ of work (15,500 m³). This will cost about 26.2 million MMK (31,000 USD)</p> <p>The second embankment is about 4,500 feet long, and protects about 25 acres of paddy land. It has been rehabilitated by the Irrigation Department, and does need any work under Tat Lan.</p> <p>The third embankment is about 19,000 feet long, and protects an area of about 300 acres. Upgrading this embankment to an average height of 5.5' will require about 1.2 million ft³ of work (34,000 m³). This will cost about 57.5 million MMK (68,000 USD)</p>			
Sluices			
<p>This area falls into Tidal Zone II.</p> <p>The first embankment has two sluices – one of concrete, and one of wood. Both are 4' wide, have sliding gates, and have no wing walls. The embankment has a catchment area of about 100 acres, of which 40% is low-lying (in two separate patches). Upgrading the concrete sluice by fitting it with a flap gate and wing walls should be enough for the northern part of this polder. In the eastern part, one 4' wide sluice of the design for Tidal Zone III must be added.</p> <p>The second embankment has a catchment area of about 50 acres, of which about 80% is low-lying. For this polder, one single sluice of the design for Tidal Zone III is sufficient.</p> <p>The third embankment has a catchment area of about 300 acres. A single sluice of the design for Tidal Zone II should be enough for this polder. If the polder is not flat enough to be drained by one sluice, it is also possible to construct three sluices of the Tidal Zone III design instead.</p>			
Drinking water			
<p>This village has enough water. The four ponds and five wells do need fencing, and the wells can be fitted with roofs.</p>			
Irrigation			
<p>There is no irrigation. In the southern polder, it might be possible to introduce treadle pumps near blocked creeks.</p>			
Other			
N/A			

5.4.6 PAUK TU TAUNG (MY 73)

Number	Township	Village Tract	Village
MY 73	Myebon	Pauk Tu Taung	Pauk Tu Taung
Introduction			
<p>Pauk Tu Taung is a large village. There are 118 farmers, cultivating 1,328 acres of paddy. Winter crops are grown on only 3 acres. There are 225 fishermen. The other 433 households are landless and depend on casual labour. Also, there is about 700 acres of prawn ponds.</p>			

Number	Township	Village Tract	Village
MY 73	Myebon	Pauk Tu Taung	Pauk Tu Taung
<p>Embankments Pauk Tu Taung's paddy fields are protected by two embankments. North of the village, there is an embankment of 7,500 feet long, which must be renovated to an average height of about 6'6", two feet higher than the spring high tide level. This will require about 580,000 ft³ of work (16,400 m³). This will cost about 27.8 million MMK (32,700 USD). South of the village, there is an embankment of about 19,700 feet long, which must be renovated to an average height of about 6'6", two feet higher than the spring high tide level. This will require about 1.5 million ft³ of work (42,000 m³). This will cost about 71.1 million MMK (83,600 USD). A third embankment protects the village itself. This embankment is 1,700 feet long, and needs to be raised to an average level of about 7'6", two feet above spring high tide level. This will require about 189,000 ft³ of work (5,400 m³). This will cost about 9.1 million MMK (10,700 USD).</p>			
<p>Sluices The two paddy embankments only have wooden sluices, which need to be replaced by concrete ones. This area is in Tidal Zone II. The northern embankment has a catchment area of about 220 acres, of which about 80-90% is low-lying. This means that a single sluice opening is enough. The southern embankment has a catchment area of about 720 acres, of which about 90% is low-lying. This means that 720 / 270 ~ 3 sluice openings are required. The village protection embankment has a catchment area of about 80 acres. It has a single concrete sluice of 3' wide in poor condition. The size of the sluice is sufficient, but it needs to be repaired and fitted with a flap gate.</p>			
<p>Drinking water The village has five ponds and six wells. It has enough drinking water throughout the year.</p>			
<p>Irrigation There is no irrigation in the village at the moment. It might be possible to promote treadle pumps along blocked creeks.</p>			
<p>Other N/A</p>			

5.4.7 NGAN TAUNG (MY 71)

Number	Township	Village Tract	Village
MY 71	Myebon	Ngan taung	Ngan Taung
<p>Introduction This village has 230 households. 78 farmers cultivate 625 acres of paddy. No winter crops are grown. There are 65 fishermen, and 87 households dependent on casual labour.</p>			
<p>Embankments Currently, Ngan Taung has seven polders in which paddy is grown. There are also large areas nearby that were used for paddy in the recent past and have now been converted to prawn ponds. It is not entirely clear if the land use is rotational (with areas switched from paddy cultivation to low-intensity prawn cultivation once every 2-3 years), or if the land use is more or less permanent. If the land use is more or less permanent, it makes sense to renovate the embankments around the seven current polders. One of these embankments has been renovated by the Irrigation Department. The remaining seven embankments have a combined length of 47,400 feet. All should be renovated to 2' above spring high tide level. This means that the average height of the different embankments will vary between about 6'6" and 10'. All embankments over 7'6" high should have a sideslope of 1:2, and all embankments over 8' high should have a crest width of 4'. The combined volume of these embankments is about 5.0 million ft³ of work (141,000 m³). This will cost about 239 million MMK (281,000 USD). In order to protect all the lands around the village, two embankments are needed: one of about 50,000 feet west of the village, one of about 85,000 feet south of the village. These embankments will require approximately 15 million ft³ of work (425,000 m³). This will cost about 720 million MMK (850,000 USD).</p>			

Number	Township	Village Tract	Village
MY 71	Myebon	Ngan taung	Ngan Taung
<p>Sluices The fields of Ngan Taung are located in Tidal Zone II. Five of the embankments have only small catchment areas, and can be served by a single sluice opening of the type for Tidal Zone III or even a single concrete culvert of 2' diameter. Two embankments have bigger catchment areas, and each can be served by a single sluice opening of the design for Tidal Zone II (4' width is enough). The embankment renovated by the Irrigation Department has two concrete sluices of 4' wide and 3' high. This is equivalent to a single standard sluice of the type for Tidal Zone III. This embankment has a catchment area of about 600 acres. This means that two more sluice openings of the type for Tidal Zone II must be added.</p> <p>If the entire area around the village is protected by three embankments as mentioned above, 35 sluice openings of the type for Tidal Zone II and 1 sluice opening of the type for Tidal Zone III must be constructed.</p>			
<p>Drinking water Ngan Taung has three ponds and six open wells. In the last month of the dry season, the ponds dry up and there is not enough water. People then take water from hand-dug wells spread out along the foot of the row of hills behind the village. Some of these wells take quite some time to reach. People asked for more wells near the foot of the hills. The area with probably the best chance of water is about 200-500 metres south of the village, on the west and east side of the hill. If the embankment around the fields west of the village does not let any saltwater pass, it is possible that a freshwater aquifer develops. An infiltration pond might help for this.</p>			
<p>Irrigation There is no irrigation in the village. It might be possible to promote the use of treadle pumps along blocked creeks.</p>			
<p>Other In order to protect the village and its drinking water sources, an embankment of about 1,500 feet long needs to be upgraded. This embankment will require approximately 272,000 ft³ of work (7,700 m³). This will cost about 13 million MMK (15,400 USD).</p>			

5.4.8 GAUNG HPYU TAUNG (MY 79)

Number	Township	Village Tract	Village
MY 79	Myebon	Yae Kaung Chein	Gaung Hpyu Taung
<p>Introduction This village is no longer a permanent village. It is inhabited by migrant fishermen during the fishing season. According to local information, the village was destroyed about ten years ago. There are currently 10 households there; all are fishermen.</p>			
<p>Embankments N/A</p>			
<p>Sluices N/A</p>			
<p>Drinking water N/A</p>			
<p>Irrigation N/A</p>			
<p>Other N/A</p>			

5.4.9 KYAUK HPYAR (MY 80)

Number	Township	Village Tract	Village
MY 80	Myebon	Yae Kaung Chein	Kyauk Hpyar
<p>Introduction This village has 245 households. 60 farmers cultivate 205 acres of paddy. 75 farmers operate 980 acres of prawn ponds. There are 60 fishermen, and 50 households dependent on casual labour.</p>			

Number	Township	Village Tract	Village
MY 80	Myebon	Yae Kaung Chein	Kyauk Hpyar
Embankments			
<p>Several hundred acres of paddy fields are currently cultivated by farmers from Yae Gaung Chein village in 10 polders. As with other villages (MY 78, MY 81), the land use in this village is variable: the use of polder lands is alternated between paddy cultivation and low-intensity prawn cultivation. It is best to protect the entire area around this village by two embankments of approximately 52,000 and 63,000 feet long.</p> <p>These embankments should be renovated to a level 2' above maximum spring high tide. The average height of these embankments will be about 7' and 6'6", respectively. Renovating them will require about 9.1 million ft³ of work (258,000 m³). This will cost about 437 million MMK (515,000 USD).</p>			
Sluices			
<p>The fields of Kyauk Hpyar are located in Tidal Zone II. There are only wooden sluices, which need to be replaced by concrete sluices. The two areas have a combined catchment area of 4,800 acres. One polder has about 80% low-lying area, and the other almost 100%. This means that a total of 18 sluice openings are needed.</p>			
Drinking water			
<p>This village has two ponds and one well. One pond and a well are used for drinking. During the end of the dry season, the pond dries up, and people dig a hole inside the pond to collect water. The yield is low however.</p> <p>Since there is freshwater underneath, it might be good then to deepen this pond.</p> <p>Also, the ponds need to be fenced to keep animals out and minimise pollution.</p>			
Irrigation			
<p>There is no irrigation. It might be possible to introduce treadle pumps near blocked creeks.</p>			
Other			
N/A			

5.4.10 YAE KAUNG CHEIN (MY 81)

Number	Township	Village Tract	Village
MY 81	Myebon	Yae Kaung Chein	Yae Kaung Chein
Introduction			
<p>This village has 766 households. 90 farmers reportedly cultivate 395 acres of paddy. Importantly, 446 farmers operate 2,350 acres of prawn ponds in this village. There are also 130 fishermen, and 100 landless households.</p>			
Embankments			
<p>This village has a huge acreage of prawn ponds. Generally, prawn ponds are converted into paddy fields after two or three years, because farmers see the yields of the prawns go down. After a few years, the paddy fields are again converted into prawn ponds. Because of this, it is best to construct a solid ring embankment around the largest area possible, and let villagers construct their own smaller embankments to separate prawn areas from paddy areas, and avoid saltwater from flowing into the paddy fields.</p> <p>There is one 26,000 foot long embankment that is being constructed by the Irrigation Department. To enclose all prawn ponds and paddy fields of the village (while keeping access to the village by creek open), five more embankments must be constructed with a total length of about 130,000 feet. With an estimated average height of 8 feet, these embankments will require about 18.3 million ft³ of work (520,000 m³). This will cost about 880 million MMK (1.05 million USD).</p> <p>An alternative is to rehabilitate 15 separate smaller embankments around paddy areas. This will require 17.2 million ft³ of work (488,000 m³), and it will cost about 828 million MMK (974,000 USD). The advantage of this option is that it will avoid problems between paddy fields and prawn ponds, but the disadvantage is that if paddy fields protected by these are converted into prawn ponds and non-protected prawn ponds are converted into paddy fields, the impact of the embankments on paddy cultivation will be reduced to almost zero.</p>			

Number	Township	Village Tract	Village
MY 81	Myebon	Yae Kaung Chein	Yae Kaung Chein
<p>Sluices Most of the sluices in the fields of this village are currently hollow wooden tree trunks. Large enough trees are becoming scarce, and such sluices must be replaced regularly. There is also one wooden sluice (2 openings of 5' wide), six concrete pipes, and two concrete sluices (one with two 5' openings, and one with two 6' openings). If the large embankments are constructed, the total catchment area will be about 5,400 acres, of which 90-95% is low-lying land. Since this area is in Tidal Zone II, this means that 5,400 / 270 ~ 20 sluice openings are needed. Taking the existing concrete sluices into consideration, this means that 15 new sluice openings must be constructed. If the small embankments are constructed, each polder needs its own sluices. The total catchment area of the 15 separate embankments is a little over 1,000 acres. Because the catchments are typically quite small, the following sluices must be constructed: four concrete pipes (2'diameter), seven sluice openings (design for Tidal Zone III) and three sluice openings (design for Tidal Zone II). In the Irrigation Department embankment, another sluice opening of the design for Tidal Zone II must be added.</p>			
<p>Drinking water The village has enough water. The community has asked for support to put up fencing around the six ponds to keep cattle out.</p>			
<p>Irrigation N/A</p>			
<p>Other The Village Development Committee has requested for help to construct a jetty (near 19.72524 N / 93.75369 E).</p>			

5.4.11 SAT TET (MY 77)

Number	Township	Village Tract	Village
MY 77	Myebon	Sat Tet	Sat Tet
<p>Introduction This village has 70 households. Most are very poor. There are 31 farmers, who cultivate 137 acres. Most of these farmers do not produce enough to meet their own needs, and they supplement their income by fishing. There are also 22 households dependent on fishing, and 10 households dependent on casual labour.</p>			
<p>Embankments The village currently has two adjoining areas in use for paddy cultivation, even though it has a lot more land. The villagers do not have the resources to take that land into use, and an embankment that was built earlier is totally damaged now. The existing embankment is 8,800 feet long. Together with this embankment, a village protection embankment of 2,500 feet long also needs to be renovated. These embankments must be raised to an average height of 8 feet. Renovating them will require about 1.5 million ft³ of work (43,200 m³). This will cost about 73.2 million MMK (86,000 USD). However, it is really possible to improve the livelihoods of the people of Sat Tet by (re)constructing an embankment around the edge of the island. That embankment will be about 29,000 feet long. This option will require about 3.7 million ft³ of work (106,000 m³). This will cost about 179 million MMK (211,000 USD). Any option in between these two extremes is also suitable.</p>			
<p>Sluices There are currently only three concrete pipes. These pipes are not fitted with collars, which leads to water seeping along the pipes, damaging the embankment. This area is in Tidal Zone II, which means that a single sluice will be enough for the existing paddy area. For the village protection embankment, a single sluice of the design for Tidal Zone III is needed. If the embankment is expanded around the entire island, three sluices of the design for Tidal Zone II are needed.</p>			
<p>Drinking water Sat Tet has three ponds, of which one is used for drinking purposes. The village faces a severe water shortage every year, because the pond is dry for 2 ½ months every year. When the pond dries up, people need to collect water by boat. If space is available, it would be good to construct another pond. Alternatively, the existing pond should be deepened if that is possible. People also asked for support in fencing the three ponds.</p>			

Number	Township	Village Tract	Village
MY 77	Myebon	Sat Tet	Sat Tet
Irrigation There is currently no irrigation. If creeks are blocked, it might be possible to introduce treadle pumps.			
Other N/A			

5.5 ISLANDS IN CENTRAL MYEBON

5.5.1 KON BAUNG (UPPER) (MY 18), TAUNG GYI YIN (MOE THEE NAT TAUNG) (MY 20)

Number	Township	Village Tract	Village
MY 18	Myebon	Moe Thee Nat Taung	Kon Baung
Introduction Kon Baung has 202 households. 81 farmers cultivate 925 acres of paddy; no winter crops are grown. There are four fishermen, and 117 landless households.			
Embankments Most of the farmers cultivate on Myin Taw Mu island (see MY 67). Near the village, there are two tiny polders of several acres each. These polders need at most minor adjustments to their embankments, which can be done for less than 5,000 USD. Note that many farmers are interested in converting their paddy fields into prawn ponds. Also, there are prawn ponds near the village that are owned by outsiders.			
Sluices See MY 67 for Myin Taw Mu island. The polders close to Kon Baung are so small that simple concrete pipes should be sufficient, as long as collars are included.			
Drinking water The village has a shortage of drinking water for about three months per year. People sometimes have to collect water by boat, which takes about two hours. There are three ponds and one good well, but the groundwater availability is limited. People are asking for another well, but it might be better to construct another pond or to expand the existing ponds.			
Irrigation There is currently no irrigation. It might be interesting to introduce some treadle pumps.			
Other N/A			

Number	Township	Village Tract	Village
MY 20	Myebon	Moe Thee Nat Taung	Taung Gyi Yin (Moe Thee Nat Taung)
Introduction Moe Thee Nat Taung has 202 households. 102 farmers cultivate 830 acres on an island to the east of the village (see MY 67, Nga Shwe Gyi polder). 30 farmers grow 3 acres of winter crops. There are also 35 fishermen and 65 households dependent on casual labour.			
Embankments For the embankments around the major paddy area of the village, see MY 67.			
Sluices See MY 67.			
Drinking water This village has two ponds and six wells, of which four wells are used for drinking. During the dry season, there is not enough water. People then go to the 'crocodile spring', about a mile away. This spring however also does not have enough water. People asked for another well. If the volume of water in the aquifer is the problem, a pond might be better.			
Irrigation See MY 67.			
Other N/A			

5.5.2 KYEE GAUNG TAUNG (MY 19)

Number	Township	Village Tract	Village
MY 19	Myebon	Moe Thee Nat Taung	Kyee Gaung Taung
<p>Introduction This village has 263 households. 130 farmers are reported to cultivate about 2,290 acres of paddy (though this seems to be an overestimation). 8 farmers grow about 2 acres of winter crops. There are 21 fishermen, and 112 landless households. There are prawn ponds near the village, but these are owned by outsiders.</p>			
<p>Embankments Paddy is grown in three polders. The first (Ah Htet Sat Pya) is located on an island west of the village, near Lay Tu (MY 27). Some of the land in this polder is cultivated by farmers from Lay Tu and Hpa Lar Kya (MY 10). It has a surface area of about 1,200 acres. The ring embankment has a length of 28,700 feet, and needs to be upgraded to an average height of 6.5 feet. This embankment will require about 2.7 million ft³ of work (76,600 m³). This will cost about 130 million MMK (153,000 USD). The second polder (Auk Sat Pya) is located on an island southwest of the village. It is protected by a horseshoe embankment of about 20,000 feet long, and has a surface area of about 620 acres. This embankment will need to be rehabilitated to an average height of 6.5 feet. It will require about 1.8 million ft³ of work (50,800 m³). This will cost about 86 million MMK (101,500 USD). The third polder is on the other side of the hills behind the village. This polder has a surface area of about 560 acres, and it is protected by an embankment of 18,000 feet. Of this embankment, about 13,000 feet have already been upgraded by UNDP, but it is not up to the proposed design standard. It needs to be rehabilitated up to an average height of 8.5 feet. This embankment will require about 2.4 million ft³ of work (68,500 m³). This will cost about 116 million MMK (137,000 USD).</p>			
<p>Sluices The fields of this village are located in Tidal Zone II. Some sluices have been constructed by the villagers, but without reinforcement and without too much hydrological analysis. The Ah Htet Sat Pya polder has two sluice structures, each with double openings. These structures are in poor condition. It needs a total of five sluice openings (design Tidal Zone II). If the existing sluices are rehabilitated and fitted with flap gates, a single structure with two openings needs to be added (the existing sluices are not deep enough) Auk Sat Pya has three sluice structures with five sluice openings in total. These structures are in poor condition. It needs two sluices (design Tidal Zone II) with 6' wide openings. If the existing sluices are rehabilitated, a single structure with one opening must be added (the existing sluices are not deep enough) The field east of the village has two sluices with three openings. This embankment has a catchment area of 1,550 acres, of which about 60-65% is low-lying. This polder needs six sluice openings. If the existing sluices are rehabilitated, two structures with two openings each must be added.</p>			
<p>Drinking water The village has some shortage of drinking water. There are three ponds, used for domestic purposes and for livestock, and three wells. The wells do not have enough water in the dry season. People then go to a spring nearby, but this does not have enough water. It might be good to upgrade the spring with a storage reservoir. People also ask for more wells, but if the aquifer does not have enough water it might be better to add another pond.</p>			
<p>Irrigation There is no irrigation. Introduction of treadle pumps might be possible.</p>			
<p>Other N/A</p>			

5.5.3 LAY TU (MY 27)

Number	Township	Village Tract	Village
MY 27	Myebon	Nga Shwe Pyin	Lay Tu
<p>Introduction This village has 80 households. 50 are farmers, cultivating 300 acres (mostly in the Ah Htet Sat Pya polder, see MY 19). The other 30 households are landless and depend on casual labour.</p>			

Number	Township	Village Tract	Village
MY 27	Myebon	Nga Shwe Pyin	Lay Tu
Embankments			
See MY 19.			
Near the village, there is a paddy area of about 30 acres. This land is cultivated by 50 farmers. It is protected by an embankment of 1,100 feet long. This embankment will require about 55,000 ft ³ of work (1,600 m ³). This will cost about 2.6 million MMK (3,100 USD)			
Sluices			
The embankment has a catchment area of about 180 acres, of which 10% is low-lying. A single sluice (Tidal Zone II type) is needed to replace the existing wooden sluice.			
Drinking water			
Lay Tu has some shortage of drinking water during the end of the dry season. People then go to a spring just outside of the village. This spring was upgraded with a storage tank about 10-15 years ago, but the tank and a pipeline were damaged. If this can be repaired, the village will have enough water. People also asked for another well. If there is not enough water in the aquifer (this seems to be the case), then a pond is a better idea.			
Irrigation			
There is currently no irrigation. There is a possibility of constructing a small dam at the upstream end of the paddy area near the village. That will make it possible to irrigate about 10 acres of winter crops. It is however likely that the costs do not weigh up to the benefits.			
Other			
N/A			

5.5.4 TAUNG MAW (MY 30), TAUNG NYO (MY 31)

Number	Township	Village Tract	Village
MY 30	Myebon	Nga Shwe Pyin	Taung Maw
Introduction			
Taung Maw has 78 households. 54 farmers cultivate 400 acres of paddy, and four of the farmers cultivate 7 acres of winter crops. The remaining 24 households are landless			
Embankments			
Taung Maw and Taung Nyo together have about 900 acres of paddy fields, which are protected from the sea by a low ridge of hills and, to the north and south, by two embankments constructed by the Irrigation Department. There is no need for Tat Lan to get involved in embankments in these villages.			
Sluices			
The embankments around the fields of Taung Maw and Taung Nyo have a catchment area of about 1,300 acres, of which about 70% is low-lying. Being located in Tidal Zone II, this means that 1,300 / 270 ~ 5 sluice openings are needed.			
There currently are three sluice structures with seven openings, but one structure is in very poor condition, and the other two (with five openings together) need to be repaired. Fitting these two structures with flap gates will be enough to ensure good drainage for the area.			
Drinking water			
This village has enough drinking water throughout the year.			
Irrigation			
Farmers irrigate a few acres of vegetables at the moment. It might be possible to expand this a little by introducing treadle pumps.			
Other			
N/A			

Number	Township	Village Tract	Village
MY 31	Myebon	Nga Shwe Pyin	Taung Nyo
Introduction			
Taung Nyo has 80 households. 41 farmers cultivate 700 acres of paddy, and 6 farmers grow about 4 acres of winter crops. There are 15 fishermen, and 24 landless households.			
Embankments			
See MY 30. A small part of Taung Nyo's paddy fields are protected by the embankment of Nga Shwe Pyin and two other villages (see MY 28).			

Number	Township	Village Tract	Village
MY 31	Myebon	Nga Shwe Pyin	Taung Nyo
Sluices See MY 30.			
Drinking water The village has two wells and two ponds, of which one well and one pond are used for drinking. For about 2 ½ months of the year, there is not enough water, and people go to Taung Maw and Nga Shwe Pyin. People asked for another well. If land is available, another pond might be a better idea.			
Irrigation See MY 30.			
Other N/A			

5.5.5 GANT GAW (MY 52), YAE SHIN (MY 53)

Number	Township	Village Tract	Village
MY 52	Myebon	Yae Shin	Gant Gaw
Introduction Gant Gaw has 195 households. Of these, 132 cultivate about 800 acres of paddy. 10 farmers grow 5 acres of winter crops. 24 households have 72 acres of nipa palms. There are 60 landless households.			
Embankments The paddy fields are protected by two embankments. North of the village, there is an embankment of 2,500 feet around 18 acres of paddy. This embankment must be upgraded to an average height of 6 feet. This will require about 125,000 ft ³ of work (3,500 m ³). This will cost about 6.0 million MMK (7,000 USD). South of the village, there is an embankment of around 14,000 feet around 380 acres of paddy. This embankment must be upgraded to an average height of 6.5 feet. This will require about 1.0 million ft ³ of work (28,200 m ³). This will cost about 48 million MMK (56,300 USD).			
Sluices The fields of Gant Gaw are in Tidal Zone III. The northern embankment has one wooden sluice; the southern embankment has four wooden sluices. The northern embankment has a catchment area of about 120 acres, of which 20% is low-lying. This means that a single sluice opening is needed. The southern embankment has a catchment area of about 750 acres, of which about 45% is low-lying. This means that 750 / 125 ~ six sluice openings are needed.			
Drinking water The village has two springs and two wells. It has enough drinking water throughout the year.			
Irrigation It might be possible to irrigate some winter crops near blocked creeks using treadle pumps.			
Other N/A			

Number	Township	Village Tract	Village
MY 53	Myebon	Yae Shin	Yae Shin
Introduction Yae Shin has 355 households. 250 farmers cultivate 2,500 acres of paddy. 15 farmers grow 10 acres of winter crops. There are 30 fishermen, and 88 landless households.			

Number	Township	Village Tract	Village
MY 53	Myebon	Yae Shin	Yae Shin
<p>Embankments</p> <p>There are about 170 acres of paddy fields adjoining the village. This area is protected by an embankment of 6,500 feet long. This embankment must be upgraded to an average height of 5 feet. This will require about 333,000 ft³ of work (9,400 m³). This will cost about 16.0 million MMK (18,800 USD).</p> <p>The majority of the village's fields however are located on a large island just across the creek in front of the village. The paddy fields on this island are protected by two ring embankments. The first embankment is about 60,000 feet long – but 25,000 feet is rehabilitated by the Irrigation Department, so 35,000 feet remains to be done. It encloses an area of about 2,400 acres. This embankment must be upgraded to an average height of 6.5 feet. This will require about 2.5 million ft³ of work (70,500 m³). This will cost about 120 million MMK (141,000 USD). These fields are also cultivated by farmers from several other villages.</p> <p>The second embankment is about 37,000 feet long and encloses an area of about 1,400 acres. It must be upgraded to an average height of 6.5 feet. This will require about 2.6 million ft³ of work (74,500 m³). This will cost about 126 million MMK (149,000 USD).</p>			
<p>Sluices</p> <p>All the embankments of Yae Shin only have wooden embankments, with exception of a single damaged concrete sluice in the northern embankment on the island. The area is on the border of Tidal Zones II and III. The embankment near the village has a catchment area of about 275 acres, of which 40% is low-lying. A single sluice of the type for Tidal Zone II is enough.</p> <p>The northern embankment on the island has a catchment area of 2,400 acres, all of which is low-lying. This embankment needs to be fitted with nine sluice openings of the type for Tidal Zone II.</p> <p>The southern embankment on the island has a catchment area of 1,400 acres, all of which is low-lying. This embankment must be fitted with four sluice openings of the type for Tidal Zone II and two of the type for Tidal Zone III.</p>			
<p>Drinking water</p> <p>The village faces some shortage in the dry season, but there is a spring nearby. People asked for two water collection tanks (one near the spring, and one near the village) that will be connected by a pipeline.</p>			
<p>Irrigation</p> <p>It might be possible to promote the use of treadle pumps near blocked creeks.</p>			
<p>Other</p> <p>N/A</p>			

5.5.6 NGA SHWE PYIN (MY 28), NGA SHWE PYIN (NORTH) (MY 29)

Number	Township	Village Tract	Village
MY 28	Myebon	Nga Shwe Pyin	Nga Shwe Pyin
<p>Introduction</p> <p>Nga Shwe Pyin has 145 households. Of these, 40 cultivate 567 acres of paddy. 15 farmers grow 10 acres of winter crops. There are 6 fishermen, and 99 landless households. Low-lying paddy fields are used for prawn cultivation in the dry season.</p>			
<p>Embankments</p> <p>The paddy fields of Nga Shwe Pyin, Nga Shwe Pyin (North) (MY 29), Tha Yet Taw (not on Tat Lan list) and a small part of the fields of Taung Nyo (MY 31) are located at the foot of a long row of hills. It is possible to only rehabilitate the embankment for the first two villages, but it might be more sensitive to extend the embankment all the way up to Tha Yet Taw. In the first case, the embankment will be about 19,200 feet long. In the second case, the embankment will be about 29,200 feet long. This embankment will need to be rehabilitated up to an average height of about 6.5 feet.</p> <p>For only the embankment of the two targeted villages, this will require about 1.3 million ft³ of work (36,800 m³). This will cost about 62.4 million MMK (73,400 USD).</p> <p>If the embankment is renovated all the way up to Tha Yet Taw, this will require about 2.0 million ft³ of work (56,000 m³). This will cost about 95 million MMK (112,000 USD).</p>			

Number	Township	Village Tract	Village
MY 28	Myebon	Nga Shwe Pyin	Nga Shwe Pyin
Sluices This area falls into Tidal Zone II. The catchment area of the embankment for Nga Shwe Pyin and Nga Shwe Pyin (North) is about 1,400 acres, of which 30% is low-lying. This means that a total of 1,400 / 330 ~ 5 sluice openings are needed (or two sluice openings of 6' wide and two of 5' wide). There are currently only wooden sluices in the embankment, and they are in poor condition, so the sluices must all be replaced. If the embankment is renovated for all three villages, it will have a catchment area of about 2,000 acres. In this case, 2,000 / 330 ~ 6 sluice openings are needed.			
Drinking water There is enough drinking water in the village.			
Irrigation About 2 acres are irrigated from hand-dug wells. It might be possible to dig a few more wells near the hills and expand irrigation using treadle pumps.			
Other N/A			

Number	Township	Village Tract	Village
MY 29	Myebon	Nga Shwe Pyin	Nga Shwe Pyin (North)
Introduction Nga Shwe Pyin (North) has 76 households. 30 households are into farming, and cultivate 450 acres. The remaining households are landless labourers.			
Embankments See MY 28.			
Sluices See MY 28			
Drinking water This village has two ponds and four wells. One pond is damaged. The village has some shortage during the dry season. People then collect water from the adjoining village. It would be good to repair the damaged pond.			
Irrigation N/A			
Other N/A			

5.5.7 CHAUNG KYA (LOWER) (MY 02), CHAUNG KYA (UPPER) (MY 03), PIN KHAR (MY 04), HLA LAR KYA (MY 10), IN DAING GYI (MY 12), KAN YAN PYIN (MY 13), LA HAR GYI (MY 14), KYAUK HPA LAR (MY 15)

Number	Township	Village Tract	Village
MY 02	Myebon	Chaung Kya	Chaung Kya (Lower)
Introduction This village has 72 households. 24 farmers cultivate about 137 acres. Ten of them cultivate a total of 5 acres of winter crops in the dry season. There are 20 fishermen. The remaining 28 households are dependent on casual labour. There are no prawn ponds in this village.			
Embankments The villages in this cluster are located on two islands that are separated by a narrow creek. The total catchment area is about 9,500 acres, and together the villages have about 4,000 acres of paddy fields. These villages can be treated as one cluster, because the north and south side of the creek and the paddy fields have been blocked by large embankments that were constructed by the Irrigation Department. There is no need for Tat Lan to be involved in any embankment construction here.			

Number	Township	Village Tract	Village
MY 02	Myebon	Chaung Kya	Chaung Kya (Lower)
<p>Sluices The embankments built by the Irrigation Department are properly constructed, but so far the Irrigation Department has not been able to construct outlet structures that are big enough to evacuate the drainage water. As a consequence, the embankments have failed regularly over the past couple of years. There are currently four sluice structures with a total of 15 openings of 6 feet wide and 3 openings of 5 feet wide. This is equivalent to 21 sluice openings of 5 foot wide as proposed for Tat Lan. One of the sluice structures with five 6-foot wide sluice openings is not operational. One reason that is given is that nearby farmers refuse to give up land for the access channel; another reason that is given is that no proper sluice gates have been fitted as yet..</p> <p>The sluices are located in Tidal Zone II. For a total catchment area of 9,500 acres with 40% low-lying area, a total of 9,500 / 300 ~ 32 sluice openings are needed. This means that an additional 11 sluice openings of 5' wide are needed. If the Irrigation Department is not going to do this, these additional sluices should be included under Tat Lan.</p>			
<p>Drinking water This village has two ponds and three wells. Only one well is for drinking; the other water points are for domestic use. Because the well has a slow recharge rate, there is a shortage of water in the last two months of the dry season. When that happens, people go to a spring several hundred metres outside the village (it takes about one and a half hours to make one trip to the spring). People asked for an extra well in the village. A location has already been identified by the villagers. If the problem is lack of recharge, another well might help a little bit. If the water level goes down because the total availability is limited, then adding another well is not going to make a difference. What is needed then is one or more recharge ponds.</p>			
<p>Irrigation Currently, some people grow second crops on the residual soil moisture, and if necessary they dig small wells and irrigate from them. By using treadle pumps to take water from creeks or handdug wells in the fields, people can expand the area under winter crops.</p>			
<p>Other N/A</p>			

Number	Township	Village Tract	Village
MY 03	Myebon	Chaung Kya	Chaung Kya (Upper)
<p>Introduction This village has 183 households. 58 farmers cultivate 816 acres. Two of these also cultivate a total of about an acre of winter crops. The other 125 households are landless and mostly dependent on casual labour. There are no prawn ponds in this village.</p>			
<p>Embankments See MY 02</p>			
<p>Sluices See MY 02</p>			
<p>Drinking water The village faces a water shortage during the last two months of the dry season because recharge to the existing wells is very slow. When that happens, people go to a spring several hundred metres out of the village. People have requested for a storage tank at the spring to capture the night flow and thus increase the effective yield of the spring</p>			
<p>Irrigation See MY 02</p>			
<p>Other N/A</p>			

Number	Township	Village Tract	Village
MY 04	Myebon	Chaung Kya	Pin Khar
<p>Introduction Pin Khar has 67 households. 19 farmers cultivate 142 acres. The other 48 households are landless and mostly dependent on casual labour. There are no prawn ponds in this village.</p>			
<p>Embankments See MY 02</p>			

Number	Township	Village Tract	Village
MY 04	Myebon	Chaung Kya	Pin Khar
Sluices See MY 02			
Drinking water The village has two ponds and four wells, of which three wells are for drinking water. During the dry season, the recharge is slow, and people go to a spring between Pin Khar and Chaung Kya to fetch water. People asked for help in renovating the ponds, which will not only increase storage, but will also increase groundwater recharge during the dry season.			
Irrigation See MY 02			
Other N/A			

Number	Township	Village Tract	Village
MY 10	Myebon	Hpa Lar Kya	Hpa Lar Kya
Introduction This village has 420 households. 123 farmers cultivate 991 acres of paddy; 30 among them also cultivate winter crops on a total of about 4 acres. The remaining 297 households are landless and dependant on casual labour. There are no prawn ponds in this village.			
Embankments See MY 02			
Sluices See MY 02			
Drinking water The village has one pond and ten wells, three of which are used for drinking. During the dry season, recharge is slow and people ration the water from the wells or go to a spring (which is timeconsuming). In order to increase the availability of drinking water, people have asked for help to repair the existing pond and construct a new pond. Also, some of the wells need some work after they were affected by saltwater during Giri. It might also be good to look at possibilities for constructing one or more recharge basins upstream from the village.			
Irrigation See MY 02.			
Other N/A			

Number	Township	Village Tract	Village
MY 12	Myebon	Ka Yan Pyin	In Daing Gyi
Introduction In Daing Gyi has 40 households. 18 farmers cultivate 109 acres; one is a fisherman, and the remaining 21 households depend on casual labour. There are no prawn ponds in this village.			
Embankments See MY 02			
Sluices See MY 02			
Drinking water The village has one pond for domestic use and one drinking water well. The pond was damaged during Giri. For two months every year, there is a water shortage. People go to Kha Yan Pyin, but there the yield is not large, so people need to queue. Some people take water at night, which is risky given the presence of snakes and centipedes. People requested for renovation of the pond, and for construction of another well. If the problem is lack of recharge, another well might help a little bit. If the water level goes down because the total availability is limited, then adding another well is not going to make a difference. What is needed then is one or more recharge ponds.			
Other N/A			

Number	Township	Village Tract	Village
MY 13	Myebon	Kha Yan Pyin	Kha Yan Pyin

Number	Township	Village Tract	Village
MY 13	Myebon	Kha Yan Pyin	Kha Yan Pyin
Introduction The village has 40 households. 21 farmers cultivate 149 acres of rainfed paddy. Three of them cultivate about two acres of winter crops. The other 19 households depend on casual labour. There are no prawn ponds in this village.			
Embankments See MY 02			
Sluices See MY 02			
Drinking water The village has two ponds and two wells, of which one well is used for drinking water. There is also a small spring. During the dry season, there is a water shortage and people depend on the spring (also people from MY 12). The yield is low however. If a storage tank is built, the night flow can be harvested and the effective yield will increase.			
Irrigation See MY 02			
Other N/A			

Number	Township	Village Tract	Village
MY 14	Myebon	Kha Yan Pyin	La Har Gyi
Introduction This village has 83 households. 44 households cultivate 520 acres of rainfed paddy. Of these, 7 households cultivate about 2 acres of winter crops. The other 39 households are landless and depend on casual labour. There are no prawn ponds in this village.			
Embankments See MY 02			
Sluices See MY 02			
Drinking water The village has two ponds and two wells, of which one well is used for drinking purposes. The other water points are for domestic use and for livestock. In the dry season, there is a shortage for about two months. During this period, people use a small spring near the village. The problem is that the yield of the spring is very low. People asked for a storage tank near the spring to collect the night flow, and also for an additional well in the village. If the sluices are fitted with proper gates, salinity in the creeks will go down, and it might be possible to let the livestock drink from the creeks instead of from the ponds.			
Irrigation See MY 02			
Other N/A			

Number	Township	Village Tract	Village
MY 15	Myebon	Kyauk Hpya Lar	Kyauk Hpya Lar
Introduction This village has 259 households. 106 households cultivate rainfed paddy on 623 acres. Of these, 30 households cultivate winter crops on about 5 acres. There are three fishermen, and the remaining households depend on casual labour. There are no prawn ponds in this village.			
Embankments See MY 02. Outside the Irrigation Department embankments, this village also has an embankment of 6,300 feet long that protects about 100 acres of paddy. This embankment will require about 775,000 million ft ³ of work (22,000 m ³). This will cost about 37.1 million MMK (43,600 USD).			

Number	Township	Village Tract	Village
MY 15	Myebon	Kyauk Hpya Lar	Kyauk Hpya Lar
Sluices See MY 02. The embankment outside the Irrigation Department embankment has a catchment area of 170 acres. About 60% of this is low-lying land. This means that the area needs one sluice of the design for Tidal Zone II, or two sluice openings of the design for Tidal Zone III. The second option is probably cheaper.			
Drinking water The village has some shortage of water in the dry season. There are three ponds and nine wells, of which only one well is used for drinking purposes. When they dry up, people go to a spring, but this is timeconsuming. The ponds are affected by salinity. People asked for renovation of the ponds.			
Irrigation The only option for irrigation is by promoting treadle pump irrigation from creeks after any remaining salinity has been flushed out.			
Other N/A			

5.5.8 THA YAR WA DI (MY 09), DAING BON (MY 05), KYAUK MOE (MY 06), KYAUK TAN (MY 07), MAUNG SHIN (MY 08)

Number	Township	Village Tract	Village
MY 09	Myebon	Daing Bon	Tha Yar Wa Di
Introduction MY 05, MY 06, MY 07, MY 08 and MY 09 are all located on the eastern side of a row of hills. Tha Yar Wa Di village has 38 households. 8 farmers cultivate 56 acres of paddy, and five of them cultivate 3 acres of winter crops. There are 11 fishermen, and 19 landless households. The village has no prawn ponds.			
Embankments Tha Yar Wa Di has an embankment around its paddy fields that encloses both the paddy fields on the east of the village and a valley to the northwest of the village. Together, these fields are about 80 acres in size. It has a length of 7,500 feet and needs to be rehabilitated up to a height of on average 7.5-8 feet. This embankment will require about 900,000 ft ³ of work (25,500 m ³). This will cost about 43 million MMK (50,500 USD).			
Sluices The embankment of Tha Yar Wa Di currently has six wooden sluices of 3 feet wide. It has a catchment area of about 360 acres, of which about 40% is low-lying. As it is located on the border of Tidal Zone II and III, this means that 360 / 210 ~ 2 sluice openings are needed. In principle, the existing wooden sluices are sufficient, but if they can be replaced by concrete sluices that will substantially reduce the maintenance cost to the farmers.			
Drinking water The village has one pond, four (unlined) hand-dug wells and one water collection tank on the hillside. Only one of the well has good water throughout the year. It is located on the other side of a small hill behind the village. People have requested for upgrading this well. The wells in the village do not have good water, and they carry very little water at the end of the dry season.			
Irrigation Currently, some people grow second crops on the residual soil moisture, and if necessary they dig small wells and irrigate from them. By using treadle pumps to take water from creeks or handdug wells in the fields, people can expand the area under winter crops.			
Other N/A			

Number	Township	Village Tract	Village
MY 05	Myebon	Daing Bon	Daing Bon
Introduction Daing Bon has 233 households. 97 are engaged in farming, cultivating 2,295 acres of paddy. 70 households are engaged in fishing, and the remaining 70 are dependent on casual labour. About 122 households grow nipa palms on about 300 acres. There are no prawn ponds in this village.			

Number	Township	Village Tract	Village
MY 05	Myebon	Daing Bon	Daing Bon
<p>Embankments The paddy fields to the north of Daing Bon are protected by an embankment of 9,300 feet that needs to be rehabilitated up to a height of on average 7.5-8 feet. This embankment will require about 1.1 million ft³ of work (31,500 m³). This will cost about 53.3 million MMK (62,700 USD).</p> <p>The paddy fields of (the southern part of) Daing Bon (MY 05), Kyauk Moe (MY 06), Kyauk Tan (MY 07), Maung Shin (MY 08) and Maung Shin Kone Tan (not on Tat Lan list) are located along one long row of hills, and are protected by a single embankment of about 23,500 feet long. This embankment must be rehabilitated to an average height of 7.5-8 feet. This embankment will require about 3.0 million ft³ of work (86,000 m³). This will cost about 145 million MMK (171,000 USD).</p>			
<p>Sluices The embankments of these villages are in tidal Zone III. The catchment area of the northern embankment is about 100 acres, of which 35% is low-lying. This means that one sluice is required. It currently has three sluices of 3' wide, but made of wood.</p> <p>The catchment area of the southern embankment is about 1,900 acres, of which 50% is low-lying. This means that 1,900 / 125 ~ 15 sluices are required. It currently has one concrete sluice with two openings of 6' wide and 16 wooden sluices (openings about 3' wide). While there are about enough sluices at the moment, it would be good to replace the wooden sluices by 13 sluice openings of the proposed standard design for Tidal Zone III. If this is not done, in any case the existing sluices must be fitted with flap gates.</p>			
<p>Drinking water The village has some shortage (for about 1.5 months per year). When this happens, people go to a spring. It takes about an hour to go there and come back. The village has five ponds and four wells. Three wells are used for drinking water, but their yield declines in the dry season. People have asked for another pond, and for construction of a storage reservoir near the spring. If the problem is lack of recharge, another well might help a little bit. If the water level goes down because the total availability is limited, then adding another well is not going to make a difference. What is needed then is one or more recharge ponds.</p>			
<p>Irrigation See MY 09</p>			
<p>Other Between MY 07 and MY 08, there is an embankment that serves as an access road. This embankment is 3,200 feet long. Raising and widening it will require about 73,600 ft³ of work (2,100 m³). This will cost about 3.5 million MMK (4,200 USD).</p>			

Number	Township	Village Tract	Village
MY 06	Myebon	Daing Bon	Kyauk Moe
<p>Introduction This village has 83 households. 47 engage in the cultivation of 350 acres of rainfed paddy. 18 of the farmers cultivate a total of 3 acres of winter crops. 10 farmers have 10 acres of nipa palms. There are seven fishermen, and 29 landless households.</p>			
<p>Embankments See MY 05</p>			
<p>Sluices See MY 05</p>			
<p>Drinking water The village has a pond, four wells (one is used for drinking) and two springs, and there is one water collection tank. The wells and ponds dry up in April. People then depend on the springs. There is one water collection tank. It is not clear if any measures (another water collection tank, another well, another pond, or recharge ponds) are needed and useful.</p>			
<p>Irrigation See MY 09</p>			
<p>Other N/A</p>			

Number	Township	Village Tract	Village
MY 07	Myebon	Daing Bon	Kyauk Tan

Number	Township	Village Tract	Village
MY 07	Myebon	Daing Bon	Kyauk Tan
Introduction			
This village has 89 households. 50 farmers cultivate 300 acres of rainfed paddy (some of this land must be away from the village), and five of them cultivate 2.5 acres of winter crops. The other 39 households are landless and depend on casual labour. About 120 acres of paddy land close to the village are planted with short-duration paddy, and then converted into prawn ponds for the dry season.			
Embankments			
See MY 05. The villagers also want to rehabilitate the boundary embankment between Kyauk Tan and Kyauk Moe (3,200 feet long). This embankment is used for road access. Although the access road is important, it does not protect the paddy fields against the sea and should be given low priority. Once the fields are protected by the outer embankment, the water level inside the fields will not get very high anymore, and the access road will probably not need too much work anymore.			
Sluices			
See MY 05			
Drinking water			
The village has two ponds (one average, one small), seven wells (one damaged, and three for drinking water) and a spring. In the dry season the quality and quantity of the water reduce, and people depend on the spring, which means people have to wait in the queue for a long time. Some people go to Gant Gaw instead to collect drinking water, even though a trip takes at least four hours. People want to upgrade the spring source and improve the existing wells. If there is not enough water in the aquifer, it might be worth investigating the usefulness of recharge reservoirs.			
Irrigation			
See MY 09			
Other			
N/A			

Number	Township	Village Tract	Village
MY 08	Myebon	Daing Bon	Maung Shin
Introduction			
This village has 338 households. 165 farmers cultivate 1,150 acres of paddy. 25 of them cultivate about 6 acres of winter crops. The other 173 households are landless. Part of the paddy fields are double-cropped: after the harvest, salt water is allowed into the fields, and people grow prawns. After the prawns are harvested at the start of the rainy season, the saltwater is flushed out and people grow paddy using zero tillage. This has increased the yields quite a lot compared to their earlier, more traditional system of cultivation.			
Embankments			
See MY 05.			
On the opposite side of the large creek in front of the village, there is a polder known as the Set Pyin field that is also cultivated by Maung Shin farmers. This polder has an embankment of 40,000 feet long. The entire polder is about 1,200 acres, of which 626 acres of paddy field belong to Maung Shin. The embankment will need to be renovated to an average height of 7.5 feet. This will require about 4.8 million ft ³ of work (136,000 m ³). This will cost about 230 million MMK (270,000 USD).			
Sluices			
See MY 05. The Set Pyin field has no sluices. For this polder, a total of 1,200 / 110 ~ 11 sluice openings are needed.			
Drinking water			
This village has four ponds and many wells. The problem is however that the wells are shallow, and they dry up towards the end of the dry season. If there is shortage, people go by boat to Gant Gaw to collect water. Either the existing wells should be deepened, or groundwater recharge should be enhanced using ponds.			
Irrigation			
See MY 09			
Other			
N/A			

5.6 SUMMARY OF SUGGESTED INTERVENTIONS IN MYEBON

The table below summarises the possible interventions in Myebon Township, which covers about 40% of all Tat Lan villages.

As can be seen, the total budget required for addressing all embankments and sluices in the 49 villages is between 7.1 and 8.8 million USD. This involves about 3.5 to 4.4 million m³ of earthworks, the construction of 267-357 sluice openings (0 of the type for Tidal Zone I, 131-227 of the type for Tidal Zone II, 111-130 of the type for Tidal Zone III and 9-16 concrete pipes), and the repair of 38-44 sluice openings.

Note that there are 11 villages that do not require embankments or sluices, or where construction of embankments and sluices is not financially feasible due to the shape of the landscape.

For irrigation development, there are eight villages where small dams or weirs can be constructed. This will cost about 140,000 to 275,000 USD, and benefit about 120-150 acres of winter crops. In several villages, there is potential for the introduction of treadle pumps. These can be either distributed, or demonstrated and linked to microcredit interventions.

In order to bring drinking water availability up to standard in all 62 villages on the list, the following interventions are needed:

- Enlarge, deepen or and/or fence 48-59 ponds
- Construct 9-22 ponds
- Provide lining for 0 ponds
- Upgrade 5-7 springs
- Construct 8-23 wells
- Renovate 26-40 wells
- Construct 2-18 recharge basins

This will cost anywhere between 150,000 and 300,000 USD (but probably around 200,000 USD).

Apart from embankments, sluices, irrigation infrastructure and drinking water infrastructure, also some other infrastructure is needed:

- Upgrade 2 village access roads
- Construct 7 cyclone shelters for 9 villages in flat areas where people have no hills to run to
- Upgrade 2 embankments to protect villages against floods
- Improve one short drainage channel.

This will cost anywhere between 150,000 and 300,000 USD.

Besides, a reservation must be made for planting mangroves.

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 01	Done by ID		- Only if ID does not do this: Construct at most 13 sluice openings (T.Z. II type) and fix flap gates to existing gates	250,000-330,000	Possibly introduce treadle pumps	PM	Fencing for 2 ponds	PM	Cyclone shelter	PM
MY 02	Done by ID		- Construct 11 sluice openings (T.Z. II type) if ID does not do this	200,000-275,000	Possibly introduce treadle pumps	PM	Construct 1 well or construct 1-2 recharge ponds	PM	N/A	-
MY 03	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Construct storage tank near spring	PM	N/A	-
MY 04	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Renovate 2 ponds	2,000-4,000	N/A	-
MY 05	117,500	233,700	Construct 14 sluice openings (T.Z. III design)	70,000-112,000	Possibly introduce treadle pumps	PM	Construct 1 well or construct 2-3 recharge ponds	PM	N/A	-
MY 06	See MY 05	See MY 05	See MY 05	See MY 05	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 07	See MY 05	See MY 05	See MY 05	See MY 05	Possibly introduce treadle pumps	PM	Upgrade 1 spring and either improve 4 wells or construct 1-2 recharge ponds	PM	Renovate access road (2,100 m ³ earthworks)	4,200
MY 08	136,000 And see MY 05	270,000 And see MY 05	Construct 11 sluice openings (T.Z. III type) And see MY 05	55,000-88,000 And see MY 05	Possibly introduce treadle pumps	PM	Deepen 5 wells or construct 1-2 recharge ponds	PM	N/A	-
MY 09	25,500	50,500	Construct 2 sluice openings (T.Z. II type)	35,000-50,000	Possibly introduce treadle pumps	PM	Upgrade 1 well and construct 1 recharge pond	PM	N/A	-
MY 10	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Construct 1-3 recharge ponds	2,000-9,000	N/A	-
MY 11	31,500	63,000	Construct 1 sluice opening (T.Z. III type)	5,000-8,000	N/A	-	Construct 1 well or upgrade 1 spring	PM	N/A	-
MY 12	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Construct 1 well or construct 1-2 recharge ponds	PM	N/A	-
MY 13	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Construct storage tank near spring	PM	N/A	-

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 14	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Construct storage tank near spring and construct 1 well	PM	N/A	-
MY 15	See MY 02	See MY 02	See MY 02	See MY 02	Possibly introduce treadle pumps	PM	Repair 3 ponds	3,000-6,000	N/A	-
MY 16	See MY 46. (and one embankment done by ID)	See MY 46	See MY 46	See MY 46	See MY 46	See MY 46	Construct 1 pond or deepen 1 pond	1,000-3,000	N/A	-
MY 17	Done by ID	-	Only if ID does not construct/repair sluices	PM	Possibly introduce treadle pumps	PM	Fencing for 2 ponds	PM	Cyclone shelter	PM
MY 18	2,500 And see MY 67	5,000 And see MY 67	Construct 2 concrete pipes (1' or 1'6" diameter) And see MY 67	2,000-5,000 And see MY 67	Possibly introduce treadle pumps	PM	Construct 1 pond or enlarge 3 ponds or construct 1 well	PM	N/A	-
MY 19	159,000	391,500	Construct 7 sluice openings (T.Z. II type) and repair 13 sluice openings (incl. fitting flap gates)	140,000-175,000	Possibly introduce treadle pumps	PM	Construct 1-2 wells or construct 1 pond	PM	N/A	-
MY 20	See MY 67	See MY 67	See MY 67	See MY 67	See MY 67	See MY 67	Construct 1 well or construct 1 pond	PM	N/A	-
MY 21	N/A	-	N/A	-	N/A	-	Strengthen bunds around 3 ponds and provide fencing for 3 ponds	PM	Cyclone shelter (could be combined with MY 23)	PM
MY 22	37,300	74,200	2 sluice openings (T.Z. III type)	12,000-16,000	N/A	-	Fencing for 4 ponds	PM	Cyclone shelter	PM
MY 23	N/A	-	N/A	-	N/A	-	Strengthen bunds around 2 ponds	PM	Village protection bund (2,500 m ³ earthworks) Cyclone Shelter (could be combined with MY 21)	5,000 + PM
MY 24	Village no longer exists									

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 25	Done by ID		- 6 sluice openings (T.Z. II type) if ID does not do this	Possibly 100,000-150,000	Possibly introduce treadle pumps	PM	Fencing for 5 ponds, deepen 1 pond, raise embankment around 1 pond	PM	Cyclone shelter (could be combined with MY 26)	PM
MY 26	Done by ID		- See MY 25	See MY 25	Possibly introduce treadle pumps	PM	Construct 1-2 ponds or deepen 2 ponds	2,000-6,000	Cyclone shelter (could be combined with MY 25)	PM
MY 27	1,600 And see MY 19	3,100 And see MY 19	Construct 1 sluice opening (T.Z. II type)	20,000-25,000	Possibly construct 1 small dam	30,000-40,000	Repair 1 spring storage tank and pipeline or construct 1 pond or construct 1 well	PM	N/A	-
MY 28	36,800-56,000	73,400-112,000	Construct 5 or 6 sluice openings (T.Z. II type)	100,000-150,000	Dig additional irrigation wells and introduce treadle pumps	PM	N/A	-	N/A	-
MY 29	See MY 28	See MY 28	See MY 28	See MY 28	N/A	-	Repair 1 pond	1,000-2,000	N/A	-
MY 30	Done by ID		- Repair 5 sluice openings and fit with flap gates	5,000-15,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 31	See MY 30 and see MY 28	See MY 30 and see MY 28	See MY 30 and see MY 28	See MY 30 and see MY 28	Possibly introduce treadle pumps	PM	Construct 1 well or construct 1 pond	PM	N/A	-
MY 32	49,000 (and see MY 58)	97,000 (and see MY 58)	Fit 8 sluice openings with flap gates	5,000-25,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 33	1,800	3,600	Repair 2 sluice structures (3 openings)	6,000-15,000	N/A	-	Construct 1 pond	2,000-3,000	N/A	-
MY 34	10,600	21,100	Construct 4 sluice openings (T.Z. III type) or 2 sluice openings (T.Z. III type) plus 1 overflow weir	22,000-30,000	Renovate 1 small dam	25,000-40,000	N/A	-	N/A	-
MY 35	N/A		- N/A		- Renovate storage embankment (including spillway structure)	10,000-25,000	Construct 1 pond	2,000-3,000	N/A	-

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 36	See MY 32	See MY 32	See MY 32	See MY 32	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 37	See MY 32	See MY 32	See MY 32	See MY 32	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 38	27,000	54,000	Construct 1 sluice opening (T.Z. III type), fix flap gates to 3 sluice openings	8,000-15,000	Possibly introduce treadle pumps	PM	Provide lining and roof for 1 well	PM		
MY 39	53,400	106,500	7 sluice openings (T.Z. III type)	30,000-55,000	Construct low weirs in creeks	PM	N/A	-	N/A	-
MY 40	2,800 (and see MY 39)	5,600 (and see MY 39)	See MY 39	See MY 39	See MY 39	See MY 39	Construct 1 pond	2,000-3,000	NA	-
MY 41	See MY 25	See MY 25	See MY 25	See MY 25	Possibly introduce treadle pumps	PM	Fencing for 3 ponds.	PM	Cyclone shelters	PM
MY 42	See MY 25	See MY 25	See MY 25	See MY 25	Possibly introduce treadle pumps	PM	N/A	-	Cyclone shelters	PM
MY 43	345,000 or 775,000	690,000 or 1,500,000	Construct 45 sluice openings (T.Z. II type) Or construct about 25 sluice openings (T.Z. II type)	500,000-1,000,000 or 350,000-600,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 44	N/A	-	N/A	-	Construct irrigation wells along stream	PM	Enlarge 1 or 2 ponds	1,000-4,000	Improve drainage (300-600 m ³ excavation)	500-1,000
MY 45	Detailed study needed to assess possibility of embankments	PM	To be studied	PM	N/A	-	Construct 3 or 4 lined wells. Construct 1 pond	PM	N/A	-
MY 46	75,600	151,000	Repair 1 sluice opening and construct 7 sluice openings (T.Z. III type)	35,000-60,000	Construct irrigation wells and/or low weirs across creeks/streams	PM	Construct 1 pond	2,000-3,000	N/A	-
MY 47	19,200	38,200	Construct 4 concrete pipes (2'diameter)	3,000-6,000	N/A	-	Upgrade 1 pond or construct 1 pond	1,000-3,000	N/A	-

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 48	14,200	28,000	Construct 1 sluice opening (T.Z. II type)	20,000-25,000	N/A	-	Provide lining and roofing for 1 well	PM	N/A	-
MY 49	5,800	13,500	Construct 1 sluice opening (T.Z. II type)	20,000-25,000	N/A	-	Provide roofing for 1 well	PM	N/A	-
MY 50	1,200-5,000	2,400-10,000	N/A	-	N/A	-	Provide lining and roofing for 3 wells	PM	N/A	-
MY 51	64,000	127,500	Construct 4 sluice openings (T.Z. III type).	20,000-30,000	N/A	-	N/A	-	N/A	-
MY 52	31,700	63,300	Construct 7 sluice openings (T.Z. III type)	35,000-55,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 53	153,400	308,800	Construct 14 sluice openings (T.Z. II type) and 2 sluice openings (T.Z. III type)	275,000-365,000	Possibly introduce treadle pumps	PM	Upgrade 1 spring with 2 storage tanks and a pipeline	PM	N/A	-
MY 54	N/A	-	N/A	-	N/A	-	Construct 1 well or 1 recharge basin	PM	Access road MY 55-MY54-MY59 (2.5-3 km long)	12,000-30,000
MY 55	N/A	-	N/A	-	Renovate 3 small dams (including spillway structures)	40,000-70,000	Construct 1 pond	2,000-3,000		
MY 56	19,200	38,000	Construct 1 sluice opening (T.Z. II type)	20,000-25,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 57	See MY 58	See MY 58	See MY 58	See MY 58	Possibly introduce treadle pumps	PM	Construct 1 well	PM	N/A	-
MY 58	58,500	117,000	Construct 8 sluice openings (T.Z. III type)	40,000-65,000	Possibly construct 1 small dam	25,000-40,000	N/A	-	N/A	-

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 59	77,200 (and one embankment done by ID)	154,400	Construct 15 sluice openings (T.Z. III type), fit flap gates to 2 sluice openings. If ID does not take on sluices along its embankment, construct 5 more sluice openings (T.Z. III type) and fix flap gates to 2 more sluice openings	75,000-125,000. If ID does not take on sluices, add 25,000-45,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-
MY 60	N/A	-	N/A	-	N/A	-	Construct 1 pond	2,000-3,000	N/A	-
MY 61	8,000	15,900	Construct 2 concrete pipes (2' diameter)	2,000-6,000	N/A	-	Construct 1 pond	2,000-3,000	N/A	-
MY 62	N/A	-	N/A	-	N/A	-	Enlarge 2 ponds	2,000-4,000	N/A	-
MY 63	40,100	79,700	Repair 1 sluice (T.Z. II type), construct 6 sluice openings (T.Z. II type), construct 2 sluice openings (T.Z. III type), construct 1 concrete pipe (2' diameter)	135,000-180,000	N/A	-	N/A	-	N/A	-
MY 64	N/A	-	N/A	-	N/A	-	Construct 1 well	PM	N/A	-
MY 65	N/A	-	N/A	-	N/A	-	Construct 1 well	PM	N/A	-
MY 66	N/A	-	N/A	-	N/A	-	Construct 1 well	PM	N/A	-
MY 67	244,000	477,000	Construct 21 sluice openings (T.Z. II type)	400,000-525,000	N/A	-	Construct 1-2 wells or 1-2 ponds	PM	N/A	-
MY 68	77,800	153,000	Construct 5 sluice openings (T.Z. II type) and 1 sluice opening (T.Z. III type)	100,000-133,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 69	74,000	147,000	Construct 6 sluice openings (T.Z. III type)	30,000-48,000	Possibly introduce treadle pumps	PM	Repair 2 ponds	2,000-4,000	N/A	-
MY 70	59,500	99,000	Construct 1 sluice opening (T.Z. II type) or 3 sluice openings (T.Z. III type). Construct 2 sluice openings (T.Z. III type). Repair 1 sluice opening	30,000-40,000	Possibly introduce treadle pumps	PM	Provide fencing for 4 ponds and 5 wells, and roofing for 5 wells	PM	N/A	-
MY 71	141,000 Or 425,000	281,000 Or 850,000	Construct 4 sluice openings (T.Z. II type), construct 2 sluice openings (T.Z. III type), construct 3 concrete culverts (2' diameter) and fit flap gates to 2 sluice openings. Or Construct 35 sluice openings (T.Z. II type) and 1 sluice opening (T.Z. III type)	90,000-120,000 Or 650,000-880,000	Possibly introduce treadle pumps	PM	Construct 1-2 wells or 1-2 infiltration ponds	PM	1 embankment to protect the village and its drinking water resources (7,700 m ³)	15,400
MY 72	144,000	287,000	Construct 7 sluice openings (T.Z. III type – 4 x 6' wide, 3 x 4' wide)	35,000-55,000	Possibly introduce treadle pumps	PM	Repair 2 ponds and construct 1-2 ponds	4,000-10,000	N/A	-
MY 73	63,800	127,000	Construct 4 sluice openings (T.Z. II type) and repair 1 sluice opening (T.Z. III type)	80,000 – 100,000	Possibly introduce treadle pumps	PM	N/A	-	N/A	-

Village	Embankments		Sluices		Irrigation		Drinking water		Other infrastructure	
	M ³	US \$	No.	US \$	Intervention	US \$	Intervention	US \$	Intervention	US \$
MY 74	54,500	108,500	Construct 2 sluice openings (T.Z. II type, 4' wide)	35,000-50,000	N/A	-	Renovate 1-2 ponds and 0-4 wells	PM	N/A	-
MY 75	900	1,800	N/A	-	N/A	-	Provide lining and roof for 3 wells	PM	N/A	-
MY 76	12,000	24,100	Construct 2 sluice openings (T.Z. III type)	10,000-15,000	N/A	-	Provide fencing for 7 wells	PM	N/A	-
MY 77	43,200 or 106,000	86,000 or 211,000	Construct 1 sluice opening (T.Z. II type) and 1 sluice opening (T.Z. III type) or construct 3 sluice openings (T.Z. II type)	25,000-33,000 or 60,000-75,000	Possibly introduce treadle pumps	PM	Deepen 1 pond or construct 1 new pond. Provide fencing for 3 ponds.	PM	N/A	-
MY 78	250,000-300,000	500,000-600,000	Construct 9 sluice openings (T.Z. II type) and 8 sluice openings (T.Z. III type)	200,000-290,000	Possibly introduce treadle pumps	PM	Provide 4 wells with roofing and fencing	PM	N/A	-
MY 79	This village no longer exists (only migrant fishermen stay here)									
MY 80	258,000	515,000	Construct 18 sluice openings (T.Z. II type)	350,000-450,000	Possibly introduce treadle pumps	PM	Deepen 1 pond. Provide fencing for 2 ponds	PM	N/A	-
MY 81	520,000 or 488,000	1,050,000 or 974,000	Construct 15 sluice openings (T.Z. II type) or Construct 4 concrete pipes (2'dia), 7 sluice openings (T.Z. III type and 4 sluice openings (T.Z. II type)	275,000-375,000 or 120,000-170,000	Possibly introduce treadle pumps	PM	Provide fencing for 6 ponds	PM	N/A	-
Total	3,516,000 – 4,398,000	7,060,000-8,787,000	269-355 sluice openings	3,043,000-6,577,000		140,000-275,000 + PM for treadle pumps		150,000-300,000		150,000-300,000 + PM for mangrove replanting