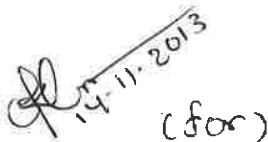


(b) JCC 議事録等

- 第一回 JCC 会議 (2013 年 11 月 14 日)
- 第二回 JCC 会議 (2014 年 11 月 17 日)
- 第三回 JCC 会議 (2015 年 5 月 28 日)
- 第四回 JCC 会議 (2016 年 2 月 18 日)
- 最終 JCC 会議 (2017 年 1 月 24 日)

Minutes of Meeting
on
the 1st JCC meeting
of
The Project on Establishment of End-to-End Early Warning System
For Natural Disaster
In the Republic of the Union of Myanmar
among
Relief and Resettlement Department,
Ministry of Social Welfare, Relief and Resettlement
and
Department of Meteorology and Hydrology,
Ministry of Transport
and
Japan International Cooperation Agency

Nay Pyi Taw, November 14, 2013


14.11.2013
(for)

Mr. Soe Aung
Director General, Relief and
Resettlement Department (RRD),
Ministry of Social Welfare, Relief
and Resettlement



Mr. Kyaw Moe Oo
Deputy Director General
Department of Meteorology and
Hydrology (DMH), Ministry of
Transport



Mr. Ichiro Kobayashi
Chief Advisor, The Project on
Establishment of End-to-End
Early Warning System for
Natural Disaster in the Republic
of the Union of Myanmar, Japan
International Cooperation
Agency



Mr. Kyosuke Inada
Senior Representative
Japan International Cooperation
Agency Myanmar Office

On the occasion of concluding 1st year's activities, Joint Coordination Committee (hereinafter called as JCC) of "the Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar" was held on November 14, 2013 at Amara Hotel in Nay Pyi Taw.

Relief and Resettlement Department (RRD) of the Ministry of Social Welfare, Relief and Resettlement, Department of Meteorology and Hydrology (DMH) of the Ministry of Transport, Japan International Cooperation Agency (JICA) and relevant parties of the Project joined JCC, chaired by Mr. Win Htein Kyaw, Director of RRD and co-chaired by Mr. Kyaw Moe Oo, Deputy Director General of DMH, on 14 November 2013. The list of the participants is shown in Appendix 1.

It was followed by the explanation of the progress of the project by Mr. Yoshihiko Uchikura, Deputy Chief Advisor of the Project. Presentation file of the JCC is attached as Appendix 2.

All parties basically agreed to the JICA Expert Team's proposal for 2nd year's activities. The followings are the main points discussed and/or agreed in the meeting.

1. Progress of the project

JICA Expert Team reported progress of the Project to all participants, and Myanmar side confirmed its progress.

2. Selection of pilot villages

Following pilot villages of the Project were proposed by JICA Expert Team, and Myanmar side agreed to its proposal.

- 1) Hlwa Zar Village, Hlwa Zar Village Tract, Labutta Township
- 2) Kwa Kwa Lay Village, Hlwa Zar Village Tract, Labutta Township
- 3) Shwe Kyun Thar Village , Hlwa Zar Village Tract, Labutta Township

3. Selection of communication and information equipment

JICA Expert Team proposed communication and information equipment for early warning to be installed in the pilot area from the second year, and Myanmar side agreed to its proposal. Both Japanese side and Myanmar side confirmed that installation fee of the equipment is covered by Japanese side and operation and maintenance cost of the equipment is covered by Myanmar side.



The owner of communication equipment between DMH and MRTV is DMH.

4. Tidal gauge

JICA Expert Team proposed the location of tidal gauge station as Haing Gyi Kyun in Pathein district and Myanmar side agreed to the location. Japanese side requested Myanmar side to make necessary arrangements for its installation, and Myanmar side noted the request.

Myanmar side requested operation and maintenance trainings and manuals for tidal gauge operation such as technology for data analysis and processing of tidal level data.

5. Submission of A4 Form

Japanese side requested to finalize the A4 Form which is the official request form for procuring the equipment to the Japanese government should be started to circulate within the Myanmar government by the end of November. It is expected to submit to the Japanese government by the end of February, 2014.

6. 2nd Pilot state

Both Japanese side and Myanmar side agreed that the second pilot state of the Project is Rakhine State. Japanese side requested Myanmar side to make recommendations of pilot areas, and Myanmar side noted the request and will inform to Japanese side before the commencement of the second year activity.

Japanese side concerned the security condition of Rakhine State, and requested Myanmar side to monitor its condition and make necessary arrangement for site visit and project implementation. Myanmar side confirmed these requests and agreed to cooperate and negotiate with relevant ministries for security.

7. Office space for the Expert Team

Japanese side requested office space for JICA Expert Team in Nay Pyi Taw and Pathein. Myanmar side agreed to provide office space in DMH Ayeyarwaddy Region, and to arrange the space in Nay Pyi Taw.

8. Necessary Data and Information

Japanese side requested Myanmar side to provide necessary data and information for activities in Rakhine state, and Myanmar side noted the request.



9. Other matters

JICA Myanmar office questioned the following items:

- 1) Selection criteria of pilot village in Rakhine state
- 2) Target area of expansion plan
- 3) Measurement of project output

JICA Expert Team answered each question for the following:

- 1) For the selection criteria, regional characteristic of Rakhine State will be considered.
- 2) Target of the expansion area is Ayeyarwaddy Region and Rakhine State according to overall goal of PDM. Detailed target will be further discussed with Myanmar side.
- 3) Capacity Assessment and time of warning transmission from national level to community level will be measured again by the end of the pilot activities.

Myanmar explained the situation of Rakhine State such as past record of disaster.

These items mentioned above will be discussed during the 2nd year, and PDM will be revised according to the discussion.

End

Handwritten signatures and initials at the bottom right of the page. There are three distinct marks: a circled 'M', a signature that appears to be 'D. Z.', and another signature that appears to be 'H. M.' with a long horizontal line extending to the right.

List of Participants

Myanmar Side

Relief and Resettlement Department (RRD)

Win Htein Kyaw	Director
Than Htut Swe	Director
Win Zaw Htay	Assistant Director
Thurein Tun	Assistant Director
Nobuyuki Ichihara	JICA Long Term Expert

Department of Meteorology and Hydrology (DMH)

Kyaw Moe Oo	Deputy Director General
Chit Kyaw	Director
Daw Tin Yi	Deputy Director
Kyaw Lwin Oo	Deputy Director
Daw Htay Htay Than	Deputy Director
U Kyaw Kyaw Lin	Assistant Director
Dr Yin MyoMin Htue	Assistant Director

General Administration Department (GAD)

Hla Than Aung	Assistant Director
ThonHtun Aye	Staff Officer

Myanmar Radio and Television (MRTV)

Than Lwin	Deputy Director
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News and Periodicals Enterprise (NPE)

Tha Sein	Deputy Chief Editor
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Information and Public Relations Department (IPRD)

Aung Ngwe

Myanmar Fire Service Department

Kyaw Naing	Assistant Director
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Japan Side

JICA

Kunio Akatsu	Advisor
Kai Kikuri	Deputy Director

JICA Myanmar Office

Kyosuke Inada	Senior Representative
Noriko Sakurai	PFA
Myo Min	Program officer

Expert Team

Ichiro Kobayashi	Chief Advisor / Disaster Management (1)
Yoshihiko Uchikura	Deputy Chief Advisor / Organizational Strengthening
Susumu Murata	Disaster Management (2)
Masahiro Satake	Procurement Planning
Yoshihiro Asano	Disaster Management Planning
Yoko Ota	Community-Based Disaster Risk Management
Zayar Win	Social Survey
Masato Fujimoto	Project Coordinator / Assistant for Organizational Strengthening / Capacity Assessment
Su Pyi Son	Japanese Interpreter
Aung Khaing	Disaster Management Planning



The Project for Establishment of End-to-End Early Warning System for Natural Disaster



JCC Meeting

Date: November 14, 2013

Place: Amara Hotel

No.	Time	Agenda	Presenter
1	8:30 - 9:00	Registration	
2	9:00 - 9:20	Opening Remarks	<i>Mr. Aung Khaing</i> <i>Deputy Director General, RRD</i> <i>Mr. Kyosuke Inada</i> <i>(JICA Myanmar Office)</i>
3	9:20 - 9:50	Communication and Information System in Japan	<i>Mr. Kunio Akatsu</i> <i>(JICA Mission Member)</i>
4	9:50 - 10:50	Progress of the Project	<i>Mr. Ichiro Kobayashi</i> <i>Mr. Yoshihiko Uchikura</i> <i>(JICA Experts Team)</i>
5	10:50 - 11:20	Tea Break	
6	11:20 - 12:00	Discussion	
7	12:00 - 12:10	Closing Remarks	<i>Mr. Kunio Akatsu</i> <i>(JICA Mission Member)</i> <i>Mr. Aung Khaing</i> <i>Deputy Director General, RRD</i>



Joint Coordinating Committee (JCC) Meeting

November 14, 2013
Nay Pyi Taw

JICA Expert Team

Agenda

1. Summary of the Project
2. Progress of the Project (Project Formulation)
3. 2nd pilot Region/State
4. Important Meeting
5. PDM
6. Schedule
7. Confirmation

Project Purpose

Overall Goal

End-to-end early warning systems for natural disaster are expanded to coastline area, especially in Ayeeyawaddy Region and Rakhine State, expansion plan based on the expansion plan

Project Purpose

The improved model of end-to-end early warning systems for natural disaster with an expansion plan is set up in pilot areas.

Output

Output 1
Information management system for natural disasters improved.

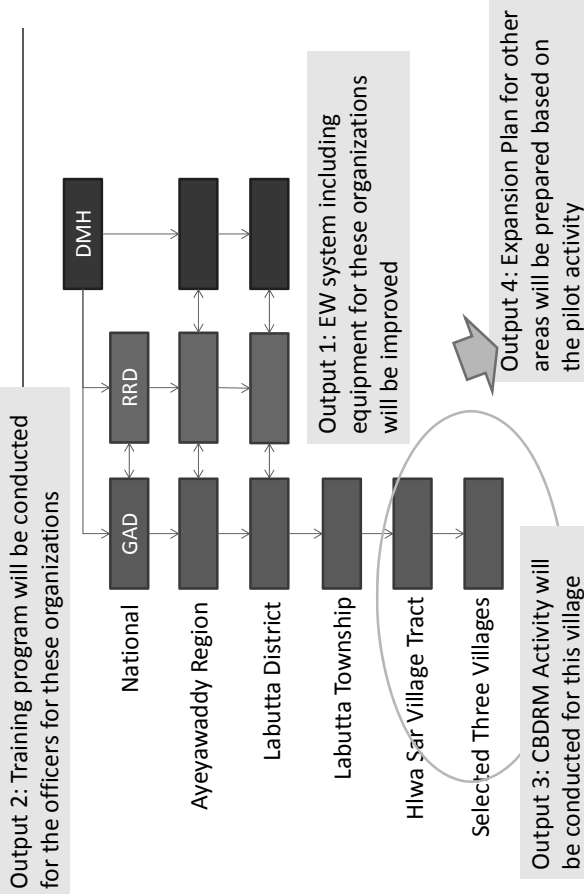
Output 2
Response capacity of national government officers improved.

Output 3
Response capacity of community people improved.

Output 4
The expansion plan to other regions is prepared.

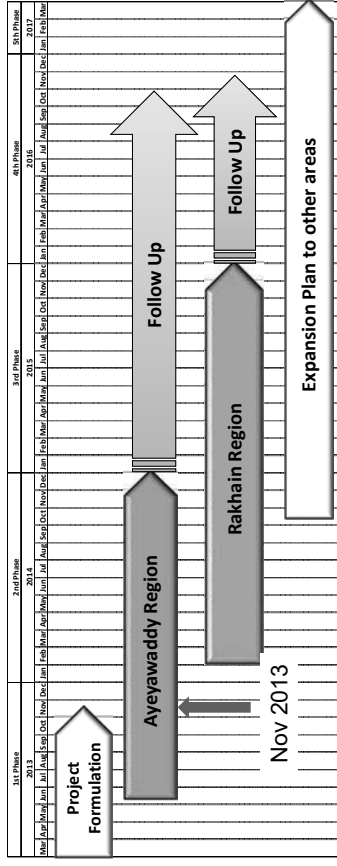
1. Summary of the Project

Project Image (Pilot Activity → Expansion Plan)



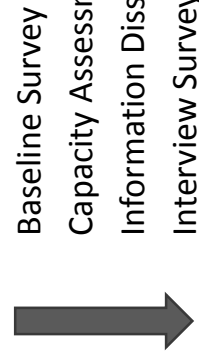
Schedule of Project

Overall Schedule



Project Formulation

Surveys: Site Survey



Implementation Plan

- Output 1: Early Warning System Improvement
- Output 2: Capacity Enhancement of Government Officers
- Output 3: Capacity Enhancement of Community People

2. Progress of the Project (Project Formulation)

- 2.1 Result of Survey
- 2.2 Implementation Plan

1) Site Survey

Date	Place	Objective
March 18 – 21	Patheingyi, Labutta	Interview to RRD, DMH and GAD Visit to villages in Labutta Township
April 5 – 17	Pyawon, Bogalay	Interview to RRD, DMH and GAD Visit to villages in Bogalay Township
April 8 – 12	Patheingyi, Labutta	Interview to RRD, DMH and GAD Visit to villages in Labutta Township
April 26 – 28	Patheingyi, Haing Gyi Kyun	Community Survey, Survey on locations for tide gauge station
July 7 – 11	Dedaye, Patheingyi, Labutta, Haing Gyi Kyun	Community Survey, Survey on locations for tide gauge station
November 2 – 7 November 8 - 11	Patheingyi, Labutta	Interview to RRD, DMH and GAD Pilot community survey

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2.1 Result of Surveys

- 1) Site Survey
- 2) Baseline Survey
- 3) Capacity Assessment Survey
- 4) Information Dissemination Survey (MAHASEN)

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Disaster Characteristics Carte (Village / Individual Profile)


Regional Characteristics
Name of the Village: Shwe Kyun Thar

Summary:

Item	amount/ number	Unit	Note/comment
Population before being hit by major earthquake (last of 10 years ago)	1200 persons		
Population after being hit	400 persons		
Current Population	877 persons		
Household	2174		
100 household	24		
Religious group	24 of group		unaffected Christian
Ethnic group	24 of group		Burmese/Kyau
Major source of income (agriculture, fishery, etc. (cultivation, seasonal workers))	-		40% are from fishing, 30% from Agriculture and other are cross border.
Prevalence of land (barren, peasant), (not) after earthquake, assistance number	-		50% are peasant, 15% are landless, 5% are merchant, 20% are laborers and 10% are fish staff
Harvest of rice per year	1 time		during dry season, growing vegetables
Food: (depends to major natural disaster)	1 month		at least
House time and means of transportation to city during dry season	2 days		by boat
House time and means of transportation to city during rainy season	2-3 days		by boat

Notes:

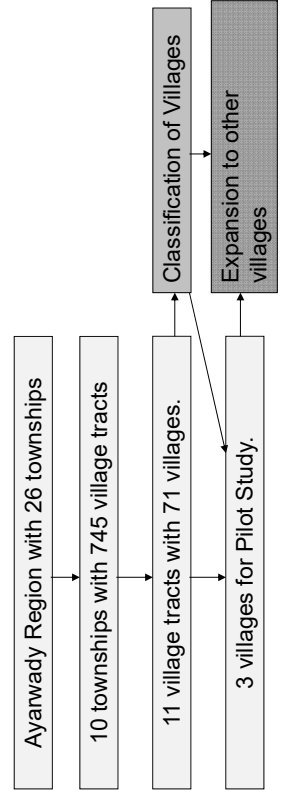
- 40% are from fishing, 30% from Agriculture and other are cross border.
- 50% are peasant, 15% are landless, 5% are merchant, 20% are laborers and 10% are fish staff
- during dry season, growing vegetables
- at least
- by boat



2) Result of Baseline Survey

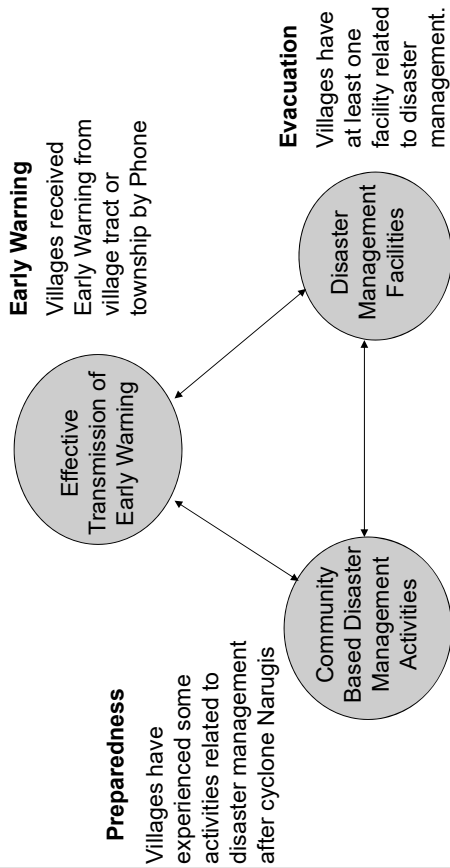
- Purpose**
- To identify characteristics of villages to conduct pilot study to enhance early warning system at community level
 - To expand lessons learnt from the pilot study at the selected villages to other villages

Selection of Villages for Pilot Study



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Criteria for Classification of Villages



The Project for Establishment of End-to-End Early Warning System for Natural Disaster

Characteristics of Villages in Terms of Disaster Management

Type	Characteristics of Villages in terms of Disaster Management
A	Villages have capacities and experience of all three aspects of disaster management, including effective transmission of early warning, DRR activities and evacuation facilities.
B, C & D	Villages have capacities of effective transmission of early warning, but need to enhance DRR activities and/or to establish evacuation facilities.
E, F & G	Villages have no capacity of effective transmission of early warning, although they have some capacities of DRR activities and/or evacuation facilities
H	Villages have no capacity and experience of all three aspects of disaster management. It is necessary to take fundamental efforts in disaster management.

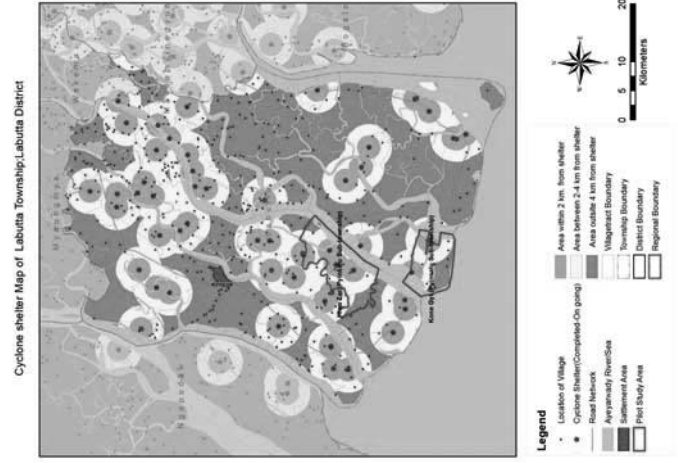
Classification of Villages by Three Criteria

Type of Village	Villages received early warning from village tract or township by Phone	Villages that have experienced DRR activities after cyclone Narugis	Villages with at least one facility related to disaster management.	No. of villages.
A	○	○	○	15
B	●	●		11
C	●		●	5
D	●			14
E		●	●	5
F		●		2
G			●	4
H				14

Location of Villages and Cyclone Shelters in Labutta Township

According to GIS data from MIMU,

- There are 54 cyclone shelters in Labutta Township: 15 completed and 39 on-going, as of February 2010.
- There are 496 villages in Labutta Township as of 2012.



Number of Villages by Distance from Cyclone Shelters

Selected Village Tract in Labutta Township	Within 2Km	Between 2-4Km	Beyond 4Km	Total Number of Villages
Hlwa Zar	10	4	0	14
Kone Gyi	1	5	4	10
Labutta Township	127	161	208	496

People in the villages can access to shelter within 1 hour by walk

People in the villages can access to shelter within 2 hours by walk

People in the villages are difficult to evacuate to shelter

Result of Selection

Township	Village tract	Village	Population	Access from major Town	Religious Group / Ethnic Group	Type
Labutta	Hlwa Sar	Hlwa Sar	1,476	2 hours from Labutta by Boat	Buddhist Barma	A
		Kwa Kwa Lay	602	3.5 hours from Labutta by Boat	Christian Kayin	A
		Shwe Kyun Thar	677	2 hours from Labutta by Boat	Buddhist Barma	B

Criteria to Select Pilot Village

- Village is included in the 11 village tracts which are selected for the baseline survey
- Village was affected by Cyclone Nargis
- Village represents the area
- Village, where Cyclone Shelter was constructed by Japanese Government
- Village, where effectiveness and issues of pilot activities are easily understood (size, ethnic, religion and Unity etc.)
- Village, where pilot activities are easily conducted (access, unity and leadership etc.)

3) Result of Capacity Assessment

- Capacity assessment was conducted in order to prepare and implement human resources development activities on EWS.
- Target officers are listed in the next slide.
- The same questionnaire was used for all interviews.

Number of officers interviewed

Departments		No. of Officers
National Government	Officers of RRD and DMH	10
	Officers of MDPA member organizations	20
Ayeyarwaddy Region	Officers of RRD and DMH	10
	Officers of member organizations of DM committee	5
Labutta District	Officers of RRD and GAD	5
	Officers of member organizations of DM committee	5
Labutta Township	Administrator and officers of township	2
	Officers of member organizations of DM committee	3
Hiwa Sar Village Tract	Administrator	1
	Members of DM committee	3
Village	Administrator, 100 households leader	2
	Total	66
		21

Key findings by capacity assessment

	RRD	DMH	other national agencies	Region	District	Township	Village Tract/ Village
Knowledge on DRM	A	B	D	C	C	C	C
Opportunity to participate DRM training	A	A	D	D	E	C	E
Understanding of Roles on DRM	A	A	E	E	E	E	E

A (High) ← → E (Low)

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Key challenges on EWS (major answers)

- Improvement of equipment / system to transmit accurate information to people
- Awareness enhancement of people
- Enhancement of forecasting capacity
- Enhancement of collaboration with related organizations
- Human resources development

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4) Survey Result of Warning Dissemination (in case of Cyclone MAHASEN)

- Actual condition of warning dissemination was surveyed through interviews to;
 - DMH (NPT, PTN), RRD (NPT, PTN, Labutta), GAD (NPT, PTN, Labutta District/TS, Hiwa Sar VT, some villages)
- Targeted warnings were the weather conditions and warning messages issued by DMH (NPT) from May 6 to May 16 2013

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Finding 1

Agencies	Number of Fax Received
DMH (NPT)	(Sent 28 Faxes)
RRD (NPT)	3
GAD (NPT)	0
DMH (Pathein)	26
RRD (Pathein)	7
GAD (Pathein)	7
RRD (Labutta District)	4
GAD (Labutta District)	14
GAD (Labutta Township)	8

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Finding 2

Sent from DMH (NPT)	Received by DMH (Pathein)	Time (min)	Sent from DMH (NPT)	Received by DMH (Pathein)	Time (min)
14:00	15:04	64	19:00	20:11	71
14:00	16:09	129	06:00	10:17	257
13:00	14:19	79	10:00	14:12	252
06:00	07:37	97	13:00	18:17	317
13:30	14:42	72	16:00	18:42	162
06:00	07:24	84	19:00	20:03	63
14:30	15:17	47	22:00	22:44	44
19:00	20:19	79	06:00	09:30	210
07:00	07:29	29	10:00	12:57	177
13:00	16:03	183	12:00	13:27	87
18:00	19:55	115	16:00	18:54	174
06:00	07:21	81	20:30	20:57	27
13:00	16:02	182	Average Time		123

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Finding 3

Time of Receipt	Time of Dissemination
DMH (NPT)	May 11, 2013 6:00 am
DMH (Pathein)	7:37 am ??
GAD (Labutta District)	9:09 am 10:20 am
GAD (Labutta Township)	9:23 am 1:00 pm
GAD (Pyinsalu Sub-Township)	1:30 pm 2:00 pm
Village Tract	5:00 pm 5:30 pm
Village	5:50 – 6:30 pm -

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2.2 Implementation Plan

Output 1 : Early Warning System Improvement

Output 2: Capacity Enhancement of Government Officers

Output 3: Capacity Enhancement of Community People

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Output 1: Early Warning System Improvement

- 1) Role and Responsibility
- 2) Contents of Warning Message
- 3) Route of Information Dissemination
- 4) Equipment for Communication

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1) Role and Responsibility

- National Natural Disaster Preparedness Central Committee (NNDPCC)
- National Natural Disaster Preparedness Management Work Committee
- DMH, Ministry of Transport
- RRD, Ministry of Social Welfare, Relief and Resettlement
- Ministry of Information
- Ministry of Foreign Affairs
- Region/State Natural Disaster Preparedness Committee
- GAD at Region/State, District, and Township level

Role and responsibility for EW will be further discussed and clarified in the 2nd Year.

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2) Contents of Warning Message

Cyclone Warning

Issued at (06:00) hours MST on (16- 5-2013)

According to the observations at (05:30) hrs. M.S.T today, Cyclonic Storm (MAHASEN) over North Bay of Bengal has moved to the Northeast direction and reached the North Bay of Bengal. It is centered at about (160)miles West - southwest of Maungdaw(Myanmar), (180)miles West of Sittwe(Myanmar), (160) miles southeast of Kolkata(India) and (180)miles Southwest of Chittagong (Bangladesh) It is forecast to move Northeast wards and likely to cross between Chittagong (Bangladesh) and Maungdaw (Myanmar) during (12) hours.

Current stage of cyclonic storm(MAHASEN) is coded as Red emergency color, it means cyclone is moving towards between Bangladesh and Myanmar border areas.

Maximum wind speed is estimated to be (60)mph, gusting (70)mph during landfall time. And probable maximum storm surge of about (8)to (10)feet in Maungdaw District, (6) to (8)feet in Sittwe District and (4)to (6)feet in Kyaukphehy District.

Isolated heavy rainfalls are likely in Sagaing, Mandalay, Magway, Bago, Yangon and Ayeerwady Regions, Kachin, Chin and Rakhine States. Due to heavy rainfall, landslides and flash floods may occur over kha.bhutan.gov.bt.

Frequent squalls with rough seas will be along Rakhine Coasts. Surface wind and along Rakhine Coasts. Surface wind

Maximum storm surge is 6 to 8 feet in Sittwe District.

All fishing boats, ship and vessels are advised to remain for safety.

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Recommendation

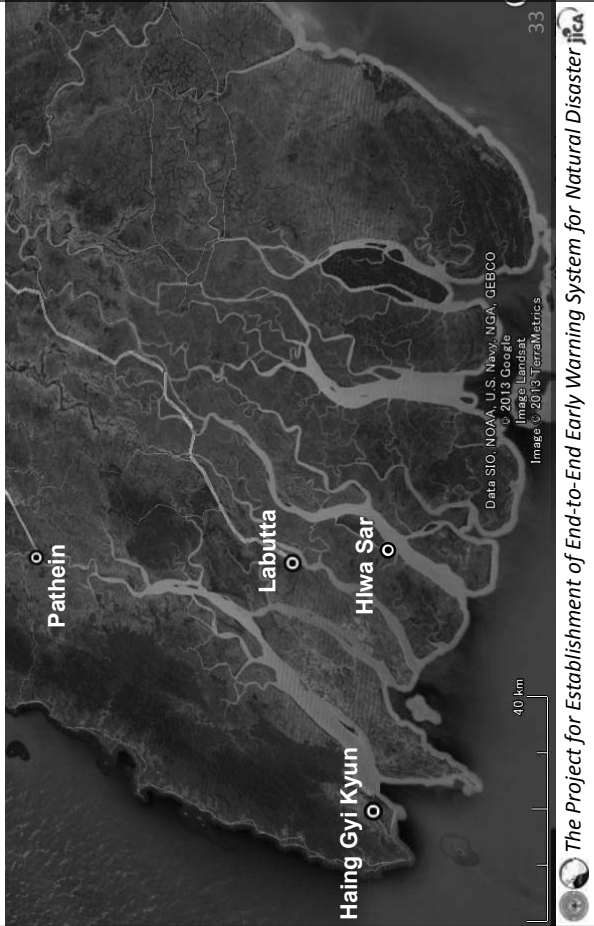
Essential Information in the Warning Message

- **WHERE** : Area, District, Region
- **WHEN** : Approximate time duration (from xxh to xxh)
- **HOW** : Estimated highest tide (m) against Mean Sea Level/Normal High Tide Level
- **Important Information**: High tide time (Source: Yamamoto)

Warning message will be improved through the project activity in the 2nd Year.

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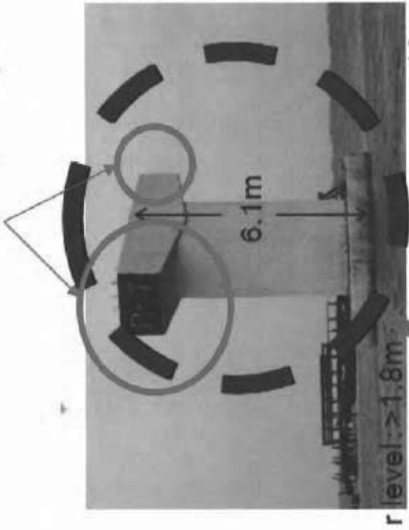
Tide Level Monitoring



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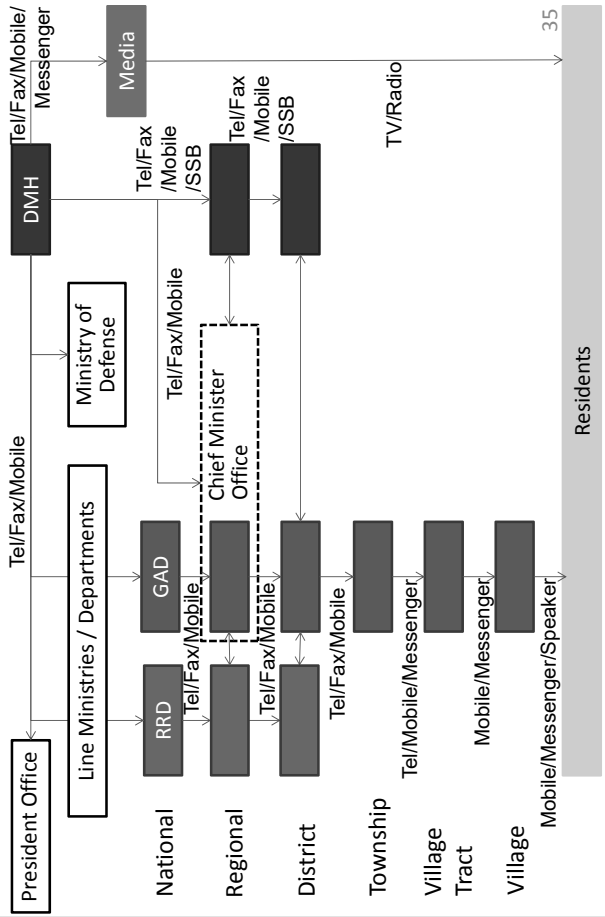
Installation of Tide Gauge Station at Haing Gyi Kyun

Tide gauge station at the pier (Both side of the pier)

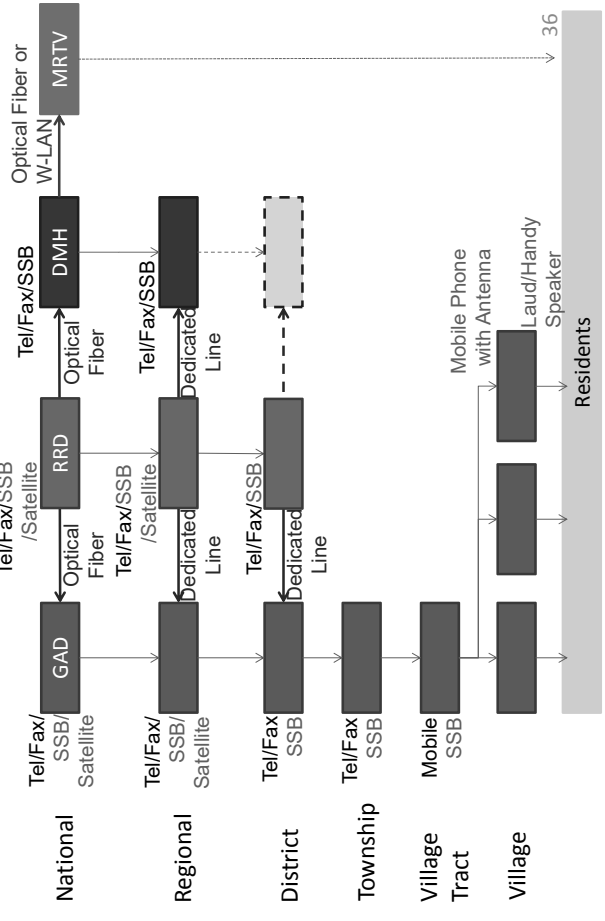


The Project for Establishment of End-to-End Early Warning System for Natural Disaster *jica*

3) Route of Information Dissemination



4) Equipment for Communication



List of Equipment

- Please refer to the list of equipment
- Equipment is purchased and installed by Japanese side. (Initial cost is owned by Japanese side)
- Operation/maintenance cost is owned by Myanmar side
- Power supply has to be secured by Myanmar side.
- Although the solar system is installed for the equipment at village tract and village level, power supply has to be secured by Myanmar side especially during rainy season.

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List of Equipment

	Satellite	SSB	Information Sharing
RRD (NPT)	IPSTAR contract/ PC/IP-Fax/IP-Phone O/M cost	SSB Equipment	Optical fiber contract PC/IP-Fax/IP-Phone O/M cost
RRD (PTN)	IPSTAR contract/ PC/IP-Fax/IP-Phone O/M cost	SSB Equipment	Dedicated telephone line contract O/M cost
RRD (Labutta)	-	SSB Equipment	Dedicated telephone line contract O/M cost
DMH (NPT)	-	-	Optical fiber contract PC/IP-Fax/IP-Phone O/M cost
DMH (PTN)	-	-	Dedicated telephone line contract O/M cost

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DMH (O/M cost, Electricity supply)

- Communication with MRTV
- Tide Gauge at Haing Gyi Kyun (with Solar System)

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	Satellite	SSB	Information Sharing
GAD (NPT)	IPSTAR contract/ PC/IP-Fax/IP-Phone O/M cost	SSB Equipment	Optical fiber contract PC/IP-Fax/IP-Phone O/M cost
GAD (PTN)	IPSTAR contract/ PC/IP-Fax/IP-Phone O/M cost	SSB Equipment	Dedicated telephone line contract O/M cost
GAD (Labutta District)	-	SSB Equipment	Dedicated telephone line contract O/M cost
GAD (Labutta Township)	-	SSB Equipment	-
Village Tract	-	SSB Equipment Solar System Electricity supply	-
3 Villages	-	-	Mobile Phone Loud/Handy Speaker Solar System O/M cost Electricity supply

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Output 2: Capacity Enhancement of Government Officers

- 1) Target of Human Resources Development (HRD) Activity
- 2) On the Job Training of Working Group Members
- 3) HRD Seminar
- 4) Information Transmission Exercise
- 5) Schedule

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1) Target of Human Resources Development (HRD) Activity

- Capacity Enhancement of officers from National Gov., Ayeyarwaddy Regional Gov. and Pilot Area on Early Warning System
- Human Resources Development on DRM at Ayeyarwaddy Regional level.



1. On the Job Training of Working Group Members
2. HRD Seminar
3. Information Transmission Exercise

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2) OJT of Working Group Members

Member of Working Group (5 – 10 members)

- RRD: Patheingyi, Labutta District
- DMH: Patheingyi
- GAD: Patheingyi, Labutta District / Township
- Other officers

General

- OJT of officers to be in charge for DRM
- Work / discuss closely with JICA expert team
- Involve officers from national gov. agencies and pilot area

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Working Group Activities

Activities

- Establish / operate Early Warning System (RRD)
- Prepare manual / module for EWS (RRD)
- Improve warning message (DMH)
- Install / familiarize communication equipment (RRD)
- Install / maintain tide gauge station (DMH)
- Implement HRD seminar / exercise (RRD)
- Prepare expansion (promotion) plan (RRD)

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3) HRD Seminar

General

- 2 seminars in July 2014
- Seminar at Nay Pyi Taw: 50 participants
- Seminar at Patheingyi: 50 participants

Contents

- Mechanism of major disasters
- Lessons learned from past disaster experiences on EWS
- Established EWS at Ayeeyarwaddy Region
- Progress of activities at pilot area

45

4) Information Transmission Exercise

General

- To evaluate validity of EWS / skills of officers on equipment and systems
- Scheduled in October 2014

Contents

- Exercise to transmit warning message issued by DMH Nay Pyi Taw to pilot community based on EWS manual
- Evaluation meeting to improve EWS and its manual

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5) Schedule of HRD Activity

2014	Working Group	Events	Outputs
February			
March		Preparation of Early Warning Manual	
April			
May			Early Warning Manual
June		Installation of Equipment / Preparation for Seminar	
July			HRD Seminar (Patheingyi) HRD Seminar (Nay Pyi Taw)
August		O & M of System / Preparation of Exercise	HRD Materials
September			
October		Preparation of Expansion Plan	Exercise Materials
November			Expansion Plan

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Output 3: Capacity Enhancement of Community People

- 1) Goal and Activities on CBDRM
- 2) TOT Workshop
- 3) CBDRM Workshop
- 4) Schedule

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1) Goal and Activities of CBDRM Activity

- **Goal**
 - To enhance the capacity of dissemination of the early warning and response to the disaster in the pilot villages
 - To develop expansion plan to other villages in pilot area by creating the model of TOT and CBDRM activities
- **Project Activities**
 1. TOT Workshop for Village Tract Disaster Management Committee
 2. CBDRM Workshops for pilot villages (5 times x 3villages)
 3. Preparation and revision CBDRM Material for TOT and CBDRM workshops
 4. Development of expansion plan

49

2) TOT Workshop

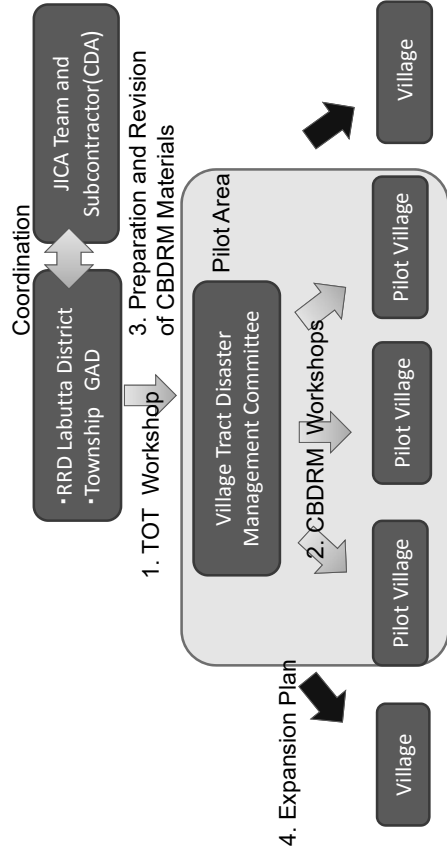
- Target: Village Tract Disaster Management Committee (VTDMC) members → Facilitator of CBDRM

Program of TOT Workshop

	Main Contents
1 st day	<ul style="list-style-type: none"> • Basic knowledge of disaster and disaster in Ayeyarwaddy region • Outline of CBDRM
2 nd day	<ul style="list-style-type: none"> • Participatory disaster management planning (evacuation plan etc.)
3 rd day	<ul style="list-style-type: none"> • Evacuation exercise • Mainstreaming of disaster management

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Design of Activities of CBDRM



3) CBDRM Workshops

- CBDRM workshops are designed to enhance the capacity of the resident on DRM
 - Five times CBDRM workshops are conducted in each pilot village
 - Target of CBDRM activities: 50 persons at each village
- ➔
- Revision of CBDRM material
 - Preparation of expansion plan through Study Visit

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Program of CBDRM Workshops

	Contents
1 st	<ul style="list-style-type: none"> Basic Knowledge of disaster and disaster in Ayeyarwaddy region Introduction of CBDRM activities
2 nd	<ul style="list-style-type: none"> Participatory community risk assessment Participatory disaster risk management planning
3 rd	<ul style="list-style-type: none"> Preparation of the evacuation exercise Community-based infrastructure planning
4 th	<ul style="list-style-type: none"> Training for evacuation exercise (First Aid, SAR, food aid)
5 th	<ul style="list-style-type: none"> Evacuation exercise Evaluation of evacuation exercise

4) Schedule of CBDRM Activities

2014	Overall schedule	Pilot Villages
Feb.	★ TOT Workshop	
Mar.	CBDRM Workshops	CBDRM WS for 1 st Village
Apr.		(Once a month)
May		
Jun.		CBDRM WS for 2 nd & 3 rd Village
Jul.		(Once a month)
Aug.		
Sep.		Community
Oct.	★ Information Transmission Exercise/Study visit	Activity based on DRM plan
Nov.		

*Expansion and Dissemination plan will be developed from 2015

Program of CBDRM Workshops

	Contents
1 st	<ul style="list-style-type: none"> Basic Knowledge of disaster and disaster in Ayeyarwaddy region Introduction of CBDRM activities
2 nd	<ul style="list-style-type: none"> Participatory community risk assessment Participatory disaster risk management planning
3 rd	<ul style="list-style-type: none"> Preparation of the evacuation exercise Community-based infrastructure planning
4 th	<ul style="list-style-type: none"> Training for evacuation exercise (First Aid, SAR, food aid)
5 th	<ul style="list-style-type: none"> Evacuation exercise Evaluation of evacuation exercise

2nd Pilot Region/State

- Rakhine State will be 2nd pilot state.
- The activities of Rakhine state will start in February 2014.
- Security condition will be monitored.

3. 2nd Pilot Region/State

4. Important Meeting

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Meeting Record (1)

Name of Meeting	Date	Place	Contents	Remarks
Kickoff meeting	12 Mar	NPT	Discussion of the Inception report	ICR was accepted by JCC meeting
PIC Meeting	26 Jul	NPT	Selection of Pilot village Communication equipment Tidal gauge station	JICA team discussed with JICA HQ
PIC Meeting	29 Jul	PTN	Selection of Pilot village Communication equipment Tidal gauge station	

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Meeting Record (2)

Name of meeting	Date	Place	Contents	Remarks
PIC meeting	10 Oct	PTN	Progress of work	PIC in NPT was done RRD and DMH separately.
PIC meeting	31 Oct	NPT	Discussion of equipment, pilot village and activities	
PCI meeting	1 Nov	PTN	Discussion of equipment, pilot village and activities	
2 nd JCC meeting	14 Nov	NPT	Discussion of activities of 1 st year Approval of activities of 2 nd year	

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5. PDM

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Revision PDM

- Current PDM is agreed between Myanmar and Japanese sides on December 10th, 2012.
- Some of indicators and a term shall be determined by JCC.

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Project Design Matrix (PDM)

Overall Goal	Means of Verification	Important Assumption	Pre-Condition
Project Purpose			
Outputs	Indicators		Inputs
Activities			

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Indicators

Output 2

More than x% of government agencies related to disaster management participates in training/drill on early warning system for natural disaster organized by the project

Output3

More than x% of communities in the pilot areas participate in training/drills of evacuation for community
Evacuation centers and routes in more than y% of the pilot areas are designed and informed more than Z% of the communities

63

Change the Terms

- Myanmar Disaster Preparedness Agency (MDPA)



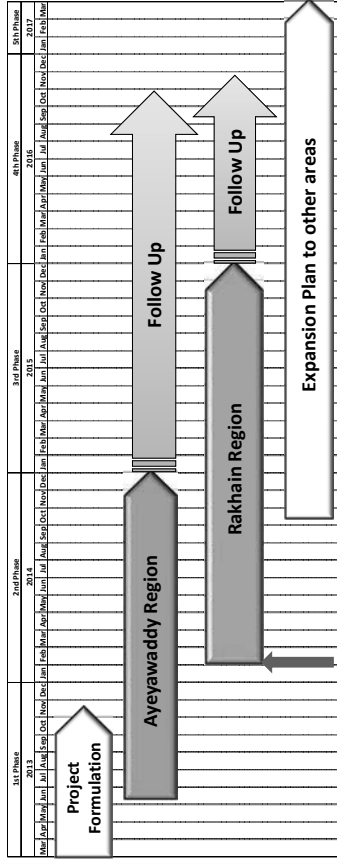
May 2013

- National Disaster Preparedness Central Committee
- National Disaster Preparedness Management Working Committee
- 10 sub-committee

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Schedule of Project

JICA Team will restart work in February 2014



Feb 2014

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6. Schedule

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Confirmation

- Selection of Pilot Community
 - Three villages
- Communication Equipment / System
 - List of equipment
 - Operation and maintenance
- Tidal Gauge Station in Haing Gyi Kyun
 - Installation of tidal gauge
 - Operation and maintenance
- 2nd year's activities

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7. Confirmation

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List of Initial Cost and O&M Cost for Early Warning Dissemination and Tide Gauge Station

Item	Contents	Initial Cost (equipment)			Initial Cost (except for equipment)			O&M Cost			Remarks		
		Unit Cost	Q'ty	Cost	Currency	Unit Cost	Q'ty	Cost	Currency	Unit Cost		Q'ty	Cost
1. Early Warning Dissemination													
1. Backbone Communication Line	1.1 SSB Short Wave Radio System 8 Sets (GAD:5, RRD:3)	3,506	8	28,048	US\$								Electricity supply cost especially for village tract is necessary
		1,450	4	5,800	US\$	6,000	4	24,000	US\$	3,180	4	12,720	
	1,450	3	4,350	US\$					600	3	1,800	US\$/year	
					3,000	2	6,000	US\$	1,200	2	2,400	US\$/year	
2. Information Sharing at Each Level	2.1 Strengthening of Communication at NavPyITaw 3 Sets (GAD, RRD, DMH)												
	2.2 Strengthening of Communication at Pahtein and Labtta 2 Areas (Pathain, Labutta)					20,000	1	20,000	US\$	5,000	2	10,000	US\$/year (in case of failure)
3. Communication with Media (Optical Fiber)	1) Installation of Optical Fiber Cable												
	2) Media Converter	10,553	1	10,553	US\$								
4. Communication with Village People	4.1 MPT Mobile Phone Network 6 Sets (3 villages *2)	404	6	2,422	US\$					600	6	3,600	US\$/year
	4.2 Information Dissemination to Residents (3 villages *2)	2,799	6	16,791	US\$								
2. Tide Gauge Station													
1. Tide Gauge Station	1.1 Installation	88,423	1	88,423	US\$	25,000	1	25,000	US\$				
	1.2 O&M												
Total				156,387	US\$			51,000	US\$				
Total (with 15% for setup)				15,649,694	Yen			5,103,570	Yen				
				179,846	US\$			75,000	US\$				
				17,997,148	Yen			7,505,250	Yen				

Equipment List

1 US\$ = 1090 kyat

1 US\$ = 100.07 yen

1. Early Warning Dissemination System

No.	Name of Equipment	Currency	Q'ty	Unit Price	Total	US\$
1	Backbone Communication Line					
1.1	SSB Shortwave Radio System					
	Immovable HF Radio (IC-7000)	JPY	8	176,400	1,411,200	14,102
	Outdoor Antenna (1/2 wavelength dipole)	JPY	8	41,700	333,600	3,334
	Outdoor Coaxial Cable (30m length)	JPY	8	6,600	52,800	528
	Stabilized DC power supply	JPY	8	26,040	208,320	2,082
	Solar power generation system	JPY	1	500,000	500,000	4,997
	15% for import					3,007
	Total					28,048
1.2	Satellite Communication System					
1)	IPSTAR Satellite Equipment					
	Antenna					
	ANT Mount					
	IDU(ATA)					
	ODU					
	Rental					
2)	Satellite Communication Device					
	Switch	USD	4	150	600	600
	IP Telephone/Fax	USD	4	300	1,200	1,200
	PC	USD	4	1,000	4,000	4,000
	Total					5,800
2	Information Sharing at Each Level					
2.1	Strengthening of Communication at NPT					
	Router	USD	3	150	450	450
	IP Telephone/Fax	USD	3	300	900	900
	PC	USD	3	1,000	3,000	3,000
	Total					4,350
3	Communication with Media					
3.1	Optical Fiber Network (DMH-MRTV)					
2)	Equipment for Media Converter (DMH)					
	7801 FR 1R Multi-Frame	JPY	1	242,000	242,000	2,418
	Redundance Power Supply for 7801 FR	JPY	1	87,000	87,000	869
	SD Elec to Opti	JPY	1	251,000	251,000	2,508
	(MRTV: ReBroadcast station)					
	7801 FR 1R Multi-Frame	JPY	1	242,000	242,000	2,418
	Redundance Power Supply for 7801 FR	JPY	1	87,000	87,000	869
	SD Opti to Elec	JPY	1	147,000	147,000	1,469
	Total					10,553
4	Communication with Village People					
4.1	MPT Mobile Phone Network					
	CDMA450 High gain antenna	kyat	6	80,000	480,000	440
	CDMA450 Immovable Phone	kyat	6	60,000	360,000	330
	CDMA450 Sim Card	kyat	6	300,000	1,800,000	1,651
	Total					2,422
4.2	Information Dissemination to Residents					
1)	Loud Speaker / Handy Speaker					
	Trumpet Speaker for outside installation	JPY	12	18,900	226,800	2,268
	Amplifier for Speaker	JPY	6	33,600	201,600	2,016
	Microphone	JPY	6	26,250	157,500	1,575
	Handy Speaker	JPY	6	18,900	113,400	1,134
	3m Pole	JPY	6	20,000	120,000	1,200
	Total					8,193
2)	Solar System Power Supply					
	Solar Panel (100w) with stand	JPY	6	60,000	360,000	3,600
	Solar Power contraller (Inverter)	JPY	6	80,000	480,000	4,800
	Battery (12V 120AH)	JPY	6	33,000	198,000	1,980
	Total					8,598
	Total					67,964
	Total (with 15% for setup)					78,159

Equipment List

1 US\$ = 1090 kyat

1 US\$ = 100.07 yen

2. Tide Gauge Station

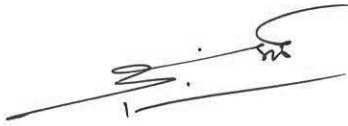
No.	Name of Equipment	Currency	Q'ty	Unit Price	Total	US\$
1	Tide Gauge Station					
	Radiowave Tide Gauge (KRG-10)	JPY	1	1,080,000	1,080,000	10,792
	Data Logger (BL-5153)	JPY	1	990,000	990,000	9,893
	DCP Transmitter / Antena (GX-1.0J)	JPY	1	900,000	900,000	8,994
	Solar Power Generation System	JPY	1	1,800,000	1,800,000	17,987
	Installation Pole / Steel Case	JPY	1	1,620,000	1,620,000	16,189
	15% for import					9,578
	Supervisor from Japan	JPY	1	1,500,000	1,500,000	14,990
	Total					88,423
	Total					88,423
	Total (with 15% for setup)					101,687

Comparative Chart of Communication Method

Item	Tel/Fax	Mobile Phone	IP-SAT Ku—Band Satellite communications	IP-SAT C-Band Satellite communications	SSB Shortwave Radio System	VHF Radio System
Reliability	High	High - Medium	Medium	High	High - Medium	High
Initial cost	Low Cost: Network by MPT only terminal cost	Low Cost: Network by MPT	High Cost: USD 4,500/set	High Cost: USD 6,500/set	High - Medium Cost: USD3,000/set	Very High Cost: more than USD50,000
Maintenance cost /year	Low Cost: ** kyat/min (Call charge)	Low Cost: ** kyat/min (Call charge)	High Cost: USD 600 (Contract fee) 50 kyat/min (Call charge)	High Cost: USD 200 (Activation) USD 240x12months = USD2,880 (Dedicated, unlimited)	not necessary (Electricity supply is necessary)	not necessary (Electricity supply is necessary)
Installation	Installed by MPT	Installed by MPT	Installed by MPT Agent	Installed by MPT Agent	Installed by User	Installed by User / Construction work is necessary including relay station.
O&M	not necessary	not necessary	Operated by User / Maintenance support by MPT	Operated by User / Maintenance support by MPT	O&M by User / Training is necessary	O&M by User (Difficult) / Maintenance of high steel tower is necessary
Scalability	Easy	Easy	Easy but costly	Easy but constly	Medium (need technical know-how)	Difficult
Means of Transmission	Voice, Fax	Voice, Text	Voice, Fax, Data (192kbps)	Voice, Fax, Data (128kbps)	Voice	Voice
Merit	High Reliability / Easy / Low Cost (initial and O&M) / used as main line	Easy / Low Cost (initial and O&M)	used as main line	High reliability / used as main line	Low Cost (O&M) / used as support line	High reliability / used as support line
Demerit	unstable during emergency situaion due to congestion	unstable during emergency situation due to congestion / unstable at Ayeyarwaddy	unstable during heavy rainfall / High Cost (initial and O&M)	High Cost (initial and O&M)	noisy and unstable depending on state of space / need technical know-how	High Cost (initial and O&M) / need technical know-how

Minutes of Meeting
on
the 2nd JCC meeting
of
The Project on Establishment of End-to-End Early Warning System
For Natural Disaster
In the Republic of the Union of Myanmar
among
Relief and Resettlement Department,
Ministry of Social Welfare, Relief and Resettlement
and
Department of Meteorology and Hydrology,
Ministry of Transport
and
Japan International Cooperation Agency

Nay Pyi Taw, November 17, 2014



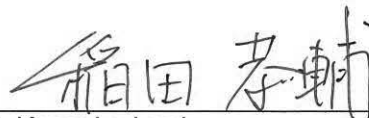
Mr. Soe Aung
Director General
Relief and Resettlement Department
(RRD)
Ministry of Social Welfare, Relief and
Resettlement



Mr. Ichiro Kobayashi
Chief Advisor
The Project on Establishment of
End-to-End Early Warning System for
Natural Disaster in the Republic of the
Union of Myanmar



Mr. Kyaw Moe Oo
Deputy Director General
Department of Meteorology and
Hydrology (DMH)
Ministry of Transport



Mr. Kyosuke Inada
Senior Representative
JICA Myanmar Office

On the occasion of concluding 2nd year's activities, Joint Coordination Committee (hereinafter called as JCC) of "the Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar" was held on November 17, 2014 at Amara Hotel in Nay Pyi Taw.

Relief and Resettlement Department (RRD) of the Ministry of Social Welfare, Relief and Resettlement, Department of Meteorology and Hydrology (DMH) of the Ministry of Transport, Japan International Cooperation Agency (JICA) and relevant parties of the Project joined JCC, chaired by Mr. Soe Aung, Director General of RRD and co-chaired by Mr. Kyaw Moe Oo, Deputy Director General of DMH, on 17 November 2014. The list of the participants is shown in Appendix 1.

It was followed by the explanation of the progress of the project by Mr. Yoshihiko Uchikura, Deputy Chief Advisor of the Project. Presentation file of the JCC is attached as Appendix 2.

All parties basically agreed to the JICA Expert Team's proposal for 3rd year's activities. The followings are the main points discussed and/or agreed in the meeting.

1. Progress of the 2nd year activity

JICA Expert Team reported progress of the Project to all participants, and Myanmar side confirmed its progress.

2. Selection of pilot area in Rakhine state

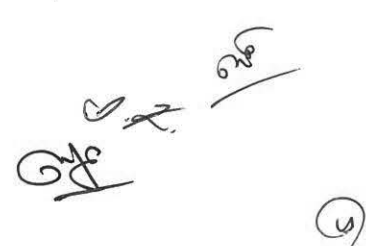
Following pilot villages of the Project were proposed by JICA Expert Team.

Department of Education inquired the reasons of selecting the pilot area. RRD and JICA Expert Team explained that the pilot area was selected from the point of security, accessibility, vulnerability, and existence of RRD and DMH offices.

RRD inquired the ethnicity of the pilot village tract and JICA Expert Team answered these are the villages of Rakhine Buddhist.

JICA Expert Team will conduct the CBDRM workshops in Thea Tan village and Kon Baung village at one time because of their adjacent locations.

- 1) Thea Tan Village, Thea Tan Village Tract, Kyauk Phyu Township
- 2) Kon Baung Village, Thea Tan Village Tract, Kyauk Phyu Township
- 3) Tan Kha Yoe Village, Thea Tan Village Tract, Kyauk Phyu Township
- 4) Let Nyot Ngon Village, Thea Tan Village Tract, Kyauk Phyu Township



3. Selection of communication and information equipment

JICA Expert Team proposed communication and information equipment for early warning to be installed in Rakhine state in the third year, and Myanmar side requested to install additional SSB in the DMH offices in Sittwe and Kyauk Phyu in Rakhine state, Pathein and Labutta in Ayeyarwaddy region for conducting project activities since the frequency of SSB for regular use of DMH is different. JICA Expert Team reported the request from a PIC member in Rakhine state that generator should be installed in village level as well as solar panel due to its unstable weather condition during rainy season. Both Myanmar side and Japanese side confirmed its necessity and JICA Expert Team will finalize the list of equipment in consultation with JICA Headquarter. Both side confirmed that installation fee of the equipment is covered by Japanese side and operation and maintenance cost of the equipment is covered by Myanmar side.

4. Submission of A4 Form

Japanese side requested Myanmar side to draft A4 form, which is the official request form for procuring the equipment in Rakhine state, by the end of November 2014. It is expected to be submitted to the Japanese government by the end of February 2015.

5. Installation of SSB

JICA Expert Team explained the progress of installing SSB in Ayeyarwaddy region and estimated that the installation will not complete by the end of November due to its prolonged process of procurement. JICA Expert Team will resume the installation from February 2015 after the commencement of the 3rd year activities.

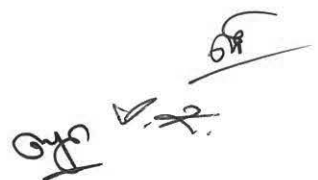
6. Office space for the Expert Team

Japanese side requested office space for JICA Expert Team in Nay Pyi Taw, Sittwe and Kyauk Phyu. DMH agreed to provide temporary office space in Rakhine state, and to arrange the space in Nay Pyi Taw.

7. Amendment of Project Design Matrix(PDM)

Japanese side proposed to amend the indicators of PDM to be in line with the current activities. Regarding to its explanation, JICA Myanmar office inquired the following three points about the indicator of overall goal:

1. Clarification of the coverage area of the indicator; whether to include some border areas which are politically unstable

Handwritten signature and initials in black ink, including a checkmark and some illegible characters.A handwritten number '5' enclosed in a circle.

2. Definition of introduction of the improved early warning system
3. Clarification of the scope of the works of HRD and CBDRM to be conducted during follow up period of the Project and to be conducted after the Project

JICA Expert Team clarified that definition of introduction is to show the methodology which was implemented in the pilot state/region. JICA Expert Team added the explanation that the follow up activities are designed to verify the effectiveness of the model proposed by the Project.

Myanmar side recognized the necessity to expand the proposed model by the Project to other areas and showed their intentions to conduct the activities by their own initiatives. Myanmar side will seek the funding from donors and parliament to secure the budget.

The amended PDM is shown in Appendix 3. Both sides will continue to review and amend the PDM during the Mid-term Review which is planned to be implemented in May 2015.

8. Tsunami early warning

After being informed the time for information dissemination from national level to village level Myanmar side recognized necessity to improve tsunami warning and dissemination to the public. Japanese side understood the concern and will provide trainings for improving tsunami early warning.

9. Next JCC

Japanese side and Myanmar side confirmed to hold the next JCC either 27th or 28th of May 2015, or 3rd or 4th of June 2015. The main topic of the next JCC is to report the result of Mid-term Review of the Project and to reach an agreement with the amended PDM in result of the Mid-term Review.

End

List of Participants

Myanmar Side

Relief and Resettlement Department

Mr. Soe Aung	Director General
Mr. Aung Khaing	Deputy Director General
Mr. Thurein Tun	Assistant Director
Ms. HOUNG HLEE	LD
Ms. Ni Ni Win	LD
Ms. Tin Tin Myat	Staff Officer

Department of Meteorology Hydrology

Mr. Kyaw Moe Oo	Deputy Director General
Ms. Nyein Nyein Naing	Assistant Director
Mr. Aung Yin	Assistant Director
Dr. Yin Myo Min Htwe	Assistant Director
Ms. Pa Pa Tun	Staff Officer

General Administration Department

Mr. Thein Htike	Management
-----------------	------------

Myanmar Radio and Television

Mr. Kyaw Naing	Assistant Director
----------------	--------------------

Information and Public Relations Department

Mr. Aung Ngwe	Deputy Director
---------------	-----------------

Myanmar Posts and Telecommunications

Ms. Myat Thandar Win	Assistant Manager
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Myanmar Fire Services Department

Mr. Hla Myo	Staff Officer
-------------	---------------

Department of Health

Mr. Nay Zar Maung	Staff Officer
-------------------	---------------

Japanese Side

JICA Myanmar Office

Mr. Kyosuke Inada

Senior Representative

Ms. Noriko Sakurai

PFA

Ms. Thet Thet Zaw

Secretary

The Expert Team

Mr. Ichiro Kobayashi

Chief Advisor

Mr. Yoshihiko Uchikura

Deputy Chief Advisor

Ms. Yoko Ota

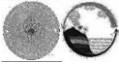
CBDRM

Mr. Masato Fujimoto

Project Coordinator

Ms. Ngwe Zin Hlaing

Project Assistant



Joint Coordinating Committee (JCC) Meeting

Report of 2nd Year Activity

November 17, 2014

Nay Pyi Taw

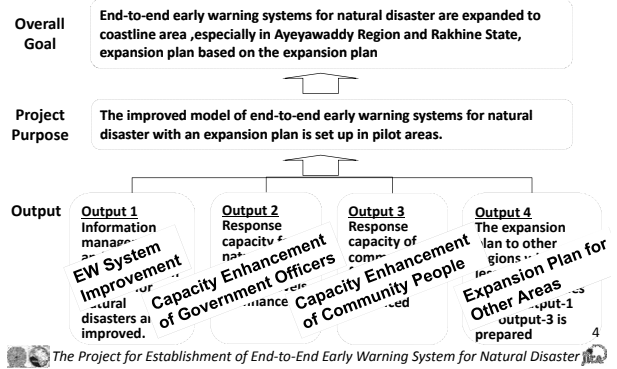
JICA Expert Team

Agenda

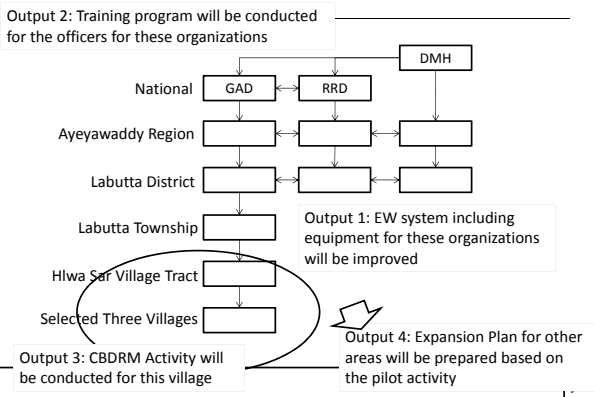
1. Summary of the Project
2. Report of 2nd Year Activity
3. Report of Information Transmission Exercise and Evacuation Drill

1. Summary of the Project

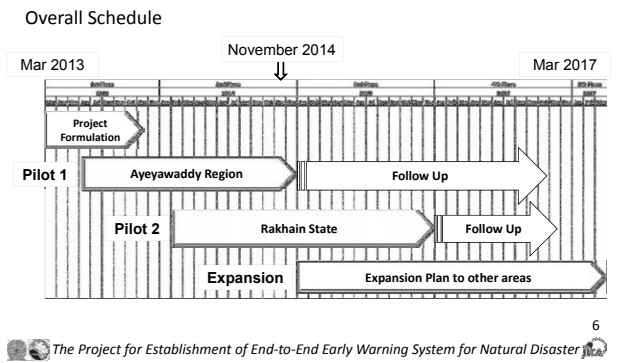
Project Purpose



Project Image (Pilot Activity → Expansion Plan)



Schedule of Project



2. Report of 2nd Year Activity

(Pilot Activity in Ayeyawaddy Region)

- Output1: Early Warning System Improvement
- Output2: HRD activity
- Output3: CBDRM activity
- Other Activity

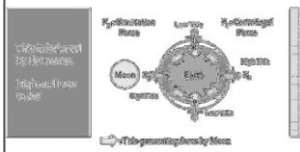
Output 1: Early Warning System Improvement

- 1) Improvement of Warning message
- 2) Installation of communication Equipment

1) Improvement of Warning message

Training for Tidal Analysis

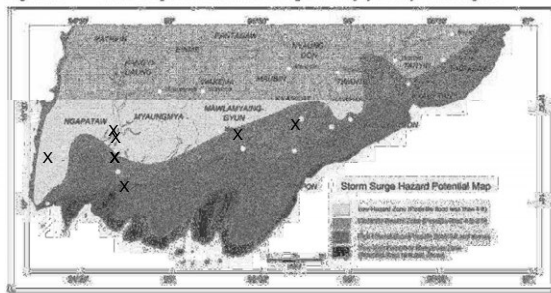
In order to improve the warning message for storm surge, basic trainings on tidal analysis have been conducted for DMH officers.



The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

Figure 26 Storm Surge Hazard Potential Map of the Ayeyarwady Delta Region***

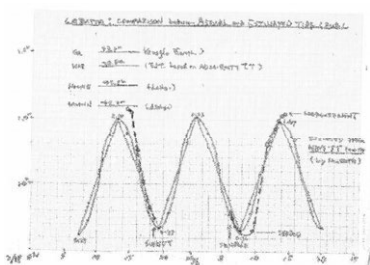


*** Map (version 1.2; 2008) by Myanmar Engineering Society; township boundaries are displayed for disaster management purpose X; Target Points

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

Verification of Suggested Estimation Method of Tide Level



The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

Contents of Cyclone, Storm surge, Heavy Rain, Tsunami warning were discussed by Mr. Akatsu (JICA Advisor) and DMH HQs.

Proposed points

- Chart information (Cyclone tracking, storm area etc.)
- District wise caution level
- The concrete action to be taken by public



Discussion about warning message at DMH HQs from July 1st - 9th

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

Proposed Storm Warning to Modify

Cyclone warning

Information Number: 1024, 2nd May 2014 (14:30hrs) 1st warning

According to the observation of satellite (GMS) on 14.5.2014, severe Cyclone Storm (SC) "Sagay" is at Northwest of Bengal and is about 90 miles West of Bangladesh, about 230 miles Southwest of Dacca about 130 miles West of Yangoon. The SC "Sagay" is heading to the East with the speed of 20 mph.

Current stage of SC "Sagay" is coded as red emergency stage. A severe cyclone is moving towards Delta area, Myanmar.

Location of Cyclone, cyclone information

SC "Sagay" is located at 14.5 degree N, 92.5 degree E, and is heading to the East with the speed of 20 mph. Center pressure of the cyclone is 994.0 hPa, estimated maximum wind speed near the center is 50 mph, 60 mph wind speed is 230 mph. Wind speed within 200 km radius from the center is under 30 mph with 100 km radius of 20 mph and 50 km radius of 10 mph.

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

Movement and Storm wind area	At the time of early formation of SC "Sagay" the direction is towards the East, with the speed of 20 mph. Storm wind area is expected to be in the East of Dacca, Bangladesh, on the evening of 17th May.
Land point (Where, When)	It is expected to be in the East of Dacca, Bangladesh, on the evening of 17th May.
Storm wind area (How)	Heavy rain, strong storm wind will be under storm wind with over 30 mph. Storm wind area is expected to be in the East of Dacca, Bangladesh, on the evening of 17th May.
Squally weather for Affect Coast	Squally, frequent squalls with rough seas will be experienced in Dacca, v/c and along the coast of Bangladesh, on the evening of 17th May.
Storm Surge	The probable maximum storm surge is about 12-14 feet at the lowest before the evening of 17th May. Storm surge is expected to be in the East of Dacca, Bangladesh, on the evening of 17th May.
General caution	It is advised to take caution against the impact of very severe squalls such as heavy rain, storm wind, storm surge, landslides and flash flood.
Advisory	It is advised to take caution against the impact of very severe squalls such as heavy rain, storm wind, storm surge, landslides and flash flood.

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

Proposed Heavy Rainfall Warning to Modify

Warning Number → Heavy Rain warning No. 14, 2014

Heavy Rain Warning (issued at 16:00 hrs M.S.T on 17th August 2014)

Cause and Effect → According to the observations and analysis of meteorological conditions at 16:00 hrs M.S.T today, under the influence of low pressure area over north-west Bay of Bengal and monsoon is strong in the Bay of Bengal, fully widespread to widespread rain are expected at wide areas with likelihood of isolated to occasionally heavy falls.

Where, When, How → Upper Ayeyarwady Region, Kachin State, Chin State. Rainfall Rate are expected 24 hours rainfall (3) inches (77 mm) and above used 17th evening.

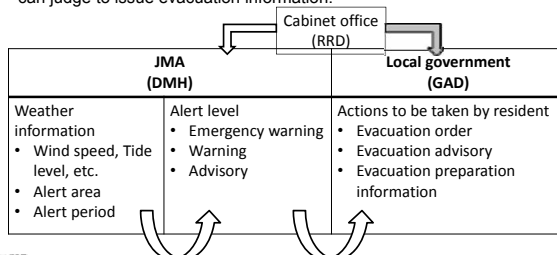
Latest Observed Rainfall data → The amounts of rainfall observed from 08:00 to 16:00 hrs M.S.T on 17th August 2014 are as follows:

No.	Station Name	Rainfall (mm)
1.	Shwe	160mm
2.	Moulmein	120mm
3.	Heho	90mm

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Improvement of Warning message

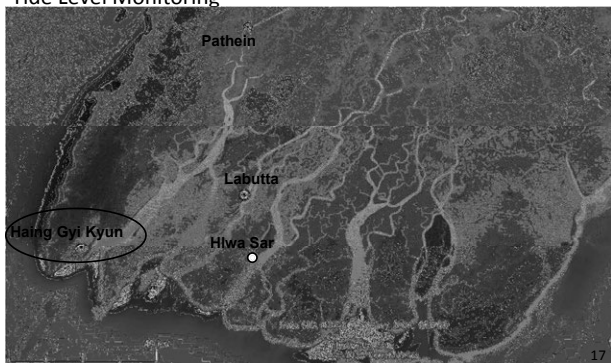
- Role of DHM ⇒ Clarification of alert level
 - Role of GAD ⇒ Clarification of actions to be taken
 - Role of RRD ⇒ Clarification of actions to be taken
- It is necessary for DMH and RRD to define the alert level by which GAD can judge to issue evacuation information.



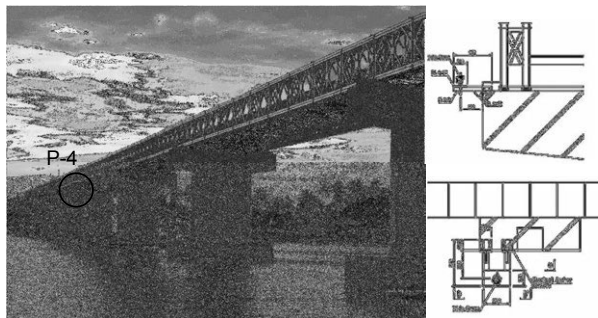
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1) Improvement of Warning message

Tide Level Monitoring



Tide Gauge

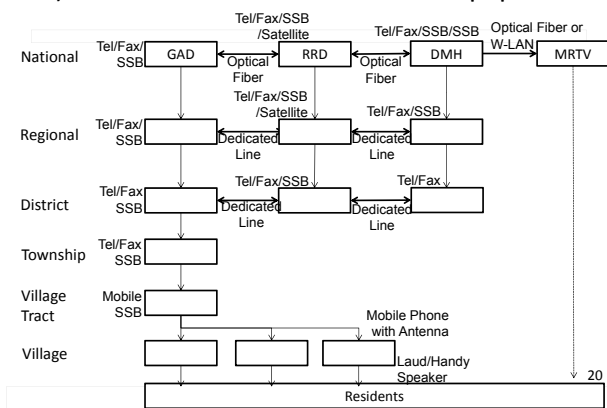


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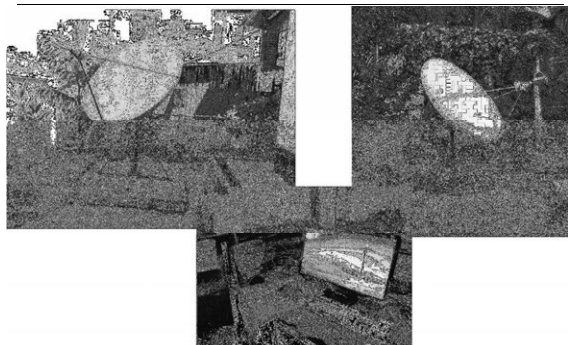
Tide Gauge



2) Installation of communication Equipment

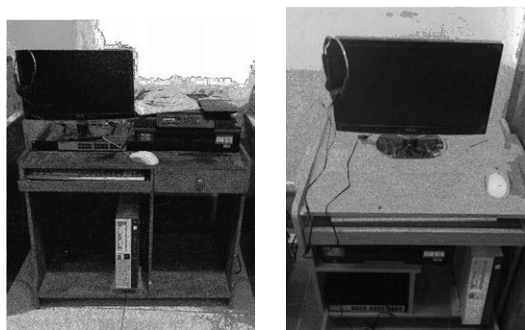


Satellite Communication (RRD)



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Optical Fiber Network (NPT)



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Village Level Communication

Loud/Handy Speaker , CDMA Telephone for village



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SSB

- Equipment will be imported soon.
- Installation will be conducted together with DMH.
- Due to the limitation of the contract period (Japanese side), installation (this year) can be done by the end of November. Installation will be continued next year (from February).

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Horizontal Communication (PTN, LBT)

- There is no service of “Dedicated Line” for the telephone line by MPT.
- Possibility to introduce the transceivers for the horizontal communication is being studied.

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DMH-MRTV Network

- DMH has discussed on the system with MPT and MRTV.
- JICA Team has received the proposal and comments on the system from Myanmar side.
- Now, Japanese side is under consideration.

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Output 2: Capacity Enhancement of Government Officers (HRD Activity)

- 1) Outline of HRD Activity
- 2) Schedule of HRD Activity
- 3) Report of HRD Activity
- 4) Output of HRD Activity

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1) Outline of the Activities

Human Resource Development (HRD) Activities

- Capacity Enhancement of officers from National Gov., Ayeyarwaddy Regional Gov. and Pilot Area on Early Warning System
- Human Resources Development on DRM at Ayeyarwaddy Regional level.



1. On the Job Training of Working Group Members
2. HRD Seminar
3. Information Transmission Exercise

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1) Outline of the Activities

Member of Working Group in Ayeyarwaddy Region

- | | |
|-------------------------|-----------------------|
| RRD | GAD |
| • Ms. Win Da Da Kyaw | • Ms. Myat Myat Khine |
| • Mr. Han Lin Htut | • Mr. Kyaw Thet Htoo |
| • Mr. Kyaw Kyaw Win San | • Mr. Soe Myat Thu |
| • Ms. Htay Myat Mon | |
| DMH | |
| • Mr. Tin Maung Yi | |
| • Mr. Aung Myint Kyi | |
| • Mr. Than Htike Ko | |

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1) Outline of the Activities

Activities of Working Group

- Establish / operate Early Warning System
- Prepare manual / HRD materials for EWS
- Implement HRD seminar / exercise
- Discussion on expansion (promotion) plan

Schedule

- Every 2 months (Kick off: 18 March 2014)

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2) Schedule of HRD Activity

2014	Working Group	Events	Outputs
February			
March	Preparation of Early Warning Manual	● 1 st WG Meeting (Mar 18)	
April			
May	Preparation HRD Program	● 2 nd WG Meeting (May 6)	
June			
July		● 3 rd WG Meeting ● HRD Seminar (Patheingyi)	● Early Warning Manual ● HRD Materials
August	Preparation of Exercise		
September		● 4 th WG Meeting	
October	Discussion on Expansion Plan	● HRD Seminar (May Pyi Taw) ● Exercise	● Exercise Materials
November			● Expansion Plan (Concept)

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2) Report of HRD Activity

1st Working Group Meeting (March 18)

Proposal to HRD materials (IEC materials)

- As a teaching materials of DRM education
- To acquire knowledge of disaster (Cyclone, Strom surge, Tsunami, etc)
- For government officers and community



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3) Report of HRD Activity

Suggested Contents of Information, Education and Communication (IEC) Materials

- Video files on recent disasters
- Animation of disaster mechanism
- Interview record on disaster experience
- Lessons learned from recent disasters



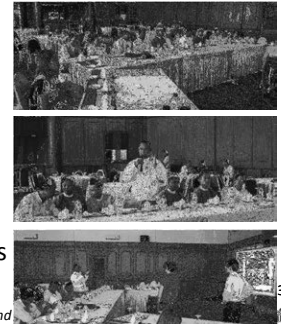
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3) Report of HRD Activity

2nd Working Group Meeting (May 6)

Proposal to EW manual

- To enhance Dissemination & Communication
- To enhance Response Capability
- For government officers

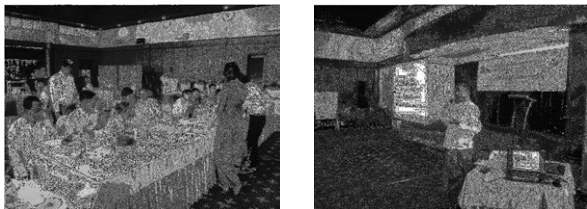


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3) Report of HRD Activity

3rd Working Group Meeting (July 22)

- Finalization of EW manual
- Rehearsal of presentation of HRD program on EW

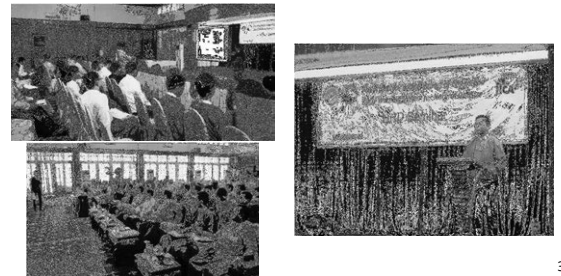


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3) Report of HRD Activity

HRD Seminar in Pathein (July 24)

- Proposal of HRD Program on EW

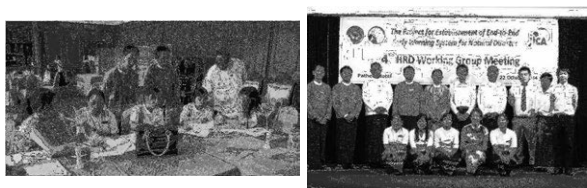


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3) Report of HRD Activity

4th Working Group Meeting (Oct 22)

- Preparation for Information Transmission Exercise



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3) Report of HRD Activity

HRD Seminar in Nay Pyi Taw (Oct 27)

- Introduction of HRD Program on Early Warning
- Preparation for Information Transmission Exercise



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3) Report of HRD Activity

Information Transmission Exercise and Evacuation Drill (Oct 30)

Information	DMH (NPT)	Village	Time
Yellow	9:00	9:40	0:40
Orange	9:35	10:03	0:28
Red	10:05	10:54	0:49
Brown	10:35	11:34	0:59
Green	10:55	12:03	1:08

Information	Village	RRD (NPT) GAD (NPT)	Time
No. of Evacuees	12:02	13:03 12:47	1:01 0:45

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3) Report of HRD Activity



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4) Output of HRD Activity

- HRD Program
- Early Warning Manual (Ayeyarwaddy)
- Exercise Material



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Output 3: Capacity Enhancement of Community People

- 1) Outline of CBDRM Activities
- 2) Schedule of CBDRM Activities
- 3) Report of CBDRM Activities
- 4) Output of CBDRM Activities

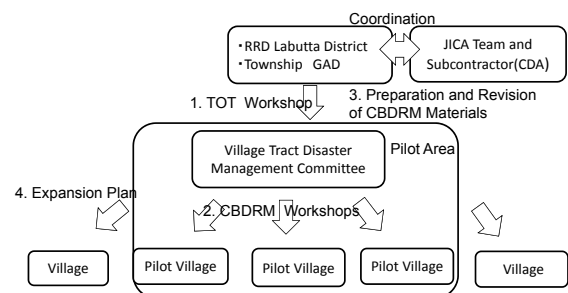
The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Outline of CBDRM Activities (1)

- **Goal**
 - To enhance the capacity of dissemination of the early warning and response to the disaster in the pilot villages
 - To develop expansion plan to other villages in pilot area by creating the model of TOT and CBDRM activities
- **Project Activities**
 1. TOT Workshop for Village Tract Disaster Management Committee
 2. CBDRM Workshops for pilot villages (5 times × 3villages)
 3. Preparation and revision CBDRM Material for TOT and CBDRM workshops
 4. Development of expansion plan

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1) Outline of CBDRM Activities (2)



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2) Schedule of CBDRM Activities

2014	Overall schedule	Pilot Villages
Feb.		
Mar.	★ TOT Workshop CBDRM Workshops	CBDRM WS for 1 st Village
Apr.		
May		
Jun.		CBDRM WS for 2 nd & 3 rd Village (Once a month)
Jul.		
Aug.		Community Activity based on DRM plan
Sep.	Information Transmission	
Oct.	★ Exercise/Study visit	
Nov.	Present	

*Expansion and Dissemination plan will be developed from 2015

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3)Report of TOT Workshop (1)

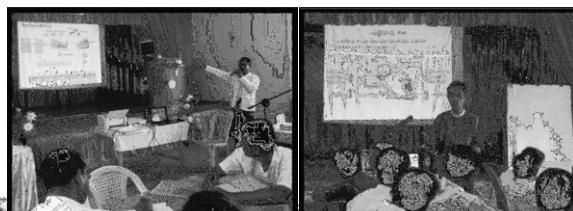
- Date: March 5-7 (3days)
- Place: Labutta Township
- Target: Village Tract Disaster Management Committee (VTDMC) members → Facilitator of CBDRM

	Main Contents
1 st day	• Basic knowledge of disaster and disaster in Ayeyarwaddy region • Outline of CBDRM
2 nd day	• Participatory disaster management planning (evacuation plan etc.)
3 rd day	• Evacuation exercise • First Aid and Search and Rescue

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

3)Report of TOT Workshop (2)

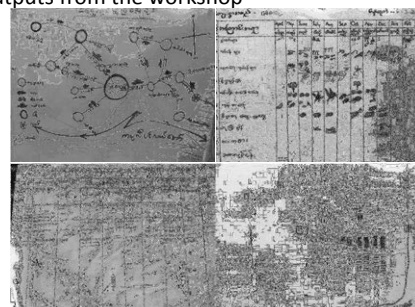
- RRD, DMH, and GAD from Labutta district provided lecture to the VTDMC and village leaders from disaster prone areas
- Township GAD and Labutta District RRD officers participated in the WS



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3) Report of TOT Workshop (3)

Outputs from the workshop



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3) Report of 1st and 2nd CBDRM WS (1)

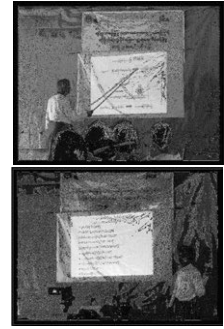
- Date: March 13-14, July 12-13, July 16-17 (2 days)
- Place: Each three village
- Target: Villagers from pilot villages

Main Contents	
1 st	<ul style="list-style-type: none"> • Basic Knowledge of disaster and disaster in Ayeyarwaddy region • Introduction of CBDRM activities
2 nd	<ul style="list-style-type: none"> • Participatory community risk assessment • Participatory disaster risk management planning

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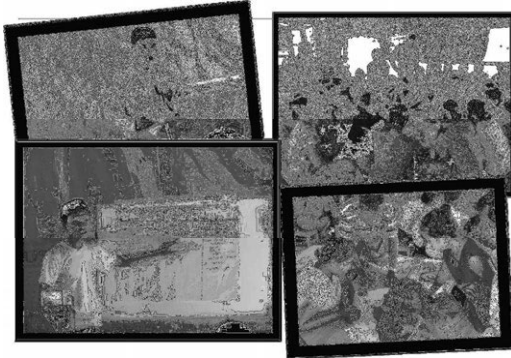
3) Report of 1st and 2nd CBDRM WS (2)

- Three facilitator from VTDPDC made presentations in the workshop
- Through participatory workshops, villagers prepared base of community disaster management plan
- RRD Labutta district and GAD Labutta and Pinsalu sub township officer observed the workshop



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3) Photos from CBDRM WS (1st day) (3)



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3) CBDRM Workshop(2nd day) (4)



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3) Report of 3rd CBDRM Workshop

- 3rd CBDRM workshop held in three villages on May 1st, August 27th and 29th

Main topics

- First Aid
- Search and Rescue
- CBDRM Action Planning
- Discussion of Community Infrastructure Project



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3) Report of 4th and 5th CBDRM workshop (1)

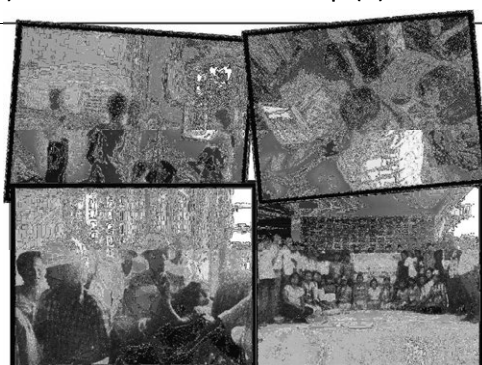
- 4th Workshop –Held in May 22nd October 16th, 18th 2014

Main topic: Preparation of Community Evacuation Drill

- Forming Teams for Community Evacuation Drill
- Discussion for Evacuation Plan
- Implementation of Community Infrastructure Project

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3) Photos from 4th Workshop (2)



55

3) Progress of CBDRM Activities

Report of 5th CBDRM workshop

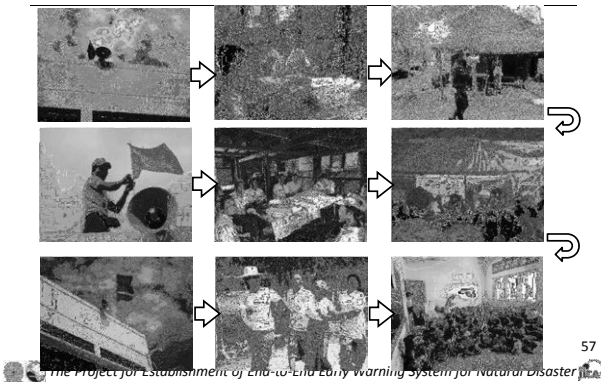
- 5th Workshop on June 2nd and October 30th, 2014

Main topic: Community Evacuation Drill

- Village-level evacuation drill
- Evaluation of the drill
- Revision of action plan/evacuation plan

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3) Progress of CBDRM Activities



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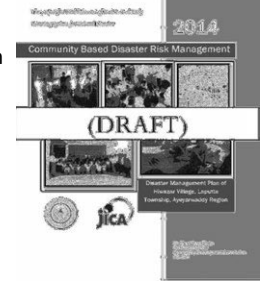
4) Output of CBDRM Activities

Community Disaster Management Planning

- With combining the result of workshop and discussion with villagers, JICA Expert Team is preparing village disaster management plan

Contents (Extracted)

- Village profile
- Village action plan
- Evacuation plan
- Disaster management committee



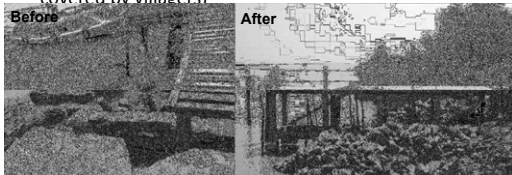
58

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4) Output of CBDRM Activities

Community Infrastructure Project

- Villagers developed action plan for DRM and the community infrastructure project in three village
 - Period : May- August, 2014
 - Cost: 5 million Kyat will be funded by JICA and rest will be covered by villagers)



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Other Activities

- 1) Annual Seminar
- 2) Counterpart Training Program in Japan
- 3) Meeting Record

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The Project for Establishment of End-to-End Early Warning System for Natural Disaster

1) Annual Seminar

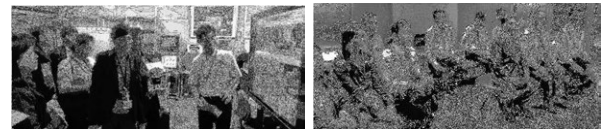
Annual seminar was successfully conducted on 8th July 2014 at Grand Amara Hotel in Nay Pyi Taw with 100 participants.



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2) Counterpart Training Program in Japan



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3) Meeting Record

Name of Meeting	Date	Place	Contents	Remarks
PIC Meeting	24 Feb	NPT	Procurement of the equipment	MM signed
PIC Meeting	26 Feb	STW	Selection of counterpart in Rakhine state	
PIC Meeting	19 Mar	PTN	Discussion of HRD, CBDRM activity in Ayeyarwaddy	
PIC Meeting	20 May	PTN	Discussion of Annual Seminar, HRD Seminar, C/P Training in Japan	
PIC Meeting	27 May	NPT	Procurement of the equipment, Discussion of Annual Seminar, C/P Training in Japan	

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3) Meeting Record

Name of Meeting	Date	Place	Contents	Remarks
PIC Meeting	23 Jul	PTN	Overall Progress of the Project, HRD, CBDRM activity in Ayeyarwaddy	
PIC Meeting	28 Jul	NPT	Procurement of the equipment	MM signed
PIC Meeting	4 Aug	STW	Overall Progress of the Project, Selection of Pilot Villages in Rakhine State	

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3. Report of Information Transmission Exercise and Evacuation Drill

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Scenario of Exercise

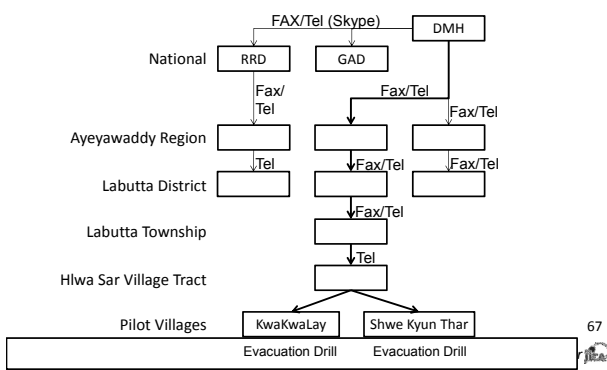
Date: October 30, 2014

Disaster: Cyclone

Information	NPT	Village	
Yellow	9:15	⇒	10:00
Orange	9:35	⇒	10:20
Red	10:05	⇒	10:50
Brown	10:35	⇒	11:20
Evacuation Situation	12:15	⇐	11:30
Green	10:55	⇒	11:40

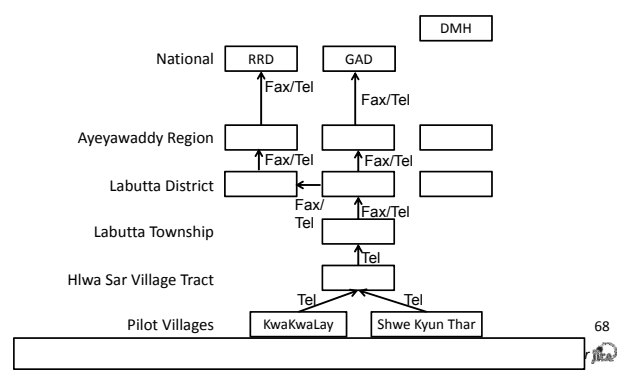
66

Information Flow (DMH=>Village)



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Information Flow (Village=>RRD)



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Photo of Exercise



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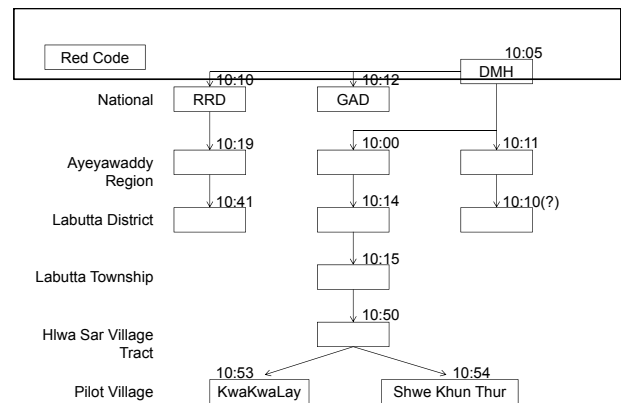
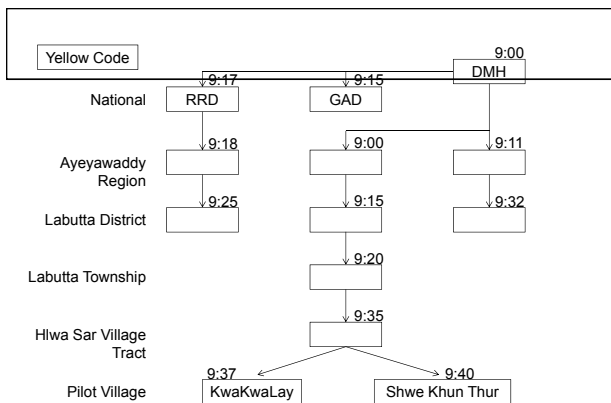
Result of the Exercise

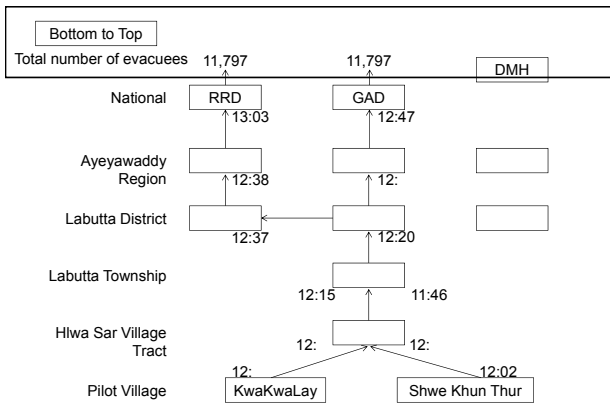
Record of Time

Information	DMH (NPT)	Village	Time
Yellow	9:00	⇒	9:40
Orange	9:35	⇒	10:03
Red	10:05	⇒	10:54
Brown	10:35	⇒	11:34
Green	10:55	⇒	12:03

Information	Village	RRD (NPT)	GAD (NPT)	Time
No. of Evacuees	12:02	⇒	13:03	1:01
			12:47	0:45

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Result of Exercise

Finding (Unexpected Condition)

- Blackout at Nay Pyi Taw
 - GAD has a power supply.
 - DMH used other fax in other building with generator.
 - RRD used only telephone and mobile phone.
- No GSM connection at Pathein and Labutta
 - Telephone, FAX and CDMA were used.
- FAX problem at Labutta District GAD
 - FAX at other agency was used.

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Result of Exercise

Finding (Positive Evaluation)

- Understanding of the objectives of exercise
 - Smooth information transmission
 - Utilization of Send/Receive format
 - Same number of evacuees (record by GAD and RRD)
- Flexible actions for information transmission
 - Utilization of alternative ways for communication
- Observation from NPT and Pathein
 - Officers from DMH NPT and RRD Pathein observed the exercise at village level.

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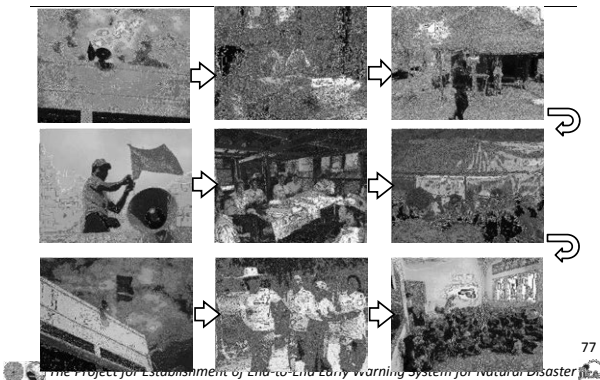
Result of Exercise

Finding (for Discussion)

- Warning messages to be disseminated
 - Necessity to transmit the "same" message by telephone
 - Only "Color Code" from Township to Village Tract
 - Contents of message from DMH
- Alternative ways for communication (Redundancy)
 - Not ready to use "Skype" before exercise
 - Necessity of electricity (generator)
- For next exercise

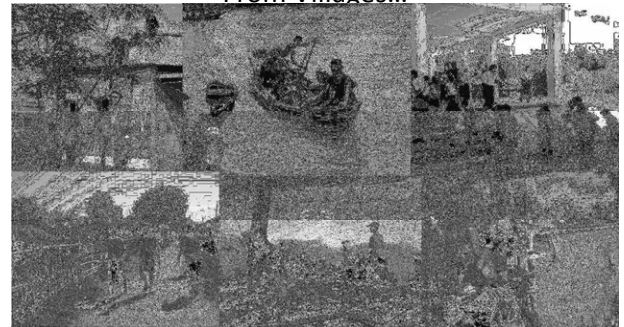
76

Evacuation Drill at Pilot Villages



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From Villages...



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Feedback from Villagers

- Involving students and children is good practice for next generation
- Search and rescue group should have list of disaster-vulnerable persons in advance
- Kwa Kwa Lay village is so long that 2 loud speaker from JICA could not cover all but utilizing existing speakers and phone, villagers could transmit the message
- In case of heavy rain, wind and thunder, sound of loud-speaker and phone will not be sufficient, so the village should have alternatives such as walkie-talkie

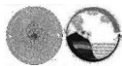
79

Observation from JICA Expert Team

- Good Points
 - Active participation from villagers (more than 250 villagers in each village)
 - Utilization of multiple ways of information transmission devices (phone, loud speakers, hand speakers)
- Points to be improved
 - Inefficient way of head counting evacuees
 - Misunderstanding of color message from village tract

Conducting drill is not the end of CBDRM, feedback and update the DM Plan is crucial!!!

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Joint Coordinating Committee (JCC) Meeting

Plan of 3rd Year Activity

November 17, 2014
Nay Pyi Taw

JICA Expert Team

1

Agenda

1. Plan of 3rd Year Activity
2. Revision of PDM
3. Schedule
4. Confirmation

2

1. Plan of 3rd Year Activity
(Pilot Activity in Ayeyarwaddy Region)
 - 1.1 Follow up Activity
(Pilot Activity in Rakhine State)
 - 1.2 Result of Survey
 - 1.3 Implementation Plan

3

Activity in Ayeyarwaddy Region

- 1.1 Follow up Activity
 - 1) O&M of installed equipment
 - 2) HRD Activity
 - 3) CBDRM Activity

4

1) Operation & Maintenance of Installed Equipment

- Installation of remaining SSBs
- Preparation of O&M manual of SSBs
- Monitoring of O&M of installed equipment
- Technical support for monitoring tide gage data at Haing Gyi Kyun

5

Support for Monitoring Tide Gauge Data

Daily work by DMH officers

- Check the tide data for last 24 hours at Sittwe and Mawlamyine
- Calculate the deviation from tide table
- Consider the reason for deviation
- O&M of tide gauge station at Haing Gyi Kyun

Support by Project

- Support for analysis of deviation at Sittwe and Mawlamyine
- Support for O&M of tide gauge station at HGK

6

2) HRD Activity

Policy of follow-up activity and expansion plan

- Activities to be disseminated (expanded) after / during the project:
 - Implementation of **HRD program** in other areas
 - Dissemination of **EW manuals** to other areas (incl. Implementation of **Information Transmission Exercise**)



- Follow-up activities shall be conducted in order to know **the effective measures and issues** to prepare the realistic expansion (dissemination) plan

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2) HRD Activity

Follow-up Activities

- Improvement of HRD program and EW manual (by Project)
- Implementation of HRD program at the periodic meetings at each government level (by Counterpart)
- Implementation of HRD program at the existing training programs (by Counterpart)
- Implementation of Information Transmission Exercise (by Project)

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2) HRD Activity

Detailed Plan of Follow up Activity (HRD Activity)

Activity	Location	Target	Responsibility	Expected Period
HRD Program	Periodical Meeting at Pathein	Officers from DRM related agencies at Regional level	RRD (Presented by WG Members)	February-May 2015
HRD Program	Periodical Meeting at Pathein	District / Township Administrators	GAD (Presented by WG Members)	February-May 2015
Information Transmission Exercise	(NPT-)Pathein-LabuttaD-T-HiwaSarVT	Without Evacuation Drill (for testing SSB)	RRD	May 2015
Information Transmission Exercise	NPT-Pathein-LabuttaD-T-HiwaSarVT-Villages	Including Evacuation Drill of CBDRM Activity	RRD / JICA Team with Rakhine State Activity	October 2015

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Schedule of Follow up Activity (HRD Activity)

2015	HRD Program	Information Transmission Exercise	Others
February	HRD Program at Pathein (for Regional officers) (for District / Township Administrators)	○ Information Transmission Exercise	Installation of SSB / Preparation of Manual
March			O&M of Equipment
April			Improvement of HRD Program / EW Manual
May			
June			
July			
August			
September			
October		○ Information Transmission Exercise	
November			Discussion on Expansion Plan

3) CBDRM Activity

Policy of follow-up activity and expansion plan

Goal of the follow-up activities is

- To develop a model to expand the output of the Project to outside pilot village and village tracts
- To redesign the program of CBDRM sustainable and affordable for Township and Village tract level



The findings of the activities will be utilized to develop expansion plan for CBDRM

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

3) CBDRM Activity

Major findings from the experience of Ayeerwaddy region

- Importance of village tract to understand EW and evacuation activities of member villages
- Importance of the role of village administrator or 100 HH leader in terms of EW and evacuation
- Small number of VTDPD facilitator
- High motivation of VTDPD members and mutual assistance within villages

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3) CBDRM Activity

Pre-condition for the activities

- Budget constraint of RRD

National		Ayeerwaddy Region	
2009-2010	954 millions		
2010-2011	575 millions		
2011-2012	965 millions		
2012-2013	2912 millions	2012-2013	42.46 millions
2013-2014	1941 millions	2013-2014	43.12 millions

(39 Townships in Ayeerwaddy region, so, approx. 1 million kyat/ township)

- No budget for DRR in Township level
 - Disaster response cost will be reimbursed after occurrence of disaster
 - Township arranges DRR lectures to village tract administrators before cyclone season and dry season (for fire)

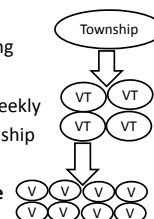
Need to conduct CBDRM within current budget for sustainability!

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3) CBDRM Activity

Follow up activities for expansion plan

- Workshop for TS officers about implementing CBDRM (By Project)
- TS instructs VT administrators during by-weekly village tract administrator meeting with township GAD (By Township)
- Village tract administrators instructs village administrators during regular village head meeting plus inviting additional leaders (By Village Tract)
- One village from Hlwa Zar village tract other than pilot villages conducts evacuation drill as a part of information transmission exercise (By Village Tract and Village)



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Schedule of Follow up Activity (CBDRM Activity)

2015	Township	Village tract	Village
February			
March	○ Workshop to instruct CBDRM to village tract		
April			
May		By weekly workshop to village tract level	By weekly workshop to village level
June			
July			
August			
September			
October		○ Village evacuation drill	
November			

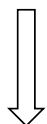
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Activity in Rakhine State

The Project for Establishment of End-to-End Early Warning System for Natural Disaster

Pilot Activity in Rakhine State

Surveys: Site Survey



- Baseline Survey
- Capacity Assessment Survey
- Interview Survey

Implementation Plan

- Output 1: Early Warning System Improvement
- Output 2: Capacity Enhancement of Government Officers
- Output 3: Capacity Enhancement of Community People
- Other Activities

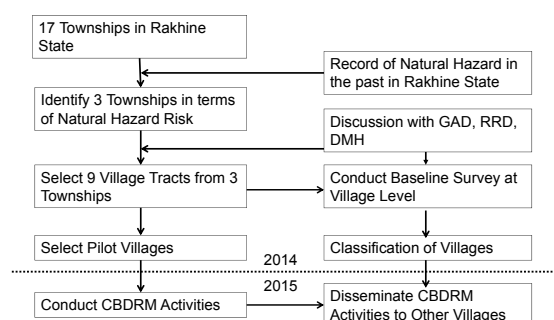
17

1.2 Result of Surveys

- 1) Baseline Survey
- 2) Capacity Assessment Survey

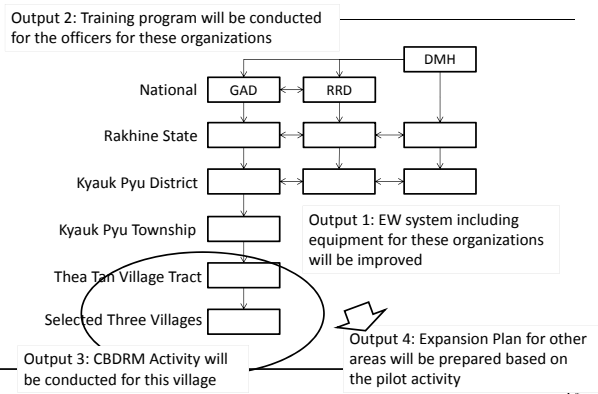
18

Selection Process of Pilot Area in Rakhine State



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Project Image (Pilot Activity → Expansion Plan)



Baseline Survey and Activities for Selection of Pilot Area in Rakhine State

2015	Overall schedule	Pilot Villages
Feb.		
Mar.	★ Kick off Meeting at Sittwe	Field trip to Sittwe, Pauktaw, Kyaupyu and Thandwe Townships
Apr.		
May	Meeting at Sittwe	Baseline Survey in Myebon, Kyaupyu and Thandwe Townships
Jun.		
Jul.		
Aug.	Meeting at Sittwe	Detailed Questionnaire Survey in selected 9 Village Tracts
Sep.		
Oct.		
Nov.	★ PIC, JCC Meeting	★ Selection of Pilot Villages

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Points of View to Select Pilot Area

- Security / Accessibility
- Existence of District Office of RRD and DMH
- Past record of Natural Disaster, including cyclone, storm surge, flood, tsunami & earthquake
- Discussion with officials of GAD, RRD, DMH and other relevant organizations
- Participation of village in DRR Activities after cyclone Giri
- Field visits by JICA team including CDA
- Socioeconomic condition
- Geographical characteristics

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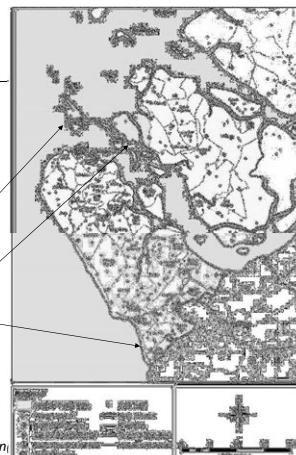
List of Village Tracts for Baseline Survey

District	Township	Village Tract	No. of Population	No. of Village
Kyaukpyu	Kyaukpyu	Thea Tan	1,010	4
		Thea Chaung	2,456	5
		Kin Myauk	1,473	7
Sittwe	Myebon	Ah Lei Kyun	835	1
		Kyet Yae Gyi	2,430	1
		Nga Man Ye Gyi	754	3
Thandwe	Thandwe	Sin Gaung	7,492	5
		Kha Maung Tone	1,879	3
		Zee Hpyu Kone	5,025	4

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Candidate Village Tracts in Kyaukpyu Township

Candidate village tract	Population	No. of Villages
Thea Tan	1,010	4
Thea Chaung	2,456	5
Kin Myauk	1,473	7

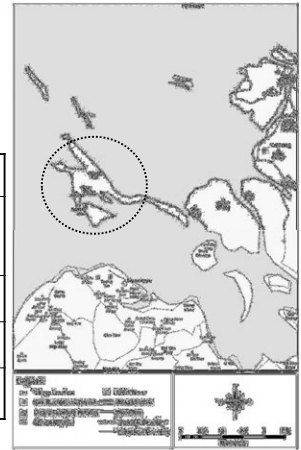


Criteria for selection of Pilot Village Tract

- **Typical disaster prone area in Rakhine state**, small islands in coastal area
- **Recommendation from local government (GAD)**
- Inactive Disaster Management Committee
- **No previous DRR activities by donors or NGOs**
- **Develop model for CBDRM activities with shelter**

Characteristics of Selected Villages for conducting CBDRM ACTIVITIES

Name of Village	Major Characteristics
Thea Tan	Main village in the village tract; cyclone shelter will be constructed by the Government
Kon Baung	Adjacent to Thea Tan village
Tan Kha Yoe	Widespread population Monastery is available
Let Nyot Ngon	Isolated island No evacuation facilities



3) Result of Capacity Assessment

- Capacity assessment was conducted in order to know the present capacity of target government officers and to prepare and implement human resources development activities on EWS.
- Target officers are listed in the next slide.
- The same questionnaire was used for all interviews.

Number of officers interviewed

Departments	No. of Officers	
Rakhine State	Officers of RRD and DMH	10
	Officers of member organizations of DM committee	5
Kyauk Pyu District	Officers of RRD, DMH and GAD	5
	Officers of member organizations of DM committee	5
Kyauk Pyu Township	Administrator and officers of township	2
	Officers of member organizations of DM committee	3
Thea Tan Village Tract	Administrator	1
	Members of DM committee	3
Village	Administrator, 100 households leader	6
Total		40

Basic Knowledge on DRM and EW

(No. of Interviewees)	State (15)	District (10)	Township (5)
RRD	8.0	6.5	-
DMH	7.3	6.0	-
GAD	6.3	9.0	7.0
Others	5.2	5.4	3.0

Averaged number of correct answers (total 10 questions)

Key Findings from Capacity Assessment

- RRD and DMH have more chances to participate in training programs on DRM.
- Number of years in current position is less than 10 years for most of the officers (except for DMH), and less than 2 years for GAD officers.
- There are not much equipment of DRM and EW.
- District and Township level have more awareness in their roles on DRM.
- Meetings on DRM are conducted at each level periodically and if necessary.

Key Challenges on EW

State Level

- Information Communication
- Transportation / Shelter for Evacuation
- Awareness of Community / Community Participation
- Coordination among agencies including NGOs

District Level

- Awareness of Community
- Training / Drill / IEC Material
- Information Communication

Key Challenges on EW

Township Level

- Information Communication
- Accurate and Immediate Information (People do not believe information and do not evacuate)
- Transportation for Evacuation
- Training / Drill
- Awareness of Community

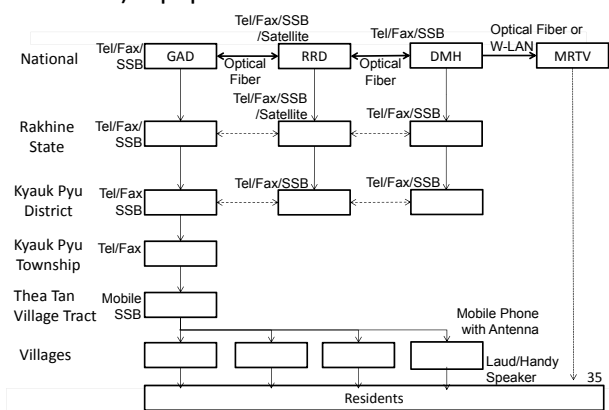
Output 1: Early Warning System Improvement

1) Equipment for Communication

1.2 Implementation Plan

- Output 1: Early Warning System Improvement
- Output 2: Capacity Enhancement of Government Officers
- Output 3: Capacity Enhancement of Community People
- Other Activities

1) Equipment for Communication



List of Equipment

- Equipment is purchased and installed by Japanese side (Initial cost is owned by Japanese side), and O & M cost is owned by Myanmar side
- Power supply has to be secured by Myanmar side.
- Although the solar system is installed for the equipment at village tract and village level, power supply has to be secured by Myanmar side especially during rainy season.
- There was a request from PIC member in Rakhine State to provide generators to pilot villages to secure the electricity during rainy season. Fuel cost shall be owned by villagers.**

List of Equipment

	Satellite	SSB	Information Sharing
RRD (STW)	IPSTAR contract/ PC/IP-Phone/Printer O/M cost	SSB Equipment	-
RRD (KYP)	-	SSB Equipment	-
DMH (STW)	-	-	-
DMH (KYP)	-	-	-
GAD (STW)	-	SSB Equipment	-
GAD (KYP District)	-	SSB Equipment	-
GAD (KYP Township)	-	-	-
Village Tract	-	SSB Equipment Solar System Electricity supply	-
4Villages	-	-	Mobile Phone Loud/Handy Speaker Solar System O/M cost Electricity supply
No. of Equipment	1 set	5 sets	7 sets

Output 2: Capacity Enhancement of Government Officers

- 1) Target of Human Resources Development (HRD) Activity
- 2) On the Job Training of Working Group Members
- 3) HRD Seminar
- 4) Information Transmission Exercise
- 5) Schedule

1) Target of Human Resources Development (HRD) Activity

- Capacity Enhancement of officers from Rakhine State Gov. and Pilot Area on Early Warning System
- Human Resources Development on DRM at Rakhine State level.



1. On the Job Training of Working Group Members
2. HRD Seminar
3. Information Transmission Exercise

2) OJT of Working Group Members

Member of Working Group (10 - 15 members)

- RRD: Sittwe, Kyauk Pyu District
- DMH: Sittwe, Kyauk Pyu District
- GAD: Sittwe, Kyauk Pyu District / Township
- Other officers

Concept

- OJT of officers to be in charge for DRM
- Work / discuss closely with JICA expert team
- Involve officers from national gov. agencies

Working Group Activities

Activities

- Discuss / improve / operate Early Warning System
- Prepare / improve EW Manual
- Improve warning message
- Install / familiarize communication equipment
- Prepare / improve HRD Program
- Implement HRD seminar / exercise
- Discuss / prepare expansion (promotion) plan

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3) HRD Seminar

General

- 2 seminars in July and October 2015
- Seminar at Sittwe: 30 participants
- Seminar at Kyauk Pyu: 30 participants

Contents

- HRD Program
- Mechanism of major disasters
- Lessons learned from past disaster experiences on EWS
- Early Warning Manual at Rakhine State
- Progress of activities at pilot area

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4) Information Transmission Exercise

General

- To evaluate validity of EWS / skills of officers on equipment and systems
- Scheduled in October 2014

Contents

- Exercise to transmit warning message issued by DMH Nay Pyi Taw to pilot community based on EW manual
- Evaluation meeting to improve EW system and its manual

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5) Schedule of HRD Activity

Month	Working Group	Events	Outputs
February			
March		1 st WG Meeting	
April	Discussion on HRD Program and EW Manual		
May		2 nd WG Meeting	
June	Installation of Equipment		
July		3 rd WG Meeting HRD Seminar (Sittwe)	Early Warning Manual HRD Materials
August	Preparation of Exercise		
September		4 th WG Meeting	
October	Dissemination Expansion Plan	HRD Seminar (Kyauk Pyu) Exercise	Exercise Materials
November			Expansion Plan

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Output 3: Capacity Enhancement of Community People

- 1) Goal and Activities on CBDRM
- 2) TOT Workshop
- 3) CBDRM Workshop
- 4) Schedule

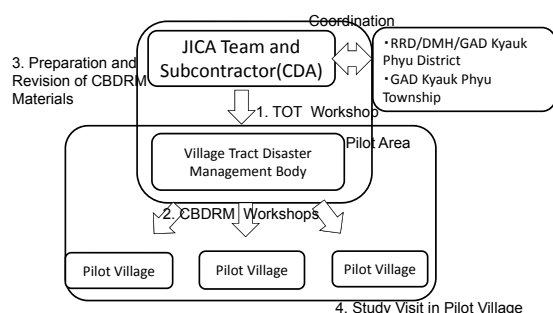
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1) Goal and Activities of CBDRM Activity

- **Goal**
 - To enhance the capacity of dissemination of the early warning and response to the disaster in the pilot villages
 - To develop expansion plan to other villages in pilot area by creating the model of TOT and CBDRM activities
- **Project Activities**
 1. TOT Workshop for Village Tract Disaster Management Organization
 2. CBDRM Workshops for pilot villages (5 times × 3villages)
 3. Revision CBDRM Material for TOT and CBDRM workshops
 4. Development of expansion plan

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Design of CBDRM



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2) TOT Workshop

- Target: Village Tract Disaster Management Body (VTDMB) members → Facilitator of CBDRM

Program of TOT Workshop

	Main Contents
1 st day	• Basic knowledge of disaster and disaster in Rakhine State • Outline of CBDRM
2 nd day	• Participatory disaster management planning (evacuation plan etc.)
3 rd day	• Skills on CBDRM (First Aid, Search and Rescue)
4 th day	• Evacuation exercise • Mainstreaming of disaster management
5 th day	• Organizing workshop, facilitation skills

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3) CBDRM Workshops

- CBDRM workshops are designed to enhance the capacity of the resident on DRM
- Five times CBDRM workshops are conducted in each pilot village
- Target of CBDRM activities: 50 persons at each village



- Revision of CBDRM material
- Preparation of expansion plan

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Program of CBDRM Workshops

	Contents
1 st	<ul style="list-style-type: none"> • Basic Knowledge of disaster and disaster in Rakhine state • Introduction of CBDRM activities
2 nd	<ul style="list-style-type: none"> • Participatory community risk assessment • Participatory disaster risk management planning
3 rd	<ul style="list-style-type: none"> • Preparation of the evacuation exercise • Community-based infrastructure planning
4 th	<ul style="list-style-type: none"> • Training for evacuation exercise (First Aid, SAR, food aid)
5 th	<ul style="list-style-type: none"> • Evacuation exercise • Evaluation of evacuation exercise

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4) Schedule of CBDRM Activities

2015	Overall schedule	Pilot Villages
Feb.		
Mar.	★ TOT Workshop	CBDRM WS for 1 st Village
Apr.	CBDRM Workshops	(Once a month)
May		
Jun.		CBDRM WS for 2 nd & 3 rd Village
Jul.		(Once a month)
Aug.		
Sep.		Community Activity based on DRM plan
Oct.	★ Information Transmission	
Nov.	Exercise/Study visit	

*Expansion and Dissemination plan will be developed from 2015

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Other Activities

- Annual Seminar
 - July 2015 at NPT
 - Expecting 100 participants
- Counterpart Training Program in Japan
 - From end of August to September 2015 (two weeks)
 - About 12 people

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2. Revision of PDM

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Revision of PDM

- Current PDM is agreed between Myanmar and Japanese sides on December 10th, 2012.
- Some of indicators and a term shall be determined by JCC.
- PDM will be reviewed at the Mid Term Review, which will be conducted jointly by JICA and Myanmar side in May 2015.

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Project Design Matrix (PDM)

Overall Goal	Indicators	Means of Verification	Important Assumption
Project Purpose			
Outputs	Inputs	Pre-Condition	
Activities			

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Indicators to be defined

Overall Goal

Improved end-to-end early warning systems are introduced in x % of coastal lined areas, especially in Ayeyarwaddy Region and Rakhine State

Output 2

More than x % of government agencies related to disaster management participates in training/drill on early warning system for natural disaster organized by the project

Output 3

More than x % of communities in the pilot areas participate in training/drills of evacuation for community

Evacuation centers and routes in more than y % of the pilot areas are designed and informed more than z % of the communities

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Overall Goal

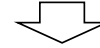
Improved end-to-end early warning systems are introduced in x % of coastal lined areas, especially in Ayeyarwaddy Region and Rakhine State



Improved end-to-end early warning systems are introduced to all coastal Regions/States

Output 2

More than x % of government agencies related to disaster management participates in training/drill on early warning system for natural disaster organized by the project



More than 80 % of government agencies related to disaster management participates in seminar/training/drill on early warning system for natural disaster organized by the project

Output 3 (1)

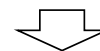
More than x % of communities in the pilot areas participate in training/drills of evacuation for community.



Villagers from all villages in the pilot village tract participate in training/evacuation drills

Output 3 (2)

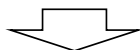
Evacuation centers and routes in more than y % of the pilot areas are designed and informed more than z % of the communities



Evacuation centers and routes of all the pilot villages are designated and presented to the villagers

Change the Term

- Myanmar Disaster Preparedness Agency (MDPA)



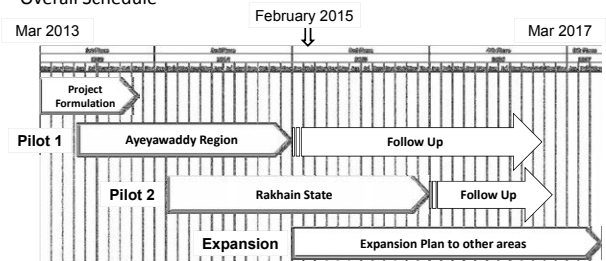
May 2013

- National Disaster Preparedness Central Committee (NDPCC)

3. Schedule

JICA Team will restart work in February 2015

Overall Schedule



4. Confirmation

- Report of 2nd Year Activity
- Plan of 3rd Year Activity
 - Follow up activity
 - Selection of Pilot Community in Rakhine State
 - Communication Equipment / System
 - HRD / CBDRM Activity
 - Other activity
- Revision of PDM
- **Next JCC will be held on 27 or 28 May 2015 or 3 or 4 June 2015.**

Necessary Arrangement

- Handover of equipment for Ayeyarwaddy Region
- Confirmation of Minutes of Meeting
- Request form of equipment for Rakhine State

Project Design Matrix (PDM1) November 17, 2014

Project Title: Project on Establishment of End-to-End Early Warning System for Natural Disaster
 Project Duration: (4 years) Project Site: Ayeayawaddy Region and Rakhine State

Target Group: (1) Staff of RRD; (2) Staff of DMH;
 (3) Local Disaster Management Committee members at each level (local government level, district level, township level and community level);
 (4) District, township officers where the pilot site is located; and (5) Community(ies) in the target area.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>[Overall Goal] End-to-end early warning systems for natural disaster are expanded to coastal lined areas, especially in Ayeayawaddy Region and Rakhine State, based on the expansion plan.</p> <p>[Project Purpose] The improved model of end-to-end early warning systems for natural disaster with the expansion plan is set up in pilot areas.</p> <p>[Outputs] 1. Information management and emergency communication system for natural disaster is improved.</p>	<p>a. Improved end-to-end early warning systems are introduced to all coastal Regions/States.</p> <p>a. Early warning is delivered surely to community in the pilot areas through more than two routes in a drill to be conducted before the Terminal Evaluation. b. Appropriate evacuation warning is delivered to community in the drill. c. The expansion plan to other regions is approved by NDPCC.</p> <p>a. Simultaneous information distribution system installed is confirmed to work normally. b. A model of information distribution system for community in a township or in a lower level areas is proposed. c. Improvement model of information distribution through mass media is proposed.</p> <p>a. More than 80% of government agencies related to disaster management participates in seminar/training/drill on early warning system for natural disaster organized by the project. b. Manuals for early warning system at various level are developed. a. Villagers from all villages in the pilot village tract participate in training/evacuation drills b. Evacuation centers and routes of all the pilot villages are designated and presented to the villagers c. More than two means of electricity generation at community level is proposed.</p> <p>a. The draft of expansion plan is proposed.</p>	<p>a. Data from NDPCC</p> <p>a. Drill report b. Record of JCC meetings</p> <p>a-c Project documents</p> <p>a. Training/drill reports b. Manuals</p> <p>a. Training reports b. Project documents c. Project documents</p> <p>a. Expansion plan documents</p>	<p>- Necessary budget of RRD for establishing the Early Warning System is secured. - Government policy on disaster management does not change significantly. - Employees who participated in trainings by the Project will continuously work for RRD and DMH.</p>
<p>2. Response capacity for natural disasters at various levels (central level including National Disaster Preparedness Central Committee (hereinafter referred to as "NDPCC"), local government level and township level) is enhanced.</p> <p>3. Response capacity of community for natural disaster is enhanced.</p>	<p>a. More than two means of electricity generation at community level is proposed.</p>		
<p>Activities</p> <p><Output1> 1-1-1 Identify the responsibilities and roles of each organization related with early warning dissemination in Myanmar and their problems. 1-1-2 Clarify appropriate mandates/responsibility for each organization related with early warning system in Myanmar based on the Activity 1-1-1. 1-1-3 Review the current weather forecast and early warning contents such as standards for issuing/clearing early warning, and identify the bottleneck. 1-1-4 Improve the current weather forecast and early warning contents such as standards for issuing/clearing early warning based on the Activity 1-1-3. 1-1-5 Make clear the early warning information distribution route for natural disaster to the members of NDPCC at various levels (central level, local government level, district level and township level) 1-1-6 Install a simultaneous information distribution system through the administrative line.</p> <p><Output2> 1-2-1 Select target township(s) and community(ies) as pilot project sites, village tracts and villages, in order to conduct the pilot project. 1-2-2 Provide communication facilities to the community(ies). 1-2-3 Consider or study the means of electricity generation at community level for securing the sustainability of early warning system for natural disaster. 1-2-4 Conduct drills on information distribution in pilot project sites.</p> <p><Output3> 1-3-1 Information distribution through mass media from DMH is improved 1-3-1 Review the current information distribution system to community through mass media from DMH and the contents of information, and identify and improve the bottleneck. 1-3-2 Cooperates with a FM station which has been jointly established by the Government of Myanmar and private companies for early warning. 1-3-3 Prepares a certain line for broadcasting real-time disaster information, and assist DMH to make an agreement with TV station for information distribution.</p> <p><Output4> 2-1 Identify needs of training based on activities through 1-1-1 to 1-1-4. 2-2 Conduct trainings on natural disaster and end-to-end early warning system, including a simulation exercise, for the staff of RRD and DMH from central government, and for the member of State/Region disaster management committee. 2-3 Develop manuals and other information, Education and Communication (IEC) materials on end-to-end early warning system at all levels (central level, local government level, district level, township level and community level) 2-4 Reflect lessons learned from 2-2 into manuals and other IEC materials.</p> <p><Output5> 3-1 Prepare/revise the community-based disaster management plan including guidance on how to utilize early warning such as when, where, how to evacuate, what items should be brought with in pilot project sites selected 1-2-1. 3-2 Prepare a manual for drafting a community-based disaster management plan. 3-3 Select and secure evacuation centers and routes. 3-4 Conduct community-based disaster management activities such as evacuation drills based on the community-based disaster risk management. 3-5 Implement training of township officers to improve community-based disaster risk management.</p> <p><Output6> 4-1 Summarize and compile a model on information distribution system through the administrative line into the expansion plan to other regions, through 1-1-1 to 1-1-6. 4-2 Summarize and compile a model on information distribution system at township/village level into the expansion plan to other regions, through 1-1-1 to 1-1-6. 4-3 Compile the manuals drafted in 2-3 and 2-4 into the expansion plan to other regions. 4-4 Summarize and compile lessons learnt in 3-1 and 3-4 into the expansion plan to other regions. 4-5 Finalize the expansion plan.</p>	<p>[Japanese side] (1) Dispatch of Experts > Short-term Experts(6): -Chief Advisor/Disaster Management Structure -Early Warning System (EWS) Operation Planning -Wireless Communication System -Community-based Disaster Risk Management -Disaster Management Planning -Project Coordinator > Lecturer(s): -Disaster Management System of Local Government -Disaster Management System on Tsunami (2) Provision of equipment *Detailed contents will be determined through the implementation of the Project. Following equipment are under consideration: -Early Warning system (SSB, Wireless LAN, I-com, speaker, etc.) -Tide gage -Solar panel (3) CP Training in Japan Comprehensive Disaster Management including: - Disaster Management in Local Governments - Early Warning System Operation - Community-Based Disaster Risk Management (4) Local cost shared by Japanese side - Costs for enlightenment programs and implementation of evacuation drills. - Costs for social surveys.</p>	<p>[Myanmar side] (1) Assignment of counterpart personnel(C/P) -Project Director -Co-Project Director -Project Manager -Regional Project Manager -Regional Project Coordinator -Necessary number of C/P (2) Office space and facilities for the Project -in the buildings of RDD in Nay Pyi Taw -in the buildings of DMH in Yangon -Regional Administration Office in target area (the detail will be decided after the Commencement of the Project.) (3) Expenses for conducting awareness program, emergency simulation exercises and evacuation drills (4) Provision of necessary data (5) Expenses for operation and maintenance of the Project office (6) Others, if any</p>	<p>- Necessary budget for the Project is allocated without any significant delay.</p> <p>[Pre-condition] Political situation of Myanmar is stable.</p>

Minutes of Meeting
on
the 3rd JCC meeting
of
The Project on Establishment of End-to-End Early Warning System For
Natural Disaster
In the Republic of the Union of Myanmar
among
Relief and Resettlement Department,
Ministry of Social Welfare, Relief and Resettlement
and
Department of Meteorology and Hydrology,
Ministry of Transport
and
Japan International Cooperation Agency

Nay Pyi Taw, May 28, 2015



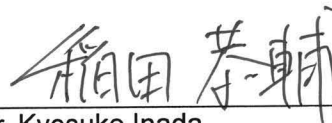
Mr. Soe Aung
Director General
Relief and Resettlement Department
(RRD)
Ministry of Social Welfare, Relief and
Resettlement



Mr. Ichiro Kobayashi
Chief Advisor
The Project on Establishment of
End-to-End Early Warning System for
Natural Disaster in the Republic of the
Union of Myanmar



Mr. Kyaw Moe Oo
Deputy Director General
Department of Meteorology and
Hydrology (DMH)
Ministry of Transport



Mr. Kyosuke Inada
Senior Representative
JICA Myanmar Office

On the occasion of conducting Mid-term Review, Joint Coordination Committee (hereinafter called as JCC) of “the Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar” was held on 28 May 2015 at RRD office in Nay Pyi Taw.

Relief and Resettlement Department (RRD) of the Ministry of Social Welfare, Relief and Resettlement, Department of Meteorology and Hydrology (DMH) of the Ministry of Transport, Japan International Cooperation Agency (JICA) and relevant parties of the Project joined JCC, chaired by Mr. Soe Aung, Director General of RRD and co-chaired by Mr. Kyaw Moe Oo, Deputy Director General of DMH, on 28 May 2015. The list of the participants is shown in Appendix 1.

It was followed by the explanation of the progress of the project by Mr. Turein Tun, Assistant Director of RRD, Dr. Yin Myo Min Htwe, Assistant Director of DMH, and Mr. Maung Maung Gyi, Staff Officer of RRD Kyauk Phyu District.

The followings are the main points discussed and/or agreed in the meeting.

1. Confirmation of the counterpart officers

Both Myanmar side and JICA Expert Team confirmed the counterpart officers of RRD, DMH and GAD attached as Appendix 2. Based on the recommendation from the Mid-term Review mission, Japanese side requested Myanmar side to nominate the counterpart of Output 4 to discuss the contents of the expansion plan.

2. Selection of candidates of counterpart workshops in Japan

Myanmar side confirmed to finalize the selection of candidates of counterpart workshops in Japan by 5 June 2015 and commence necessary application process.

3. Operation and maintenance of the procured equipment

Based on the recommendations of the Mid-term Review, Myanmar side in cooperation with JICA Expert Team will accelerate the procedure for obtaining the frequency of SSB and develop a feasible operational framework of the procured equipment in each level of the government organization. Both sides will validate the framework by conducting information transmission exercise immediately after obtaining the frequency of SSB. DMH will undertake the operation and maintenance of the tide gauge installed in Haing Gyi Kyun.

4. Procurement of communication and information equipment

JICA Expert Team initiated the procurement of equipment in Rakhine State in accordance with the request from Myanmar side. Myanmar side confirmed to undertake necessary arrangements for the procuring the equipment.




5. Annual seminar

Japanese side is planning to hold the annual seminar on 7 July 2015 in Grand Amara Hotel in Nay Pyi Taw, and requested Myanmar side to adjust the schedule and make necessary arrangements for inviting resource persons and related agencies.

6. Amendment of PDM

Japanese side proposed the amendment of PDM to Myanmar side. Both side confirmed to finalize the amendment by the next JCC.

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*The Project for Establishment of End-to-End Early Warning System
for Natural Disaster*

Attendance List of the 3rd JCC Meeting

	Name	Agency, position
1	Mr. Soe Aung	Director General, RRD
2	Mr. Kyaw Moe Oo	Deputy Director General, DMH
3	Mr. Aung Khaing	Deputy Director General, RRD
4	Mr. Win Htein Kyaw	Director, RRD
5	Mr. Chun Hre	Director, RRD
6	Mr. Turein Tun	Assistant Director of RRD
7	Mr. Maung Maung Gyi	Staff Officer, RRD Kyauk Phyu District
8	Ms. Nwe Ni Hlaing	Upper Divisional Clerk ,RRD
9	Mr. Hla Htun	Deputy Director, DMH
10	Dr. Yin Myo Min Htwe	Assistant Director, DMH
11	Ms. Nyein Nyein Hlaing	Assistant Director, DMH
12	Ms. Pa Pa Tun	Staff officer, DMH
13	Ms. Pa Pa Swe	Assistant Engineer, DMH
14	Mr. Than Tun Aye	Staff Officer, GAD
15	Mr. Kyaw Swar Nyunt	Staff Officer, GAD
16	Mr. Tin Htut Oo	Senior Engineer, MRTV
17	Ms. Sun Sun Oo	Assistant Director, MRTV
18	Mr. Ye Win Tun	Staff Officer, MPT
19	Mr. Mg Mg	Assistant Director, Information and Public Relations Department
20	Mr. Hlaing Win Aung	Assistant Director, RSD
21	Mr. Don Price	RRD Advisor, USAID
22	Mr. Yukihiko EJIRI	Senior Assistant Director, Water Resources and Disaster Management Group, Global Environment Department, JICA
23	Mr. Kunio AKATSU	JICA Senior Advisor
24	Mr. Atsushi SOMA	Deputy Director, Global Environment Department, JICA Headquarters
25	Mr. Kyosuke INADA	Senior Representative, JICA Myanmar Office
26	Ms. Noriko Sakurai	PFA, JICA Myanmar Office
27	Mr. Kaneyasu IDA	Senior Consultant, Tekizaitekisho Organization
28	Mr. Ichiro KOBAYASHI	Chief Advisor, JICA Expert Team
29	Mr. Yoshihiko UCHIKURA	Deputy Chief Advisor, JICA Expert Team
30	Ms. Yoko OTA	CBDRM Expert, JICA Expert Team
31	Mr. Masato FUJIMOTO	Project Coordinator, JICA Expert Team
32	Ms. Ngwe Zin Hlaing	Project Assistant, JICA Expert Team
33	Ms. Thet Thet Zaw	Secretary, JICA Myanmar Office

Appendix 2

List of Counterpart

Output	Organization	Position	Name
1 EW system improvement	RRD	Deputy Director, Administrative section	U Aye Min Thu
		Assistant Director	Win Ohnmar
		Upper Division Clark	Daw Nwe Ni Hlaing
	DMH	Deputy Director	U Hla Htun
		Executive Engineer	U Ye Htut
		Officer	U Htun Lin Kyaw
	GAD	Director	U Ye Naing
		Staff officer	U Than Tun Aye
		Staff officer	U Nay Myo Tun
2 HRD activity	RRD	Director, Relief Section	U Chum Hre
		Assistant Director	Su Su Tun
		Assistant Director, CR Section	U Thurein Htun
	DMH	Assistant Director	Dr. Yin Myo Min Htwe
		Officer	Daw Han Swe
	GAD	Director	U Ye Naing
		Staff officer	U Nay Myo Tun
		Staff officer	U Nay Zaw Aung
	3 CBDRM Activity	RRD	Director, Relief Section
Staff Officer, Relief Section			Daw Aye Nandar Win
Assistant Director, Relief Section			Daw Htwe Kyi
DMH		Assistant Director,	Daw Nyein Nyein Hlaing
		Superintendent	Dr Wah Wah Thein
GAD		Deputy Director	Daw Ohn Khin
		Staff officer	U Nay Zaw Aung
		Deputy Staff officer	U Zaw Myo Htet




CP in Regional Level

Output	Organization	Position	Name
All outputs	RRD	Director, Ayeyarwaddy Region	U Than Soe
		Director, Rakhine State	U Myint Soe
		Deputy Director, Labutta District	U Win Zaw Htay
		Staff Officer, Rakhine State	Daw Nan Moe New
		Staff Officer, Kyauk Phyu District	U Maung Maung Gyi
	DMH	Assistant Director, Ayeyarwaddy Region	U Tin Maung Yee
		Officer	U Hla Myint
		Staff Officer, Labutta District	U Than Zin Oo
		Assistant Director, Rakhine State	U Hla Yin Tun
		Staff Officer, Rakhine State	U Tun Aye Kyaw
		Assistant Engineer, Kyauk Phyu District	U Than Tun Win
	GAD	Director, Ayeyarwaddy Region	U Tun Min Zaw
		Director, Rakhine State	U Myint Lwin
		District Administrator, Labutta District	U Tin Oo
		District Administrator, Kyauk Phyu District	U Soe Thein
		Township Administrator, Labutta Township	U Toe Toe Tun
		Township Administrator, Kyauk Phyu Township	U Nyi Nyi Lin

Minutes of Meeting
on
the 4th JCC meeting
of
The Project on Establishment of End-to-End Early Warning System For
Natural Disaster
In the Republic of the Union of Myanmar
among
Relief and Resettlement Department,
Ministry of Social Welfare, Relief and Resettlement
and
Department of Meteorology and Hydrology,
Ministry of Transport
and
Japan International Cooperation Agency

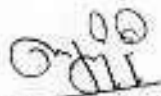
Nay Pyi Taw, February 18, 2016



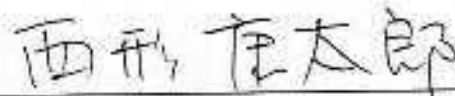
Mr. Soe Aung
Director General
Relief and Resettlement Department
(RRD)
Ministry of Social Welfare, Relief and
Resettlement



Mr. Ichiro Kobayashi
Chief Advisor
The Project on Establishment of
End-to-End Early Warning System for
Natural Disaster in the Republic of the
Union of Myanmar



Mr. Kyaw Moe Oo
Deputy Director General
Department of Meteorology and
Hydrology (DMH)
Ministry of Transport



Mr. Kotaro Nishigata
Senior Representative
JICA Myanmar Office

The 4th Joint Coordination Committee (hereinafter called as JCC) of "the Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar" was held on 5th February 2016 at Amara Hotel in Nay Pyi Taw.

Relief and Resettlement Department (RRD) of the Ministry of Social Welfare, Relief and Resettlement, Department of Meteorology and Hydrology (DMH) of the Ministry of Transport, Japan International Cooperation Agency (JICA) and relevant parties of the Project joined JCC, chaired by Mr. Soe Aung, Director General of RRD and co-chaired by Mr. Kyaw Moe Oo, Deputy Director General of DMH, on 5th February 2016. The list of the participants is shown in Appendix 1.

It was followed by the explanation of the progress of the project by Mr. Yoshihiko Uchikura, Deputy Chief Advisor of the Project.

The followings are the main points discussed and/or agreed in the meeting held on 5th February 2016.

1. Progress of the activities in the third year

JICA Expert Team reported the progress of the third year's activities and Myanmar side confirmed its progress.

2. Schedule of activities in the fourth year

JICA Expert Team presented the proposed activities in the fourth year and inquired CP officers for the comments including Ayeyarwaddy Region and Rakhine State. Myanmar side confirmed the planned activities and schedule.

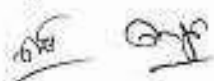
3. Report the flood analysis and the interview survey, and arrangement of the "Lessons Learned Workshop on 2015 Floods and Landslide Response"

JICA Expert Team presented the overview of the result of flood analysis and interview survey which were conducted from December 2015 to January 2016 and requested Myanmar side to arrange the facilitators and participants of "Lessons Learned Workshop on 2015 Floods and Landslide Response" which will be held on February 9th in Aureum Hotel in Nay Pyi Taw.

4. Expansion Plan in Ayeyarwaddy Region

JICA Expert Team presented the overview of expansion plan which is the result of discussion between JICA Expert Team and CP organizations in Nay Pyi Taw and Ayeyarwaddy Region. Both side confirmed the contents of expansion plan.



Both side also confirmed the contents of letter issued by Ayeyarwaddy Regional Government stating that the Ayeyarwaddy Regional Government is trying to allocate the budget of implementing expansion plan. JICA Expert Team will monitor the implementation of expansion plan with the initiative of CP officers during the fourth year of the project.



5. Amendment of PDM

Japanese side proposed the amendment of PDM to Myanmar side. Both sides agreed the amendment and confirmed that this amendment will be finalized by another Minutes of Meeting after the authorization of JICA Head Quarters.
Amended PDM (draft) is attached as Appendix 2.

End

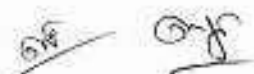

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The Project for Establishment of End-to-End Early Warning System

For Natural Disaster

Attendance List of the 4th JCC Meeting

No.	Name	Agency, position
1	Mr. Kyaw Moe Oo	Deputy Director General, DMH
2	Ms. Lei Lei Aye	Director, RRD
3	Ms. Myat Moe Thwe	Deputy Director, RRD
4	Ms. Khine Mon Mon Ei	Assistant Director, RRD
5	Ms. Su Su Tun	Assistant Director, RRD
6	Mr. Aung Kyaw Khaing	Assistant Director, RRD Rakhine Regional Office
7	Ms. Win Pa Pa Kyaw	Staff Officer, RRD Ayeyarwaddy Regional Office
8	Ms. Thandar Aung	Deputy Staff Officer, RRD
9	Ms. Ei Shwe Zin Win	Deputy Staff Officer, RRD
10	Ms. Nwe Ni Hlaing	Upper Divisional Clerk, RRD
11	Mr. Min Soe Han	Upper Divisional Clerk, RRD
12	Ms. Khin Nyein Nyein Ko	Lower Divisional Clerk, RRD
13	Ms. Zin Mar Htay	Lower Divisional Clerk, RRD
14	Ms. Khine Wah Thinn	Lower Divisional Clerk, RRD
15	Mr. Hla Tun	Deputy Director, DMH
16	Dr. Yin Myo Min Htwe	Assistant Director, DMH
17	Mr. Lin Zaw Htwe	Staff Officer, GAD
18	Mr. Zay Naw Win	Staff Officer, GAD
19	Mr. Aung Myo Sett	Staff Officer, GAD
20	Mr. Tin Htut Oo	Senior Engineer, MRTV
21	Ms. Nan Htike Htike Aung	Staff Officer, MRTV
22	Mr. Ngwe Thaug	Executive Engineer, MPT
23	Mr. Myint Zaw	Assistant Engineer, MPT
24	Mr. Than Naing	Staff Officer, Information and Public Relations Department
25	Ms. Win Win Maw	Staff Officer, Information and Public Relations Department
26	Mr. Hlaing Win Aung	Assistant Director, Fire Service Department
27	Mr. Aung Ko Ko Oo	Staff Officer, Fire Service Department
28	Ms. Khin Myo Lwin	Assistant Director, Department of Human Resource & Educational Planning
29	Ms. Tin Ma Latt	Staff Officer, Department of Human Resource & Educational Planning
30	Mr. Kotaro NISHIGATA	Senior Representative, JICA Myanmar Office
31	Ms. Noriko Sakurai	PFA, JICA Myanmar Office
32	Ms. Thet Thet Zaw	Secretary JICA Myanmar Office
33	Mr. Yoshihiko UCHIKURA	Deputy Chief Advisor, JICA Expert Team
34	Ms. Yoko OTA	CBDRM Expert, JICA Expert Team
35	Dr. Zayar Win	Social Survey, JICA Expert Team
36	Ms. Ngwe Zin Hlaing	Project Assistant, JICA Expert Team




Project Design Matrix

February 18, 2016 (draft)

Project Title: Project on Establishment of End-to-End Early Warning System for Natural Disaster

Project Duration: (4 years) **Project Site:** Ayeyarwaddy Region and Rakhine State

Target Group: (1) Staff of RRD; (2) Staff of DMH;

(3) Local Disaster Management Committee members at each level (local government level, district level, township level and community level);

(4) District, township officers where the pilot site is located; and (5) Community(ies) in the target area.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>[Overall Goal] End-to-end early warning systems for natural disaster are expanded to coastal lined areas, especially in Ayeyarwaddy Region and Rakhine State, based on the expansion plan.</p> <p>[Project Purpose] The improved model of end-to-end early warning systems for natural disaster with the expansion plan is set up in pilot areas.</p>	<p>a. Improved end-to-end early warning systems are introduced to all coastal Regions/States.</p> <p>a. Early warning is delivered surely to community in the pilot areas through more than two routes in a drill to be conducted before the Terminal Evaluation</p> <p>b. Appropriate evacuation warning is delivered to community in the drill.</p> <p>c. The expansion plan to coastal lined areas is approved by JCC.</p>	<p>a. Data from NNDMC</p> <p>a. Drill report b. Record of JCC meetings</p>	<p>- Necessary budget of RRD for establishing the Early Warning System is secured.</p> <p>- Government policy on disaster management does not change significantly</p>
<p>[Outputs] 1. Information management and emergency communication system for natural disaster is improved.</p>	<p>a. Simultaneous information distribution system installed is confirmed to work normally.</p> <p>b. A model of information distribution system for community in a township or in a lower level areas is proposed.</p> <p>c. Tide data is monitored by installed tide gauge and analyzed for improving early warning system.</p> <p>d. Improvement model of information distribution through mass media is proposed.</p>	<p>a-c Project documents</p>	<p>- Employees who participated in trainings by the Project will continuously work for RRD and DMH.</p>

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<p>2. Response capacity for natural disasters from central government level to local government level is enhanced.</p>	<p>a More than 80% of government agencies related to disaster management participates in seminar/training/drill on early warning system for natural disaster organized by the project. b Manuals for early warning system at various level are developed.</p>	<p>a. Training/drill reports b Manuals</p>	
<p>3. Response capacity of community for natural disaster is enhanced.</p>	<p>a Villagers from all villages in the pilot village tract participate in training/evacuation drills b Evacuation centers and routes of all the pilot villages are designated and presented to the villagers</p>	<p>a. Training reports b Project documents c Project documents</p>	
<p>4. The expansion plan to coastal lined areas which include lessons learnt through activities under Output-1 to Output-3 is prepared.</p>	<p>a The expansion plan to coastal lined areas is approved by JCC.</p>	<p>a. Expansion plan documents</p>	
<p>Activities</p> <p><Output1> 1-1 Early warning information distribution through an administrative line is improved 1-1-1 Identify the responsibilities and roles of each organization related with early warning dissemination in Myanmar and their problems. 1-1-2 Clarify appropriate mandates/responsibility for each organization related with early warning system in Myanmar based on the Activity 1-1-1. 1-1-3 Review the current contents of early warning for natural disaster such as standards for issuing/clearing early warning, and identify the bottleneck. 1-1-4 Improve the current contents of early warning for natural disaster such as standards for issuing/clearing early warning based on the Activity 1-1-3. 1-1-5 Make clear the early warning information distribution route for natural disaster to the members of disaster management related organizations from national and local level (region/state government level, district level and township level) 1-1-6 Install communication equipment including simultaneous system through administrative lines. 1-1-7 Install tide gauge for improving early warning system. 1-1-8 Conduct flood analysis and interview survey of the flood disaster in 2015 and compile its lessons learned.</p>		<p>[Japanese side] (1) Dispatch of Experts ➢ Short-term Experts(6): -Chief Advisor/Disaster Management Structure -Early Warning System (EWS) Operation Planning -Wireless Communication System -Community-based Disaster Risk Management -Disaster Management Planning -Project Coordinator ➢ Lecturer(s): -Disaster Management System of Local Government</p>	<p>Input</p> <p>[Myanmar side] (1) Assignment of counterpart personnel(C/P) -Project Director -Co-Project Director -Project Manager -Regional Project Manager -Regional Project Coordinator -Necessary number of C/P (2) Office space and facilities for the Project -in the buildings of RDD in Nay Pyi Taw -in the buildings of DMH in Yangon -Regional Administration Office in target area (the detail will be decided after the Commencement of the</p> <p>Necessary budget for the Project is allocated without any significant delay.</p>

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<p>1-2 Information distribution system for community in a township or in a lower level areas is developed</p> <p>1-2-1 Select target township(s) and community(ies) as pilot project sites, village tracts and villages, in order to conduct the pilot project</p> <p>1-2-2 Provide communication equipment to the community(ies).</p> <p>1-2-3 Consider or study the means of electricity generation at community level for securing the sustainability of early warning system for natural disaster.</p> <p>1-2-4 Conduct drills on information distribution in pilot project sites.</p> <p>1-3 Information distribution through mass media from DMH is improved.</p> <p>1-3-1 Review the current information distribution system to community through mass media from DMH and the contents of information, and identify and improve the bottleneck.</p> <p>1-3-2 Cooperates with a FM station which has been jointly established by the Government of Myanmar and private companies for early warning.</p> <p>1-3-3 Propose a certain line for broadcasting real-time disaster information.</p> <p><Output2></p> <p>2-1 Identify needs of training based on activities through 1-1-1 to 1-1-4.</p> <p>2-2 Conduct trainings on natural disaster and end-to-end early warning system, including a simulation exercise, for the staff of RRD, DMH and GAD from central, state/region, district and township level.</p> <p>2-3 Develop manuals and other information, Education and Communication (IEC) materials on end-to-end early warning system at all levels (central level, local government level, district level, township level and community level)</p> <p>2-4 Reflect lessons learned from 2-2 into manuals and other IEC materials through conducting Pilot activities and Follow up activities.</p> <p><Output3></p> <p>3-1 Prepare/revise the community-based disaster management plan including guidance on how to utilize early warning such as when, where, how to evacuate, what items should be brought with in pilot project sites selected 1-2-1.</p> <p>3-2 Prepare a manual for drafting a community-based disaster management activity including developing community disaster management plan.</p> <p>3-3 Select and secure evacuation centers and routes.</p> <p>3-4 Conduct community-based disaster management activities such as evacuation drills based on the community-based disaster management plan.</p> <p>3-5 Implement training of township officers for instructing village tract administrators about community-based disaster risk management as follow up activities.</p>	<p>-Disaster Management System on Tsunami</p> <p>(2) Provision of equipment</p> <p>*Detailed contents will be determined through the implementation of the Project. Following equipment are under consideration:</p> <p>-Early Warning system (SSB, Wireless LAN, I-com, speaker, etc.)</p> <p>-Tide gage</p> <p>-Solar panel</p> <p>(3) C/P Training in Japan</p> <p>Comprehensive Disaster Management including:</p> <p>- Disaster Management in Local Governments</p> <p>- Early Warning System Operation</p> <p>- Community-Based Disaster Risk Management</p> <p>(4) Local cost shared by Japanese side</p> <p>- Costs for enlightenment programs and implementation of evacuation drills.</p> <p>- Costs for social surveys.</p>	<p>(3) Expenses for conducting awareness program, emergency simulation exercises and evacuation drills</p> <p>(4) Provision of necessary data</p> <p>(5) Expenses for operation and maintenance of the Project office</p> <p>(6) Others, if any</p>	<p>[Pre-condition]</p> <p>Political situation of Myanmar is stable.</p>
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	<p><Output4></p> <p>4-1 Summarize and compile a model on information distribution system through the administrative line into the expansion plan to coastal lined areas, through 1-1-1 to 1-1-6.</p> <p>4-2 Summarize and compile a model on information distribution system at township/village level into the expansion plan to coastal lined areas, through 1-2-1 to 1-2-4.</p> <p>4-3 Compile the manuals drafted in the activities of 2-3 and 2-4 into the expansion plan to coastal lined areas.</p> <p>4-4 Summarize and compile lessons learned in the activities of 3-1 and 3-4 into the expansion plan to other coastal lined areas.</p> <p>4-5 Finalize the expansion plan.</p>

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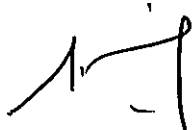
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Minutes of Meeting
on
the Final JCC meeting
of
The Project on Establishment of End-to-End Early Warning System
For Natural Disaster
In the Republic of the Union of Myanmar
among
Relief and Resettlement Department,
Ministry of Social Welfare, Relief and Resettlement
and
Department of Meteorology and Hydrology,
Ministry of Transport and Communication
and
Japan International Cooperation Agency

Nay Pyi Taw, January 24, 2017



Dr. Ko Ko Naing
Director General
Relief and Resettlement Department
(RRD)
Ministry of Social Welfare, Relief and
Resettlement



Mr. Ichiro Kobayashi
Chief Advisor
The Project on Establishment of
End-to-End Early Warning System for
Natural Disaster in the Republic of the
Union of Myanmar



Dr. Kyaw Moe Oo
Deputy Director General
Department of Meteorology and
Hydrology (DMH)
Ministry of Transport and
Communication



Mr. Kotaro Nishigata
Senior Representative
JICA Myanmar Office

Final Joint Coordination Committee (hereinafter called as JCC) meeting of "the Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar" was held on 24 January 2017 at PARKROYAL Nay Pyi Taw.

Relief and Resettlement Department (RRD) of the Ministry of Social Welfare, Relief and Resettlement, Department of Meteorology and Hydrology (DMH) of the Ministry of Transport and Communication, Japan International Cooperation Agency (JICA) and relevant parties of the Project joined JCC meeting, chaired by Dr. Ko Ko Naing, Director General of RRD and co-chaired by Dr. Kyaw Moe Oo, Deputy Director General of DMH. The list of the participants is shown in Appendix 1.

Mr. Ichiro Kobayashi, Chief Advisor of JICA Expert Team presented the overview of project activities and outputs.

The followings are the main points discussed and/or agreed in the meeting.

1. Completion of the project activities

Both Myanmar side and JICA side confirmed that all planned project activities were completed in January 2017 as scheduled in Record of Discussion signed on 10 December 2012.

2. Approval of the Expansion Plans

Both Myanmar side and JICA side discussed and agreed the Expansion Plans for Ayeyarwaddy Region and Rakhine State which had been discussed and agreed by Project Implementing Committee (PIC) meetings held in Ayeyarwaddy Region on 12 December 2016 and in Rakhine State on 13 December 2016. As a part of implementation of the Expansion Plan, with collaboration of RRD, DMH and GAD, the information transmission exercise will continue at least once a year, and DMH will initiate this exercise by sending the test information to related agencies.

3. Update of the result of the Terminal Evaluation

Both Myanmar side and JICA side updated result of the terminal evaluation. Both parties confirmed the achievement of the Project Purpose, evaluation by Five Criteria, and recommendations in the Terminal Evaluation Report agreed in the JCC held on 3 November. The summary of the update is shown in the Appendix 2.

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4. Results of Input

The inputs from Japanese side and Myanmar side for the implementation of project were confirmed such as assignment of experts and C/Ps, provision of equipment and project budget. List of inputs are shown in Appendix 3. Myanmar side agreed that each organization in the list is responsible for operation and maintenance of listed deliverables and equipment properly.

End

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Appendix 1: List of Participants

Myanmar Side

Relief and Resettlement Department

Mr. Win Htut Oo	Deputy Director General
Mr. Win Htein Kyaw	Director
Ms. Myat Moe Thwe	Deputy Director
Ms. Ei Shwe Zin Win	Deputy Staff Officer
Ms. Ei Khaing San	Deputy Staff Officer
Ms. Lai Yin Win	Deputy Staff Officer
Ms. Aye Mar Thin	Staff Officer
Ms. Thidar Aung	Staff Officer
Ms. Kay Thi Htay	Deputy Staff Officer
Ms. Moe Sandar	Assistant Staff Officer
Mr. Aung Zaw Win	Upper Division Clerk
Ms. Houg Hlee	Upper Division Clerk
Mr. Ye Htut Paing	Lower Division Clerk
Mr. Arkar Sann Lwin	Lower Division Clerk
Mr. Aung Ko Oo	Lower Division Clerk

Department of Meteorology Hydrology

Dr. Kyaw Moe Oo	Deputy Director General
Ms. Han Swe	Staff Officer

General Administration Department

Mr. Zay Naw Win	Staff Officer
Mr. Soe Moe Oo	Staff Officer

Myanmar Radio and Television

Ms. Moe Thuzar Aung	Director
Mr. Satoshi Hamanaka	MRTV-NEXT
Ms. May Thin Zaw	MRTV-NEXT
Mr. Yazar Kyaw	MRTV-NEXT

Information and Public Relations Department

Ms. Myint Myint Kyi	Assistant Director
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Myanmar Fire Services Department

Mr. Saw Hla Tun San Staff Officer

Mr. Kaung Myat Naing Staff Officer

Department of Rural Development

Mr. Win Oo Assistant Director

Department of Agriculture

Dr. Aung Moe Myo Tint Deputy Director

Education research and planning

Ms. Tin Ma Lat Staff Officer

Department of Irrigation and Water Utilization

Dr. Aung Than Oo Assistant Director

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Japanese Side


JICA Myanmar Office

Mr. Kotaro Nishigata	Senior Representative
Ms. Noriko Sakurai	PFA
Mr. Lu Kyee Noe	Secretary

The Expert Team

Mr. Ichiro Kobayashi	Chief Advisor
Mr. Yoshihiko Uchikura	Deputy Chief Advisor
Ms. Yoko Ota	CBDRM
Mr. Masato Fujimoto	Project Coordinator
Ms. Ngwe Zin Hlaing	Project Assistant
Ms. Tin Tin Oo	Project Assistant
Ms. Thin Thin Wei	Project Assistant

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Appendix 2: Update of the result of the Terminal Evaluation

1. Achievement of the Project Purpose

Summary of the achievement of the Project Purpose" The improved model of end-to-end early warning systems for natural disaster with the expansion plan is set up in pilot areas" is summarized as follows:

	Verifiable indicator	Condition of the achievement
(a)	Early warning is delivered surely to community in the pilot areas through more than two routes in a drill to be conducted before the Terminal Evaluation.	It had been verified already at the time of Terminal Evaluation Survey conducted from 17 October to 3 November 2016.
(b)	Appropriate evacuation warning is delivered to community in the drill.	It was observed that the warning message was appropriate in that it made community people take necessary actions such as evacuation in the Community Evacuation Drills held on 13 December 2016 as well as on 2 Feb 2016.
(c)	The expansion plans to Ayeyarwaddy Region and Rakhine State are approved by JCC.	Both Myanmar side and JICA side approved the Expansion Plans for Ayeyarwaddy Region and Rakhine State which include concrete plans of activities and their necessary budget, which had been already approved by Project Implementing Committee (PIC) meetings held in Ayeyarwaddy Region on 12 December 2016 and in Rakhine State on 13 December 2016.

2. Update of Five Evaluation Criteria

Both side confirmed the actions taken after the Terminal Evaluation to improve the evaluation pointed out in the Terminal Evaluation Report.

	Criteria(evaluation)	Update/Actions taken before the completion of the Project
1	Relevance(high)	These criteria was already evaluated as "high" during the Terminal Evaluation
2	Effective(high)	
3	Efficiency(medium)	Challenges about the frequent transfer of the CPs and communication with HQs seemed to be improved because both parties strived to increase communications at Nay Pyi Taw and pilot areas.
4	Impact(medium)	Two more tangible impacts of the Project have been emerged after the Terminal Evaluation. 1) 3 sets of SSB radio were installed in Ayeyarwaddy Region as a part of expansion plan 2) DMH and MRTV decided to increase the number of weather forecast TV program by using latest information through optical fiber network installed by the project.
5	Sustainability(medium)	The prospect of sustainability is still "medium" from the financial aspect. However, it may be improved if the disaster management fund will be available for each local government to implement the expansion plan.

3. Update of Recommendations

Both parties confirmed the necessary actions to be taken before the completion of the Project which were presented in the Terminal Evaluation Report.

	Recommendation	Update/Actions taken before the completion of the Project
1	The Project needs to address such issues caused by the personnel relocation of the project C/Ps as the lack of necessary handover from predecessors to successors, and the lack of timely information sharing and communication in NPT on project activities.	JICA expert team stayed in Nay Pyi Taw as much as possible to communicate with C/Ps, and tried to communicate with newly assigned C/Ps and new ministers especially in Ayeyarwaddy Region and Rakhine State for better mutual understandings on the project. The expansion plans have been understood by more C/Ps and ministers through these efforts.
2	The Project need to explain the importance to the PIC meeting of the Expansion Plans, and advocate these plans to other disaster risk areas than the pilot sites of the Project in Ayeyarwaddy region and Rakhine State	The PIC meetings were held in Ayeyarwaddy Region on 12 December 2016 and in Rakhine State on 13 December 2016, and in Nay Pyi Taw on 16 December 2016 to share and discuss on the expansion plan, and the expansion plan was agreed by PICs.
3	The Project tries to secure or get necessary financial resources for 2017 to continue the project activities and implement the expansion plans.	In the PIC meetings, securing necessary financial resources for implementing the expansion plan was one of the main topics discussed. RRD explained that RRD understood the importance to implement expansion plan, but the budget was limited and had to be allocated not only to Ayeyarwaddy Region and Rakhine State but to whole country. However, RRD also explained that 30 sets of SSB radios were newly purchased by 100 days plan of RRD, and 3 radios of them were installed and operated already in Ayeyarwaddy Region as a part of expansion plans, and the disaster management fund of local government could be utilized for implementing expansion plan, which was recently allocated to each local government.
4	The Project is requested to explore the possibility to share the achievements to other JICA projects.	There are two on-going JICA projects related to the project, such as "Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar" (SATREPS) and "The Project for Capacity Development of the Myanmar Radio and Television" (MRTV Next Project). The project shared the project achievements with these related projects not only by the meetings but through inviting SATREPS members to the Workshop of discussing "TIMELINE" and the final seminar in the project, and through inviting MRTV Next Project C/Ps as a presenter of the final seminar. Outputs of the project especially "TIMELINE" and optical fiber connection between MRTV and DMH will be utilized and improved by

		these projects.
5	RRD should include the expansion plans into revising the MAPDRR.	The review workshop of MAPDRR was held in Patheingyi on 22-23 November 2016, and RRD explained about the project and expansion plan to be included in new MAPDRR. RRD will continue to try to include the expansion plans into new MAPDRR.

4. Recommendations after the Project completion

Both Myanmar side and JICA side confirmed the necessity to continue the following recommendations agreed in the Terminal Evaluation Report for further improvement of early warning system in Myanmar after the cooperation period.

- 1) RRD and region/state governments try to mobilize or get necessary financial resources to implement expansion plans.
- 2) RRD continues to seek an opportunity to include the expansion plans into higher polices and/or plans.
- 3) Facilities such as evacuation shelters and access routes need to be developed more in the pilot areas and other high-risk areas to make the early warning system effective.

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Appendix 3: List of Inputs

1. Deliverables

No.	Name	Type
1	Expansion Plan for Ayeyarwaddy Region	Document
2	Expansion Plan for Rakhine State	Document
3	HRD Program	Document / DVD
4	CBDRM Manual	Document / DVD
5	Early Warning Manual	Document
6	2015 Flood Survey Report	Document
7	TIMELINE for Cyclone Disaster	A0 Document

2. Provided Equipment

Type	Location		Quantity	Total
SSB Radio communication	Nay Pyi Taw	RRD	1	15
		DMH	1	
		GAD	1	
	Pathein	RRD	1	
		GAD	1	
	Labutta	RRD	1	
		DMH	1	
		GAD (District)	1	
		GAD (Township)	1	
		Hlwa Sar Village	1	
	Sittwe	RRD	1	
		GAD	1	
Kyauk Phyu	RRD	1		
	GAD (District/Township)	1		
	Thea Than Village	1		
Satellite Communication Equipment	Nay Pyi Taw	RRD	1	3
	Pathein	RRD	1	
	Sittwe	RRD	1	
PC (Communication through optical fiber network)	Nay Pyi Taw	RRD	1	3
		DMH	1	
		GAD	1	
Loud Speaker, Handy Speaker	Labutta	Hlwa Zar Village	2	13
		Kwa Kwa Lay Village	2	
		Shwe Kyun Thar Village	2	
	Kyauk Phyu	Thea Tan Village	2	
		Kon Baung Village	2	
		Than Kha Yae Village	2	
		Let Nyot Ngon Village	1	

Type	Location		Quantity	Total
Strengthened CDMA Telephone	Labutta	Hlwa Zar Village	2	6
		Kwa Kwa Lay Village	2	
		Shwe Kyun Thar Village	2	
Strengthened GSM Telephone	Kyauk Phyu	Thea Tan Village	2	7
		Kon Baung Village	2	
		Than Kha Yae Village	2	
		Let Nyot Ngon Village	1	
Solar System Power	Labutta	Hlwa Zar Village	3	15
		Kwa Kwa Lay Village	2	
		Shwe Kyun Thar Village	2	
	Kyauk Phyu	Thea Tan Village	3	
		Kon Baung Village	2	
		Than Kha Yae Village	2	
		Let Nyot Ngon Village	1	
Diesel Engine / Generator	Kyauk Phyu	Thea Tan Village	2	7
		Kon Baung Village	2	
		Than Kha Yae Village	2	
		Let Nyot Ngon Village	1	
Automatic Tide Gauge Station	Haing Gyi Kyun	DMH	1	1
Manual Tide Gauge Staff	Pyapone	DMH	1	3
	Labutta	DMH	1	
	Gwa	DMH	1	
Optical Connection Fiber	Nay Pyi Taw	Between DMH and MRTV	1	1

3. Office equipment to be provided

Name	Quantity	Agency
Satellite Image	1	RRD HQs
Arc GIS	1	RRD HQs
Laptop PC	1	RRD HQs
Desktop PC	1	RRD HQs
Copy Machine	1	RRD HQs

4. Dispatch of Experts

Number of Experts	Days of Stay in Myanmar				Total Days
	JFY2013	JFY2014	JFY2015	JFY2016	
19	775	830	778	379	2,762

As of January 2017

5. Counterpart Training

Date	Participants	Visited Sites
27 Aug – 7 Sep 2013	RRD 4, GAD 4, DMH 2	Gifu Prefectural Gov., Nagoya Municipal Minato Disaster Prevention Center, Nagoya City office, DRI, MLIT, JMA, etc.
24 Aug – 6 Sep 2014	RRD 3, GAD 3, DMH 4	Honjo Bosai Kan, MLIT, JMA, Tono Magokoro Net, Kamaishi City, Disaster Management Drill in Sagamihara, DRI, etc.
22 Aug – 5 Sep 2015	RRD 4, DMH 3, GAD 3, MRTV 2, Pyinsawadi FM 1	MLIT, JMA, Nine Prefectures City Joint Emergency Drill, Great East Japan Earthquake affected areas, Nippon TV Network, etc.

6. Project Local Cost (Japanese Side)

JFY2013	JFY2014	JFY2015	JFY2016	Total
38,697,647	76,988,365	68,782,362	TBC	184,468,374

(Currency: JPY)

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(c) コミュニティ防災活動に関する参考資料

表 AN 2.5.1 訓練の評価会での参加者の主なコメント

項目	コメント
ルワザー村	
早期警報	<ul style="list-style-type: none"> ● ハンドスピーカーが一つしかないため、情報伝達に時間を要した ● 情報伝達チームのメンバー内での役割分担(いつ誰が村のどこで情報を伝えるか)が漠然としたまま訓練を迎えてしまい、効率的に動けなかった
救難援助	<ul style="list-style-type: none"> ● 水難救助の際にライフジャケットが必要 ● 救助を行うボランティアの安全確保が重要である。 ● 足腰の弱い老人などの要支援者の避難の方法が効率的ではなかった。村人数人で抱えるより担架があった方がよかった。
初期救護	<ul style="list-style-type: none"> ● 村に駐在する助産師(唯一の医療人材)は、外部の村から派遣されており、災害時にはすぐに町へ避難するため、薬や医療器具の使い方が判る人材が不足している。
シェルター・避難	<ul style="list-style-type: none"> ● シェルターの収容人数が全く足りていないことが判った。村にもう一つのシェルターが必要である。 ● もし他の村から想定外の多くの人数が避難してきた時に、自分の村の人を避難させる場所がない。 ● タウンシップへの被害報告用のフォームについてチーム内で周知されていなかった。
クワクワレイ村	
早期警報	<ul style="list-style-type: none"> ● 政府からの警報メッセージの伝達が遅れた時はどうすればいいかを考えなくてはいけない。 ● 村が広すぎて、JICA 供与のラウドスピーカーでは村全体をカバーできない。そのため、他のスピーカーを有する施設と協力したりして、効率的に情報伝達ができた。 ● 当初のタイムテーブルに記載された時間と実際の警報の時間が違い、村人への指示が混乱した。
救難援助	<ul style="list-style-type: none"> ● 事前に要支援者をリスト化の方が望ましい。
初期救護	<ul style="list-style-type: none"> ● 村に医療人材がいないため、いざというときに不安を感じる。
シェルター・避難	<ul style="list-style-type: none"> ● 家財道具やボートなどの重要な財産を守る方法を検討する必要がある。 ● 150 人の村人に参加を呼び掛けたが、結果として 250 人以上参加することになり、村人の意識の高さが伺えた。
避難情報報告	<ul style="list-style-type: none"> ● 人数の集計方法が非効率的で、集計を報告するのに 40 分弱の時間を要した(専門家チーム所見)
シュエチュンター村	
早期警報	<ul style="list-style-type: none"> ● 川の対岸にボートで情報を知らせる必要があるなど、想像した以上に人手が必要なのがあった。
救難援助	<ul style="list-style-type: none"> ● 集落が川で分かれているため、効率的な人員配置が必要。
初期救護	<ul style="list-style-type: none"> ● けが人のための薬などの医療器具一式が足りていない。 ● 救護に係るより詳しい知識を得たい。
シェルター・避難	<ul style="list-style-type: none"> ● 食糧を集めてシェルターに運ぶには、メンバーが 6 人では足りない事がわかった。 ● 水や食料の備蓄が足りない事がわかった。 ● 小学生や子供を避難訓練に参加させることは、若い世代に知識を伝える上でよいことである。
避難状況報告	<ul style="list-style-type: none"> ● 人数の集計方法が非効率的で、集計を報告するのに 1 時間弱の時間を要した(専門家チーム所見)
タン村	
早期警報	<ul style="list-style-type: none"> ● 携帯電話が繋がらない場合は、隣のコンバウンには歩いて伝えるに行かなくてはならない。25 分かかるので、村を繋ぐ橋が早くできて欲しい。
救難援助	<ul style="list-style-type: none"> ● 水難救助の際に村人が中々協力してくれなかった。被災者役などを誰もやりたがらない。
初期救護	<ul style="list-style-type: none"> ● 訓練では上手くできたけど、実際の状況で包帯等の手当てでできるか不安が残る。
シェルター・避難	<ul style="list-style-type: none"> ● 避難者の集計を行う際に、村人が協力してくれず家に帰りたがり、集計が大変だった。

コンバウン村	
早期警報	<ul style="list-style-type: none"> ● 携帯電話が繋がらない場合は、誰かメッセージを送った方が良い。 ● 通信が途絶えた時は、雨や波、風の強さに注意を払い、危ないと思ったら避難する必要がある。
初期救護	<ul style="list-style-type: none"> ● 村に医療従事者がいない事もあり、自分たちだけでは手当に不安を感じる。チームとしてより多くの訓練が必要だと思った。
シェルター・避難	<ul style="list-style-type: none"> ● 実際に避難してみて、丘に避難するのは危険だというのが判った。丘に続く道は雨季には浸水することや、丘の上には建物が一切なく、雨風をしのぐものがない。丘の上にも建物が必要だと感じた。 ● 今回避難場所を2か所で実施したが、集計を担当するメンバーが3人だけでは足りない事がわかったので、増員を検討する。
タンカヨー村	
早期警報	<ul style="list-style-type: none"> ● ハンドスピーカーの調子が良くなかったため、村人がメッセージを理解できているか不安だった。【訓練前にハンドスピーカーの点検をする必要性を指導】
救難援助	<ul style="list-style-type: none"> ● ヘルメットやライフジャケットや安全な靴がもっと必要だということがわかった。海難救助の際は、自らの安全の確保も必要である。
初期救護	<ul style="list-style-type: none"> ● 3時間の初期救護のトレーニングだけでは不十分で、より一層の訓練が必要であることと、薬が不足していることがわかった。
シェルター・避難	<ul style="list-style-type: none"> ● シェルターの中の子供が泣き始めたりしたので、当初の予定より早めに食べ物を配った。実際の災害でもそのように対応すべきだと考えている。 ● 村の人口は193名で、121名が参加した。訓練をやることで、実際には僧院には全員避難できないことが分かった。そのため、妊婦・子供・老人を優先して僧院に避難させ、若者は山に逃げるべきである。実際の災害の時には、上記を考慮する必要があることが分かった。 ● 避難者を数え間違いから2度数えることとなった。避難者の集計は改善の余地がある。
レニョゴン村	
早期警報	<ul style="list-style-type: none"> ● サイクロンの強さを示す旗の色を赤からカラーコードに合わせて変えたことによって住民に伝わりやすくなったと感じている。 ● テタン村のビレッジトラクトの電話が途中でつながらなくなった、ビレッジトラクトアドミニストレーター携帯電話もつながらなくなったので、ほかの電話番号も用意しておくべきである。
救難救助	<ul style="list-style-type: none"> ● シェルターを管理しているグループと避難者の情報を共有すべきだった。
初期救護	<ul style="list-style-type: none"> ● もう少し包帯の巻き方など、手当での訓練が必要だと感じている。
シェルター・避難	<ul style="list-style-type: none"> ● 女性だけのメンバーだったため、丘の上に備蓄物資を運ぶのに時間がかかったため、救難救助グループの若い男性の助けが必要である。

出典：専門家チーム作成

表 AN 2.5.2 タウンシップ職員向けワークショッププログラム

時間	講義科目	講師
9:30-10:30	プロジェクトの活動内容について	JICA 専門家チーム
10:40-11:40	防災概論	RRD ラブッタ郡
13:00-14:00	エーヤワディ地域の災害について	DMH ラブッタ郡
14:10-15:40	コミュニティ防災概論	NGO
15:50-16:20	日本のコミュニティ防災について	GAD ラブッタタウンシップ

出典：専門家チーム作成

表 AN 2.5.3 ビレッジトラクト向け防災教育プログラム

	講義科目	講師
3月	村で注意すべき災害について	DMH ラブッタ郡
4月	コミュニティ防災活動概論	RRD ラブッタ郡
5月	避難マップ作成	ルワザービレッジトラクト防災委員会
6月	災害時の情報伝達について	GAD ラブッタタウンシップ
7月	コミュニティ防災グループの活動	ルワザービレッジトラクト防災委員会
8月	コミュニティ避難訓練	RRD ラブッタ郡

出典: 専門家チーム作成

表 AN 2.5.4 ジンピュンゴン村での訓練のプログラム

時間		内容	講師
1 日目			
09:00	09:30	訓練開会	ビレッジトラクトアド ミニストレーター
09:30	09:45	訓練のルールの説明	参加者
10:00	10:30	ラブッタにおける災害	U Than Htike
10:30	11:30	ジンピュンゴン村における災害リスクのスコア付	U Sein Win
11:30	12:00	防災の基本用語	U Sein Win
01:30	03:30	災害リスク (DMH) - サイクロン前の状況 - サイクロン接近中の状況 - サイクロン後の状況 -サイクロンのカラーコード	U Sein Win, U Than Htike , U Po Po
03:45	04:45	参加型コミュニティリスク分析 (グループワーク) - 村の歴史 - 村の地図 - 避難地図 - 関係者分析 - 問題分析	U Than Htike
04:45	05:00	講義の振り返り	U Sein Win
2 日目			
09:00	10:00	前日のグループワークの宿題の解説(各グループ 20 分)	U Than Htike
10:15	11:15	前日の宿題の解説続き	U Than Htike
11:15	12:00	初期救護の理論の説明	U Thein Htwe
01:30	02:30	防災サイクル (RRD)	U Sein Win
02:30	03:15	街歩き (グループワーク)	
03:30	04:15	街歩きの気づきの記入	U Po Po
04:15	04:45	避難マップの作成	U Sein Win
04:45	05:00	講義の振り返り	U Than Htike
3 日目			
09:00	09:30	防災委員会の結成 (11 委員会)	U Po Po
09:30	10:30	災害時の各グループの役割と責任の確認 ● コミュニティ早期警報 ● 避難 ● 初期救護/救難援助 ● 救援物資配布 ● シェルター管理	U Than Htike 保健局派遣の看護師
10:45	12:00	5グループの復讐	U Sein Win
01:30	02:00	火災リスク	U Than Htike
02:00	03:00	Review of 3 days training.	U Po Po, U Than Htike , U Sein Win
03:15	03:30	Review training for trainer	参加者
03:30	04:00	Closing the Training Ceremony	

出典：ルワザービレッジトラクト防災委員会の資料を専門家チームが翻訳

表 AN 2.5.5 ジンピュンゴン村の訓練後の参加者のコメント

項目	コメント
早期警報	村にはシェルターに付けられている学校が所有するラウドスピーカーが一つしかなく、村内の情報伝達には、ハンドスピーカーなどが必要である。シェルターから船着場近くのある民家まで徒歩約 20 分の距離があり、訓練での各カラーコードの間の時間が短かったこともあり、集落全体に伝えることが難しかった。
救難援助	今回は人の避難訓練のみを実施したが、家畜を含めた避難訓練を実施すべきである。村の資機材として、ライフジャケットやタイヤなどが必要である。
初期救護	ルワザー村の保健局職員による講義や実技指導が訓練に役に立った。初期救護班がこれらの知識を、他の機会でも活用できる。
シェルター・避難	この時期は漁業に出かけている人が多く、シェルターの規模に比べて参加者は少ない。災害の際は周辺村の住民も逃げてくるため、周辺村と連携した訓練をやりたい。

出典: 専門家チーム作成

表 AN 2.5.6 第 1 回、第 2 回ワークショップ

日時	講義項目	講師
7/8	<ul style="list-style-type: none"> • Basic information regarding disasters • Disasters in Rakhine State • Story telling of Cyclone Nargis • Overview of CBDRM • 6 steps of CBDRM (2) Building Rapport and Understanding the Community 	TOT ワークショップ参加者
7/9	<ul style="list-style-type: none"> • 6 steps of CBDRM (3) Participatory Community Risk Assessment (lecture and implementation of town watching, creation of community hazard map) • 6 steps of CBDRM (4) Participatory Disaster Risk Management Planning • (Creation of community action plan) 	TOT ワークショップ参加者

出典: 専門家チーム作成

表 AN 2.5.7 キンミヤック村の訓練後の参加者のコメント

項目	コメント
早期警報	<ul style="list-style-type: none"> ・ 訓練実施前は、村が広いことや、家々が離れていることから、グループ内で情報伝達に関する懸念があったが、訓練当日はバイクを使って村を回ることによって効率的に情報伝達ができた。 ・ 村が広いことから、メンバーを村の各所に配置したので、村中に情報伝達が行われているかを確認することができた。
救難援助	<ul style="list-style-type: none"> ・ 村の住民が避難にあまり協力的でなかったことに反省が残る。
初期救護	<ul style="list-style-type: none"> ・ 複数回練習したメンバーは問題なく動けたが、練習が不足していたメンバーは村人の前で手当てを行う自信が持てなかった。チーム全体として、頻繁に練習すべきだと感じた。
シェルター・避難	<ul style="list-style-type: none"> ・ 訓練を実施することによって、実際の災害が来る前に、防災計画に書かれた自分たちの役割や災害対応に関する知識を確認できて満足している。

出典: 専門家チーム作成

表 AN 2.5.8 タウンシップ防災委員会向けワークショッププログラム

時間	プログラム	講師
8:30-9:00	参加者受付	
9:00-9:20	開会式	
9:30-10:30	コミュニティ防災概要・2015年の洪水の教訓	JICA 専門家チーム
10:30-10:40	休憩	
10:40-11:40	ラカイン州における災害	チャオピュー郡 DMH
11:40-12:40	昼食	
12:40-13:40	CBDRM マニュアル紹介	JICA 専門家チーム
13:40-14:10	パイロット活動紹介	CDA(再委託先 NGO)
14:10-14:20	休憩	
14:20-16:20	参加者によるディスカッション	全参加者
16:20-16:30	閉会式	

出典: 専門家チーム

(d) 専門家の派遣実績

専門家氏名	所属	期間(日)	担当分野
小林 一郎	(株)オリエンタルコンサルタンツグローバル	267	総括/災害対応(1)
内倉 嘉彦	(株)オリエンタルコンサルタンツグローバル	431	副総括/組織体制強化
村田 進	パシフィックコンサルタンツ(株)	200	災害対応(2)
伊藤 孝司	パシフィックコンサルタンツ(株)	200	無線通信システム
佐竹 正博	(株)オリエンタルコンサルタンツグローバル ((一財)海外通信・放送コンサルティング協会)	151	機材調達計画
浅野 良博	(株)オリエンタルコンサルタンツグローバル (International Development Initiative, INC)	295	防災計画
太田 陽子	(株)オリエンタルコンサルタンツグローバル	439	コミュニティ防災
ゼイヤール ウイン	(株)オリエンタルコンサルタンツグローバル	302	社会調査
佐伯 達郎	復建調査設計(株)	90	ハザードマップ/脆弱性 評価
奥野 あずさ	(株)オリエンタルコンサルタンツグローバル	30	業務調整/組織体制強化
藤本 雅人	(株)オリエンタルコンサルタンツグローバル	236	補助/キャパシティア セスメント
		14	災害調査
Angelito Ong ARJINA	(株)オリエンタルコンサルタンツグローバル	30	GIS/データベース
嶋田 宏	パシフィックコンサルタンツ(株)	82	潮位計設置
辻尾 大樹	パシフィックコンサルタンツ(株)	15	潮位データ解析
村山 貢司	(株)オリエンタルコンサルタンツグローバル (気象業務支援センター)	5	防災情報伝達(放送)
青木 寛匡	(株)オリエンタルコンサルタンツグローバル	14	洪水分析
栗原 弘一	(株)オリエンタルコンサルタンツグローバル (気象業務支援センター)	8	気象分析
丹羽 竜也	パシフィックコンサルタンツ(株)	9	高潮解析

(e) 通信機材リスト

機器種別	設置場所		数量	合計
SSB 無線機	ネビドー	RRD	1	15
		DMH	1	
		GAD	1	
	パテイン	RRD	1	
		GAD	1	
	ラブッタ	RRD	1	
		DMH	1	
		GAD (郡)	1	
		GAD (タウンシップ)	1	
	シットウエ	RRD	1	
		GAD	1	
	チャオビュー	RRD	1	
GAD (郡/タウンシップ)		1		
テタン村		1		
衛星通信機器	ネビドー	RRD	1	3
	パテイン	RRD	1	
	シットウエ	RRD	1	
PC (光ファイバー網による通話)	ネビドー	RRD	1	3
		DMH	1	
		GAD	1	
ラウドスピーカー、ハンデイスピーカー	ラブッタ	ルワザー村	2	13
		クワクワレイ村	2	
		シュエチュンター村	2	
	チャオビュー	テタン村	2	
		コンバウン村	2	
		タンカーヨー村	2	
		レニョゴン村	1	
アンテナを強化した CDMA 回線固定電話	ラブッタ	ルワザー村	2	6
		クワクワレイ村	2	
		シュエチュンター村	2	
アンテナを強化した GSM 回線固定電話	チャオビュー	テタン村	2	7
		コンバウン村	2	
		タンカーヨー村	2	
		レニョゴン村	1	
ソーラーパワーシステム	ラブッタ	ルワザー村	3	15
		クワクワレイ村	2	
		シュエチュンター村	2	
	チャオビュー	テタン村	3	
		コンバウン村	2	
		タンカーヨー村	2	
ディーゼルエンジン	チャオビュー	レニョゴン村	1	7
		テタン村	2	
		コンバウン村	2	
		タンカーヨー村	2	

		レニョゴン村	1	
自動潮位計	エーヤワディ	ハイヂチョン	1	1
簡易潮位計	エーヤワディ、ラ カイン	ラブッタ、ピャーボン、グワ	3	3
DMH-MRTV 接続（光ファイバー網による接続）	ネピドー	DMH, MRTV	1	1

(f) 出典：専門家チーム作成

(f) プロジェクト投入情報

再委託契約実績一覧

件名	「Baseline survey and CBDRM activities」 「Capacity Assessment and HRD Activity」
契約相手方	Community Development Association
契約内容	エーヤワディ地域におけるベースライン調査およびキャパシティアセスメントの実施
予定価格と契約価格	予定価格：8,915,504 円 再委託契約金額：90,974,000 Kyat (8,915,452 円)
契約方式	指名見積競争
契約年月日	2013年5月7日～2013年11月30日
支払年月日及び支払額	2013年5月16日 (27,292,200 Kyat)、2013年9月2日 (27,292,200 Kyat)、 2013年11月11日 (36,389,600 Kyat)：合計 90,974,000 Kyat

件名	Sub-Consulting Agreement for JICA aided “The Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar (2nd Year)”
契約相手方	Community Development Association
契約内容	エーヤワディ地域におけるCBDRM活動およびHRD活動
予定価格と契約価格	予定価格：13,520,618 円 再委託契約金額：107,150 USD (10,978,000 円)
契約方式	2ヵ年業務のうちの第2年次契約
契約年月日	2014年2月28日～2014年11月30日
支払年月日及び支払額	2014年3月4日 (32,145 USD)、2014年9月26日 (32,145 USD)、2014年12月12日 (42,860 USD)：合計 107,150 USD

件名	Sub-Consulting Agreement for JICA aided “The Project on Establishment of End-to-End Early Warning System for Natural Disaster in The Republic of The Union of Myanmar” Activity in Rakhine State (1st Year)
契約相手方	Community Development Association
契約内容	ラカイン州におけるベースライン調査およびキャパシティアセスメントの実施
予定価格と契約価格	予定価格：11,595,790 円 再委託契約金額：97,276 USD (9,978,552 円)
契約方式	指名見積競争
契約年月日	2014年5月21日～2014年10月31日
支払年月日及び支払額	2014年6月23日 (29,183 USD)、2014年12月5日 (29,183 USD)、2014年12月5日 (38,910 USD) 合計：97,276 USD

件名	Installation of Stage for Tide Gauge Station
契約相手方	Saramayri Fuji Construction Co., Ltd.
契約内容	ハイギキョンに設置する潮位計および関連機材のために、設置するための架台やフェンスを建設する業務
予定価格と契約価格	予定価格：2,474,224 円 再委託契約金額：18,165 USD (1,884,982 円)
契約方式	見積り合せ
契約年月日	2014年9月1日～2014年10月31日
支払年月日及び支払額	2014年9月26日 (7,266 USD)、2014年11月18日 (10,899 USD)：合計18,165 USD

件名	ミャンマー国自然災害早期警報システム構築プロジェクトに係る潮位観測所設置
契約相手方	株式会社 テックインターナショナル
契約内容	潮位観測所設置
予定価格と契約価格	予定価格：10,175,809 円 再委託契約金額：10,135,000 円
契約方式	一般競争入札
契約年月日	2014年8月18日～2014年11月10日
支払年月日及び支払額	2014年10月24日 (8,605,000 円)、2014年12月10日 (1,530,000 円)：合計10,135,000 円

件名	Sub-Consulting Agreement for JICA aided “The Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar” Activity in Rakhine State (2nd Year)
契約相手方	Community Development Association
契約内容	ラカイン州における CBDRM 活動および HRD 活動
予定価格と契約価格	予定価格： 14,052,440 円 再委託契約金額： 116,219 USD (13,705,795 円)
契約方式	2 ヶ年業務のうちの第 2 年次契約
契約年月日	当初：2015 年 2 月 12 日～2015 年 11 月 27 日 契約変更後：2015 年 2 月 12 日～2016 年 2 月 29 日
支払年月日及び支払額	2015 年 2 月 20 日 (34,866 USD)、2015 年 7 月 24 日 (34,866 USD)、2016 年 3 月 11 日 (46,487 USD)：合計 116,219 USD

件名	Installation of Lightning Rod for Tide Gauge Station
契約相手方	CIVIL SOLUTION CONSULTANTS LTD.
契約内容	ハイギキョンに設置した潮位計および関連機材のための避雷針を建設する業務
予定価格と契約価格	予定価格： 833,450 円 再委託契約金額： 6,947 USD (819,259 円)
契約方式	見積り合せ
契約年月日	2015 年 2 月 24 日～2015 年 3 月 31 日
支払年月日及び支払額	2015 年 3 月 20 日 (6,947 USD)

件名	SALES CONTRACT OF THE PROJECT FOR ESTABLISHMENT OF END-TO-END EARLY WARNING SYSTEM FOR NATURAL DISASTER IN THE REPUBLIC OF THE UNION OF MYANMAR
契約相手方	Demo Trade International Ltd.,
契約内容	ラカイン州シットウェ、チャオピューに設置する SSB 機材を調達する業務
予定価格と契約価格	予定価格： 2,924,050 円 再委託契約金額： 23,940 USD (2,967,602 円)
契約方式	指名見積競争
契約年月日	2015 年 6 月 18 日～2015 年 9 月 30 日
支払年月日及び支払額	2015 年 10 月 21 日 (23,940 USD)

件名	SALES CONTRACT OF THE PROJECT FOR ESTABLISHMENT OF END-TO-END EARLY WARNING SYSTEM FOR NATURAL DISASTER IN THE REPUBLIC OF THE UNION OF MYANMAR
契約相手方	Tun Electronic Trading Co., Ltd.,
契約内容	チャオピューに設置するスピーカー類を調達する業務
予定価格と契約価格	予定価格：1,092,980 円 再委託契約金額：4,597 USD (569,844 円)
契約方式	見積り合せ
契約年月日	2015 年 6 月 18 日～2015 年 7 月 31 日
支払年月日及び支払額	2015 年 8 月 21 日 (4,597 USD)

件名	Sub-Consulting Agreement for JICA aided “The Project on Establishment of End-to-End Early Warning System for Natural Disaster in The Republic of The Union of Myanmar” Interview Survey
契約相手方	MYANMA CHAYYAR CO., LTD. (MMCY)
契約内容	6 月～8 月にかけて発生した洪水に関して、被災地域でのインタビュー調査を 通じて、災害特性、情報伝達や避難に関する行動の現状と課題を整理する
予定価格と契約価格	予定価格： 2,891,520 円 再委託契約金額：22,000 USD (2,702,700 円)
契約方式	指名見積競争
契約年月日	2015 年 12 月 11 日～2016 年 2 月 29 日
支払年月日及び支払額	2015 年 12 月 18 日 (8,800 USD)、2016 年 3 月 11 日 (13,200 USD) : 合計 22,000 USD

件名	Sub-Consulting Agreement for JICA aided “The Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar (4th Year)”
契約相手方	Community Development Association
契約内容	ラカイン州における HRD フォローアップ活動および CBDRM フォローアップ活動
予定価格と契約価格	予定価格：49,742,310 kyat 再委託契約金額：49,322,820 kyat (42,347 USD)
契約方式	指名見積競争
契約年月日	2016年6月17日～2017年1月31日
支払年月日及び支払額	2016年7月1日(16,939 USD)、2017年2月11日(25,408 USD)：合計 42,347 USD

件名	Establishment of communication network system between DMH and MRTV
契約相手方	Linn IT Solution Co., LTD
契約内容	気象水文局 DMH からテレビ局 MRTV まで天気予報ファイルを伝送するための光ファイバーケーブルによるネットワークを構築する工事
予定価格と契約価格	予定価格：1,979,748 円 再委託契約金額：16,570 USD (1,694,779 円)
契約方式	指名見積競争
契約年月日	2016年8月1日～2016年9月30日
支払年月日及び支払額	2016年8月5日(4,971 USD)、2016年10月21日(11,559 USD)：合計 16,570 USD

再委託契約変更

件名	Sub-Consulting Agreement for JICA aided “The Project on Establishment of End-to-End Early Warning System for Natural Disaster in the Republic of the Union of Myanmar” Activity in Rakhine State (2nd Year)
契約相手方	Community Development Association
契約内容	ラカイン州における CBDRM 活動および HRD 活動
契約変更日	2015 年 11 月 27 日
変更内容	契約期間および成果品提出日の延長（業務内容の変更はなし） 当初：2015 年 2 月 12 日～2015 年 11 月 27 日 契約変更後：2015 年 2 月 12 日～2016 年 2 月 29 日
理由	本プロジェクトは、契約変更を伴う追加業務（洪水実態調査）により履行期間が延長された。そのため、再委託業務監理の観点から、本再委託契約も本プロジェクトの履行期間に合わせた期間の延長が必要であったため。

供与機材概要

機器種別	設置/使用場所		数量	調達場所	納入日 (使用開始時期)	使用状況 (頻度)	
SSB 無線機	ネピドー	RRD	1	現地	2015/4/7	毎日	
		DMH	1		2015/4/8		
		GAD	1		2015/4/6		
	パテイン	RRD	1		2014/12/1		
		GAD	1				
	ラブッタ	RRD	1		2015/4/1		
		DMH	1		2016/1/15		
		GAD (郡)	1		2015/4/1		
		GAD (タウンシップ)	1				
	ルワザー村	1					
	シットウェ	RRD	1		2016/1/15		
		GAD	1				
	チャオピュー	RRD	1				
		GAD (郡/ タウンシップ)	1				
テタン村		1					
衛星通信機器	ネピドー	RRD	1	現地		2014/10/1	毎週
	パテイン	RRD	1			2014/10/8	
	シットウェ	RRD	1			2016/2/22	
PC (光ファイバー網による通話)	ネピドー	RRD	1	現地		2014/10/1	毎週
		DMH	1				
		GAD	1				
ラウドスピーカー、ハンデイスピーカー	ラブッタ	ルワザー村	2	現地		2014/9/18	災害時
		クワクワレイ村	2			2014/9/20	
		シュエチュンター村	2			2014/9/19	
	チャオピュー	テタン村	2		2016/1/15		
		コンバウン村	2				
		タンカーヨ一村	2				
		レニョゴン村	1				
アンテナを強化した CDMA 回線固定電話	ラブッタ	ルワザー村	2	現地	2014/9/18		
		クワクワレイ村	2		2014/9/20		
		シュエチュンター村	2		2014/9/19		
アンテナを強化した GSM 回線固定電話	チャオピュー	テタン村	2	現地	2016/1/15		
		コンバウン村	2				
		タンカーヨ一村	2				
		レニョゴン	1				

ソーラーパワ ーシステム	ラブッタ	ルワザー村	3	現地	2014/9/18	
		クワクフレ イ村	2		2014/9/20	
		シュエチュ ンター村	2		2014/9/19	
	チャオピュー	テタン村	3		2016/1/15	
		コンバウン 村	2			
		タンカーヨ ー村	2			
		レニョゴン 村	1			
ディーゼルエ ンジン	チャオピュー	テタン村	2	現地	2016/1/15	
		コンバウン 村	2			
		タンカーヨ ー村	2			
		レニョゴン 村	1			
自動潮位計	エーヤワディ	ハイヂチョ ン	1	本邦	2014/10/17	随時観測
簡易潮位計	エーヤワディ、 ラカイン	ラブッタ、 ピャーポ ン、グワ	3	現地	2016/1/25	随時観測
DMH・MRTV 接続（光ファ イバー網によ る接続）	ネピドー	DMH, MRTV	1	現地	2016/12/16	毎日

供与機材の故障

対象機材	自動潮位計
故障内容	潮位計によって観測されたデータが不定期に記録されない現象が発生した。
故障原因/要因	アンテナケーブル保護用のコンジットパイプの一部に亀裂があったため。 ロガーあるいは DCP 送信機に何らかの問題が存在している可能性が疑われた。
発生した時期	設置後の 2014 年から 2016 年にかけて不定期
修理時期	2015/11/1, 2016/11/10
修理の主体	東洋電子による無償サービス
要した費用	修理担当者の人件費、交通費等（額は不明）

(g) カウンターパートナーリスト

No	成果	組織	役職 (2016年11月時点)	2014年2月時点	2015年5月時点	2016年5月時点	2016年10月時点
1	1. 早期警報システム改善	RRD	Deputy Director, Administrative Section	U Aye Min Thu	U Aye Min Thu	U Aye Min Thu	-
2			Assistant Director	-	Win Ohnmar	Win Ohnmar	-
3			Upper Division Clerk	-	Daw Nwe Ni Hlang	Daw Nwe Ni Hlang	-
4			Director, CR Section	-	-	-	U Win Htein Kyaw
5			Deputy Director EOC Section	-	-	-	Daw Thiri Maung
6			Staff officer	-	-	-	Daw Su Nandar Myint
7	DMH	DMH	Deputy Director	-	U Hla Htun	U Hla Htun	U Hla Htun
8			Executive Engineer	-	U Ye Htut	U Ye Htut	U Ye Htut
9			Officer	-	U Htun Lin Kyaw	U Htun Lin Kyaw	U Htun Lin Kyaw
10			Director	-	U Ye Naing	U Ye Naing	U Ye Naing
11	12	GAD	Staff officer	-	U Than Tun Aye	U Than Tun Aye	U Than Tun Aye
12			Staff officer	-	U Nay Myo Tun	U Nay Myo Tun	U Nay Myo Tun
13	2. 人材育成活動	RRD	Director, Relief Section	-	U Chum Hre	U Chum Hre	-
14			Assistant Director	Daw Su Su Tun	Daw Su Su Tun	Daw Su Su Tun	-
15			Assistant Director, CR Section	-	U Thurein Htun	U Thurein Htun	-
16			Director, Training Section	-	-	-	Dr Min Thein
17			Deputy Director	-	-	-	Dr Aung Thurein
18			Assistant Director	-	-	-	Daw Khaing Mon Mon Ei
19	19	DMH	Assistant Director	-	Dr Yin Myo Min Htwe	Dr Yin Myo Min Htwe	Dr Yin Myo Min Htwe
20			Officer	-	Daw Han Swe	Daw Han Swe	Daw Han Swe
21	22	GAD	Director	-	U Ye Naing	U Ye Naing	U Ye Naing
22			Staff Officer	-	U Nay Myo Tun	U Nay Myo Tun	U Nay Myo Tun
23			Staff Officer	-	U Nay Zaw Aung	U Nay Zaw Aung	U Nay Zaw Aung
24			Director, Relief Section	Daw Phyu Lai Lai Htun	Daw Phyu Lai Lai Htun	Daw Phyu Lai Lai Htun	Daw Phyu Lai Lai Htun
25	25	RRD	Staff Officer, Relief Section	-	Daw Aye Nandar Win	Daw Aye Nandar Win	-
26			Assistant Director, Relief Section	-	Daw Htwe Kyi	Daw Htwe Kyi	Daw Htwe Kyi
27	27	DMH	Assistant Staff Officer	-	-	-	Daw San San Win
28			Deputy Director	-	Daw Nyein Nyein Naing	Daw Nyein Nyein Naing	Daw Nyein Nyein Naing
29	30	GAD	Staff Officer	-	Dr Wah Wah Thein	Dr Wah Wah Thein	Dr Wah Wah Thein
30			Deputy Director	-	Daw Ohn Khin	Daw Ohn Khin	-
31			Staff Officer	-	U Nay Zaw Aung	U Nay Zaw Aung	U Nay Zaw Aung
32			Deputy Staff Officer	-	U Zaw Myo Htet	U Zaw Myo Htet	U Zaw Myo Htet
33	33	RRD	Director	-	U Win Htein Kyaw	U Win Htein Kyaw	-
34			Assistant Director	Daw Htwe Kyi	Daw Htwe Kyi	Daw Htwe Kyi	-
35			Junior Officer	-	U Than Kyaw Htay	U Than Kyaw Htay	-
36			Director	-	-	-	Daw Lai Lai Aye
37	37	DMH	Deputy Director	-	-	-	U Win Zaw Htay
38			Assistant Staff Officer	-	-	-	Daw Khaing Marlar Kyaw

39		Deputy Director	-	U Sein Win	-	-
40	DMH	Assistant Director	-	Daw Sein Than	-	-
41		Staff Officer	-	U Phyo Maung Maung	-	-
42		Assistant Engineer	-	-	-	Daw Pa Pa Swe
43		Staff Officer	-	-	-	Dr Tin Mar Htay
44		Staff Officer	-	-	-	Daw Pa Pa Tun
45	GAD	Director	-	U Ye Naing	-	U Ye Naing
46		Staff Officer	-	U Zay Naw Win	-	U Zay Naw Win
47		Deputy Staff Officer	-	U Thein Htike	-	U Thein Htike

JICA プロジェクトブリーフノート

ミャンマー国

自然災害早期警報構築プロジェクト



1. プロジェクトの背景と問題点

ミャンマー国では毎年多くの地域で自然災害による被害が発生している。近年では、サイクロン「ナルギス」が2008年5月2日に同国南部のエーヤワディ・デルタの南西端にあるハイジー島に上陸し、同デルタを横断しヤンゴンに至った。同サイクロンは13万8千人を超える死亡・行方不明者を出す未曾有の人的被害をもたらし、また地域住民の生活、生産活動を壊滅させる甚大な物的被害を与えた。ASEAN事務局の発表によると同サイクロンによる被害総額は40億ドルと言われている。また、2010年10月に同国西部のラカイン州に上陸したサイ

クロン「ギリ」では、45人が死亡、10万人以上が家屋を失う被害があり、被害総額は5千7百万ドルと言われている。

ナルギスによる被害を受け、JICAは2008年8月にプロジェクト形成調査を実施した。サイクロンによる被害がここまで拡大した原因として、情報伝達システムが不十分であり、気象警報は中央政府から地域・州レベル、郡レベル、タウンシップレベルまでは周知されていたものの、タウンシップからビレッジトラクト、また、各ビレッジまでは十分に届いていなかったことが挙げられ、自然災害早期警報システムの整備が急務であることが確認された。

気象予警報を発令するのは運輸省気象水

2017年2月 Vol.4

文局（Department of Meteorology and Hydrology, Ministry of Transport - DMH）であり、コミュニティまで情報を伝達する責任は社会福祉・救済復興省救済復興局（Relief and Resettlement Department, Ministry of Social Welfare, Relief and Resettlement - RRD）、内務省総務局（General Administration Department, Ministry of Home Affairs）が負っているため、これらの組織の連携体制の強化・整備が不可欠である。

以上の通り、適切な警報が発令され迅速に住民一人一人まで確実に伝わり災害に備える体制整備が、自然災害による被害を軽減する上で喫緊の課題となっていることから、ミャンマー国政府は我が国に対して、気象予報・警報、コミュニティ防災等に対する能力向上について技術協力を要請した。

同要請を受けて、JICA は 2013 年 3 月に本プロジェクトを開始した。

2. 問題解決のためのアプローチ

本プロジェクトの概要は以下の通りである。

(1) プロジェクト実施機関

4 年間：2013 年 3 月～2017 年 3 月

(2) 業務対象地域

ミャンマー国エーヤワディ地域及びバカイン州

(3) 相手国実施機関及び関係機関

実施機関：社会福祉・救済・復興省救済復興局（RRD）、運輸省気象局（DMH）

関係機関：各地方レベルの防災委員会のメ

ンバー（地方政府レベル、郡レベル、タウンシップレベル及びコミュニティレベル）

(4) 対象災害

パイロット活動に関しては、パイロットエリアに発生するサイクロン、高潮、津波を対象とする。DMH に対する警報の改善に関しては上記に加え強風や大雨も対象とした。

(5) プロジェクトの枠組み

本プロジェクトは、パイロット・プロジェクトサイトにて、自然災害の早期警報が住民まで迅速かつ適切に伝わるシステムの改良モデルが確立され、他地域への展開計画が作成されることを目標とした。そのための成果として、以下の 4 項目を想定した。

成果 1：自然災害早期警報の情報伝達システムが改善される。

成果 2：NDMC（国家災害対策中央委員会）を始め防災関係機関の災害対応能力（成果 1 において明確にした責任・役割に沿った活動）が中央レベル、地域・州レベル、郡レベル、タウンシップレベルで向上する。

成果 3：自然災害に対する住民の災害対応能力が向上する。

成果 4：成果 1～3 の教訓をとりまとめた他地域への展開計画がとりまとめられる。

プロジェクトの枠組みは図 1 の通りである。

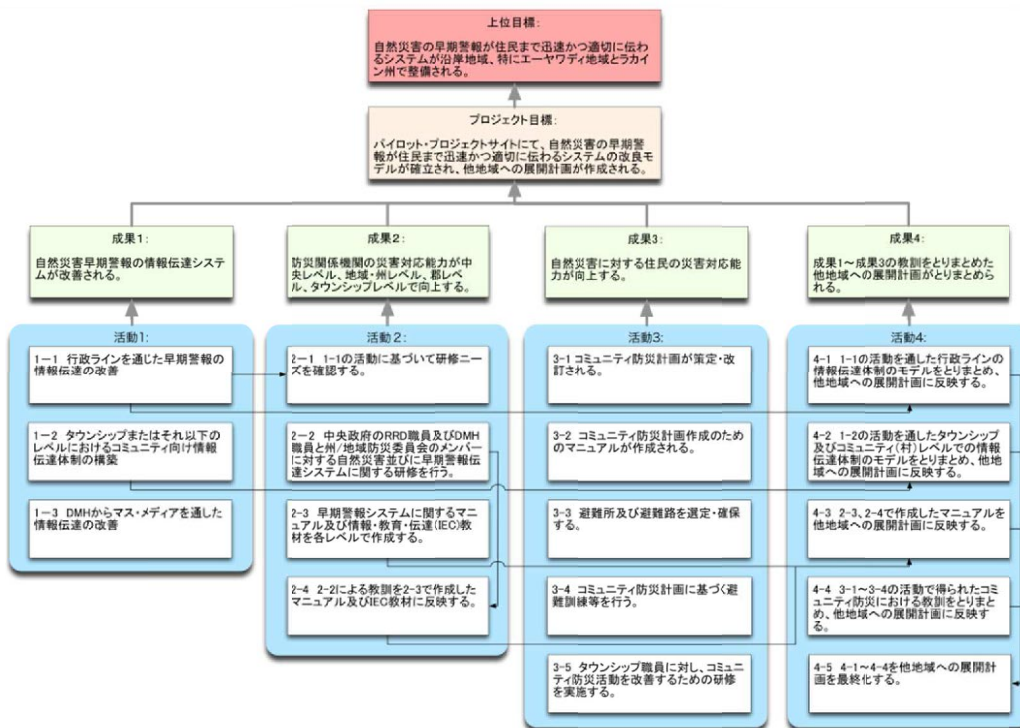


図 1 プロジェクトの枠組み

3. アプローチの実践結果

プロジェクトの全体スケジュールは以下の通りである。

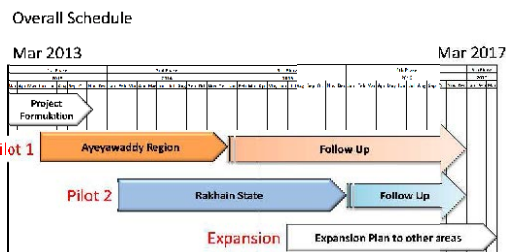


図2 プロジェクトスケジュール

エーヤワディ地域およびラカイン州それぞれにおいて、パイロット活動の活動計画（全体計画）を策定し、翌年にパイロット活動を、翌々年にフォローアップ活動を実施し、最終年度に展開計画を取りまとめた。以下から各成果の活動概要を示す。

[成果 1：早期警報システムの改善]

(1) 役割分担の明確化

サイクロンを対象にして、中央及び地方（地域・州／郡／タウンシップ）レベルの防災機関の連携が必要な業務について、可能な限り実践的な対応レベルにまでブレイクダウンし、時系列で業務内容と責任・協力部署を明示する「タイムライン」を作成した。これにより、防災諸活動の「見える化」、情報の発信・伝達・受信や防災諸活動のメイン・サブの分担等の明確化、防災活動を起動するきっかけとなる事象や活動の明確化等を行った。

(2) 潮位観測・解析に関する能力強化

ハイギョンに自動潮位計、ラブッタ、ピャーポン、グワに簡易潮位計が本プロジェクトによって設置された。また、プロジェクト活動を通じて、DMH の以下の能力

強化が図られた。

- 自動潮位計、簡易潮位計の設置と維持管理
- 10分潮、60分潮の天文潮位予測（調和分解）
- 実測値と天文潮位の偏差の日々の確認と高潮偏差の確認
- 高潮予報の改善に向けて今後実施すべきことと、上記成果の位置づけの理解



写真1 設置された自動潮位計

(3) 予警報内容の改善

DMHが発令している警報の文面は、注意すべき時間や場所、危険度などの詳細が明らかでなかったため、受取り側にとって有益な情報になっていないという課題があった。本プロジェクトでは、サイクロン警報の文面に関して、JICA国際協力専門員の助言の下、DMH本局の職員とともに改善案を作成した。また、今後も継続的に警報を改善するためのプロセスや、RRD、DMH、GADがどのように協力するのかについても議論した。

(4) 情報伝達システムの改善

DMHのネピドー本局が発令した情報を住民まで確実に伝達するシステムを提案し、パイロットエリアにて、実際に機材を供与してシステムを構築した。

表1 設置された通信機材

機器種別	設置場所	数量	
シングルサイドバンド無線 (SSB)	ネピドー バテイン ラブッタ シットウェ チャオピュー	RRD DMH GAD パイロ ット村	15
衛星通信機器	ネピドー バテイン シットウェ	RRD	3
PC (光ファイバー網による通話)	ネピドー	RRD DMH GAD	3
村用通信機材 (ラウドスピーカー、ハンディスピーカー、アンテナ強化固定電話等)	ラブッタ チャオピュー	パイロ ット村	13
DMH-MRTV 接続 (光ファイバー網による接続)	ネピドー	DMH MRTV	1

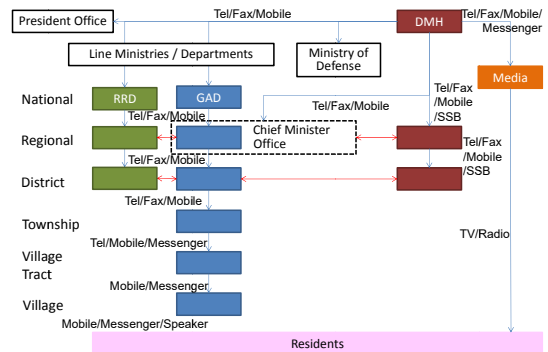


図3 情報伝達系統図



写真2 衛星通信(左)、シングルサイドバンド無線 SSB(右)



写真3 村用通信機材

また、プロジェクトで作成した運用・維持管理マニュアルを用いて機材の運用・維持管理が行われているほか、訓練を通じて機材運用に習熟することができた。

(5) マスメディアの防災での活用

本邦研修に参加した MRTV の職員を中心に、MRTV や Pyinsawadi FM の職員の防災意識が向上した。これにより、PIC や JCC で積極的な発言が見られたほか、別途実施中の MRTV 向け技術協力プロジェクトにおいて「防災報道能力の向上」が主要な活動に選ばれた。

(6) 高潮氾濫シミュレーションの実施

パイロット地域の村々の住民の防災意識の向上を図るため、強いサイクロンが来襲した場合にどのような状況になるのかを、分かりやすく、実感として理解させるために高潮シミュレーションを実施した。

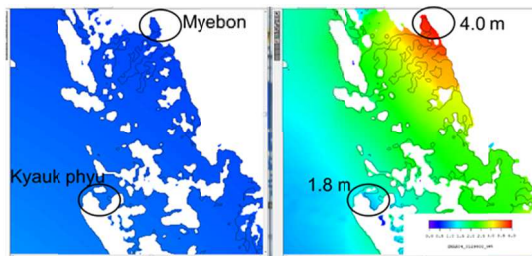


図4 高潮偏差の平面分布

このような科学的な根拠に基づくリスク

評価が、住民教育の際にも非常に効果的であること、また、高潮による浸水被害には通常潮位の影響が大きいこと、ゆえに通常潮位変動を観測、把握することが重要であることへの理解度が高まった。

(7) 洪水実態調査の実施

「洪水特性調査」および「インタビュー調査」で構成される2015年洪水災害の災害記録を作成した。関係機関が一堂に会したワークショップを通じて、災害が発生する度にこのような災害記録を残すことで、将来の災害対応に役立てることができることを共有し、災害記録の重要性の理解が深まった。

【成果2：防災関係機関の能力強化】

(8) 人材育成活動

第2年次、第3年次に、それぞれエーヤワディ地域およびラカイン州で、パイロット活動（各種会議、セミナー、訓練）を通じて、主にワーキンググループメンバー（RRD、DMH、GADからエーヤワディ地域10名、ラカイン州9名）を対象に早期警報に関わる人材育成を行った。

ワーキンググループメンバーは、早期警報マニュアルの作成を通じて、早期警報のための情報伝達ルートおよび機材や、サイクロン接近時の各段階における取るべき行動について必要な知見を得た。

人材育成プログラムの作成にあたっては、ワーキンググループメンバーは防災、早期警報に関わる一般的な知識を得たことに加え、近年の各国の大災害に関わる教訓について知見を得た。また、フォローアップ活動を通じて、本プログラムを実施するための講

師を務めることができるようになった。

目次	
1.	早期警報マニュアルの目的
2.	情報伝達ルートおよび機材
2.1	情報伝達ルート
2.2	連絡先リスト
2.3	機材のマニュアル
3.	それぞれの組織が取るべき行動
3.1	行動の決定および実施
3.2	取るべき行動の考慮事項
4.	早期警報情報の送受信フォーム
4.1	DMITからの警報文
4.2	行動の指示
4.3	現場の状況

図5 早期警報マニュアルの目次構成

表2 HRDプログラムの内容

所要時間	プログラム内容
15分	HRDプログラムの紹介
15分	IEC教材-1：サイクロナルギス
20分	プログラム1：防災一般
15分	IEC教材-2：被災住民へのインタビュー
20分	プログラム1：早期警報システム一般
15分	IEC教材-3：フィリピンの台風ヨランダ
10分	(コーヒーブレイク)
15分	IEC教材-4：インド洋大津波
20分	プログラム3：近年の災害から学ぶ教訓
15分	IEC教材-5：東日本大震災
20分	プログラム4：高潮氾濫および津波シミュレーション

(9) 情報伝達訓練の実施

情報伝達のルートとプロセスの確認、新規導入した通信機器の習熟、早期警報マニュアルの活用と改善等を目的として情報伝達訓練をエーヤワディ地域、ラカイン州それぞれで実施した。

表3 訓練におけるネピドーから村レベルまでの情報伝達平均時間

年次	平均所要時間
第2年次	49分
第3年次	36分
第4年次	31分

ネピドーから村レベルまでの情報伝達に関しては、訓練の回数を重ねるごとに所要時間が短くなっていることがわかる。また、SSBを使用した場合は約10分でネピドーから村レベルまで情報が伝達され、SSBを使用することで情報が素早く村レベルに伝わることを確認できた。

[成果3：住民の能力強化]

(10) コミュニティ防災活動の実施

第2年次および3年次業務では、それぞれエーヤワディ地域、ラカイン州において以下のコミュニティ防災活動を行った。

- ビレッジトラクト防災委員会を対象としたTOTワークショップの開催
- ビレッジトラクト防災委員会メンバーが講師となった各村でのCBDRMワークショップの開催
- コミュニティ・インフラストラクチャー支援プロジェクトの実施
- 政府レベルの情報伝達訓練に合わせた避難訓練の実施



写真4 CBDRMワークショップの様子



写真5 コミュニティ・インフラストラクチャー支援によって整備された避難路(左：整備前、右整備後)



写真 6 避難訓練の様子

コミュニティ防災活動における成果品は、活動を通じて策定された、避難マップ・情報伝達体制を含む災害時取るべき行動が含まれたパイロットビレッジの防災計画である。また、他地域への展開を考慮して、パイロット活動で実施したコミュニティ防災の手法をまとめたマニュアルおよび住民用啓発教材(ワークショップおよび訓練の様子を収めた DVD)を作成した。



図 6 サイクロンに対する住民啓発教材

[成果 4：展開計画の策定]

(11) 展開計画の策定

成果 4 の活動では、成果 1、成果 2、成果 3 のパイロット活動の経験に基づき、早期警報システムのモデルを構築し、エーヤワディ地域、ラカイン州内の他地域にモデルを展開する展開計画を策定した。

展開計画は、5 年間でエーヤワディ地域およびラカイン州内の全タウンシップを網羅する実施計画とした。

必要な予算は、エーヤワディ地域では 5 年で 294 百万チャット（年間約 60 百万チャット=約 5 百万円）、ラカイン州では 5 年で 214 万チャット（年間約 40 百万チャット=約 3.7 百万円）である。

展開計画を実施することによる効果は、以下のように表現できる。

情報伝達機材の設置

- 5 年間で、エーヤワディ地域およびラカイン州内のすべての GAD および RRD の地方事務所（エーヤワディ地域:34 事務所、ラカイン州:16 事務所）が SSB 無線機のネットワークにより同時にコミュニケーションを取ることができるようになる。
- 5 年間で、エーヤワディ地域の 26 ビレッジ、ラカイン州の 16 ビレッジにスピーカーや電話機が設置される。

人材育成活動の実施

- 5 年間で、エーヤワディ地域およびラカイン州の全ての地域・州、郡、タウンシップレベルの職員（エーヤワディ地域:1700 人、ラカイン州:1200 人）が防災や早期警報の基本的な知識を身につけることができる。（1 回の人材育成プログラムの出席者を 50 名として計算した。）
- 合計 10 回の情報伝達訓練が実施される。

コミュニティ防災活動の実施

- 5 年間で、エーヤワディ地域の住民 5200 人およびラカイン州の住民 3200 人が、避難活動を含めたコミュニティ防災活動のトレーニングを受けることができる。（1 ビレッジでの CBDRM 活動への参加者数を 200 名として計算し

た。)

- 合計 42 回の避難訓練が実施される。

【その他の主な活動】

(12) 年次セミナーの開催

2014 年 7 月 8 日、2015 年 7 月 7 日、2017 年 1 月 24 日に、プロジェクトの進捗を共有すること、関係者の能力強化を図ることを目的として、主要な防災関連機関の職員を約 100 名招待した年次セミナーを開催した。

(13) 本邦研修の実施

2013 年、2014 年、2015 年それぞれ 2 週間、プロジェクト関係者合計 33 名を対象として本邦研修が実施された。

災害時における情報伝達、早期警報に係る国、県、市の役割分担、日本の防災訓練等について学んだ。

4. プロジェクト実施上の工夫・教訓

さらなる早期警報システムの改善

本プロジェクトで策定した展開計画の内容は、早期警報システムにおける重要な要素ではあるものの、どこにどのような危険があるのか、どこに安全な場所があるのか、といった調査や解析は行わない。科学的根拠に基づいたリスク評価は、仙台防災枠組みでも優先行動に挙げられており、リスク評価に基づいた警報の発令、リスク評価に基づいた避難場所の整備も、早期警報システムには不可欠な活動であり、今後、推進する必要がある。

関係機関と連携、協力した業務実施

本プロジェクトは、RRD と DMH が R/D

に署名しているメインカウンターパート機関である。しかしながら、活動の大半はエーワディ地域とラカイン州で実施したため、これら地方での活動にあたっては、GAD が意思決定の権限を実質的に有していること、また、GAD のみが中央政府レベルからビレッジトラクトレベルまでの組織体系を有していることから、GAD との関係が非常に重要であることを認識し、GAD との関係強化に努めた。また、プロジェクトでは、関係機関の防災上の役割を整理することで、効率的に、また、関係機関が協力して防災活動を実施する枠組みの構築に努めた。さらに、プロジェクトにおける議論やワークショップ、セミナー、訓練等には、関係機関を幅広く招待することで、関係機関との連携強化に努めた。

プロジェクト資金や機材の効果的な投入

本プロジェクトでは、パイロット活動に対しては資金を提供し、その後の活動の展開はミャンマー側が実施するという方針であった。展開計画の素案ができたのが第 3 年次業務の最後であり、第 4 年次は、展開計画の最終化、ならびに、予算確保のための協議に時間を費やした。政権交代の影響で、第 3 年次から第 4 年次にかけて関係者が大きく交代したという難しさがあった中で、例えば、展開計画の一部に資金を提供することで、新しい大臣や担当者が展開計画の内容を理解し、展開計画の実施により現実的なイメージを持つことができたなら、より、活動の持続可能性を高めることができたのではないかと想像している。

プロジェクト実施期間

2013 年 3 月～2017 年 3 月

2017 年 2 月 Vol.4

(i) 収集資料リスト

No	Name of Books	Organization	Version	Target Audience	Available	Pages	Year
1. International Framework							
1-1	Asean Agreement On Disaster Management And Emergency Response	ASEAN	Eng	UN, INGO, NGO and Government	Soft	124	
1-2	Asean Regional Forum Strategic Guidance For Humanitarian Assistance	ASEAN	Eng	UN, INGO, NGO and Government	Soft	48	
1-3	AADMER WORK PROGRAMME 2016 - 2020	ASEAN	Eng		Soft	100	2016
1-4	UN Strategic Framework for Myanmar	UN	Eng	UN, INGO, NGO and Government	Soft	32	
1-5	Implementing HFA		Eng	UN, INGO, NGO and Government	Soft	110	
1-6	Recommendations for Recovery and Reconstruction in Post-2015 Global Framework for DRR (HFA2)	International Recovery Platform	Eng	UN, INGO, NGO and Government	Soft	33	
1-7	Implementation of the Hyogo Framework for Action	UNISDR	Eng	UN, INGO, NGO and Government	Soft	66	
1-8	Guidance and Indicator Package for Implementing Priority Five of the Hyogo Framework	UN	Eng	UN, INGO, NGO and Government	Soft	60	
1-9	World Conference on Disaster Reduction 18-22 January 2005, Kobe, Hyogo, Japan		Eng	UN, INGO, NGO and Government	Soft	25	
1-10	9th Meeting of Regional Consultative Committee on Disaster Management 28-30 November, 2011 – Phnom Penh, Cambodia		Eng	Government	Soft	19	2011
1-11	HFA Implementation in Myanmar Presentation files on Int'l framework and DRR (MAPDRR WS 6.15. 2016)	RRD	Eng	Government	Soft	9 files	2016
2. Government Law and Plan							
2-1	Disaster Management Law	Government of Myanmar	Eng	Government	Soft	3	2013
2-2	Disaster Management Rule	MSWRR	Eng	Government	Soft	31	2015
2-3	Institutional Arrangements for Disaster Management in Myanmar	ADPC. Social Welfare	Eng	Government	Soft	161	2009
2-4	Myanmar Action Plan on Disaster Risk Reduction (MAPDRR)	Social Welfare. RRD	Myan/Eng	UN, INGO, NGO & Government	Soft	91	2012
2-5	Report for MAPDRR 2011 - 2012	RRD	Eng	Government	Soft	55	2012
2-6	Lesson Learnt Workshop on implementation of MAPDRR	RRD	Eng	UN, INGO, NGO & Government	Soft/PPT	39	2016
2-7	Standing Order on Natural Disaster Management in Myanmar	Government	Eng	Government	Soft	161	2009
2-8	Township Disaster Management Plan	Government	Myan	Government	Soft	77	2010
2-9	Disaster Risk Management Sector Plan	Technical Working Group on DRR	Eng	UN, INGO, NGO & Government	Soft	42	2008
2-10	Ayeyarwaddy Region Disaster Management Plan	Ayeyarwaddy Region	Eng	Government	Soft	45	2013
2-11	Region or State Government Law	Government	Eng	Government	Soft	13	2010
2-12	Organization and Tasks of Natural Disaster Protection Committee	GAD Labutta	Eng	Government	Soft	11	2013
2-13	GAD Regional Data Labutta Township	GAD Labutta	Eng	Government	Soft	45	2013
2-14	Communication Network Project to be able to use in Emergency	GAD Labutta	Eng	Government	Soft	22	2011
2-15	Guide Book For Provision Of Natural Disaster Management Plan At Township Level	MSWRR. MOHA	Eng/Myan	Government	Soft	43	2010
2-16	Township Disaster Management Plan(Bogalay Township)	GAD Bogalay	Eng/Myan	Government	Soft	62	2011

2-17	Disaster Management Plan in Rakhine State (Extracted)	GAD	Eng	Government	Soft	41	-
2-18	Disaster Management Plan in Kyauk Phyu Township	GAD Kyauk Phyu TS	Eng	Government	Soft	15	2014
2-19	Myanmar NGO Contingency Plan	MNGO-CP	Myan	UN, INGO, NGO &	Soft	111	2010
2-20	Myanmar Tsunami Preparedness & Risk Reduction (TPRR) Program. 2015-2020	DMH, RRD	Eng	Government	Soft	70	2014
2-21	(Draft) Myanmar National Framework on Community Disaster	RRD, ADB, DRRWG	Eng	Government	soft	81	2016
3. Mainstreaming DRR							
3-1	Mainstreaming Disaster Risk Reduction into Shelter DRR Good Practices in Myanmar/ To Reduce Disaster on Construction Works	European Commission, Actionaid & Ministry of Social Welfare Relief and Resettlement	Eng/Myan	INGO, NGO & Government	Hard Copy	55	unknown
3-2	Guidance on Mainstreaming Disaster Risk Reduction in the Education Sector, Myanmar - Rural Setting	ADPC, RRD, Education Department	Eng	INGO, NGO, Government, Education Sector	Soft	83	2010-2011
3-3	Guidance on Mainstreaming Disaster Risk Reduction in the Health Sector, Myanmar - Rural Setting	ADPC, RRD, Health Department	Eng	INGO, NGO, Government, Health Sector	Soft		2010-2011
3-4	Mainstreaming Disaster Risk Reduction into Livelihood	UNDP	Eng	INGO, NGO & Government	Soft		2011
3-5	Mainstreaming Disaster Risk Reduction into Education	UNDP	Eng	INGO, NGO & Government	Soft		2011
3-6							
4. Hazard Information							
4-1	Manual on Cyclone (Causes, Effects & Preparedness)	UNDP, RRD	Eng/Myan	Community, NGO, NGO & Government	Soft	48	2011-2012
4-2	Manual on Earth Quake(Causes, Effects & Preparedness)	UNDP, RRD	Eng/Myan	Community, INGO, NGO & Government	Soft	50	2011-2012
4-3	Manual on Fire(Causes, Effects & Preparedness)	UNDP, RRD	Eng/Myan	Community, INGO, NGO & Government	Soft	50	2011-2012
4-4	Manual on Flood(Causes, Effects & Preparedness)	UNDP, RRD	Eng/Myan	Community, INGO, NGO & Government	Soft	50	2011-2012
4-5	Hazard Profile of Myanmar	RRD, DMH	Myan/Eng	HRD	Soft	97	2009
4-6	Poster (Tsunami, Fire, Flood, Cyclone, Climate Change, Storm & Earthquake)	Plan	Myan	Community	Soft Copy	1	unknown
4-7	Living with Earthquakes	Myanmar Engineer Society	Myan	all level	Soft	16	2009
4-8	Disaster Risk Reduction and Early Warning (Poster, leaflets) IEC materials	EU and Action Aid	Myanmar	Community level	Soft		2010-2011
4-9	Drought Educational Pamphlet	EU and Action Aid	Myan				
4-10	Erosion Educational Pamphlet	EU and Action Aid	Myan				
4-11	Earthquake Educational Pamphlet	EU and Action Aid	Myan				
4-12	Flood Educational Pamphlet	EU and Action Aid	Myan				
4-13	Cyclone Educational Pamphlet	EU and Action Aid	Myan				
4-14	Fire Educational Pamphlet	EU and Action Aid	Myan				
4-15	Tsunami Educational Pamphlet	EU and Action Aid	Myan				
4-16	Poster (our protect from Heavy Rain, Storm & Flood)	UN-HABIT & DFIT	Eng/Myan	Community	Soft Copy	1	unknown
4-17	Multi Hazard Risk Assessment in Natrgis Affected Areas	UNDP	Eng	INGO, NGO & Government	Soft	285	2011
4-18	Multi Hazard Risk Assessment in Rakhine State	UNDP	Eng/Myan	INGO, NGO & Government	Soft	301	2011

4-19	Multi Hazard Risk Assessment in Rakhine State Additional Technical Details	UNDP	Eng	INGO, NGO & Government	Soft	179	2011
4-20	Early Warning Poster	Save the Children	Myan	Community	Soft	1	2011
5. CBDRM							
5-1	Inclusive Community-Based Disaster Risk Reduction; Guidance on Good Practice in the Ayeeyarwaddy Delta, Myanmar	MCCR	Eng	INGO, NGO & Government	Soft	36	2015
5-2	Inclusive Framework and Toolkit for Community-Based Disaster Risk Reduction in Myanmar	MCCR	Eng	INGO, NGO & Government	Soft	43	2016
5-3	Inclusive CBDRR power point	Action Aid	Myan	INGO, NGO & Government	PPT		2013
5-4	Training Of Trainers "Inclusive Community-based Disaster Risk Reduction" A Training Pack	MCCR	Eng	INGO, NGO & Government	Soft	128	2013
5-5	Community Based Disaster Risk Management DRR Good Practices in Myanmar	UNDP, RRD	Eng/Myan	Community Level, Field Facilitator, Volunteer Teachers, Education Sector	Soft	111	2011
5-6	School Safety Manual	UNDP, RRD	Eng/Myan	INGO, NGO & Government	Soft	61	-
5-7	Manual on Community First Aid	European Commission, DFID, ADPC & UNDP	Eng/Myan	INGO, NGO & Government	Soft	83	-
5-8	Manual Book for Community Based Search and Rescue	UNDP, EC, DFID, Denmark & ADPC	Eng/Myan	Community Volunteers, NGO, INGO	Soft	78	-
5-9	Disaster Preparedness Simulation Guideline For Community Level	Action Aid & European Commission	Myan	Community Level, Field Facilitator	Soft/Hard Copy	41	2011
5-10	Manual on Community Based Disaster Risk Management	ADPC	Eng	INGO, NGO, Government	Soft	74	2010-2011
5-11	VCA Guidelines	MRCs & ICRC	Myan	Government & Community	Soft Copy	60	2010
5-12	Participatory Vulnerability Analysis At Community Level Guidelines For Field Staff	Action Aid	Eng	INGO, NGO, Government	Soft	42	-
5-13	Training Manual on Disaster Risk Reduction Programming in Climate Change Context in Myanmar	Action Aid	Eng	INGO, NGO, Government	Soft	58	2011
5-14	Child-led Disaster Risk Reduction A Practical Guide	Save the Children	Eng	INGO, NGO & Government	Soft Copy	59	2009
5-15	How To Mobilize Coastal Communities In Labutta Township To Build Safer And More Resilient Villages	Malteser International	Eng	INGO, NGO & Government	Soft	102	-
5-16	CBDRR Guide Facilitator Guidebook	MRCs	Eng/Myan	INGO, NGO & Government	Soft	66	2014
5-17	Manual on Community-Based Disaster Risk Reduction	MRCs	Eng/Myan	INGO, NGO & Government	Soft	118	2014
5-18	Community-Based Disaster Risk Reduction Step by Step	MRCs	Eng/Myan	INGO, NGO & Government	Soft	76	2014
5-19	Civil Society on DRR Hand book (First Aid)	MRCs	Myan	all level			
5-20	Guidelines & Preparedness on Village Level	Actionaid & European Commission	Myan	Community Level & Village DRM Committee	Hard Copy	38	2011
5-21	Technical Workshop on CBDRM	UNDP	Eng	INGO, NGO & Government	Soft	48	2008
5-22	A Study On Knowledge, Attitudes And Practices (KAP) For Disaster Risk Reduction In Northern Rakhine State	USAID	Eng	INGO, NGO & Government	Soft	50	2015
5-23	A study report on the existing policies and practices on disaster risk reduction relating to Myanmar coastal fishing communities	Action Aid	Eng/Myan	INGO, NGO & Government	Soft	44	2011
5-24	Study on disaster vulnerability and preparedness of small and medium scale fisher folks in coastal region of Myanmar	Action Aid	Eng/Myan	INGO, NGO & Government	Soft	65	-

5-25	First Civil Society Forum on CBDRM Institutionalisation	Action Aid, ADPC, MRCS, Save the Children UNDP	Eng	INGO, NGO & Government	Soft	66	2009
5-26	Community-Driven Recovery: Cyclone Nargis One Year On	UNDP	Eng	INGO, NGO & Government	Soft	76	2009
5-27	Consultation on Emerging DRR Needs in Changing Context of Partnership for Disaster Risk Reduction DRR Good Practices in Myanmar	MRCS	Eng	INGO, NGO & Government	Soft	16	2012
5-28		UNDP	Eng	INGO, NGO & Government	Soft	93	2011
5-29	DMTC TOT CBDRM	UNDP	Myan	NGO & Government	PPT		2016
5-30	Community-based Disaster Risk Reduction Project Manual Ayeayawady Region, Myanmar	CWS	Eng/Myan	Community, NGO, Government	Soft	60	2016
6. DRR Training Material							
6-1	Disaster Management Courses Facilitator guide	RRD	Myan/Eng	Government & NGO, INGO	Soft	190	2012
6-2	Disaster Management Courses Participant guidebook	RRD	Myan/Eng	INGO, NGO & Government	Soft Copy	178	2012
6-3	Manual Book on Myanmar Climate Change to Disaster Risk Reduction	European Commission & Actionaid	Eng/Myan	INGO, NGO & Government	Hard Copy	44	Oct-11
6-4	Handbook for a School based Risk Reduction Initiative	IFRC	Eng	INGO, NGO & Government	Soft	96	2015
6-5	Myanmar Tsunami Exercise Guidebook	RRD, DMH	Eng	INGO, NGO & Government	Soft	82	2014
6-6	Basic Disaster Management Course	RRD (MCCDDM)	Myan	INGO, NGO & Government	PPT file		2016
7. Shelter and Housing							
7-1	Lessons Learned & Way Forward for Resilient Shelter Interviews in Rural Myanmar	ISDR & Norwegian Ministry of Foreign Affairs	Eng	INGO, NGO & Government	Hard Copy	146	2011
7-2	How To Build A Safer Shelter, A guide to households on how to build a shelter that is safer against natural forces	Schweizerische Eidgenossenschaft, UNHABITAT, DFID & Myanmar Engineering Society, UNHABITAT & UNHABITAT	Eng	INGO, NGO, Government, village shelter committee (carpenter) & Community	Soft/Hard Copy	15	2010
7-3	Guidelines on Retrofitting of Rural Houses in Myanmar	Myanmar Engineering Society, UNHABITAT & UNHABITAT	Eng	INGO, NGO, Government & Community Level	Soft/Hard Copy	43	2010
7-4	Report on Impact Study on Disaster Resilient Cyclone Shelter	UNHABITAT	Eng	INGO, NGO & Government	Soft	87	2011
7-5	Cyclone Shelter Assessment	UNHABITAT	Eng	INGO, NGO & Government	Soft	26	2012
7-6	Village Shelter Committee Guide, Guide For Village Shelter Committee on How To Promote To Build Back Safer	Schweizerische Eidgenossenschaft, UNHABITAT, DFID & UNHABITAT & USAID	Eng	INGO, NGO, Government, village shelter committee (carpenter) & Community	Soft/Hard Copy	31	2010
7-7	Villager on Housing Committee Guide Line	UNHABITAT & USAID	Myan	INGO, NGO, Government, village shelter committee (carpenter) & Community	Hard Copy	31	2010
8. DRR Terms							
8-1	DRR Glossary	UNHABITAT	Myan	all level			
8-2	Standardization of DRR Terms	UNHABITAT	Myan	all level	soft	41	
8-3	Report of Workshop on Standardization of Disaster Risk Reduction Terminology in Myanmar Language (Chatruium Hotel)	UNDP, RRD & UNHABITAT	Eng	INGO, NGO & Government	Soft Copy	4	Dec-10

9. DRR Reports						
					Soft Copy	Nov-08
9-1	Post Nargis Recovery and Preparedness Plan		Eng	INGO, NGO & Government	Soft Copy	26
9-2	Post Nargis Joint Assessment	ASEAN	Eng	UN, INGO, NGO &	Soft	213
9-3	Disaster Management Reference Handbook	Center for excellence in DM and HA	Eng	INGO, NGO & Government	Soft Copy	2014
9-4	Learning from Cyclone Nargis	UNEP	Eng	INGO, NGO & Government	Soft Copy	2009
9-5	Myanmar Post-disaster Needs Assessment Of Floods And Landslides July-september 2015	Government of Myanmar	Eng	INGO, NGO & Government	Soft	2015
9-6	Post Nargis Social Impacts Monitoring April 2010	ASEAN	Eng	INGO, NGO & Government	Soft	2010
0. Material in Myanmar Language						
1	Comprehensive Disaster Risk Reduction Programme (CDRRP)	UN-HABIT	Myan	INGO, NGO & Government	Soft Copy	41
2	Natural Hazard to Development Plan Small Organization (Book-2)	European Commission & Actionaid	Myan	Community Level	Soft/Hard Copy	315
3	Natural Hazard to Development Plan Small Organization (Book-1)	European Commission & Actionaid	Myan	Community Level	Soft/Hard Copy	203
4	Small Business Development and Recovery Book	CDA, ECCDI, Golden Plain (GP) & UNDP	Myan	Communities	Hard Copy	14
5	All Villagers had to co-operate for Regional Development	Actionaid & UNDP	Myan	Government & Community	Hard Copy	6
6	For Villager had to Co-operate and Monitoring & Evaluation (Staff Guideline)	European Commission & Actionaid	Myan	Field staffs/Facilitator, NGOs, CSOs	Soft/Hard Copy	47
7	Self Study Program by Own DRRLP (1)	Save the Children	Myan	NGO, CSO, Field Facilitator	Soft/Hard Copy	250
8	Self Study Program by Own DRRLP (2)	Save the Children	Myan	NGO, CSO, Field Facilitator	Soft/Hard Copy	250
9	GAD Function for Disaster		Myan	all level	Soft	7
10	Disaster to development plan organization pamphlet	European Commission & Action aid	Myna	INGO, NGO, & Community	Hard Copy	6
						2011
						unknown

Project Design Matrix (ver. 3)

November 3, 2016

Project Title: Project on Establishment of End-to-End Early Warning System for Natural Disaster

Project Duration: March 2013 to February 2017 (4 years) Project Site: Ayeyarwaddy Region and Rakhine State

Target Group: (1) Staff of RRD; (2) Staff of DMH;
 (3) Local Disaster Management Committee members at each level (local government level, district level, township level and community level);
 (4) District, township officers where the pilot site is located; and (5) Community(ies) in the target area.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>[Overall Goal] End-to-end early warning systems for natural disaster are expanded to coastal lined areas, especially in Ayeyarwaddy Region and Rakhine State, based on the expansion plan.</p>	<p>a. Improved end-to-end early warning systems are introduced to <u>Ayeyarwaddy Region and Rakhine State</u>.</p>	<p>a. Data from NNDMC</p>	
<p>[Project Purpose] The improved model of end-to-end early warning systems for natural disaster with the expansion plan is set up in pilot areas.</p>	<p>a. Early warning is delivered surely to community in the pilot areas through more than two routes in a drill to be conducted before the Terminal Evaluation. b. Appropriate evacuation warning is delivered to community in the drill. c. The expansion plans to <u>Ayeyarwaddy Region and Rakhine State</u> are approved by JCC.</p>	<p>a. Drill report b. Record of JCC meetings</p>	<p>- Necessary budget of RRD for establishing the Early Warning System is secured. - Government policy on disaster management does not change significantly.</p>
<p>[Outputs] 1. Information management and emergency communication system for natural disaster is improved.</p>	<p>a. Simultaneous information distribution system installed is confirmed to work normally. b. A model of information distribution system for community in a township or in a lower level areas is proposed. c. Tide data is monitored by installed tide gauge and analyzed for improving early warning system. d. Improvement model of information distribution through mass media is proposed.</p>	<p>a-c Project documents</p>	<p>- Employees who participated in trainings by the Project will continuously work for RRD and DMH.</p>

<p>2. Response capacity for natural disasters from central government level to local government level is enhanced.</p>	<p>a More than 80% of government agencies related to disaster management participates in seminar/training/drill on early warning system for natural disaster organized by the project. b Manuals for early warning system at various level are developed.</p>	<p>a. Training/drill reports b Manuals</p>	
<p>3. Response capacity of community for natural disaster is enhanced.</p>	<p>a Villagers from all villages in the pilot village tract participate in training/evacuation drills b Evacuation centers and routes of all the pilot villages are designated and presented to the villagers</p>	<p>a. Training reports b Project documents c Project documents</p>	
<p>4. The expansion plan to coastal lined areas which include lessons learnt through activities under Output-1 to Output-3 is prepared.</p>	<p>a The expansion plans to <u>Ayeyarwaddy Region and Rakhine State</u> are approved by JCC.</p>	<p>a. Expansion plan documents</p>	
<p>Activities</p>		<p>Input</p>	
<p><Output1></p>			
<p>1-1 Early warning information distribution through an administrative line is improved.</p>			
<p>1-1-1 Identify the responsibilities and roles of each organization related with early warning dissemination in Myanmar and their problems.</p>		<p>【Japanese side】 (1) Dispatch of Experts ➢ Short-term Experts(6): -Chief Advisor/Disaster Management Structure -Early Warning System (EWS) Operation Planning -Wireless Communication System -Community-based Disaster Risk Management -Disaster Management Planning -Project Coordinator ➢ Lecturer(s): -Disaster Management System of Local Government -Disaster Management System on Tsunami</p>	<p>【Myanmar side】 (1) Assignment of counterpart personnel(C/P) -Project Director -Co-Project Director -Project Manager -Regional Project Manager -Regional Project Coordinator -Necessary number of C/P (2) Office space and facilities for the Project -in the buildings of RDD in Nay Pyi Taw -in the buildings of DMH in Yangon -Regional Administration Office in target area (the detail will be decided after</p>
<p>1-1-2 Clarify appropriate mandates/responsibility for each organization related with early warning system in Myanmar based on the Activity 1-1-1.</p>			
<p>1-1-3 Review the current contents of early warning for natural disaster such as standards for issuing/clearing early warning, and identify the bottleneck.</p>			
<p>1-1-4 Improve the current contents of early warning for natural disaster such as standards for issuing/clearing early warning based on the Activity 1-1-3.</p>			
<p>1-1-5 Make clear the early warning information distribution route for natural disaster to the members of disaster management related organizations from national and local level (region/state government level, district level and township level)</p>			
<p>1-1-6 Install communication equipment including simultaneous system through administrative lines.</p>			
<p>1-1-7 Install tide gauge for improving early warning system.</p>			
<p>1-1-8 Conduct flood analysis and interview survey of the flood disaster in 2015 and compile its lessons learned.</p>			

<p>1-2 Information distribution system for community in a township or in a lower level areas is developed.</p> <p>1-2-1 Select target township(s) and community(ies) as pilot project sites, village tracts and villages, in order to conduct the pilot project.</p> <p>1-2-2 Provide communication equipment to the community(ies).</p> <p>1-2-3 Consider or study the means of electricity generation at community level for securing the sustainability of early warning system for natural disaster.</p> <p>1-2-4 Conduct drills on information distribution in pilot project sites.</p> <p>1-3 Information distribution through mass media from DMH is improved.</p> <p>1-3-1 Review the current information distribution system to community through mass media from DMH and the contents of information, and identify and improve the bottleneck.</p> <p>1-3-2 Cooperates with a FM station which has been jointly established by the Government of Myanmar and private companies for early warning.</p> <p>1-3-3 Propose a certain line for broadcasting real-time disaster information.</p> <p><Output2></p> <p>2-1 Identify needs of training based on activities through 1-1-1 to 1-1-4.</p> <p>2-2 Conduct trainings on natural disaster and end-to-end early warning system, including a simulation exercise, for the staff of RRD, DMH and GAD from central, state/region, district and township level.</p> <p>2-3 Develop manuals and other Information, Education and Communication (IEC) materials on end-to-end early warning system at all levels (central level, local government level, district level, township level and community level)</p> <p>2-4 Reflect lessons learned from 2-2 into manuals and other IEC materials through conducting Pilot activities and Follow up activities.</p> <p><Output3></p> <p>3-1 Prepare/revise the community-based disaster management plan including guidance on how to utilize early warning such as when, where, how to evacuate, what items should be brought with in pilot project sites selected 1-2-1.</p> <p>3-2 Prepare a manual for drafting a community-based disaster management activity including developing community disaster management plan.</p> <p>3-3 Select and secure evacuation centers and routes.</p> <p>3-4 Conduct community-based disaster management activities such as evacuation drills based on the community-based disaster management plan.</p> <p>3-5 Implement training of township officers for instructing village tract administrators about community-based disaster risk management as follow up activities.</p>	<p>(2) Provision of equipment</p> <p>*Detailed contents will be determined through the implementation of the Project.</p> <p>Following equipment are under consideration:</p> <ul style="list-style-type: none"> -Early Warning system (SSB, Wireless LAN, I-com, speaker, etc.) -Tide gage -Solar panel <p>(3) C/P Training in Japan</p> <ul style="list-style-type: none"> Comprehensive Disaster Management including; - Disaster Management in Local Governments - Early Warning System Operation - Community-Based Disaster Risk Management <p>(4) Local cost shared by Japanese side</p> <ul style="list-style-type: none"> - Costs for enlightenment programs and implementation of evacuation drills. - Costs for social surveys. 	<p>the Commencement of the Project.)</p> <ul style="list-style-type: none"> (3) Expenses for conducting awareness program, emergency simulation exercises and evacuation drills (4) Provision of necessary data (5) Expenses for operation and maintenance of the Project office (6) Others, if any 	<p>[Pre-condition]</p> <p>Political situation of Myanmar is stable.</p>
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	<p><Output4></p> <p>4-1 Summarize and compile a model on information distribution system through the administrative line into the expansion plan to coastal lined areas, through 1-1-1 to 1-1-6.</p> <p>4-2 Summarize and compile a model on information distribution system at township/village level into the expansion plan to coastal lined areas, through 1-2-1 to 1-2-4.</p> <p>4-3 Compile the manuals drafted in the activities of 2-3 and 2-4 into the expansion plan to coastal lined areas.</p> <p>4-4 Summarize and compile lessons learned in the activities of 3-1 and 3-4 into the expansion plan to coastal lined areas.</p> <p>4-5 Finalize the expansion plan.</p>
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