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### Appendix-1. Member List of the Study Team

Name	Position/Expertise	Organization
Mr. Kenichiro KOBAYASHI	Director Team Leader	Rural Development Department Japan International Cooperation Agency (JICA)
Mr. Jun YAMAZAKI	Deputy Director Cooperation Planning	Rural Development Department Japan International Cooperation Agency (JICA)
Mr. Hironobu MORI	Consultant Team Leader / Embankment Construction Project Planning	Sanyu Consultants Inc.
Mr. Hironori TAKAHASHI	Construction Equipment Planning / Operation and Maintenance Planning	Project Operation Division No.3, International Department, Sanyu Consultants Inc.
Mr. Shigeru OTSUKI	Soil Laboratory / Operation and Maintenance Planning	Project Operation Division No.4, International Department, Sanyu Consultants Inc.
Mr. Yuichi MATSUMOTO	Procurement / Cost Estimation (1)	Project Operation Division No.3, International Department, Sanyu Consultants Inc.
Mr. Yoji SAWADA	Procurement / Cost Estimation (2)	Project Operation Division No.3, International Department, Sanyu Consultants Inc.

## Appendix-2. Study Schedule

### First Field Survey

No.	Month	Day	SANYU CONSULTANTS INC.					Accommodation	
			Hironobu Mori	Hironori Takahashi	Shigeru Otsuki	Yuichi Matsumoto	Yoji Sawada		
1	1	14	Sat	10:45 Tokyo TG641 → 17:55 Bangkok TG305 → 18:40 Yangon					Yangon
2	1	15	San	Team meeting					Yangon
3	1	16	Mon	Construction circle (9). ITC					Yangon. Bago
4	1	17	Tue	MoAI (ID) : Naypyitaw	Data Collection : MoAI, ID (Yangon), ITC (Bago)				Naypyitaw, Yangon
5	1	18	Wed	MoAI (ID) : Naypyitaw	Data Collection : MoAI, ID (Yangon), ITC (Bago)				Naypyitaw, Yangon
6	1	19	Thu	MoAI (ID) : Naypyitaw	Data Collection : MoAI, ID (Yangon), ITC (Bago)				Naypyitaw, Yangon
7	1	20	Fri	JICA Office : Yangon	Data Collection : MoAI, ID (Yangon), ITC (Bago)				Yangon
8	1	21	Sat	Data consolidation					Yangon
9	1	22	San	Data consolidation					Yangon
10	1	23	Mon	Additional data collection : ID, ITC					Yangon. Bago
11	1	24	Tue	Additional data collection : ID, ITC					Yangon. Bago
12	1	25	Wed	Data consolidation					Yangon
13	1	26	Thu	Additional data collection : ID, ITC					Yangon. Bago
14	1	27	Fri	Additional data collection : ID, ITC					Yangon. Bago
15	1	28	Sat	Data consolidation					Yangon
16	1	29	San	Data consolidation					Yangon
17	1	30	Mon	Additional data collection : ID, ITC					Yangon
18	1	31	Tue	Additional data collection : ID, ITC					Yangon
19	2	1	Wed	Data consolidation					Yangon
20	2	2	Thu	Data consolidation, 19:40 Yangon TG306 → 23:50 Bangkok TG642					Night flight
21	2	3	Fri	→ 08:10 Tokyo					

### Second Field Survey

No.	Month	Day	SANYU CONSULTANTS INC.					Accommodation	
			Hironobu Mori	Hironori Takahashi	Shigeru Otsuki	-	Yoji Sawada		
1	3	21	Wed	10:45 Tokyo TG641 → 17:55 Bangkok TG305 → 18:40 Yangon					Yangon
2	3	22	Thu	Data Collection : MoAI, ID (Yangon), ITC (Bago)					Yangon
3	3	23	Fri	Data Collection : MoAI, ID (Yangon), ITC (Bago)					Yangon
4	3	24	Sat	Data consolidation					Yangon
5	3	25	San	Data consolidation					Yangon
6	3	26	Mon	Data collection : Project area					Project area : (Labutta)
7	3	27	Tue	Data collection : Project area					Project area : (Labutta)
8	3	28	Wed	Data collection : Project area					Project area : (Labutta)
9	3	29	Thu	Data collection : Project area					Project area : (Labutta)
10	3	30	Fri	Data collection : Project area					Project area : (Labutta)
11	3	31	Sat	Data consolidation					Yangon
12	4	1	San	Data consolidation					Yangon
13	4	2	Mon	Additional data collection : ID (Yangon), Mechanical ( 1 )					Yangon
14	4	3	Tue	Additional data collection : ITC					Yangon
15	4	4	Wed	Additional data collection : ID (Yangon)					Yangon
16	4	5	Thu	Additional data collection : Vibration Hammer (Yangon)					Yangon
17	4	6	Fri	Additional data collection : Mechanical(1), ID (Yangon), Construction (9)					Yangon
18	4	7	Sat	Data consolidation					Yangon
19	4	8	San	Data consolidation					Yangon
20	4	9	Mon	Data consolidation, 19:40 Yangon TG306 → 23:50 Bangkok TG642					Night flight
21	4	10	Tue	→ 08:10 Tokyo					

### Third Field Survey

No.	Month	Day	SANYU CONSULTANTS INC.					Accommodation	
			Hironobu Mori	-	-	-	Yoji Sawada		
1	7	5	Thu	11:00 Nagoya TG645 → 17:50 Bangkok TG305 → 18:45 Yangon					Yangon
2	7	6	Fri	Additional data collection : ITC					Yangon
3	7	7	Sat	Data consolidation					Yangon
4	7	8	San	Data consolidation					Yangon
5	7	9	Mon	JICA Office → Naypyitaw					Naypyitaw
6	7	10	Tue	Explanation of study					Naypyitaw
7	7	11	Wed	Explanation of study					Naypyitaw
8	7	12	Thu	Explanation of study					Yangon
9	7	13	Fri	19:45 Yangon TG306 → 23:50 Bangkok TG642					Night flight
10	7	14	Sat	→ 08:10 Tokyo / Nagoya					

### Appendix-3. List of Parties Concerned in the Recipient Country

<b>Ministry of Agriculture and Irrigation (MoAI)</b>		
No.	Name	Position
1	Mr. Kyaw Myint Hlaying	Director General , Irrigation Department
2	Mr. Tint Zaw	Deputy Director General , Irrigation Department
3	Mr. Soe Myint Tun	Director, Planning and Work Section
4	Mr. Tin Maung Aye	Deputy Director, Planning and Work Section
5	Mr. Htay Aung Tint	Staff Officer, Planning and Work Section
6	Mr. Tun Tun Oo	Assistant Director
7	Mr. Thein Htwe	Assistant Director
8	Mr. Bo Bo Kyaw	Director, Construction Circle (9)
9	Mr. Than Htut	Deputy Director, Construction Circle (9)
10	Mr. Kaung Myat Thein	Assistant Director, Construction Circle (9)
11	Mr. Nyi Nyi Lwin	Assistant Director, Construction Circle (9)
12	Mr. Tin Tun	Assistant Director, Construction Circle (6)
13	Mr. Aung Thu Kywe	Staff Officer, Construction Circle (1)
14	Mr. Mg Mg Moe Nyunt	Staff Officer, Construction Circle (1)
15	Mr. Kaung Myat Thein	Staff Officer, Construction Circle (9)
16	Mr. Tin Moe Kyaw	Staff Officer, Construction Circle (9)
17	Mr. Tin Moe Kyaw	Staff Officer, Construction Circle (9)
18	Mr. Kaung Myat Thein	Staff Officer, Construction Circle (9)
19	Mr. Kyaw Zeyar Tint	Staff Officer, Phyapon
20	Mr. Ye Myint	Staff Officer, Design Branch, Yangon
21	Mr. Win Htut Win	Staff Officer, Design Branch, Yangon
22	Mr. Zaw Min Htut	Director, ITC
23	Ms. Kyawt Kyawt	Assistant Director, ITC
24	Mr. Thiha Aung	Staff Officer, ITC
25	Mr. Aung Win Swe	Staff Officer, ITC
26	Mr. Tin Myint Aung	Staff Officer, ITC
27	Mr. Dr.Maung Maung Naing	Staff Officer, ITC
28	Mr. Tin Myint Aung	Staff Officer, ITC
29	Mr. Myint Kyaing	Chief Engineer, Mechanical(Naypyitaw)
31	Mr. Tun Kyaw Soe	Deputy Director(Mechanical(Naypyitaw)
30	Mr. Myint Cho	Director,Mechanical Division (1)
32	Mr. Tun Shein	Assistant Director, Mechanical Division (1)
31	Mr. Myo Win Kyaw	Staff Officer, Mechanical Division (1)
33	Mr. Tin Aung Myint	Deputy Director, Procurement Section
32	Mr. Hla Kyaw	Director General, Department of Agriculture Planning
34	Mr. Aung Hlaing	Director, International Relation and Trade
33	Mr. Tin Win	Director, Ayeyawaddy Division, Patein
35	Mr. Myint Thein	Assistant Director, Ayeyawaddy Division, Pathein
34	Mr. Myat Thu Lwin	Staff Officer, Ayeyawaddy Division, Laputta
36	Mr. Kyaw Zayar Tint	Staff Officer, Phyapon
<b>Embassy of Japan in Myanmar</b>		
1	Mr. Hidenori WADA	First Secretary
<b>JICA Myanmar Office</b>		
1	Masahiko TANAKA	Representative
2	Katsuyoshi SAITO	Senior Representative
3	Minoru YOSHIDA	Project Formulation Adviser

**Appendix-4. Minutes of Discussion (M/D)**

**Appendix-4.1 M/D on 18th January 2012**

Minutes of Discussions  
on  
the Preparatory Survey (for Outline Design)  
on  
the Project for Improvement of Machinery for Rehabilitation  
of Polder Embankment in Ayeyawady Delta  
in the Republic of the Union of Myanmar

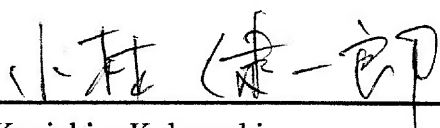
In response to a request from the Irrigation Department of the Ministry of Agriculture and Irrigation of the Republic of the Union of Myanmar (hereinafter referred to as "ID"), Japan decided to conduct a Preparatory Survey on the Project for Improvement of Machinery for Rehabilitation of Polder Embankment in Ayeyawady Delta (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Republic of the Union of Myanmar the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Mr. Kenichiro Kobayashi, Director of Paddy Field Based Farming Area Division 1, Rural Development Department, JICA. It is scheduled to stay in the country from 14 January to 2 February, 2012.

The Team held discussions with the officials concerned from ID and the Department of Agricultural Planning under the Ministry of Agriculture and Irrigation of the Republic of the Union of Myanmar and conducted field survey.

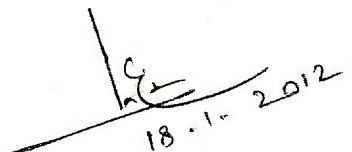
In the courses of discussions and field survey, both sides have confirmed items described in the attached sheet.

Nay Pyi Taw, 18 January, 2012



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Mr. Kenichiro Kobayashi  
Team Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
(JICA)



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U Kyaw Myint Hlaing  
Director General  
Irrigation Department  
Ministry of Agriculture and Irrigation  
The Republic of the Union of Myanmar

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to restore the Polder Embankments to preserve farming land in Ayeyawady Delta

### 2. Project Sites

Ayeyawady Region (Labutta, Boglay, Phyapon, Daydaye, Kyaiklatt Township)

The location map is shown in Annex-1.

### 3. Responsible and Implementing Agency

Responsible and Implementing Agency of the Project is the Irrigation Department of the Ministry of Agriculture and Irrigation.

### 4. Items requested

After the discussion, the items described in the table were finally requested by ID.

JICA will assess the appropriateness of the requested items on the result of the preparatory survey which includes field survey, discussion with Myanmar side, and the analysis in Japan, and will recommend suitable machinery, equipment, specification, and quantities to the Government of Japan for approval.

#### (1) Construction Machinery

No	Items requested	Main Specs	Q'ty	Purpose
1	Backhoe	Bucket size=1.0 – 1.4m <sup>2</sup> , HP= not less than 150	28	For excavation and embankment
2	Bulldozer	Class II HP= not less than 200	14	For stripping, spreading and compaction
3	Vibrating Roller	10t	2	For finishing of surface on embankment
4	Mobile Workshop	-	2	To repair the machinery in the Project Site
5	Borehole Drilling Machine	φ 30cm	1	To construct foundation of sluice gate for concrete bore pile construction
6	Spare Part	-	1 set	To repair the machinery

\*Installation and Operation training included

#### (2) Test Laboratory Equipment

No	Items requested	Purpose
1	Soil material test equipment (Large scale triaxial compression test machine, Sieve Sets etc.)	For soil tests (C and Ø value of soil and rock, grain size distribution, permeability, etc.)

2	Concrete material test equipment ( Blaine Air Permeability Apparatus, Soft Pieces percent Test Set, Rebound Concrete Schmidt Test Hammer, etc)	For material test (fineness of cement, softness and hardness of coarse aggregate, compressive strength of concrete, etc.)
3	Water quality test equipment (Digital Water Analyzer, pH Meter & Buffer Solution or Calibration solution, Conductivity/ TDS/ Salinity (Banch Meter), etc.)	For water quality tests

\*Installation and Operation training included

### 5. Japan's Grant Aid Scheme

- a) The Myanmar side understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex -2.
- b) The Myanmar side will take the necessary measures, especially tax exemption and payment for banking commission, as described in Annex -2.

### 6. Schedule of the Survey

The Team will proceed to further studies in Myanmar until 2 February, in addition, from 21 March to 2 April. JICA will prepare the draft report and dispatch a mission to Myanmar to explain about the content of the report around August, 2012.

### 7. Other relevant issues

#### (1) Priority of Items

Both sides agreed on the following priority for selecting procured items of the Project.

##### Priority A

(a) Sets of Construction Machinery (Backhoe and Dozer), mobile workshop, and their spare parts, which are necessary but currently not sufficient to operate a rehabilitation plan of Polder Embankment by the construction circle in charge.

(b) Equipment at Irrigation Technology Centre (ITC) which is necessary to ensure and improve the quality of civil engineering work for Polder Embankment, including sluice gate construction.

##### Priority B

(c) Machinery and Equipment, such as compactor, borehole drilling machine, which are desirable for an improvement of efficiency, quality and maintenance of work of rehabilitation of Polder Embankment, including sluice gate construction.

Suitable specification and quantity of machinery and equipment will be selected in consideration of the geographical feature of the Project sites, condition of existing machinery and equipment, and expected embankment and test method. These items will be selected within the human resources and budget allocated by Myanmar side so that the procured machinery and equipment can be fully utilized. In addition, it was explained and understood that the procured items will be used for the highly prioritized Polder Embankment based on the Master Plan.

#### (2) Rationale and Selection Criteria of Equipment for Irrigation Technology Centre (ITC)

Both sides confirmed that the objective of the Project is to rehabilitate the Polder Embankment in Ayeyawady Delta and equipment for soil, concrete material, and water quality test may be included in the list of items if these are utilized in the rehabilitation work. The Team will examine the

requested items and existing equipment in consideration of the following criteria and Japanese side will conclude and determine the suitable items.

- (a) Applicability to the rehabilitation work of Polder Embankment
- (b) Necessity of replacement (condition and accessibility to service of existing equipment)
- (c) Necessity to install additional equipment (work volume, frequency, and accuracy required for test)

ID strongly requested to include a large scale triaxial compression test apparatus because it is important for construction projects. The Team took note of the request, though the above criteria will be applied in the selection of items.

### **(3) Progress and Future Plan of Rehabilitation of Polder Embankment**

ID explained that it has completed the rehabilitation of 13 Polders (186.83 miles, 300.61km) and 88.48 miles (142.36 km) out of 398.52 miles (641.22 km) of uncompleted 21 Polders with ID's revised rehabilitation design (ANNEX-3). Both sides agreed the Project mainly puts priority on the uncompleted 19 polders for the next 5 years based on the Master Plan with its design crest level, by using the machinery procured in the Project. ID is responsible for the plan which will not be covered by the Project with its own budget and machinery.

### **(4) Responsibility of Rehabilitation of Sluice Gate**

Both sides confirmed that the Project aims at rehabilitation of Polder Embankment, excluding sluice gates which shall be rehabilitated by Myanmar side with its own budget.

### **(5) Operation and Maintenance of Procured Machinery and Equipment**

ID shall allocate necessary budget and human resources (operators, mechanics and other officers) for operation and maintenance of the machinery and equipment procured in the Project. The necessary operation and maintenance cost and number of staff will be calculated and reported by the Team. ID will take necessary actions and secure the budget before implementation of the Project.

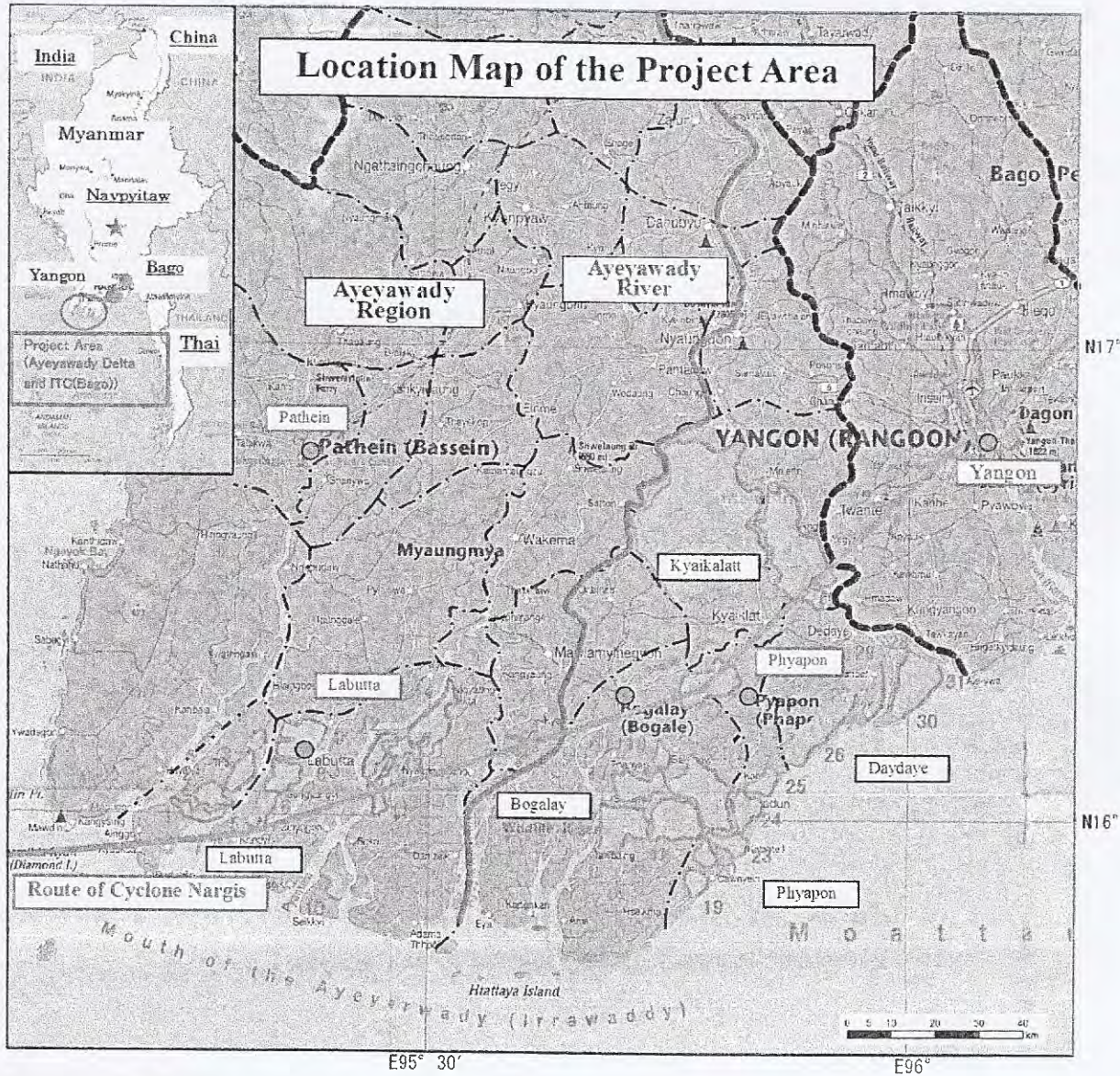
### **(6) Output indicators of the Project**

Both sides confirmed that the possible outputs and measurable indicators of the Project as described in the tentative monitoring sheet (ANNEX- 4). ID agreed to monitor the progress of the Project by collecting the indicators and to submit an annual report to JICA Office. Japanese side will conduct surveys and inspections including field visit and auditing to monitor the achievement of the Project and proper use of equipment during and after the Project.

## **ANNEX**

- 1 Map of Location of the Project
- 2-1 Flow Chart of Japan's Grant Aid
- 2-2 Flow of Funds for Implementation Under The Japan's Grant Aid
- 3 Progress and future plan of rehabilitation work
- 4 Monitoring sheet (draft)





**Polders in Project Area**

<b>[Labutta]</b>	<b>[Labutta]</b>	<b>[Bogalay]</b>	<b>[Phyapon]</b>	<b>[Daydaye]</b>	<b>[Kyaikalatt]</b>
1. Aleyyuni(1)polder	5. Thingangyi	15. Daunggyi polder	19. Dewayein polder	26. Myasenukan	32. Maubin Island(North)
2. Aleyyuni(2)polder	6. Zinywe	16. Daunggyi(East)	20. Myekone polder	27. Thandi	33. Maubin Island(South)
3. Aleyyuni(3)polder	7. Leikkwin	17. Daunggyi (West)	21. Kyetphamwezaung	28. Suclubbaluma	34. Thonegyakyun
4. Magyibinmadauken	8. Labutta(South)	18. Deunggyi(Upper)	22. Banbwazu	29. Hlesetkchaunggyi	
	9. Labutta(North)		23. Daydele	30. Tamatekaw	
	10. U Gaungpye		24. Letpanbin	31. Kyonsoa	
	11. Bitud Island(1)		25. Zinbaung		
	12. Bitud Island(2)				
	13. Bitud Island(3)				
	14. Bitud Island(4)				

LEGEND	
--- : Region boundary	● : Major city town
- · - · : Township boundary	□ : Township
○ : Project area	
— : Polders (34 places)	

## JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as “the GOJ”) is implementing the organizational reforms to improve the quality of Development Assistance operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

### 1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as “the G/A”)
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

### 2. Preparatory Survey

#### (1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid

Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

## (2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

## (3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

## 3. Japan's Grant Aid Scheme

### (1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

### (2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey

will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under

an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

End

## Major Undertakings to be taken by Each Government

NO	Items	To be covered by the Grant	To be covered by Recipient side
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
5	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant		●
6	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A)

**ANNEX-3 : Progress and Future Plan of Rehabilitation Work**

Township	No	Name of Polder Dike	Dike Length (mile)	Master Plan Design ACL (ft)	Remained Necessary Volume(Sud)	Priority	Construction Schedule (tentative)						Reference				
							1st year No.5, No.6	2nd year No.1, No.4	3rd year No.3, No.10	4th year No.2, No.8	5th year No.7, No.9						
Labutta	1	Alegyun (1)	13.40	13.5	41,100	2		41,100									
	2	Alegyun (2)	22.70	14.0	128,446	2		128,446									
	3	Alegyun (3)	17.65	14.0	0												Completed
	4	Magyibhmadaitkar	3.40	14.0	0												Completed
	5	Thingangyi	6.30	11.5	45,446	4				45,446							Completed
	6	Zinywe	6.00	11.5	40,998												
	7	Leikkwin	3.75	11.5	45,937	4				45,937							
	8	Labutta (S)	20.20	11.0	194,236	2		194,236									
	9	Labutta (N)	38.00	11.0	74,000												High Priority Part Completed
	10	U Gaungpu	5.20	12.0	107,572	4				107,572							
	11	Bitud Island (1)	14.02	12.0	141,045	3			141,045								
	12	Bitud Island (2)	18.60	12.0	172,102	3			172,102								
	13	Bitud Island (3)	28.00	12.0	258,145	2		258,145									
	14	Bitud Island (4)	40.53	12.0	68,223												Completed
Bogalay	15	Daunggyi	37.00	12.0	180,671	1	180,671										
	16	Daunggyi (East)	33.90	12.5	326,292	1	326,292										
	17	Daunggyi (West)	31.60	12.0	32,961												Completed
Phyapou	18	Daunggyi (Upper)	10.50	12.0	107,073	1	107,073										
	19	Dawmyein	14.00	12.5	100,513												Completed
	20	Myokone	17.00	12.5	130,915												Completed
	21	Kyepharmwezaun	46.00	12.5	469,368	4				469,368							
	22	Banbwezu	26.00	12.0	190,302	5							190,302				
	23	Daydalu	13.00	12.5	92,932												Completed
	24	Leparbin	20.00	12.5	138,656												Completed
	25	Zinbaung	15.00	12.5	115,129	5								115,129			
Daydave	26	Myaseinkan	13.50	13.0	37,597												Low Priority
	27	Thandi	4.25	13.0	43,51												Completed
	28	Sucubbaluma	7.40	13.0	11,654												Completed
	29	Hleseikhaunggyi	7.40	13.0	21,262	3			21,262								
	30	Tarnatakaw	7.00	14.0	8,021												Completed
Kyaiklatt	31	Kyonsaet	5.00	14.0	4,457												Completed
	32	Maubin Island (N)	12.40	13.5	63,000	3			63,000								
	33	Maubin Island (S)	4.40	12.0	8,525	3			8,525								
Total	34	Thonegvakyun	22.25	13.5	132,189	3			132,189								Total(sud)
	Grand Total for remained, increased and additional vol.		585.35	Ave (12.5)	3,492,618				614,036	621,927	538,123	668,323	305,431				
					<b>Remained → 2,747,840</b>			1,737,722	1,760,053	1,522,888	1,891,354	864,370					7,776,387

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ANNEX-4: Monitoring Data Sheet (Draft)

Project: the Project for Improvement of Machinery for Rehabilitation of Polder Embankment in Ayeyawady Delta  
Year:

◇ Achievement of This Year		
Length of Polder Embankment Rehabilitated	mile / km	The detail of each polder
Volume of Embankment Rehabilitated	sud / m3	The detail of each polder
Utilization of Equipment		
Backhoe	Unit Deployed	
	Working Hrs	
Bulldozer	Unit Deployed	
	Working Hrs	
Vibrating Roller	Unit Deployed	
	Working Hrs	
Mobile Workshop	Number of Machinery Repaired	
Newly Preserved Farmland Area	Acre	
Result of Compaction Test	Number of Test	
Result of Compaction Test	D-value	More than D-value 90%
Remaining Length of Polder Embankment	mile / km	The detail of each polder
Remaining Volume of Polder Embankment	sud / m3	The detail of each polder
◇ Projection for Next Year		
Length of Polder Embankment Rehabilitated	mile / km	The detail of each polder
Volume of Embankment Rehabilitated	sud / m3	The detail of each polder

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**MINUTES OF DISCUSSION  
ON  
THE PREPARATORY SURVEY  
ON  
THE PROJECT FOR IMPROVEMENT OF MACHINERY FOR  
REHABILITATION OF POLDER EMBANKMENT IN AYEYAWADY DELTA  
IN THE REPUBLIC OF THE UNION OF MYANMAR  
(EXPLANATION OF DRAFT REPORT)**

In January, 2012, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team on the Project for Improvement of Machinery for Rehabilitation of Polder Embankment in Ayeyawady Delta (hereinafter referred to as "the Project") to the Republic of the Union of Myanmar (hereinafter referred to as "Myanmar"), and through discussions, field survey and technical examination of the results in Japan, JICA prepared the draft report of the survey.

In order to explain and to discuss with the concerned officials of the Government of Myanmar on the components of the draft report, JICA sent the Preparatory Survey Team (hereinafter referred to as "the Team"), from 8 July to 13 July, 2012 headed by Mr. Jun Yamazaki, Deputy Director of Paddy Field Based Farming Area Division 1, Rural Development Department of JICA to Myanmar.

As a result of discussions, both sides confirmed the main items described in the attached sheets.

Nay Pyi Taw, 12 July, 2012

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Mr. Jun Yamazaki  
Team Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
(JICA)

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U Kyaw Myint Hlaing  
Director General  
Irrigation Department  
Ministry of Agriculture and Irrigation  
The Republic of the Union of Myanmar

## ATTACHMENT

### 1. Components of the Draft Report

The Myanmar side agreed and accepted in principle the components of the draft report explained by the Team.

### 2. Japan's Grant Aid Scheme

The Myanmar side understood the Japan's Grant Aid scheme and necessary measures to be taken by the Myanmar side as explained by the Team.

### 3. Schedule of the Survey

JICA will complete the final report in accordance with the confirmed items and send it to Myanmar by September 2012.

### 4. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in Annex-I. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the contract(s) for the Project.

### 5. Other Relevant Issues

#### 5-1. Cost of Construction Operation

The Myanmar side confirms to allocate necessary budget for fuel, oil and maintenance of machinery and equipment as described in Annex-I in order to conduct the rehabilitation work for the targeted polder embankments.

#### 5-2. Arrangement of Personnel

Both sides confirmed that the Myanmar side assigns necessary number of operators, mechanics, technicians and drivers to fully utilize the procured machinery in the rehabilitation works of the Project.

#### 5-3. Proper Use of Machinery and Test Laboratory Equipment

The Myanmar side confirmed that procured heavy machinery be properly utilized only for the Project by the time total extension length reach to the target and necessary and proper tests on soil, concrete and water quality be conducted to ensure the quality of the rehabilitation works of the Polder Embankments in Ayeyawady Delta.

#### 5-4. Reporting on Operational Plan

The Myanmar side shall submit annual reports described in Annex-II on the use of the machinery and equipment procured under the said grant and on the performance of the rehabilitation works every year for at least 5 years after procuring the machinery and equipment in the Project or by the time total extension length reach to the target, whichever comes later. The plan would include not only for machinery procured by the

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Project but also the existing ones, if any, managed by Irrigation Department (ID).

ANNEXES:

- Annex-I            Project Cost Estimation (Cost to be Borne by Japan's Grant Aid)
- Annex-II           Project Cost to be Borne by the Myanmar side
- Annex-III          Annual Report and Monitoring Sheet

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<Confidential>

Annex-I

(1) Project Cost to be Borne by Japan's Grant Aid

Category	Cost (Million Japanese Yen)
Equipment procurement cost	
Design supervision cost	
Total	

Note: Condition of Estimation

- a) Date of estimation : April 2012
- b) Exchange rate : 1USD=79.38 Japanese Yen

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## (2) Project Cost to be Borne by the Myanmar side

## a) Initial Cost

Category	Cost (Million Kyat)
Commission for banking arrangement and issuance of authorization to pay	19
Total	19

## b) Cost for Construction Operation, Maintenance and Repair

Category	Cost (Annual) (Million Kyat)	Cost (5 years) (Million Kyat)	Remarks
Fuel, oil and lubricant cost for heavy machinery	1,163	5,817	
Operation and repair	80	400	
Allowances of heavy machinery operators	0	0	Heavy machinery operators are staff of ID already employed, thus no additional expenditure would be evolved
Securing the work space for assembling of heavy machinery	0	0	Making use of the yard of Mechanical Division 1 of ID (A=2.4 ha)
Inland transportation of heavy machinery from Yangon to the construction site	82	408	Transporting with mounting vessels held by ID
Total	1,325	6,625	

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Annual Report on the Use of Japan's Grant Assistance (submitted on ○○○)

1. Outline of the Project

- (1) Name of Country:
- (2) Name of the Project:
- (3) Date of the Grant Agreement:
- (4) Name of the Executing Organization:

2. General Situation (how the facilities and/or equipments are used in general)

3. Detailed Explanation

4. Photos (please attach photos of the facilities and/or equipments)

Facilities and/or equipments;	How they are being used;	In case they haven't been used as planned Reason for it; (Please specify the reason such as budgetary problems and problems in employing appropriate staffs etc.)	Measures to be taken to redress the situation;

ANNEX-III(2): Monitoring Data Sheet

Project: the Project for Improvement of Machinery for Rehabilitation of Polder Embankment in Ayeyawady Delta  
Year:

◇ Achievement of This Year	Unit	Remarks
Length of Polder Embankment Rehabilitated	mile , ( km)	Detail of each polder
Volume of Embankment Rehabilitated	sud , ( m <sup>3</sup> )	Detail of each polder
Crest Elevation of Embankment Rehabilitated	ft	Detail of each polder
Utilization of Equipment		
Backhoe	Unit Deployed Working Hrs	
Bulldozer	Unit Deployed Working Hrs	
Vibrating Roller	Unit Deployed Working Hrs	
Mobile Workshop	Number of Machinery Repaired	
Hydraulic Vibration Hammer	Working Hrs	
Newly Preserved Farmland Area	Acre	
Result of Compaction Test	Number of Test	
Result of Compaction Test	D-value	More than 90%
Result of Density Test	Number of Test	
Result of Concrete Compression Test	Number of Test	
Testing Record of Soil Mechanical, Concrete Materials and Water Quality	Each Test	
Remaining Length of Polder Embankment	mile , ( km)	Detail of each polder
Remaining Volume of Polder Embankment	sud , ( m <sup>3</sup> )	Detail of each polder
◇ Projection for Next Year		
Length of Polder Embankment to be Rehabilitated	mile , ( km)	Detail of each polder
Volume of Embankment to be Rehabilitated	sud , ( m <sup>3</sup> )	Detail of each polder

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## Appendix-5.2 Achievement of Laboratory Test in ITC

No	Kind of Test	Quantity											Total	Remark	
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 up to data			
Soil Mechanics															
1	Grain Size Test	162	51	53	56	10	200	74	127	55	15	114	917		
2	Atterberg Limit Test	128	61	50	50	8	183	60	116	33	12	114	815		
3	Specific Gravity Test	157	73	53	52	10	189	62	116	34	12	114	872		
4	Standard Compaction Test	132	34	34	40	12	152	52	114	17	10	68	665		
5	Permeability Test	58	10	34	25	3	123	53	97	15	-	38	456		
6	Consolidation Test	32	15	11	10	2	24	18	53	6	-	31	202		
7	Direct Shear Test	70	23	15	12	2	145	49	71	7	11	48	453		
8	Triaxial Test (Std.)	25	8	10	12	2	10	20	8	-	-	20	115		
9	Emersion test	48	27	15	35	5	186	55	72	15	9	-	467		
10	Unconfined Compression	-	-	-	-	5	1	2	13	-	-	5	26		
11	Cone Penetration Test	2	3	-	-	-	-	-	-	-	-	-	5		
12	Plate Bearing Test	-	-	-	-	-	2	-	-	-	-	-	2		
13	Large Scale Triaxial	4	3	3	3	-	11	14	8	2	5	5	58		
Concrete Technology															
1	Physical Test of cement	81	30	51	5	46	105	95	242	116	280	63	1114		
2	Physical Test of Fine	269	59	72	62	128	132	49	239	209	241	423	1883		
3	physical Test of Coarse	381	65	120	95	87	79	33	206	384	346	174	1970		
4	Tensile Test of Sheet Bars	292	15	30	136	200	70	146	280	204	624	426	2423		
5	Compressive Strength Test	840	822	524	713	623	353	330	1448	287	828	394	7162		
6	Physical Properties of Rock	8	43	104	81	322	81	44	306	879	199	582	2649		
Water Quantity Test															
1	Physical Test	8	5	30	38	15	16	34	18	1	-	38	203		
2	Chemical Test	8	5	30	38	15	16	34	18	1	-	38	203		

## Appendix-5.3 Data Collection List

1	Budgets for Irrigation Department including the break-down, revenues and expenses (Last 5 Years)
2	Progress of rehabilitation work in Ayeyawady Region (Length of polder dike embankment rehabilitated)
3	Existing rehabilitation work plan of polder dike embankment (schedule, volume, type of work (direct or contract-out), budget)
4	Existing rehabilitation work plan of water gates at polder dike embankment (schedule, volume, type of work (direct or contract-out), budget)
5	Organization Chart of the Irrigation Department
6	Ministry of Agriculture and Irrigation, Irrigation Department Construction Circle (9) Organization Chart
7	Ministry of Agriculture and Irrigation, Irrigation Department Director's Office Ayeyawady Region Organization Chart
8	Number of officials and staff of Irrigation Department (Engineers, technicians, clerical staff and drivers/operators) including the personnel list distributed on the organization chart, especially of the Construction Circle 9 office and ITC
9	Procedure of requesting and allocation budget in the Ministry of Agriculture and Irrigation
10	Delivery site, transportation route
11	Operators List of Mechanical Circle (1) Yangon, Office and Staff Strength of Mechanical Circle (1).Yangon
12	Irrigation Department Construction Circle (9), Director Office Machine Requirement For (2013-2014) and (2014-2015)
13	Number Of Equipments & Machineries For Irrigation Department
14	Equipment / Machineries Condition of Irrigation Department (1)
15	Equipments /Machineries Condition of Irrigation Department (2)
16	Procurement list of construction machineries by Irrigation Department (Especially of the Construction 9)
17	Equipments / Machineries Condition of Mechanical Circle (1), Yangon
18	Equipments/Machineries Condition of Irrigation Department Mechanical Department, Construction (9), Irrigation
19	Irrigation Department, Construction (9) Machine List Chart
20	Equipments/Machineries Condition of Irrigation Construction (9)
21	O & M Cost for the Equipment/Machineries Presently Owned by Irrigation Department in the Last 6 Years Assistant Director (Mechanical), Operation Construction (9)
22	O & M Cost for the Equipment / Machineries Presently Owned by Irrigation Department Mechanical Circle (1)-(4) in the Last 5 Years

23	Ministry of Agriculture and Irrigation, Irrigation Department Mechanical Circle(1) Repair and Maintenance of Machines
24	Procurement list of construction machineries by Irrigation Department (Especially of the Construction 9)
25	Procurement List of Machinery for Kabaung and Thonze Dam Project under OPEC Fund
26	Procurement List of Machinery for Thonze Dam Project (Construction 9) under OPEC Fund
27	Procurement List of Machinery for Kanyin Dam Project (Construction 9) under Saudi Fund
28	ITC Organization Chart (Present)
29	Office and Staff Strength of ITC
30	Organization Chart of ITC (Bago) and Staff Personnel of Each Section (As of January 2012)
31	Implementation Structure of ITC (Budget)
32	Construction Material Test Laboratory Present Condition of Soil Laboratory Testing Equipment
33	Construction Material Test Laboratory Present Condition of Concrete Laboratory Testing Equipment
34	Proposed Equipment List of the Irrigation Technology Center
35	The Operation and Maintenance Conditions of ITC Owned Equipment
36	Procurement of Equipment/Devices for the Construction Material Testing Laboratory
37	ITC Budget and operation and Maintenance cost of the equipment device of Construction Material Test Laboratory