

Japan International Cooperation Agency
Ministry of Agriculture and Cooperatives

THE PROJECT FOR FLOOD
COUNTERMEASURES FOR THAILAND
AGRICULTURAL SECTOR
IN
THE KINGDOM OF THAILAND

FINAL REPORT
Appendix I: Supporting Documents

July 2013

SANYU CONSULTANTS INC.
NIPPON KOEI CO., LTD.

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List of Appendixes

1) Record of discussions

A-1-1 Record of Discussions on project for flood countermeasures for Thailand agricultural sector agreed upon between the MOAC and JICA.....	A-1-1
A-1-2 Records on Kick-off Meeting.	A-1-11
A-1-3 JCC Appointment.....	A-1-21
A-1-4 Minutes of Meeting between JICA Consultants Team and OAE.....	A-1-22
A-1-5 Minutes of Meeting for Supports for Reproduction of Pastures as Component 1.	A-1-26
A-1-6 Minutes of Meeting for Explanation and Discussion on Interim Report.....	A-1-30
A-1-7 Minutes of Meeting for Explanation and Discussion on Draft Final Report	A-1-35

2) Under 1.3.1

A-2-1 History and situation of the Natural Disaster in Thailand.....	A-2-1
--	-------

3) Under 1.3.3

A-3-1 Ministries and departments closely related with the Project.....	A-3-1
A-3-2 Institutional Background of the Project	A-3-7
A-3-3 Outlines/Introduction of each Topics related with the Project.....	A-3-8

4) Organization Chart, etc. Under 1.3.3

A-4-1 MOAC Organization Chart.....	A-4-1
A-4-2 MOI Organization Chart	A-4-2
A-4-3 OPM Organization Chart	A-4-3
A-4-4 Single Command Authority	A-4-4
A-4-5 RID Organization Chart.....	A-4-10
A-4-6 OAE Organization Chart.....	A-4-11
A-4-7 DLD Organization Chart.....	A-4-12
A-4-8 DOAE Organization Chart.....	A-4-13
A-4-9 RD Organization Chart	A-4-14
A-4-10 DOF Organization Chart.....	A-4-15
A-4-11 LDD Organization Chart.....	A-4-16
A-4-12 Local Administration System in Thailand Including the Relation with the Autonomous Body	A-4-17
A-4-13 The Disaster Prevention and Mitigation Plan (2009).....	A-4-19
A-4-14 Strategic National Action Plan for Disaster Risk Reduction (2010-2019)	A-4-24
A-4-15 M/P on Water Resource and Flood Management.....	A-4-30

5) Under 1.3.4

A-5-1 Supporting activities by JICA and other donors	A-5-1
--	-------

6) Support for the Reproduction of Pastures: Component 1

B-1	Government Operation Policy	B-1-1
B-2	Mandate of Units under the Central DLD	B-2-1
B-3	DLD's formats to concerning to fertilizers distribution	B-3-1
B-4	Result of Monitoring Survey	B-4-1
B-5	Number of Sample Farmers	B-5-1
B-6	Monitoring Sheet on Distribution of Seeds and Fertilizer for Beneficial Farmers.....	B-6-1
B-7	Monitoring Sheet on Distribution of Seeds and Fertilizer for DLD Station /Center.....	B-7-1
B-8	Participants Information	B-8-1
B-9	Problems and Countermeasures Discussed in Group.....	B-9-1
B-10	Evaluation comment by participants in Site A	B-10-1
B-11	Sub-District on Forage Bank under the Royal Irrigation Project	B-11-1

7) Rehabilitation and Improvement of Irrigation and Drainage Facilities: Component 2

C-1	Construction drawings for typical prevention works and structures	C-1-1
C-2	SSIRP Inventory Survey	
C.2.1	Location Map of SSIRP Inventory Survey	C-2-1
C.2.2	Method of SSIRP Inventory Survey	C-2-2
C.2.3	Analysis of SSIRP Inventory Survey Result	C-2-2
C.2.4	Current Status of Recovery for Damaged Facilities by RID or TAO	C-2-4
C.2.5	List of SSIRP Projects for Inventory Survey	C-2-6
C.2.6	Result of SSIRP Inventory Survey	C-2-10
C.2.7	Questionnaire of SSIRP Inventory Survey	
C-3	Design of the Pilot Project.....	C-3-1
C.3.1	JICA Design Review Report for Phlai Chumphon Project	
C.3.1.1	Hydraulic Design Statement of Outlet Drainage Structure at km 56+227.563 Case a-1 and Case b-1.....	C-3-1
C.3.1.2	Hydraulic Design Statement of Outlet Drainage Structure at km 56+227.563	C-3-8
C.3.1.3	Comparative Table of Gate Type for Drainage Outlet Structure at Phlai Chumphon Main Canal.....	C-3-14
C.3.1.4	Structural Calculation of Conduit (3-barrel box culvert, original dimensions and modifies loadings).....	C-3-15
C.3.2	RID Design Report for Phlai Chumphon Project	C-3-21
C.3.2.1	Design Criteria, Survey-Design of The Improvement of Phlai Chumphon O&M Project	C-3-21
C.3.2.2	Structural Design of Outlet Drainage Structure at km 56+151.898 of C-1 Main Canal	C-3-52
C.3.2.3	Drawings of Spillway km 56+151.898.....	C-3-68
C.3.2.4	Results of Soil and Boring Tests.....	C-3-86
C.3.3	Phlai Chumphon Project Costs	C-3-102
C.3.3.1	JICA Review Project Costs.....	C-3-102

C.3.3.1.1	Revised Project Costs of Outlet Drainage Structure at km 56+151.898 of C-1 Main Canal.....	C-3-102
C.3.3.1.2	JICA Review Quantity Calculation	C-3-103
C.3.3.1.3	Temporary Works.....	C-3-127
C.3.3.1.4	Calculation for Construction Supervision Fee.....	C-3-129
C.3.3.1.5	Survey Data	C-3-130
C.3.3.1.6	Report on Project Costs	C-3-131
C.3.3.2	RID Original Project Costs.....	C-3-133
C.3.3.2.1	Original Project Costs of Outlet Drainage Structure at km 56+151.898 of C-1 Main Canal.....	C-3-133
C.3.3.2.2	RID BOQ for Outlet Drainage Structure	C-3-134
C.3.3.2.3	Original Unit Costs	C-3-137
C.3.3.2.4	Project Unit Costs.....	C-3-151

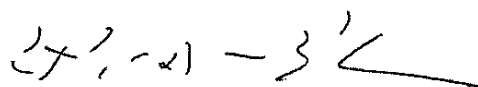
8) Guideline for Disaster-Resilient Agriculture and Agricultural Community: Component 3

D-1	Location Map of 8 Model Areas	D-1-1
D-2	Flood Condition in 8 Model Areas from 2006 to 2011	D-2-1
D-3	Summary of Main Characteristics of 8 Model Areas.....	D-3-1
D-4	Flood Damage in Agricultural Sector in the Model Area Provinces	D-4-1
D-5	2011 Flood Damage in Model Areas.....	D-5-1
D-6	Learning from Good Practice.....	D-6-1
D-7	Location Map of Related Large Scale Irrigation Project Area by RID	D-7-1
D-8	Monkey Cheek and Water Retention Project in Chainat Province.....	D-8-1
D-9	Farming System in the Project Area.....	D-9-1
D-10	Fishery.....	D-10-1
D-11	Value Chain/ Marketing Channel of Agricultural Product	D-11-1
D-12	Tambon Administrative Organization (TAO)	D-12-1
D-13	Task Force at each Province.....	D-13-1
D-14	Summary Definition about Self Sufficiency Economy in Thailand.....	D-14-1
D-15	MOAC's Preparedness Plan for Agricultural Disaster in the Budgetary Year 2012	D-15-1
D-16	Extracts from the MOAC Manual for Aids to Disaster Victims in Agricultural Sector (June 2008).....	D-16-1
D-17	Summary of the Pilot Project at Each Model Area	D-17-1
D-18	Report on Final Workshop on Project for Flood Countermeasures for Thailand Agricultural Sector	D-18-1

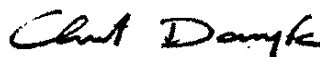
Appendix A

RECORD OF DISCUSSIONS
ON
PROJECT FOR FLOOD COUNTERMEASURES FOR THAILAND AGRICULTURAL
SECTOR
IN
THE KINGDOM OF THAILAND
AGREED UPON BETWEEN
THE MINISTRY OF AGRICULTURE AND COOPERATIVES (MOAC)
OF THE KINGDOM OF THAILAND
AND
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Bangkok, April 12 , 2012



Mr. Kazuhiro YONEDA
Chief Representative
Thailand Office
Japan International Cooperation Agency



Mr. Chalit Damrongsak
Deputy Permanent Secretary
Ministry of Agriculture and Cooperatives

Witnessed by



Mr. Arkhom Termpittayapaisith
Secretary General
National Economic and Social Development Board

Based on the minutes of meetings on the concerning Detailed Planning Survey on the Project for Flood Countermeasures for Thailand Agricultural Sector (hereinafter referred to as "the Project") signed on January 23, 2012 between Ministry of Agriculture and Cooperatives of the Kingdom of Thailand (hereinafter referred to as "MOAC") and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with MOAC and its relevant organizations to develop a detailed plan of the Project.

Both parties agreed the details of the Project and the main points discussed as described in the Appendix 1 and the Appendix 2 respectively. Both parties also agreed that MOAC, the counterparts to JICA, will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project will be sustained during and after the implementing period in order to contribute toward social and economic development of the Kingdom of Thailand.

The Project will be implemented within the framework of the Agreement on Technical Cooperation between the Government of Japan (hereinafter referred to as "GOJ") and the Government of the Kingdom of Thailand (hereinafter referred to as "GOT") signed on November 5, 1981 (hereinafter referred to as "the Agreement").

Appendix 1: Project Description
Appendix 2: Main Points Discussed

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Chut Dang

PROJECT DESCRIPTION

I. BACKGROUND

Seasonal south-west monsoon rain increased significantly during September 2011 and it was further intensified by the tropical storm Nalgae in early October, causing severe flood in the Northeast, East and Central regions of the country. It is announced that 63 out of 77 provinces were affected in some way by the floods. The affected area covers 12.5 percent of the total national cropped land including 1.4 million ha of paddy, 25 thousand ha of field crops, 83 thousand ha of horticulture, and 12.3 million of livestock (November 23, 2011, MOAC).

In order to support quick recovery from disaster, JICA has provided emergency items, such as tents, life jackets and water purifiers in October, followed by the dispatch of experts teams on subway, airport, water and sewerage, drainage pump in October to November, as well as needs assessment team on emergency supports for industrial area in November.

As for agricultural sector, JICA started its consideration of support, from the first needs assessment mission dispatched from November 27 to December 3. Based on the series of discussions with GOT in the first mission as well as the second mission dispatched from December 13 to December 23, 1) Reproduction of pastures, 2) Recovery and reinforcement of damaged irrigation facilities, and 3) Implementation of mitigation measures of agricultural damages caused by flood with participatory manner, are identified as possible collaboration areas between GOT and JICA.

This project is formulated to implement supports in above mentioned areas.

II. OUTLINE OF THE PROJECT

1. Title of the Project

Project for Flood Countermeasures for Thailand Agricultural Sector

2. Expected Goals which will be attained after the Project Completion

(1) Goal of the Proposed Plan

Recovery of agricultural damages from 2011 flood is promoted and medium and long-term plan for mitigating agricultural damages caused by flood is prepared.

(2) Goal which will be attained by utilizing the Proposed Plan

Agricultural damages and losses caused by big-scale flood are reduced.

3. Outputs

Component 1: Improvement plan on pasture reproduction is proposed.

Component 2: Guidelines on rehabilitation and reinforcement of irrigation facilities are proposed.

Component 3: Guidelines on disaster-resilient agriculture and agricultural community planning are proposed.

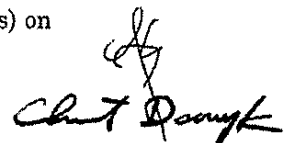
4. Activities

<Component 1: Reproduction of pastures >

- 1) Monitoring on the distribution of fertilizer and planting material
- 2) Training on sustainable production of pasture
- 3) Recommendation for improvement of quick recovery plan of pasture reproduction after the flood

<Component 2: Rehabilitation and reinforcement of irrigation facilities >

- 1) Technical advices on recovering works for irrigation facilities
- 2) Prioritization, outline design and a part of construction work (pilot projects) on reinforcement of irrigation facilities



- 3) Recommendation of medium- and long-term guidelines for improvement of irrigation facilities based on the analysis on the causes of damages
- 4) Damage assessment and recommendation measures for JICA supported irrigation and other agriculture related facilities

<Component 3: Development of guidelines for disaster-resilient agriculture and agricultural community planning >

- 1) Selection and grasp in detail of model areas
- 2) Detail damage assessment in model areas
- 3) Assessment of causes of damages in model areas
- 4) Listing-up and comparison of flood damage mitigation measures
- 5) Coordinates between Flood damage mitigation measures and government policy as well as comprehensive flood management plan for the Chao Phraya river basin
- 6) Implementation of flood damage mitigation measures through model activities
- 7) Development of disaster-resilient agriculture and agricultural community plan in each model area
- 8) Development of guidelines for disaster-resilient agriculture and agricultural community planning

5. Input

(1) Input by JICA

(a) Dispatch of Mission

A team of consultant whose scope of works is mentioned above is to be dispatched. Tentative idea of assignment of member of mission is follows.

- Chief consultant
- Coordinator
(Component 1)
- Deputy chief consultant/ Livestock
- Training coordination / Monitoring
(Component2)
- Deputy chief consultant/ Irrigation planning
- Irrigation planning
- Facility design
- Cost estimation
- Supervision of construction works
- Environmental & social consideration
(Component3)
- Deputy chief consultant / rural infrastructure
- Flood damage survey
- Water use planning
- GIS Engineer
- Community disaster prevention planning
- Farm planning
- Rice cultivation
- Horticulture cultivation
- Marketing/Logistics

(b) Expenses of pilot projects (component 2) and model project (Component 3).

All expenses necessary for the implementation of the pilot projects in Component 2 and model activities in Component 3 are borne by JICA.

Input other than those indicated above will be determined through mutual consultations between JICA and MOAC during the implementation of the Project, as necessary.



(2) Input by MOAC

MOAC will take necessary measures to provide at its own expense:

- (a) Services of the counterpart personnel of MOAC, and administrative personnel;
- (b) Suitable office space with necessary equipment;
- (c) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the equipment provided by JICA;
- (d) Necessary means of transport for members of the JICA missions for official travel within Thailand;
- (e) Information as well as support in obtaining medical service;
- (f) Credentials or identification cards;
- (g) Available data (including maps and photographs) and information related to the Project;
- (h) Running expenses necessary for the implementation of the Project;
- (i) Expenses necessary for transportation within Thailand of the equipment referred to in II-5-(1) as well as for the installation, operation and maintenance thereof; and
- (j) Necessary facilities to members of the JICA missions for the remittance as well as utilization of the funds introduced into Thailand from Japan in connection with the implementation of the Project.

6. Implementation Structure

The roles and assignments of relevant organizations are as follows,

- (1) Deputy permanent secretary of MOAC will be responsible for overall administration and implementation of the Project.
- (2) Department of Livestock Development (hereinafter referred to as "DLD") will be responsible for administration and implementation of the Component 1.
- (3) Royal Irrigation Department (hereinafter referred to as "RID") will be responsible for administration and implementation of the Component 2
- (4) Office of Agricultural Economics (hereinafter referred to as "OAE") will be responsible for administration and implementation of the Component 3.
- (5) JICA experts will give necessary technical guidance, advice and recommendations to MOAC on any matters pertaining to the implementation of the Project.
- (6) Advisory Committee (hereinafter referred to as "AC") composed by Japanese experienced persons in the project area will be established in order to confirm outputs by the Project from technical view point. AC will be held whenever deems it necessary.
- (7) Joint Coordination Committee (hereinafter referred to as "JCC") will be established in order to facilitate inter-organizational coordination. JCC will be held whenever deem as necessary. A list of proposed members of JCC is shown in the Annex I.

7. Project Site(s) and Beneficiaries

Project Site: Chao Phraya River Basin and other related area
Beneficiaries: Affected people of the disaster in the target area

8. Duration

The Project is implemented from March 2012 to June 2013



9. Reports

JICA will prepare and submit the following reports to the MOAC written in English

- (1) Twenty-Five (25) copies of Inception Report at the time about six weeks after the commencement of the work
- (2) Twenty-Five (25) copies of Interim Report during the work period
- (3) Twenty-Five (25) copies of Draft Final Report at the end of the work
- (4) Twenty-Five (25) copies of Final Report within one (1) month after the receipt of the comments on the Draft Final Report

10. Environmental and Social Considerations

- (1) MOAC agreed to abide by 'JICA Guidelines for Environmental and Social Considerations' (April, 2010) in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project.

III. UNDERTAKINGS OF MOAC AND GOT

1. MOAC and GOT will take necessary measures to:

- (1) Ensure that the technologies and knowledge acquired by the Thai nationals as a result of Japanese technical cooperation contributes to the economic and social development of Thailand, and that the knowledge and experience acquired by the personnel of Thailand from technical training as well as the equipment provided by JICA will be utilized effectively in the implementation of the Project; and
- (2) Grant privileges, exemptions and benefits to members of the JICA missions referred to in II-5 (1) above and their families, which are no less favorable than those granted to experts of third countries performing similar missions in Thailand under the Colombo Plan Technical Cooperation Scheme.
- (3) Other privileges, exemption and benefits will be provided in accordance with the Agreement signed on November 5, 1981 between the GOJ and the GOT.

IV. EVALUATION

JICA will conduct the following evaluations and surveys to mainly verify sustainability and impact of the Project and draw lessons. MOAC is required to provide necessary support for them.

1. Ex-post evaluation three (3) years after the Project completion, in principle
2. Follow-up surveys on necessity basis

V. PROMOTION OF PUBLIC SUPPORT

For the purpose of promoting support for the Project, MOAC will take appropriate measures to make the Project widely known to the people of Thailand.

VI. MUTUAL CONSULTATION

JICA and MOAC will consult each other whenever any major issues arise in the course of Project implementation.

VII. AMENDMENTS

The record of discussions may be amended by the minutes of meetings between JICA and MOAC.



The minutes of meetings will be signed by authorized persons of each side who may be different from the signers of the record of discussions.

Annex I List of Proposed Members of Joint Coordination Committee (JCC)
Annex II Implementation structure

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List of Proposed Members of Joint Coordination Committee (JCC)

1. Functions

The Joint Coordination Committee (hereinafter referred to as "JCC"), composed of members listed in Section 2 below, will meet once a year and whenever the necessity arises. The main functions of JCC shall be as follows;

- (1) To review the overall progress and achievements of the Project;
- (2) To examine major issues arising from or in connection with the Project; and
- (3) To work out the modification of the activities depending on the necessity.

2. Committee Composition

The JCC will be composed of the following members.

(1) Chairperson

Deputy Permanent Secretary: Ministry Agriculture and Cooperatives

(2) Members

<Thai Side>

- (a) Representative from DLD, (Coordinator of Component 1)
- (b) Representative from RID, (Coordinator of Component 2)
- (c) Representative from OAE, (Coordinator of Component 3)
- (d) Representative from Office of the Permanent Secretary (hereinafter referred to as "OPS")
- (e) Representative from Agricultural Land Reform Office (hereinafter referred to as "ALRO")
- (f) Representative from Department of Agriculture (hereinafter referred to as "DOA")
- (g) Representative from Department of Agricultural Extension (hereinafter referred to as "DOAE")
- (h) Representative from Department of Fisheries (hereinafter referred to as "DOF")
- (i) Representative from Department of Rice (hereinafter referred to as "DOR")
- (j) Representative from Land Development Department (hereinafter referred to as "LDD")
- (k) Representative from National Economic and Social Development Board (hereinafter referred to as "NESDB")
- (l) Representative from Thailand International Development Cooperation Agency (hereinafter referred to as "TICA")

<Japanese Side>

- (a) Chief consultant
- (b) Deputy chief consultant / Livestock
- (c) Deputy chief consultant / Irrigation planning
- (d) Deputy chief consultant / Rural infrastructure
- (e) Policy Advisor on Integrated Water Resource Management, JICA
- (f) Chief representative, JICA Thailand office
- (g) Other personnel(s) concerned to be decided and/or dispatched by JICA

3. Observer

- (a) Official(s) from Embassy of Japan in Thailand
- (b) Chief engineer of the Project for Comprehensive flood management plan for the Chao Phraya river basin

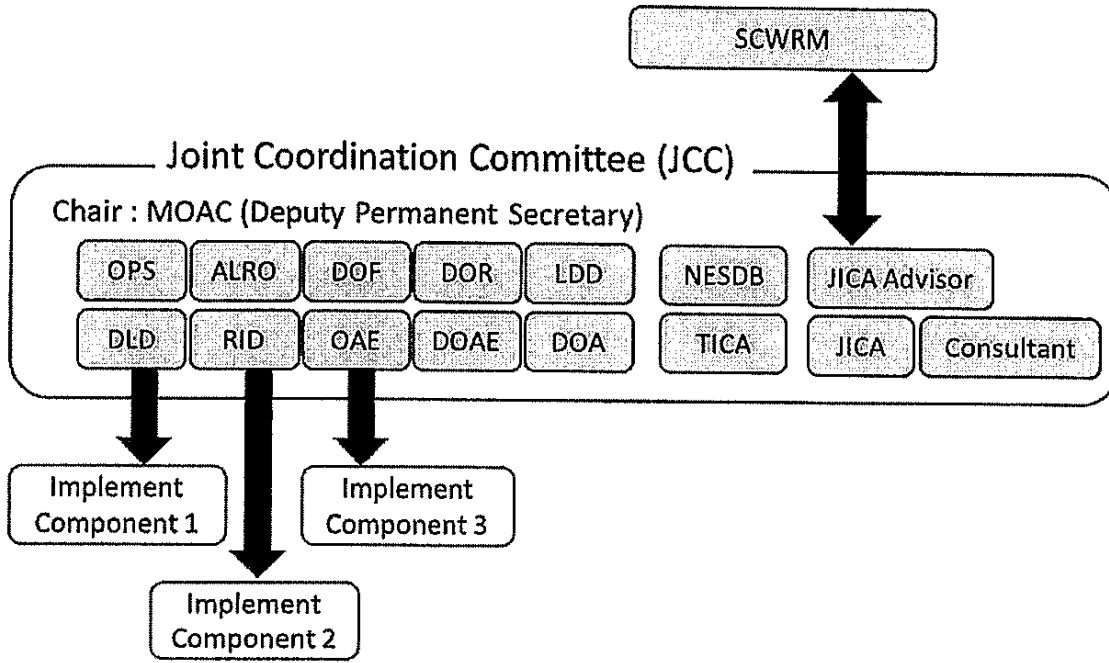


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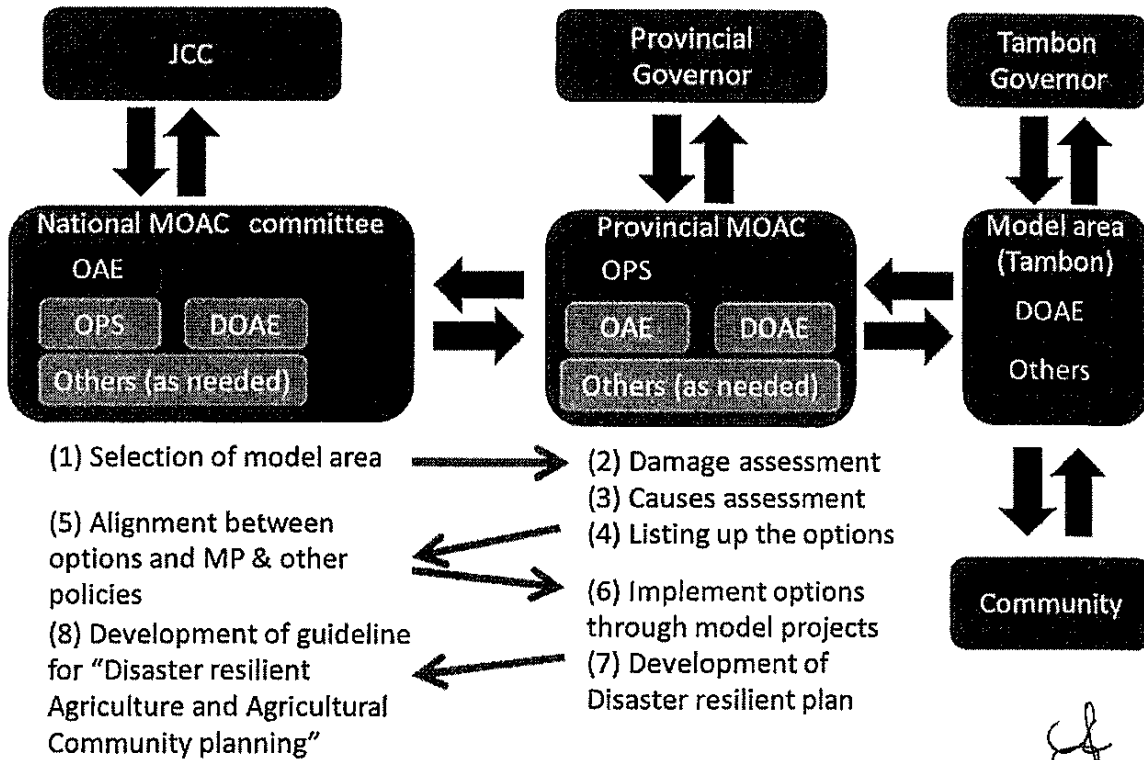
Implementation Structure

Annex II

(A) Overall



(B) Component 3



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Appendix 2

Main Points Discussed

1. Model projects in Component 3

In component 3, the project will implement most appropriate disaster mitigation options in 4 or 5 selected model areas (between 10 and 100 ha scale) where frequently inundated in flooding period. There are number of considerable disaster mitigation options, some options contribute to improve resilience of community, whereas others contribute to improve in the points of engineering aspect or farming aspects. The options will be carefully selected and implemented based on the opinions of community as well as discussion with Thailand government institutes. The project considers that consensus making is one of most important factors for successful implementation of the options. The Thailand Government side understood the background and agreed to decide model projects after commencement of the project.



Records on Kick-off Meeting held at MOAC dated 28th March, 2012

(The Project for Flood Countermeasures for Thailand Agriculture Sector)

1. Participants

The kick-off meeting was attended by the participants as shown in the attached name list (Attachment 1). The meeting was chaired by Mr. Chalit Damrongsak, Deputy Permanent Secretary of MOAC and started at 14:30 as scheduled.

2. Materials distributed

All the attendants in the meeting were provided with the following materials.

-Inception Report (Draft) both in Thai and English versions

-Power-point presentations in print

*-Outline of JICA's Cooperation on Flood Disaster in the Kingdom of Thailand (Distributed in the meeting)

*Summary of Inception Report (Draft)
(Distributed in the meeting)

3. Proceedings

The meeting was proceeded in the following order and manner and the major points questioned/answered and commented are noted hereunder for confirmation purpose.

3-1. Opening remarks by Chairman

The Chairman began the meeting with his welcome remarks to all the attendants in the meeting. He stated briefly about the serious damages, maybe the worst in modern Thai history, taken place in the agriculture sector as caused by the 2011 flood and emphasized the needs for measures to be taken for possible recovery at the earliest. At the same time the Chairman reiterated on behalf of MOAC sincere appreciation to JICA and people of Japan for their various cooperation extended for

supporting Thai Government's efforts for disaster relief.

The Chairman then suggested introducing by each of Thai side representative of NESDB and various Departments under MOAC by themselves first. The self-introductions were made by representatives from NESDB, DLD, OPS, OAE, LDD, DOAE, RID, DOR and ALRO. After that, Japanese side introduced themselves including the representatives from EOJ, JICA Mission as well as the Consultant Team. (Participants list is attached)

3-2. Remarks by JICA Mission Leader

Mr. Fumito MIZUMA, Senior Special Advisor of JICA, gave remarks on this occasion of holding the kick-off meeting for the subject Project for Flood Countermeasures for Thailand Agricultural Sector as the JICA Mission Leader with the following major points.

- The flood disaster occurred in 2011 was an enormous one with once in 50 years probability and caused serious damages on 1.44 million ha paddy fields, 36 thousand ha of aquaculture and more than 12 million heads of livestock. The disaster and the damages caused were widely communicated in Japan and many of Japanese people shared the pain of Thai people.
- With such heavy damages on people and various infrastructures, RTG tried hard and have been exerting all possible effort toward restoring the condition at the earliest, for which the Mission Leader expressed his deep respect. While, JICA has been extending a full cooperation to the Thailand's rehabilitation and reconstruction from flood disaster to date.
- As for the agriculture sector, JICA's cooperation for flood countermeasures will be substantially enhanced with the kick-off of the subject project inclusive of the following components for short, medium and long term objectives.

*Component 1: Reproduction of pasture

*Component 2: Rehabilitation and reinforcement of irrigation facilities

*Component 3: Guideline for disaster resilient agriculture and agricultural community

-Concerning the project period, the schedule is considered very tight to be completed by June 2013 and for attaining smooth progress in the subject project, selection of model areas seems to hold the key at this stage, for which a decision making in this meeting is desired.

-The friendly relationship between Thailand and Japan has a long history over 600 years to date and Japanese people are very grateful to Thai people for their help offered during the time of Tsunami disaster in Japan occurred in March, 2011. It is hoped that the undertakings of the subject project will do contribute to further strengthen the close and friendly relationship between two countries.

3-3. Presentation by using power-point (1) and (2)

Presentations were made by Mr. Fumihiko SUZUKI, Assistant Director and officer in charge of the subject project, Paddy Field Based Farming Area Division 1, Rural Development Department of JICA Headquarter for (1) and Mr. Tetsuro ODA, Deputy Team Leader of the JICA Consultant Team for (2) as noted below. The presentation was made based on the Power-point projection and materials in print. In the presentation, Mr SUZUKI commented on necessity and importance of due coordination among the various JICA undertakings being underway, while Mr. ODA commented on the limited time available for selection of model areas. Mr. ODA also commented on the intention of Consultant Team that the Inception Report (Draft) may be modified and finalized at the end of April 2012 after the final selection of model areas.

-(1) for Outline of JICA's Cooperation on Flood Disaster in the Kingdom of Thailand

-(2) for Summary of Inception Report (Draft)

3-4. Questions and answers

Upon the presentations made by Japanese side, the Chairman invited questions from Thai side. The followings are the questions and answers and discussions made in the meeting.

Question (By Deputy DG of DLD):

Concerning the Component1, JICA provided chemical fertilizers for restoring the pasture production. DLD has an intention to expand the beneficiary provinces to cover nation-wide from the 9 provinces in the central plain region. The damages caused by 2011 flood are seriously large extent covering as many as 51 provinces nation-wide, for which consideration by JICA for possible adjustment is requested.

Answer (By Mr. Kenichiro KOBAYASHI, Director of PFBFA Division 1, JICA HQ):

The number of provinces targeted for fertilizer distribution is based on the request paper previously submitted to us by MOAC and JICA explained to MFA (Ministry of Foreign Affairs) of GOJ about the scheme based on this number of provinces. However, after learning yesterday the intention of DLD to possibly increase the number of provinces, this Mission is in the position to consider the matter positively. In this concern, counter question is whether DLD intends to increase the number of provinces while maintaining the same quantity of fertilizer in total or not ?

Confirmation (By DLD):

Yes, the number of provinces hopefully be increased from 26 to 51 with the same quantity of fertilizers provided. In case if the number of provinces be increased as requested, we are not sure whether monitoring by consultant's team may cover all or not.

Answer (By JICA):

JICA Mission is of the opinion that the increase of the number of provinces would be made within the limit of time and man-power resource of the consultant team and would like to request DLD to have due consultation with the consultant's team concerning the method and manner of monitoring for the increased number of provinces. For JICA, monitoring is very important for the necessity to explain to the people of Japan that the fertilizers provided have been fully utilized for pasture production.

Invitation by Chairman for question by RID

Comments (By RID Representative):

RID representative commented that there is no particular comment on the project contents as presented/explained, since the scope of works is based on the items as mutually discussed and agreed upon during the past meetings with JICA Mission. While, one thing RID would like to suggest in this meeting is to avoid any unnecessary duplication of survey work already done by the previous projects (2 antecedent projects underway). This may cause repeating of data request already provided.

Answer (By JICA):

In JICA, 2 antecedent projects (Chao Phraya flood management master plan , topographic survey) and the subject project for Thailand Agriculture Sector are being carried out under the different Department of JICA HQ, and for realizing practical collaboration among three projects, periodical meetings are scheduled to be held for better coordination. In the field site, JICA is in the position to suggest the subject project teams to have a concerted effort in sharing as much as possible data/information commonly useful and needed. Further, JICA intends to guide the project teams to hold a monthly meeting to share data and progress of survey works with each other.

Question (By RID Representative):

Supposing that RID joins in the monthly meetings, for the practical working level may be no problem, but for management level, monthly frequency is seemed too often and difficult to manage.

Answer (By JICA):

The monthly meeting to be held is designed for just among the JICA project teams without participation by RID.

Confirmation (By Chairman):

It is clear now and there is no other comment for the Component 2. Then the Chairman invited questions for the component 3.

Comment (By OAE):

OAE is prepared to provide necessary data/information as GIS and data-base.

Comment (By DOAE):

There have been very serious damages on orchard and horticulture fields by the 2011 flood disaster. Accordingly, it is requested to add damages on orchard and horticulture in the Draft Inception Report (Damages on agriculture sector, Introduction) presented today. Relevant data have been provided for the previous JICA Mission already.

Answer (By Mr. ODA, Consultant team):

The Inception Report (Draft) has been prepared based on the information obtained prior to the commencement of the survey work and required descriptions as suggested by DOAE shall be added in revising the Draft Inception Report.

Comment (By DOAE):

For the orchard and horticultural cropping, the most serious damages caused by 2011 flood can be seen in the province of Nakhon Pathom, to which JICA Mission made a visit to confirm the damages. However, the said province is not included in the proposed provinces to select model areas. DOAE is of the opinion that it is necessary to include Nakhon Pathom province in the candidate provinces.

Answer (By Mr. SUZUKI, JICA HQ):

In the selection of candidate provinces, considerations were given on the representative farming types and the idea is that the orchard and horticulture can be covered by the provinces of Ayutthaya and Pathum Thani. Due to the limited time frame and man-power input of consultant team, it is difficult to increase the number of model areas.

Answer (By Mr. ODA, Consultant team):

As explained in the presentation, time factor is important and limited.

However, it is considered possible to include Nakhon Pathom province in the candidate for model area selection, if increase the number of provinces (4 to 5) without increasing the number of model areas in total, i.e. 2 each of model areas for 3 provinces and 1 each for 2 provinces.

Comment (By DOR):

DOR expected that the JICA Mission would visit the Rice Research Centers located at Pathum Thani and Chainat, but cancelled. Does this imply that these Centers will not be included in the project ? We consider these Centers are so important with the function of paddy storing against emergencies.

Comment (By OPS):

The JICA Mission visited several sites to observe the prevailing conditions at the sites, but due simply to the time limit the Mission could not visit the Rice Research Center, and it is considered there is no connection with the selection of candidate provinces as proposed. For this matter, JICA's comment is desirable.

Answer (By Mr. SUZUKI, JICA):

JICA requested to MOAC for arranging the places to visit for the Preliminary Mission dispatched in November. It is understood that MOAC arranged the visit to the Rice Research Center originally but finally cancelled due to the limit of time available.

Comment (By Mr. ODA, Consultant team):

2 provinces of Pathum Thani and Chainat are selected as the candidate provinces for further selection of model areas and rice is one of the important crops under the project planning. The consultant team, especially the consultant expert in rice will visit the Rice Research Centers during the course of this project.

Comment (By LDD):

For the Component 3, farmers' participation is important. As the flood countermeasures, micro-organism will play very important role for recovery of soil

condition after a pollution caused by inundation for a long period. LDD developed some micro-organism materials (Por Dor) through research and experimentation and tries to extend to beneficiaries through volunteer farmers called "Soil Doctor". Moreover, LDD is readily available with the existing farmers' network, of which active use of the network by the JICA project team is expected.

Comment (By ALRO):

For ALRO, involvement in the subject project is not yet identified. After the selection of model areas, ALRO will consider how to share the roles in more concrete manner under the project.

Comment (By Mr. SUZUKI, JICA HQ):

Prior to the selection of model areas, it is preferable to have mutual agreement in the selection of candidate provinces. Is it agreeable to confirm the candidate provinces as 5 provinces including Nakhon Pathom in addition to 4 provinces as proposed by the Consultant team ? As many as 8 model areas will be selected from the said 5 provinces.

Comment (By Chairman):

No objection from Thai side and please proceed to selection of 8 model areas from the confirmed 5 provinces.

Comment (By Mr. ODA, Consultant Team)

Starting from the next week, the consultant team will visit the candidate provinces confirmed today, explain about the project and request the provinces to select the candidate model areas. For this, the Consultant team will consult the schedules in detail with OAE and inform the results to the agencies concerned.

Finally, the Chairman of the meeting and the representative of JICA exchanged the closing remarks in a way to express thanks for the cooperation extended and the meeting was adjourned at 16:30.

Name List of Attendants of Kick-off Meeting
Subject : JICA Project for Flood Countermeasures for Thailand Agricultural Sector

March 28, 2012 (Wednesday at 2:30 p.m.)
At Conference Room No. 124 of MOAC

(page 1 of 2)

No.	Name	Position	Department	Remarks
	Thai side			
(1)	Mr. Chalit Damrong sak	Deputy Permanent Secretary	MOAC	Chairman in the meeting
(2)	Wimolporn Thitisak	Deputy Director General	DLD	
(3)	Dr. Thumrongsakd Phonbumrung	Senior Researcher, Animal Nutrition Division	DLD	
(4)	Ms. Supalak Prabsriphum	Veterinary Officer	DLD	
(5)	Mr. Chatchom Chompradist	Director, Water Management Division	RID	
(6)	Mr. Kanchadin Srapatoom	Irrigation Engineer	RID	
(7)	Mr. Rathsayam Tiyarathtagarn	Irrigation Engineer	RID	
(8)	Dr. Bhumisak Rasri	Director, Agricultural Economics Operation Centre	OAE	
(9)	Ms. Jatupom Nonthasiri	Professional Statician	OAE	
(10)	Ms. Rungtip Kunnakulsoontorn	Senior Statician	OAE	
(11)	Mr. Montree Boonpanit	Director of Agricultural National Resources and Environmental Planning Office	NESDB	
(12)	Mr. Chamnong Paungpook	Policy and Plan Analyst	NESDB	
(13)	Mr. Wisit Ngamson	Policy and Plan Analyst	NESDB	
(14)	Ms. Apisiree Meeklang	Policy and Plan Analyst	NESDB	
(15)	Dr. Settapong Lekawattana	Director of Vegetable, Flower, Ornamental Plant and Herbal Plant Production Promotion Division, Bureau of Agricultural Commodities Promotion and Management	DOAE	
(16)	Ms. Sunisa Boonyapatipark	Chief of Foreign Relations Sub-division, Planning Division	DOAE	
(17)	Mr. Akapong Nooplup	Subject Matter Specialist, Flower and Ornamental Plant Production Promotion Group, Bureau of Agricultural Commodities Promotion and Management	DOAE	
(18)	Dr. Chamaiporn Tanomsridejchai	Foreign Relations Officer, Foreign Relations Sub-division, Planning Division	DOAE	
(19)	Mr. Angsutorn Wasusun	Agricultural Research Officer	DOR	
(20)	Ms. Surutwadee Pak-uthai	Land Reform Technical Officer	ALRO	

Name List of Attendants of Kick-off Meeting
Subject : JICA Project for Flood Countermeasures for Thailand Agricultural Sector

March 28, 2012 (Wednesday at 2:30 p.m.)
 At Conference Room No. 124 of MOAC

(page 2 of 2)

No.	Name	Position	Department	Remarks
	Japanese side			
(1)	Mr. Fumito Mizuma	Special Senior Advisor and Mission Leader	JICA	
(2)	Mr. Kenichiro Kobayashi	Director, Rural Development Department, JICA Head Quarter	JICA	
(3)	Mr. Hiroshi Saito	Senior Advisor Livestock	JICA	
(4)	Mr. Fumihiko Suzuki	Assistant Director, Paddy Field Based Farming Division 1 Rural Development Department	JICA	
(5)	Mr. Tetsuya Murakami	First Secretary	EOJ	
(6)	Mr. Koichi Okamoto	First Secretary	EOJ	
(7)	Mr. Tomoyuki Kawabata	Senior Representative	JICA	(JICA, Thailand)
(8)	Ms. Ayumi Yuasa	Representative	JICA	(JICA, Thailand)
(9)	Ms. Supaporn Langao	Program Officer	JICA	(JICA, Thailand)
(10)	Ms. Varaporn Piroonsawan	Interpreter	-	(JICA, Thailand)
(11)	Mr. Tetsuro Oda	Deputy Team Leader	SCI	(Consultant Team)
(12)	Mr. Ken Kozai	Training Plan/Monitoring	SCI	(Consultant Team)
(13)	Mr. Yuzuru Tomioka	Organization/Institution/ Collaboration among Agencies	SCI	(Consultant Team)
(14)	Mr. Nakorn Najaron	Flood Damage Survey 1	SCI	(Consultant Team)

Ordinance of the Ministry of Agriculture and Cooperatives
No. 324/2555
Appointment of Joint Coordination Committee, JCC
Under the Project for Flood Countermeasures for Thailand Agricultural Sector

Whereas the Government of Japan decided to operate the cooperation project between Ministry of Agriculture and Cooperatives and Japan International Cooperation Agency (JICA) under the Project for Flood Countermeasures for Thailand Agricultural Sector and the resolution of the both parties on 28th March B.E. 2555 at the Office of Permanent Secretary for Agriculture and Cooperatives confirmed to appoint the Joint Coordination Committee, JCC to perform, facilitate, cooperate and follow up actions of both parties under the project aforementioned.

In order to perform the project as above to smoothly, efficiently and optimization, the Ministry of Agriculture and Cooperatives therefore appoints Joint Coordination Committee, JCC under the Project for Flood Countermeasures for Thailand Agricultural Sector consist of:

- | | |
|--|--------------------------|
| 1. Deputy Permanent Secretary, Ministry of Agriculture and Cooperatives | The Chairperson |
| 2. Rice Department | The Member |
| 3. Royal Irrigation Department | The Member |
| 4. Department of Fisheries | The Member |
| 5. Department of Livestock Development | The Member |
| 6. Land Development Department | The Member |
| 7. Department of Agriculture | The Member |
| 8. Department of Agricultural Extension | The Member |
| 9. Office of Agricultural Economics | The Member |
| 10. Agricultural Land Reform Office | The Member |
| 11. Office of the National Economic and Social Development Board (NESDB) | The Member |
| 12. Thailand International Development Cooperation Agency (TICA) | The Member |
| 13. Japan International Cooperation Agency (JICA) | The Member |
| 14. Bureau of Foreign Agricultural Affairs, Ministry of Agriculture and Cooperatives | The Member and Secretary |

The committee has the authority as follow:

1. Follow up actions of the operation under the project and inform to chief executive.
2. Solve the problems and prefix of the operation under the project.
3. Other duties as assigned.

Henceforth

Issued on 22nd May B.E. 2555
(Signed)

(Miss Supattra Tanaseniwat)
Permanent Secretary

For the Ministry of Agriculture and Cooperatives

**Minutes of Meeting between
Japan International Cooperation Agency (JICA) Consultants Team
and
Office of Agricultural Economy (OAE), the Ministry of Agriculture and Cooperatives (MOAC)
For The Project for Flood Countermeasures for Thailand Agricultural Sector**

The Japan International Cooperation Agency Consultants Team (hereinafter referred to as "JICA Consultant"), Office of Agricultural Economy and relevant departments and offices of the Ministry of Agriculture Cooperatives (hereinafter referred to as "MOAC") had meeting on Component 3 of the Project for Flood Countermeasures for Thailand Agricultural Sector (hereinafter referred to as "the Project"). The meeting was held on 24th May 2012 at OAE conference room. List of participants is shown in Attachment 3.

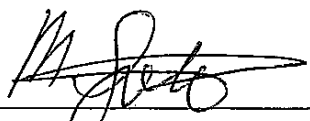
Both sides of JICA consultant and MOAC had discussed on component 3 of the Project and mutually agreed the following points.

1. Selection of Model Areas
8 Sub-Districts (Tambon) were selected as the Model Areas for Component 3 as per attached in Attachment 1.
2. Schedule of the Project Implementation
Implementation schedule of the Component 3 of the Project is as per attached in Attachment 2
3. Coordination at Provincial Level
Secretary General of OAE will send official letter to Director General of relevant departments and Governor of the 5 Provinces related to the selected Model areas for cooperation to the Project.

Date: May 24, 2012

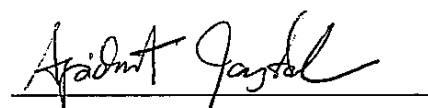
Place: Bangkok, Thailand

FOR
CONSULTANT TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY



Michio GOTO
Team Leader, Consultant Team

FOR
OFFICE OF AGRICULTURAL ECONOMY
MINISTRY OF AGRICULTURE AND
COOPERATIVES



Apichart Jongskul
Secretary General

Selected 8 Model Areas for Component 3 of the Project for Flood Countermeasures for Thailand Agricultural Sector.

Province	District	Sub-district
Phitsanulok พิษณุโลก	Bang Rakam อ. บางระกำ	Chum Saeng Songkhram ต. ชุมแสงสงคราม
	Bang Kratum อ. บางกระทุ่ม	Nakhon Pa Mak ต. นครป่าหมาก
Chainat ชัยนาท	Wat Sing อ. วัดสิงห์	Wang Man ต. วังมน
	Sapphaya อ. สรรพพยา	Khao Kaeo ต. เขากแก้ว
Ayutthaya พระนครศรีอยุธยา	Bang Ban อ. บางบาล	Gop Chao ต. กบเจา
	Lat Bua Luang อ. ลาดบัวหลวง	Singhanat ต. สิงหนาท
Pathum Thani ปทุมธานี	Khlong Luang อ. คลองหลวง	Khlong Ha ต. คลองห้า
Nakhon Pathom นครปฐม	Bnag Len อ. บางเลน	Naraphirom ต. นราภิรมย์

Implementation Schedule of Component 3 of the Project for Flood Countermeasures for Thailand Agricultural Sector.

	2012										2013			
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Model Area Selection	■	■												
Flood Damage Survey		↓												
- PRA/ Community Study		■	■	■										
- Detailed Survey		■	■	■	■									
Collection of Good Praactice			■	■	■	■	■	■	■	■	■	■	■	
Participatory Planning Process			■	■	■	■	■	■	■	■	■	■	■	
Model Project/ Activity				↓										
- Selection of Project/ Activity				■	■									
- Detailed Plan of Project/ Activity					■	■	■	■	■	■	■	■	■	
- Implementation						■	■	■	■	■	■	■	■	
- Feedback from Project/ Activity					■	■	■	■	■	■	■	■	■	
Recording Process of Planning			■	■	■	■	■	■	■	■	■	■	■	
Formulation of Draft Guideline								■	■	■	■	■	■	
Report					▲								▲	

List of Attendants

May 24, 2012 10:00-11:30 at OAE

Name-Surname	Position	Organization
Mr.Apichart Jongskul	Secretary General	Office of Agricultural Economics(OAE)
Ms.Roungtip Kunnakulsortem	Senior stacionian	OAE
Ms.Jatupron Nontasiri		OAE
Ms.Thanatrakorn Trachang	IT officer	OAE
Dr.Chamaiporn Tanomsridejchai	Senior Foreign Ralation Officer	Department of Agricultural Extension(DOAE)
Ms.Marasri Vonganansup		DOAE
Ms.Bhuripan Suwannamek		DOAE
Ms.Suratwadee Pak-uthai	Land Reform Technical Officer	Agricultural Land Reform Office(ALRO)
Mr.Wisit Ngamsom	Policy and Plan Analyst	Land Development Department (LDD)
Dr.Thumrongsakd Phonbumrung	Chief of Animal Nutrition Research	Department of Land Development(DLD)
Mr.Theerawit Kaobubpa	Chief of Special Project	DLD
Ms.Slaya Consalad		DLD
Ms.Chawee Lomlek	Policy and Plan Specialist	Department of Agriculture(DOA)
Mr.Jameekorn Srisumol	Policy and Plan Analyst	Rice Department
Ms.Budsaya Makonglad		Rice Department
Mr.Apichata Sukita	Chief of Agricultural and Co-operative Ayutthaya Province	Agricultural and Cooperative, Ayutthaya Office
Mr.Phisal Kitchpat	Policy and Plan Analyst	Agricultural and Cooperative, PathumThani Office
Ms.Siriwon Pounsudrak		Agricultural and Cooperative, Nakhon Pathum
Mr.Sattha Srithipong		Agricultural and Cooperative, Phitsanulok Office
Ms.Pimjai Pattanasiripong		
Ms.Supaporn Cangao		JICA Thailand office
Mr.Michio Goto	Team Leader	JICA Study Team
Mr.Tetsuro Oda	Co-Team Leader	JICA Study Team
Mr.Nakorn Najaroon	Flood Damage Survey	JICA Study Team
Mr.Tatsuhiro Hiraiwa	Flood Damage Survey	JICA Study Team
Mr.Fusataka Arakawa	Irrigation Plan	JICA Study Team
Mr.Fumihiro Nagao	Paddy (Rice) Farming	JICA Study Team
Mr.KeisukeShimizu	Marketing Post Harvest	JICA Study Team
Mr.Shinichi Arai	Horticulture / Farm Machinery	JICA Study Team
Ms. Akane Chiba	Coordinator	JICA Study Team
Ms.Somjai Amornrachyavijan	Assistant	JICA Study Team
Ms.Buchsawan Srilertwormkul	GIS assistant	JICA Study Team

Minutes of Meeting between
Japan International Cooperation Agency (JICA) Consultants Team

And

Department of Livestock Development (DLD), the Ministry of Agriculture and Cooperatives
(MOAC)

For Supports for Reproduction of Pastures as Component 1 in the Project for Flood Countermeasures
for Thailand Agricultural Sector

The Japan International Cooperation Agency Consultants Team (hereinafter referred to as "JICA consultant"), and Department of Livestock Development (DLD) had meeting on Component 1 of the Project for Flood Countermeasures for Thailand Agricultural Sector (hereinafter referred to as "the Project"). The meeting was held on 7th June 2012 at conference room (6th floor) of Chai Aut Sawarak building (DLD), Phra Ya Thai. List of participants is shown in Attachment 1

Both sides of JICA consultants and DLD had discussed on component 1 of the Project and mutually agreed and confirmed the following points.

1. Both parties confirmed that the number of target provinces for distribution of fertilizers is expanded from 26 to 49 Provinces.
2. Progress of work for distribution of fertilizers in total was 79% as of 6th June 2012. The detail progress at Animal Nutrition Research/Development Centers is shown in Attachment 2.
3. Not only the Pangola grass but also Giant Napier grass (Pakchong-1) will be expanded to suitable places because of its higher yield than Pangola grass and its tolerance for flooding period, and its usefulness as a bio-energy crop.
4. To develop livestock with sustainability in community level, participation of local people, introduction/expansion of the varieties of pasture, technology transfer to the local people, planning of marketing & distribution system and developing dairy farmers, etc. are essential.
5. In this regard, collaboration among related local administration agencies concerning livestock development and participatory manners in community level are very important.
6. Agricultural machinery for cultivating and harvesting fodder crops in center/station under DLD is necessary to procure because of their degradation urgently but lack of budget in DLD is one of the most serious issues.
7. JICA consultant requested recommendations and good ideas on livestock development to DLD in regard to the Guidelines preparation on disaster-resilient agriculture and agricultural community planning as component 3 of the project.

Date: June 7, 2012

Place: Bangkok, Thailand

For

CONSULTANT TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

For


DEPARTMENT OF LIVESTOCK
DEVELOPMENT,
MINISTRY OF AGRICULTURE AND
COOPERATIVES

for

入 矢 雅 介

Michio GOTO

Team Leader, Consultant Team

N. 

(Dr. Nirundorn Auntragoolsuk)

Deputy Director General

Department of Livestock Development

For Director General

Attachment 1

Participant List for Steering Committee
 For The Project for Flood Countermeasures of Thailand Agricultural Sector:
 Component 1: Support for Reproduction of Pasture
 At Department of Livestock Development (DLD) 7 June 2012

No.	Name	Office and Position
1	Dr.Ayuth Harintharanon	Deputy Director General of DLD
2	Mr.Kamon Rimkeeree	Director of Bureau of Animal Nutrition, DLD
3	Mr.Kiatisak Klum-em	DLD
4	Mr.Sakda Parjakbonjatsada	DLD
5	Mr.Somsak Doathong	DLD
6	Mr.Ittiphon Phaowphaisal	DLD (Nakorn Ratcha Sima Animal Nutrition Center)
7	Mr.Jarooroch Chantarasisi	Director, DLD (Lampang Animal Nutrition Research and Development Center)
8	Mr.Supachai Udchachon	Director, Khon Kaen Animal Nutrition Research and Development Center
9	Mr.Sirisak Jangon	Region 1
10	Mr.Thongchai Porsiri	Director, Suphanburi Animal Nutrition Development Station
11	Mr.Wijai Rattanamas	Chainat
12	Mr.Sopon Chinvaroj	Director of Chainat Animal Nutrition Research and Development Center
13	Mr.Weerasak Chinosaeang	Director of Sakaeo Animal Nutrition Research and Development Center
14	Mr.Khomsan Takan	Naratiwat Animal Nutrition Research and Development Center
15	Mr.Thawat Pomnak	Phitsanulok
16	Dr.Thumrongsakcd Phonbumrung	Researcher, DLD
17	Mr. Phannavacha Chittathana	Ayutthaya Province
18	Dr.Pornchai Chamnanpood	Director, Regional Livestock Office 6 th , Pitsanulok
19	Mr.Ake Noksang	DLD
20	Miss Lawan Mebutbee	DLD
21	Ms. Supaporn La-Ngao	Program officer of JICA Thailand
22	Mr. Michio Goto	Team Leader, the consultant team
23	Mr. Kensuke Iriya	Co-Team of Leader of component1 , the consultant team
24	Ms. Akane Chiba	Coordinator, the consultant team

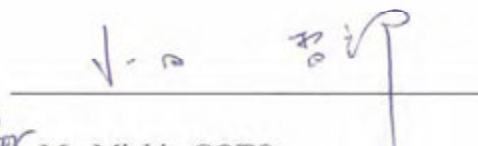
Progress of Fertilizer Distribution

Center	Total damaged area (rai)	Helped area (%)
Chainat Animal Nutrition Research and Development Centers ◆ Bangkok ◆ Nonthaburi ◆ Pathumthani ◆ Saraburi ◆ Lopburi ◆ Singburi	1,401 } 300 300 119 472 387	98.2 (No pasture area) 100 100 65 137 (532 rai)
Nakornratchasima Animal Nutrition Research and Development Centers ◆ Nakornratchasima province ◆ Chaiyaphum province	823 64	Not mentioned Not mentioned
Lampang Animal Nutrition Research and Development Centers	Not mentioned	Will be operated on 13-15 June 2012
Suphanburi Station ◆ Suphanburi province ◆ Ang Thong province ◆ Chaiyaphum province	} 3,277	} 100
Phetchaburi Animal Nutrition Research and Development Centers and Prachuapkhirikhan Animal Nutrition Development Station ◆ Kanchanaburi province ◆ Nakornpathom province ◆ Phetchaburi province ◆ Prachuapkhirikhan province ◆ Ratchaburi province	1,056 175 100 398 10 17	100 100 To be finalized in June 100 100
Region 9 ◆ Narathiwat ◆ Trang ◆ Phatthalung ◆ Songkhla ◆ Satun	685 44 85 475 45 36	Not mentioned
Khon kaen Animal Nutrition Research and Development Centers	Not mentioned	Will be operated on 3 rd week of June 2012
Sakaeo province (regional office 2) ◆ Sakaeo province ◆ Chachoengshao province	Not mentioned Not mentioned	100 100

MINUTES OF THE MEETING
ON
EXPLANATION AND DISCUSSION ON INTERIM REPORT
FOR
THE PROJECT FOR FLOOD COUNTERMEASURES FOR THAILAND
AGRICULTURAL SECTOR
IN
THE KINGDOM OF THAILAND

Bangkok,
September 10th 2012


for Mr. Chalit Damrongsak
Deputy Permanent Secretary
Ministry of Agriculture and
Cooperatives


for Mr. Michio GOTO
Team Leader of the Project Team
Japan International Cooperation
Agency

The Project Team organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Michio GOTO, had a meeting for explanation and discussion on the Interim Report for the Project for Flood Countermeasures for Thailand Agricultural Sector with the members of the Joint Coordinating Committee (hereinafter referred to as "JCC") on 10th September, 2012 at conference room of Ministry of Agriculture and Cooperatives (hereinafter referred to as "MOAC").

The Chairman began the meeting with his welcome remarks to all the attendants in the meeting and stated briefly about the Project. Following, Mr. Yoneda, JICA chief representative, expressed appreciation for continuing support from Thai organizations relating to the Project. Then the explanation of the Interim Report and additionally, results from the planning workshop in 8 model areas as well as schedule of pilot projects in Component 3 were made by the JICA Project Team and precious comments were given to it by the JCC members. The main issues discussed by both sides in relation to the Interim Report for the Project are as follows. A list of attendants is attached as ANNEX 1.

A. Cancellation of a pilot project in Component 2

JICA explained that JICA decided to cancel an implementation of a pilot project in Component 2 on concern that scope of work which would be suggested at international competition for flood prevention (the Conceptual Plan for the Design of Infrastructure for Sustainable Water Resources Management and Flood Prevention for the Kingdom of Thailand) might cover or be inconsistent with the pilot project in Component 2 of this project.

B. Discussion and Comments

As for Component 1, DLD expressed appreciation to the project, especially in terms of accepting flexibly an expansion of beneficiary provinces from the original plan. It was also mentioned the project has made contribution to the capacity building of DLD staff through training in monitoring and evaluation.

DOAE reported on the meeting organized with JICA project team, LDD, DOA and Kasetsart University Kampensaen Campus on 4th September, 2012 to the Chairman. DOAE suggested DOAE takes a leading role in a pilot project for orchid sub-sector, while OAE continues to coordinate the all concerned agency in pilot projects in Component3. The chairman confirmed that OAE and participants had no objection to this proposal

LDD said that microorganism for water quality improvement after flood and paddies growing were ready to use. For green orchid production, LDD and DOA cooperate with DOAE to have a pilot project.

DOF is promoting fish culture and basic processing for local food. DOF is ready to support community in that scope. However, catching fish and processing with higher technical knowledge such as canning are out of scope of DOF.

Rice Department stated they have no special comments on Interim Report and that they were willing to provide technical support on paddy, if necessary in the pilot projects.

ALRO had no comments on pilot projects proposed by the JICA project team.

In conclusion, no one had specific comments nor objection to the proposed pilot projects by the JICA project team.

OAE will coordinate with relevant agencies in each Province to organize working group at provincial level for monitoring of pilot projects and technical support.

ANNEX 1 : List of Participants of JCC

- | | | |
|------|-----------------------------|---|
| (1) | Mr. Chalit Damrongsak | Deputy Permanent Secretary
Ministry of Agriculture and Cooperatives |
| (2) | Mr. Kazuhiro Yoneda | JICA Chief Representative |
| (3) | Ms. Ayumi Yuasa | JICA Representative |
| (4) | Ms. Sineenart Khovitoonkij | Senior Policy and Plan Analyst
Bureau of Foreign Agricultural Affairs,
Ministry of Agriculture and Cooperatives |
| (5) | Mr. Arnon Noncie | Policy and Plan Analyst
Foreign Agricultural Relations Division
Ministry of Agriculture and Cooperatives |
| (6) | Ms. Racthanok Sangpenchan | Policy and Plan Analyst/
Land and Development Department |
| (7) | Mr. Siangjeaw Piriprin | Policy and Plan Analyst/
Land and Development Department |
| (8) | Mrs. Jintawee Thaingam | Policy and Plan Specialist
Department of Agriculture |
| (9) | Mrs. Sunisa Boonyapatipark | Chief, Foreign Relation Sub-division,
Planning Division |
| (10) | Mr. Thumrongsak Phonbumrung | Animal Nutrition Research/
Department of Livestock Development |
| (11) | Mr. Chatchom Chompradist | Director, Water Management Division/
Royal Irrigation Department |
| (12) | Ms. Jatuporn Nontasiri | Professional Statistician,
Office of Agricultural Economic |
| (13) | Ms. Angsutorn Wasusun | Agricultural Research Officer
Bureau of Rice Research and
Development,
Rice Department |
| (14) | Mr. Chitnucha Buddhaboon | Agricultural Research Officer
Bureau of Rice Research and
Development,
Rice Department |
| (15) | Ms. Suruwadee Pak-uthai | Agricultural Land Reform Office 8 |

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(16)	Ms. Arpaphon Pattanapant	Agricultural Land Reform Office
(17)	Ms. Adhinand Indrapim	Fishery Biologist/Department of Fishery
(18)	Ms. Tanamad Tikampon	Department of Livestock Development
(19)	Ms. Marasri Vongansup	Department of Agricultural Extension
(20)	Mr. Michio Goto	JICA Team Leader
(21)	Mr. Shunichi Hosono	JICA Co-Team Leader
(22)	Mr. Tetsuro Oda	JICA Co-Team Leader
(23)	Mr. Nakorn Najaroon	JICA Study Team
(24)	Mr. Tsutomu Senda	JICA Study Team
(25)	Mr. Hideaki Hiruta	JICA Study Team
(26)	Mr. Nobutoshi Eguchi	JICA Study Team
(27)	Ms. Akane Chiba	JICA Study Team

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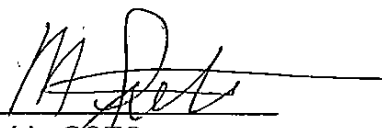
MINUTES OF MEETING
ON
DRAFT FINAL REPORT
FOR
THE PROJECT FOR FLOOD COUNTERMEASURES FOR
THAILAND AGRICULTURAL SECTOR
IN
THE KINGDOM OF THAILAND

AGREED UPON BETWEEN
MINISTRY OF AGRICULTURE AND COOPERATIVES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Bangkok, June 12th, 2013



Mr. Chalit Damrongsak
Deputy Permanent Secretary
Ministry of Agriculture and
Cooperatives



Mr. Michio GOTO
Team Leader of the Project Team
Japan International Cooperation
Agency

The JICA Project Team for the Project for Flood Countermeasures for Thailand Agricultural Sector in The Kingdom of Thailand (hereinafter referred to as the JICA Project Team) submitted Twenty Five (25) copies of the Draft Final Report (DFR) to the Ministry of Agriculture and Cooperatives (hereinafter referred to as the MOAC). The JICA Project Team explained its contents and discussed on the flood countermeasures for Thai agricultural sector and the guidelines for disaster - resilient agricultural community with JCC members and representatives of Provinces on June 12th in 2013 at the MOAC conference room in Bangkok. The list of attendants at the meetings is shown in Annex-3.

During the discussion the following points were raised: Details of the discussion is attached in Annex-1.

1. The Thai side has agreed and accepted, in principle, the contents of the Draft Final Report submitted by the JICA Project Team.
2. Further comments on the Draft Final Report, if any, will be submitted to the JICA Project Team by June 25th, 2013, so as to be reflected into the Final Report.
3. Both MOAC and JICA Thailand Office expressed satisfaction on the excellent cooperation and collaboration between the two sides during the course of the Project.
4. JICA Thailand Office recommended MOAC and the line agencies to use the outputs of the Project, especially the guideline and wide range of technical papers, in practice. MOAC replied that the final version of the guideline will be considered as an official guideline of MOAC and informed to the Cabinet.
5. Both sides confirmed that the report of the Project will be open to all the related parties.
6. The Thai side has agreed that the equipment which the JICA Project Team had procured during the Project would be provided to the each Model Tambon. The list of equipment is attached in Annex-2.



Annex-1 Main points of the discussion

The JICA Project Team explained and discussed in its presentation about the process to formulate the countermeasures in Component 1, 2, and 3 respectively and stated the recommendations to the Royal Thai Government, MOAC, Provincial Authorities, Tambon Administration Organizations and JICA. The following are the major points discussed.

1) Mr. Suwit Thanopanuwat Senior Expert from RID

The recommendations of the Component 2 are emphasizing on rehabilitation and utilization of the existing RID infrastructures for both irrigation and drainage.

- ✓ Plai Chumpon Irrigation improvement Pilot Project was finally cancelled, however the existing study was revised and confirmed for the technical competency by the JICA Project Team. Some recommendations made for the said project is good and useful. RID hopes for future collaboration between RID and JICA again.
- ✓ Recently in Japan, more emphasis is placed on the easiness in construction and less negative impact to communities during the construction period when conducting a structural design, which is different from the conventional point of view to consider the economical aspect with the highest priority. That is what Thailand need to learn from Japan.
- ✓ Many irrigation facilities are going to be renewed after the project life over. Recommendation to utilize irrigation facilities for flood shall be clearly mentioned so that new concept for design would be applied for the renewal project.

Component 3 is mainly participatory process with other local government agencies concerned such as TAO. The comments are as the following;

- ✓ The Project output shall be introduced on various strategic plans. For example; the proposed plan shall be classified for different location topography such as lowland flood countermeasure is how to live with flood which the communities' traditional life shall be applied.
- ✓ Flood warning system by RID was mentioned that delayed information by RID made damage to the communities. This lesson learned shall be clearly specified that it was only happening in emergency case not for normal condition that is still workable. It shall be claimed that the existing telemetering system is not capable for in time

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warning on last big flood so the special supplement countermeasures shall be provided to cope with the vast inundation phenomenon.

- ✓ The JICA Report in Thai version that will be disseminated widely than English version, some technical terms are not suitable and difficult to understand. Then the Draft Final Report in Thai version shall be checked and revised by Thai expert for more smoothly completion before final submission.

JICA Project Team replied to above comments;

- ✓ At present the flood area classification by the Government is still unclear so it is very difficult for the JICA Project team to classify the area in detail. However, for the Water Resources Development and Management Plan at Community Level, it is classified into 4 types as explained in the Draft Final report namely Upstream Flood Prone Area effected from Main river overflow and rainfall from hilly area, Upstream Hilly Area and Delta area, by topography and flood type.
- ✓ The Flood Information System as shown in the Draft Final report that the current information flow starting from RID to Province, district and finally to Tambon take time during the fast flash flood event. Therefore, the Team proposed the Distributing Information/ Forecasting & Warning System that shall be take less time by direct informing from RID to Tambon considering with the new installed water level gaging station data collected by the communities so as to take quicker action for preparation by TAO and farmers before flood occur.

In addition, JICA Project Team requested RID to consider how to repair and utilize effectively many of facilities of the Small Scale Irrigation Program (SSIP) which were constructed a lot since 1970 and now already transferred to TAO without improvement budget.

2) Ms. Jatuporn Nontasiri, Coordinator of Component 3, Statistician of OAE Additional explanation of estimation of flood damaged farm area by satellite image were given and instructed to add in the Report. Comments on use of technical word and Thai translation in the Draft Final report and clarification in recommendation on GIS database were raised.

JICA Project Team replied that GIS database was specifically land parcel GIS database which aims at accelerate and accurate payment of compensation and

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process to estimate damage area would be added in the report. Technical word and its translation will be checked by Thai experts.

3) Mr. Nakahori, JICA representative,

Thanked you to all participants from MOAC and said that the Project Team had already prepared several manuals and guidelines cover many technical issues concerned and requested to apply and practice by the government agencies. Due to time limitation, some activities are just started and not fully operated. Therefore, JICA is considered in support follow-up of priority activities. JICA will discuss with MOAC on prioritized and selected activities by the end of June for the follow-up works.

4) Mr. Chalit Damrongsak MOAC Deputy Permanent Secretary said on closing remarks,

- ✓ He appreciated and satisfied the JICA Assistance on the Flood Countermeasures in Thai Agricultural Sector.
- ✓ This Guideline shall be taken into consideration for MOAC guideline as well as government policy in the future. The main beneficiaries are the model communities but also the Thai Government can use this guideline to other communities for the improving procedures for the flood disaster countermeasures.

Chalit Damrongsak

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Annex-2 List of equipment provided by the JICA Project Team to Model Tambons and Chainat Animal Nutrition Research and Development Center.

1. Chum Saeng Songkhram, A. Bang Rakam, Phitsanulok Province

Order	Item	Quantity	Specification
1	Participatory Flood Monitoring Activity		
1.1	Installation of staff gages	12 sites	Metal staff gage
1.2	Community Website and Data Base System	1 set	Desktop Computer and Notebook Computer , each 1set and GPS Receiver 1 set
2	Walkie-Talkie	15 set	ICOM IC-V8

2. Nakhon Pa Mak, A. Bang Kratum, Phitsanulok

1	Project for Water Gate Repair for Monkey Cheek Development in Community Level	1 set	Repairing of Roller Type Gate (2.9 m in width x 3.0 m in height, 3 gates) including repairing miscellaneous materials
2	Participatory Flood Monitoring Activity		
2.1	Installation of staff gages	10 sites	Metal staff gage
2.2	Community Website and Data Base System	1 set	Desktop Computer and Notebook Computer , each 1set and GPS Receiver 1 set

Chainat Province

1. Wang Man, A. Wat Sing, Chainat Province

Order	Item	Quantity	Specification
1	Improvement of Dike for Prevention from Flood Damage	set	Repairing of Dike 1.3 km in length with pavement of laterite 10cm in thickness
2	To support Livestock Group, 30 members		
2.1	Hay storage house	1	Width 9 m. x Length 9 m. x Height 4 m. Located at Wangman nursery, Moo 4, T.Wangman, A.Watsing, Chainat province
2.2	Silage Making:		
	• Grass mower with two wheels	1	• Gasoline engine with 6 HP Engine power, HONDA GX 200 model • Electromotive force 220 V. with magnetic and wire cable 8 meters (TISI; Thai Industrial Standards Institute)
	• Grass chopper with Honda engine	1	• Gasoline engine 6.5 HP Engine power with forward and backward gear, HONDA GX 200 model
	• Plastic case	30	200 liters capacity
	• Plastic bag	1000	For silage making
	• Blower	2	For silage making
2.3	Installation of Biogas facility	1	Width 1.4 m. x Length 4.1 m. x Depth 0.8 m. located at Ms.Aratsaney Noolapao's house No. 196, Moo 3, T.Wangman, A.Watsing

2. Khao Kaeo, A. Sapphaya, Chainat Province

1	Drinking Water Supply System	1 set	Water Purifying System with House (3m x 4m)
2	Introduction of Aquaponics System Project	1set	Fish Pond (4m x 5 m x 1.2m Net Storage Capacity= 20 cm ³) with Fish Pond House Grow Bed for Vegetation (1m x 5 m x 1.2m) 6units including water pump (0.018m ³ /Hr) and water supply system
3	Participatory Flood Monitoring Activity		
3.1	Installation of staff gages	10 sites	Metal staff gage
3.2	Community Website and Data Base System	1 set	Desktop Computer and Notebook Computer , each 1set and GPS Receiver 1 set
4	Seeder Machine for Para shooting	1 Unit	Kubota SR-K-610 TH, including Sprinkler Rice (1set), Seeding Grow Tray (1,000 sets) and Soil Grinde (1 set)

3. Chainat Animal Nutrition Research and Development Center

1	Silage storage house	1	Width 9 m. x Length 9 m. x Height 4 m. located at Dong Gain Luang, Ban Tung Gwang, Tambon Nongkun, Amper Watsing, Chainat province
2	Hay baler	2	Kubota engine with 11 HP power
3	Silage Making:		
	• Plastic case	125	200 liters capacity
	• Plastic bag	3000	For silage making
	• Blower	2	For silage making

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Phra Nakhon Si Ayuttaya Province

1. Gop Chao, A. Bang Ban, Phra Nakhon Si Ayuthaya

Order	Item	Quantity	Specification
1	Drinking Water Supply System	1 set	Water Purifying System with House (3m x 4m)
2	Participatory Flood Monitoring Activity		
2.1	Installation of staff gages	10 sites	Metal staff gage
2.2	Community Website and Data Base System	1 set	Desktop Computer and Notebook Computer , each 1set and GPS Receiver 1 set
3	Income generation		
3.1	Grinding machine	1 set	Electric machine for grinding rice
3.2	Mincing machine	1 set	Electric machine for mincing shrimp
4	Walkie-Talkie	9 set	ICOM IC-V8
5	Oven	1 set	K.N.T. , 70cm x 70 cm x 190cm , Heater, 8,000-9,000 WT , Motor 1.2HP, with 10 trays

2. Singhanat, Lat Bua Luang, Phra Nakhon Si Ayuthaya

Order	Item	Quantity	Specification
1	Drinking Water Supply System	1 set	Water Purifying System with House (5m x 5m)
2	To support Livestock Group, 21 members		
2.1	Hay storage house	1	Width 9 m. x Length 9 m. x Height 4 m. located at Mr. Aree Panpreuk's house No. 57 Moo 1, Tambon Singhanat, Amper Ladbualuang
2.2	Silage Making:		
	• Grass mover with two wheels	1	• Gasoline engine with 6 HP Engine power, HONDA GX 200 model • Electromotive force 220 V. with magnetic and wire cable 8 meters (ns; Thai Industrial Standards Institute)
	• Grass chopper with Honda engine	1	• Gasoline engine 6.5 HP Engine power with forward and backward gear • HONDA GX 200 model
	• Plastic case	30	200 liters capacity
	• Plastic bag	1000	For silage making
	• Blower	2	For silage making
2.3	Construction of model goat house	1	Width 6 m. x Length 12 m. x Height 5.5 m. located at Mr. Swiss Sangsuwan's land No. 3/1 Moo 1, Tambon Singhanat, Amper Ladbualuang
	• Milk goat	15	Saanen Crossbred
	• Meat goat	2	Anglo-Nubian Crossbred
	• Bull (beef cattle)	1	Brahman Crossbred
2.4	Utensils for milking:		
	• Milk container	2	60 liters
	• Aluminum bucket	3	10 liters
	• Plastic cooling tank	1	300 liters
	• Electric freezer	1	16 cu.f.
	• LPG. Stove	1	For milk pasteurization
	• LPG. Container	1	15 kg.
	• Boiling pot	1	60 cm. diameter
2.5	Installation of Biogas facility	1	Width 1.4 m. x Length 4.1 m. x Depth 0.8 m. located at Ms. Aratsaneya Noolapao's house No. 196, Moo 3, T. Wangman, A. Watsing
3	Container as a Evacuation/ Rescue Center	1 unit	W x H x L = 3.0m x 2.5m x 6.0m

Pathum Thani Province

1. Khlong Ha, A. Khlong Luang, Pathum Thani

Order	Item	Quantity	Specification
1	Drinking Water Supply System	1 set	Water Purifying System with House (5m x 5m) 1) Row Water Tank & Pump, 2) Color, Odor, Hardness Filter Columns 3) Reverse Osmosis System Equipment, 4) Purified Water Tank, etc. 5) Drinking Water Vender Machine
2	Oven	1 set	K.N.T. , 70cm x 70 cm x 190cm , Heater, 8,000-9,000 WT , Motor 1.2HP, with 10 trays

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Annex-3 List of Attendant (Summary)

Ministry of Agriculture and Cooperatives

1. Mr. Chalit Damrongsak Deputy Permanent Secretary
Tel.022815955 Ext.116
2. Ms. Arnon Noncie Policy and Plan Analyst, Professional
Tel.022815955 Ext.206
3. Mrs. Sineenart Khovitoonkit Policy and Plan Analyst, Senior Professional
Tel.022828145

Department of Agriculture Extension

- Mr.Suwit Thanopanuwat Senior Expert on Civil Engineering (Project Planning)
Tel. 0847000506

Department of livestock development

- Thumrongsakd Phonbumrung Animal Husbandry Technical, Senior Professional
Tel.0814969005

Department of livestock development (Chainat Provincial)

1. Mr. Somchai Liengjai Animal Husbandry Technical, Senior Professional
Tel.086-5897498
2. Mrs. Nongnuch Tantong Finance and Accounting Officer Tel.056416380

Office of Agricultural Economics

1. Ms. Jatuporn Nontasiri Statistician Professional Level
2. Ms. nongnooch deetae Senior Statistician
Tel.029407030-1 Ext.101

Office of Agricultural Economics (Pitsanulok Provincial)

- Somphong Pruek-sakulvong Policy and Plan Analyst, Senior Professional
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Office of Agriculture (Pitsanulok Provincial)

- Mr. Pichit Teerasatien Agricultural Researcher Tel.0819958479

Chalit Damrongsak

Ms.

Office of Agriculture (Pratumtani Provincial)

Dr.Rujeepachara Boonjing Agricultural Researcher Tel. 0852378855

Office of Agriculture and Cooperative (Ayuttaya Provincial)

1. Mr. Pichai Kem Agricultural Researcher, Professional
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2. Ms. Linyaphat Noinart General Administration Officer
Tel. 035336656
3. Mrs. Wanvisa Siripatpoovadol Policy and Plan Analyst, Senior
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Japan International cooperation Agency, Thailand Office

1. Nakahori Hiroaki Representative Tel.022615250
2. Ms.Supaporn La.ngao Program Officer Tel.022615052

Jica Project Team

1. Michio Goto Team Leader Tel.0845645889
2. Tetsuro Oda Co-Team Leader Tel.0818133376
3. Nakorn Najaroon Flood Damage Survey Tel.0816693990
4. Mr.Pichai Thongutthaisiri Irrigation Engineer Tel.0816926743
5. Mr.Pongsawat Tanticharoenkit Agriculture Expert Tel.0896283831

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History and situation of the Natural Disaster in Thailand

(1) Long term review of natural disasters in Thailand and its position with regard to floods. (1951 – 2000)

In Thailand, major natural disasters are represented by flood, drought, epidemic, wave/surge and wind storm, etc. and some cases of landslides in recent times. According to the data shown in the Natural Disasters Data Book-2010 (1951-2000) by the Asian Disaster Reduction Center (ADRC), Kobe, Japan, flood disaster causes the highest rate of damage in Thailand in terms of the number of people killed, injured or affected as well as the total financial cost of damages as indicated in the following Table.

Table 1 Natural Disaster in Thailand (Type) (1951 – 2000)

Disaster Types	Count of DisNo	Lives lost	Sum of Injured	Sum of Homeless	Sum of Affected	Sum of Tot Aff	Sum of Damage US\$ ('000s)
Drought	3	0	0	0	5,500,000	8,500,000	2,000
Epidemic	2	189	0	0	4,746	4,746	
Flood	31	1,660	3,966	156,553	21,837,490	21,998,009	3,747,324
Wave/surge	2	500	0	200	0	200	267
Wind storm	18	1,454	20	92,587	3,018,598	3,111,205	674,293
Total	56	3,803	3,986	249,340	33,360,834	33,614,160	4,423,884
Share by flood	55%	44%	99%	63%	65%	65%	85%

(2) Frequency of flood occurrences in Thailand with regard to specific time periods (1961 – 2000).

Flood disasters are divided into occurrences within each decade as follows.

Table 2 Flood Disaster in Thailand (Period) (1961 – 2000)

DisTypes	Period	Count of DisNo	Sum of Killed	Sum of Injured	Sum of Homeless	Sum of Affected	Sum of TotAff	Sum of Damage US\$ ('000s)	Ratio
Floods	1961 - 1970	1	6	200	5,000	200,000	205,200	1,000	0%
	1971 - 1980	3	368	493		5,259,817	5,260,310	504,700	13%
	1981 - 1990	6	483	2,052		2,925,261	2,927,313	213,346	6%
	1991 - 2000	21	803	1,221	151,553	13,452,412	13,605,186	3,028,278	81%
	Total	31	1,660	3,966	156,553	21,837,490	21,998,009	3,747,324	100%
	Mean per year	0.78	41.5	99.2	3,914	545,937	549,950	93.7 mil	-

From the Table, the increasing tendency of flood occurrences in the 40 year period (1961-2000) is clearly confirmed. It can be said that the rapid increase in the damages, especially in the sum of people affected and the sum of financial damage is due mainly to the change of people's life style, combined with the lack of adequate land use planning in the neighboring areas of urban

cities and the gradually progressing negative effects due to climate changes. As for the land use planning and related public works, there are indications from the 2011 flood disaster occurrence, that Thailand has concentrated its investment more on industry-related infrastructures such as roads, highways, railways, ports and industrial estates and less on the water management-related infrastructures to meet the requirements.

(3) Flood disaster situation in the recent years (2002-2010).

According to the ADRC Report “Thailand Country Profiles 2011” compiled by Mr. Phatsita Rerngnirunsathit, an ADRC visiting researcher, the Thailand’s Disaster Summary in 2010 can be re-arranged and presented as follows.

Table 3 Thailand’s Disaster Situation Summary (2002 – 2010)

Year	Disaster Type	Frequency	Killed	Injured	Total affected	Damaged (USD)
2002	Flood	5	216	0	-	439,583,251
2003	Flood	17	44	10	-	67,332,020
2004	Flood	12	28	3	-	27,935,961
2005	Flood	12	75	0	2,874,673	196,462,504
2006	Flood	6	446	1,462	6,050,674	316,171,383
2007	Flood	13	36	17	2,326,179	55,430,738
2008	Flood	6	113	16	7,921,127	249,648,482
2009	Flood	5	53	22	8,881,758	172,499,637
2010	Flood	7	266	1,665	13,485,963	536,577,088
Total		85	1,277	3,195	41,540,374	2,061,641,064
Annual Mean		9.22	141.8	355.0	6,923,395 (6 years)	229,071,229

When the annual mean of the damage caused by floods during the recent 9 year period (2002-2010), is compared with the mean of the preceding 40 years (1961- 2000), as shown in the above tables, considerable increase is found in respect to the items as follows.

Items/periods	1961-2000	2002-2010	Ratio increased
Dis. Number	0.78	9.22	1,182 %
Sum killed	41.5	141.8	342 %
Sum injured	99.2	355.0	358 %
Sum affected	545,937	6,923,395	1,268 %
Sum amount	\$ 93.7 mil	\$ 229 mil	244 %

The years of 2002, 2006, 2008 and 2010 were mostly wet years except for 2005 when damage by drought out-numbered damage by flood. It is however noted that flood damage in 2005 itself was quite substantial. In the years 2002, 2006 and 2010, the flood damage were very serious already in comparison with the mean of damages of the total number of people killed, injured as well as the amount of damages as indicated, showing the increasing tendency of flood occurrence in recent years.

Ministries and departments closely related with the Project

(1) The Ministry of Agriculture and Cooperatives (MOAC)

The MOAC is one of the oldest Ministries in Thailand like the Ministry of Interior, the Ministry of Defence and the Ministry of Finance. The MOAC is considered to be one of the important Ministries under the overall national administrative mechanism. This is due to the fact that Thailand has long been an agriculture-based country and has continued sharing an important part of the national economy even after the country attained substantial economic development with a higher growth rate in the manufacturing sector in recent decades. In the Appendix, the organization chart of the MOAC is presented where there are 3 clusters depending on the missions assigned for each Department under the MOAC and the involvement of each Department in each of the components under the subject project is indicated as follows.

Component 1	Production development Cluster	DLD
Component 2	Resource management for production Cluster	RID
Component 3	Farmers/Coop development promotion Cluster	OPS and OAE
	Production development Cluster	DOAE
		DOR, DOF, DOA and DLD
	Resource management for production Cluster	LDD, RID and ALRO

As one of the MOAC organization/offices at the Regional and Provincial levels, each Department has their own local offices, but the number and locations vary depending on the Department. These details are discussed in another section describing the organizational background at Department level.

The Joint Coordination Committee in the subject project was organized by OPS of the MOAC as chaired by one of the Deputy Permanent Secretaries and appointed the committee members from relevant Departments under the MOAC, such as DOA, RID DLD and other important agencies including NESDB and TICA. Related document on JCC formation is compiled in the Appendix.

The MOAC also has within its charter the duty to manage the research institutes of the Agricultural Research Development Institute and the High-land Agriculture Research Center. The following state enterprises are required to serve the beneficiary farmers in line with the policies made by the MOAC.

- Marketing Organization of Farmers
- Fish Marketing Organization
- Dairy Farming Promotion Organization
- Rubber Estate Organization
- Office of Rubber Replanting Aid Fund

(2) The Ministry of Interior (MOI)

The MOI is also considered one of the most important Ministries in the overall administration system in Thailand, dealing with a wide range of affairs related to the population in general. The responsibilities assigned and missions of the MOI are explained in the following section. The organization chart of the MOI is presented in the Appendix.

The functions and responsibilities of the MOI.

1. Politics and administration.

The MOI is responsible for administrating the election of local administration, encouraging the people to participate in politics so as to advance the democratic system, including administration of provincial and local administration bodies.

2. Economy

The MOI is responsible for securing employment for the people and providing a sustainable living for the people through due coordination with the other Ministries concerned.

3. Society

The MOI is responsible for improvement of youth affairs and for securing peace and safety for the society.

4. Others

It is also responsible for physical development, community development and management, land administration, basic services in rural areas, basic city planning as well as specific city planning and the running of public utility services in the urban areas.

The MOI's website explains the strategy of the MOI for 2009-2011 as follows.

1. Strengthening the confidence and stimulation of business in Thailand.
2. Secure of peace, safety and internal security, upholding the justice and development of good relationships with the foreign countries.
3. Development of basic infrastructures, improved administration in land management and conserve natural resources and environment to secure safety without public hazard.
4. Attaining of good management system.

Under the MOI, Departments concerned with the subject project of flood mitigation and local administration are as follows.

- Department of Disaster Prevention and Mitigation
- Department of Provincial Administration
- Department of Local Administration

State enterprises under the MOI include the following five bodies, which provide services for basic utilities including water and electricity supply.

- Metropolitan Electricity Authority
- Provincial Electricity Authority
- Metropolitan Waterworks Authority
- Provincial Waterworks Authority
- Marketing Organization

(3) Office of the Prime Minister (OPM)

The Website of the OPM explains the authorities and the duties of the organization as follows. The authority of the Office of Prime Minister is to perform for the general administration work of the Prime Minister and the Cabinet. Its responsibilities include general administration and proposing policies and to initiate development plans in the areas of national economy, society, politics, and security as well as performing duties relating to the national budget, civil service system, public personnel management, legislation and development, monitoring and evaluation of public sector performance, and other official matters that are not within the prescribed duties and responsibilities of any particular ministries. The organization Chart of the OPM is presented in the Appendix.

It was in March 2012 that the so called Single Command Authority for the national water and flood management was organized under the OPM as per the effective regulations of the OPM after the emergency measures taken by RTG in 2011 by the initiatives and policies derived from the FROC and SCWRM, the then acting national committee for dealing with the flood disaster problem.

The organization Chart of the Single Command Authority and related information are presented in the Appendix. The Single Command Authority is composed of, and as listed in order of authority, the NWFPC, WFMC and ONWFMP. NWFPC is the committee to identify the overall policies. The WFMC is to prepare the operational program, identify the methodology, approve work plans and enhance the operation, while the ONWFMP is given the tasks to serve the 2 said committees as the secretariat. The FROC has now been disbanded and is replaced by the Single Command Authority. Currently, the SCWRM nature has been modified to be an advisory-to-NWFPC function.

Issues relevant to the Single Command Authority as well as the stream-lining of the water management body are presented in the Appendix together with the organization chart.

(4) Department Level Agencies Concerned with the Project

(a) The Department of Livestock Development (DLD)

For the component 1 under the subject project, the DLD is the responsible counterpart agency. The DLD is in charge of various aspects of animal health, animal production and livestock extension, food safety of animal-derived products and so forth. The responsibilities of the DLD cover the following 7 items.

- To prevent, control and eradicate animal diseases
- To improve animal health and productivity
- To increase livestock population in the country
- To improve and regulate animal products in terms of variety, quantity and quality to meet the standards
- To monitor and ensure the safety and quality of products of animal origins
- To encourage scientific study, research and experiment in relation to animal production and health
- To disseminate information, knowledge and technology on animal production and health to farmers and other stakeholders

The organization chart of the DLD is presented in the Appendix and the distribution of regional/provincial and other local offices and centers under the DLD and their tasks assigned shall be discussed in more detail in the following chapter for Component 1.

(b) The Royal Irrigation Department (RID)

The RID is one of the oldest Departments in Thailand and enjoyed its 110th anniversary in 2012. In terms of the budget allocated for the public infrastructure works, the RID used to be one of the top-ranking Departments being entrusted with the duty to provide the water to store and conserve, to regulate, to distribute, to release or allocate water for agriculture, energy, domestic consumption, industry and also included the prevention of damage caused by water. Under the present project, the RID is the counterpart agency for Component 2.

The responsibilities of the RID are presented in the RID's website as follows.

1. Be a main organization in water resources development for sufficient utilization and in response to the potential of each basin;
2. Manage water allocation to every stakeholder in equitable and sustainable manners;
3. Encourage people participation in water management at all levels for sustainable and utmost benefits of water management and development; and
4. Prevent and mitigate water hazards.

While, the objectives set by RID include the following two (2) items.

1. Agricultural areas shall be thoroughly supplied with irrigation water.
2. Farmers shall be served with a good irrigation service, which raises their quality of life.

To achieve the above-mentioned objectives, the RID has set 3 strategies including all tactics concerned to be in accordance with the national agenda, national policies, and strategies of the MOAC as follows;

Strategy 1 Sufficient Supply of Irrigation Water for Agriculture

This strategy is aimed at extending the irrigation system to cover the country's agricultural areas by the construction of large scale and medium scale irrigation projects as well as water development for rural and community area projects.

Strategy 2 Development of Water Hazard Prevention System

The RID will support the development of efficient water hazard prevention and mitigation

system by the construction of structures to prevent and mitigate water hazards and the installation of a warning system.

Strategy 3 Encouragement of Efficient People participation in Water management

Aiming at increasing the quality of life of farmers at all levels, the RID realizes that to render a good irrigation service to the farmers, the RID shall increase the efficiency of its irrigation projects and its administration as well encouraging participation of all concerned sectors in water management.

The above-mentioned strategies can be classified into the following 5 tactics.

- Increase of irrigated area
- Development of irrigation project's efficiency
- Water hazard prevention and mitigation
- Participation in water management and public relation
- Increase of administration efficiency

The organization chart of the RID is as presented in the Appendix.

(c) The Office of Agricultural Economics (OAE)

The OAE is a principal organization in the undertaking of economic and social research and other studies including the monitoring and evaluation for the purpose of agricultural policy recommendations and agricultural development planning in the context of world market competition, consistent with wise and sustainable uses of natural resources. The OAE is also responsible for collecting and the efficient disseminating of accurate and up-to-date statistical information concerning the agricultural sector. In view of the wide range of activities covering all of the agricultural sub-sectors and the nature of the organization having a coordinating function, the OAE is assigned as the counterpart agency for Component 3 under the subject project. For ready reference, the organization chart of the OAE is presented in the Appendix.

In the Agricultural Economics Act, B.E. 2522 (AD 1979), the manner for formation of the National Committee on Agriculture and Cooperative Development Policy and Planning as well as the power and duty to be authorized to the OAE is stipulated as follows.

- To consider formulating agriculture policy and agriculture and cooperative development plans in conformity with the National Economic and Social Development Plan,
- To consider designating the agricultural economic areas,
- To follow up and accelerate implementation of the agriculture and cooperative development plans of work units under the direction of MOAC,
- To consider attacking problems and obstacles including constraints that hinder implementation of the agricultural policy and agricultural development plans,
- To propose recommendations and options to the Cabinet of agriculture and cooperative development planning policy and measure,
- To consider and offer options to the Cabinet in regard to improvement and relief of the national agricultural economics situation, and
- To consider and matter concerning agriculture and cooperatives as assigned by the Cabinet.

(d) Other Related Departments under the MOAC

Organization charts of other Departments related with the project under the MOAC such as DOAE, DOF and LDD are also presented in the Appendix.

(e) Department of Disaster Prevention and Mitigation (DDPM)

In 2002 the DDPM was established under the MOI as a part of the overall RTG administration system reform. The establishment of the DDPM was aimed at the possible strengthening of government services to cope with the natural disasters increasing year by year. In 2007 the Disaster Prevention and mitigation Act was promulgated in a way to replace the outdated Civil Defense Act (1979) and the Fire Prevention and Suppression Act (1999) with having some additions made in relation to natural disaster prevention and mitigation issues. The DPM Act stipulates that the DDPM under the MOI is the central core agency in handling national disaster management work.

The organization chart of DDPM is presented in the Appendix.

There are four Bureaus in charge of, 1) Disaster Prevention Criteria, 2) Disaster Prevention and Promotion, 3) Disaster Prevention and Mitigation Policy and 4) Disaster Victim Relief. There are also several Divisions and working units in its central office. In the field, there are as many as 18 Regional Centers equipped with the necessary machinery and tools/materials to cope with disaster situations. Further, the DDPM assigns provincial DDPM officers who are stationed and working under provincial governors.

Taking examples in the selected provinces for the model areas Phitsanulok province as an example, there is a DDPM's Region 9 Center located to cover the 5 provinces of Tak, Sukhothai, Uttaradit, Phetchabun and Phitsanulok. While, the Region 1 Center at Pathum Thani, covers the provinces of Pathum Thani and Ayutthaya.

In addition to the above, the DDPM operates the DPM Academy with campuses located at Khon Kaen, Chiang mai, Prachinburi, Phitsanulok, Phuket and Songkhla.

Institutional Background of the Project

Institutional backgrounds are many including the existing organizations at various levels closely related directly and indirectly with the project as discussed in the foregoing sections, a variety of plans of national and local levels in the relevant sectors, some programs and schemes being implemented in and around the project areas, and also the related laws and regulations which are currently effective. Under the present study, the following points were identified as the major concerns with the subject project. They can be classified into the several clusters as indicated below.

- i) Overall planning -Definition about Self-Sufficiency Economy
 (Source: UNEP RRCAP resources, UN ESCAP (2006))

- ii) Agriculture -MOAC's Agricultural Development Plan under 11th
 NESDB Plan

(Source: Weekly Thai KEIZAI in Japanese)
 -MOAC's Preparedness Plan for Agricultural Disaster in 2012
 (Source: OPS, MOAC, Translation to English by JST)
 -Manual for Aid to Disaster Victims in Agri-sector (2008)
 (Source: OPS, MOAC, Translation to English by JST)
 -Measures taken by BAAC after the 2011 flood disaster
 (Source: BAAC and Thai KEIZAI)

- iii) Disaster Prevention -Organization and roles of local governments systems under
 and Mitigation the framework of disaster prevention administration by the RTG
 (Source: JICA Project for Disaster Management Capacity
 Building (Phase 2))
 -The Disaster Prevention and Mitigation Act (DPM Act) 2007
 (Source: DDPM)
 -The Disaster Prevention and Mitigation Plan (2009)
 (Source: DDPM)
 -Strategic National Action Plan for Disaster Risk Reduction
 (2010-2019)
 (Source: DDPM)

- iv) Flood Prevention -RTG's M/P on Water Resource and Flood Management
Water Management (Source: NESDB and SCWRM)
 -Single Command Authority
 (Source: OPM website)

The reference materials used for the institutional background are large in volume. The summarizing and extracting of information was made with a view to focusing on the matters and indications relevant to the subject project only. The same including summaries, abstracts and briefings are compiled in the Appendix. In this section, therefore, some outlines or introductions of each topic are presented as follows.

Outlines/Introduction of each Topic related with the Project

(1) Summary Definition of a Self Sufficient Economy in Thailand

The concept/philosophy of a self-sufficient economy is derived from His Majesty King of Thailand and deemed increasingly important in planning any development projects in Thailand. It is considered particularly true after the country experienced such disastrous flood damage in 2011. The concept, the principle of self-reliance and the New Theory agriculture, is widely applied and practiced in many parts of the country today. For further details, please refer to the full summary definition presented in the Appendix.

(2) The MOAC's 5 Year Agricultural Development Plan under 11th NESDB Plan (2012-2016)

(Extracted: focusing on the flood countermeasures in the agricultural sector)

This plan indicates the higher-priority-given policies by the MOAC during the period. The Plan covers sub-sectors including livestock development, fishery development and irrigation development and so forth. The introduction part of the Plan deals with the whole picture of the Plan briefly with the legal background to this Plan's preparation, and therefore, the major parts of its introduction are quoted as follows.

“Preparation of this plan is based legally on the stipulations included in the 1979 Agricultural Economics Act, which requires that the prepared plan shall be in conformity with the NESDB Plan during the same period. The Policy and Planning Committee of MOAC is responsible for the preparation of this plan.

The plan was intended to effect in improving immunity of agriculture-related sub-sectors at all levels, i.e. it aims at up-lifting of farmers' standard of living, development of production capability, security control on agricultural produces and foods as well as the sustainable development of agricultural resources with keeping a good balance and high efficiency. In addition, the plan shows the road map and promotion processes towards practical implementation of agricultural development plan formulated.

After the Introduction, some particular topics shall be quoted by picking out only those concerned closely with the subject project part by part, and for further details, reference to the original source is suggested.

(The following indicator numbers are derived from the original paper and do not indicate or relate to the numbers relating to this report.)

1.8.2 Water

The plan concludes that the water demands tend to increase continuously and there are high possibilities of water shortage occurrences in Thailand in the long term perspectives.

1.9.2 Changes within Thailand

- (1) In terms of the population composition in Thailand, the share by the aged group is rapidly escalating, while at the same time those shares by children and working force are declining sharply. The birth rate remains still in the low level.
- (2) Natural resources and environmental capital are still deteriorating. Climate change issues affect negatively the natural resources and environmental conservation problems are further enhancing the negative effects in Thailand. Global warming as well brings about negative effects on production by the agricultural sector.

1.10 Government policies and countermeasures

(1) Policies to stabilize farm income

The government is in a position to take necessary measures so as to stabilize farm income. A crop insurance system is to be developed for this purpose. It was during the implementation of the 9th NESDB Plan that BAAC initiated a pilot project called Weather Index Insurance as suggested by the then Cabinet. In February 2010 the cabinet approved the principles of creating a crop insurance system for farmers' beneficiaries and assigned the related Ministries such as Finance, Agriculture and Commerce to follow up on the matter.

(8) Conservation of farm land

Thailand is an agricultural country and the farm lands are the important element for production as the basic infrastructure. In order to cope with the sustainable use and to lead the country to becoming one of the important food production bases in the world, farm lands shall be properly conserved, rehabilitated and developed. Due to the chain effect by the rapid growing economy, land resources suited to farming are being converted to other uses. It is necessary to regulate the conversion of land use from farming to other purposes by some legal institutions, requiring a promulgation of farm land conservation law.

2.4 Agricultural resources

3) Natural disaster

Climate changes cause drought & flood, landslides and strong wind damage in many parts of the country with higher frequency of occurrence and on larger scales. It is predicted that such disasters may cause more serious damage on the small and poor farmers who are more vulnerable than the others. Countermeasures for amending this situation are necessary.

Development strategies

- i) Farmers' standard of living shall be raised. Farmers shall be provided with self-help capability and immunity to cope with the risks in production and marketing aspects. Income inequality shall be minimized.

- ii) Capacity development for attaining target production, control and food security shall be enhanced. Through the strengthening of the production base for the agricultural sector, stabilized job opportunities and income shall be secured for the majority of farmers.
- iii) Development of agricultural resources shall be accomplished in a way to maintain higher efficiency, good balance and sustainability so that necessary infrastructures are developed adequately for sustainable use of the facilities.

(3) Summarized Briefing on Extract from MOAC's "Preparedness Plan for Agricultural Disaster in the Budgetary Year 2012"

This plan was prepared by the Working Group for Natural Disaster Prevention and Troubleshooting under the Planning and Special Projects Bureau, Office of the Permanent Secretary, MOAC in December 2011 aiming at coping with the imminent agricultural disasters for the budgetary year 2012. In the preparation, the concept of 2P's and 2R's: Prevention, Preparedness, Response and Recovery was adopted as guideline and measure in preventing and troubleshooting such disasters as flood, drought and plant-oriented epidemics for quick and effective actions by concerned government agencies in helping farmer victims.

Due to the serious flood damages experienced in 2011, the Plan emphasizes prevention measures against floods and indicated the overview of the preparedness plan for 2012 as follows.

Flood problem

It is expected that the rainy season of 2012 will cause flood problems like those of the previous year since the present volume of water in most reservoirs is still high so their capacities to accept some more water will be relatively less. Furthermore, drainage of water is very limited by the changes of land use that hinder our water resources management. In addition, la niña effect has caused an irregularity of more rainfall, especially during the cyclonic season that caused flash floods and enormously inundated many areas of the country.

According to the analyses of repetitious flood-risk areas it is found that there are 52 flood-risk provinces covering the area of 10.59 million rai, and landslide-risk and flash flood-risk areas of 52 provinces with the total area of 5.72 million rai.

Further, the Plan discusses the preventive measures and aids to flood victims as follows in accordance with the 2P's and 2R's concept.

Preventive measures and aids to flood victims

"Prevention" comprises the monitoring, emergency alarming, development of water resources for prevention and reliefs of flood problems: development of Kaemling projects; construction of water resources and water conveying systems; construction of medium irrigation buildings; additional

reinforcement of dams to increase their safety factors; flood prevention and mitigation; swamp excavations in paddy fields and farmlands out of irrigation areas; construction of small water resources for communities; elimination of weeds to increase storage and drainage capacities; development of information technological data system to upgrade forecasting and emergency alarming systems; and installation of telemeters to forecast and raise the alarm in each basin.

“Preparedness” comprises the setting up of disaster-risk area data and farmer registration; setting up of preparedness plan to help agricultural victims in each province; and preparedness of quick actions of concerned government agencies: flash flood management planning in 25 basins, reservation of 3,624-ton provisions for livestock and 832-ton plant seeds, livestock evacuation planning, and preparedness of vehicles, machinery, tools and equipment such as 1,611 water pumps, 87 water pushing machines, 249 water trucks, 48 trucks, 46 tractors, 73 backhoes, 22 dredgers, 83 patrol boats, 7 barges, as well as public relations and supporting technical advice.

“Response” comprises the alarming and public relations in central and provincial agencies, and water management to solve flood problems such as adjustment of reservoir drainage plans, conveying water into the irrigation system of agricultural areas, additional reinforcement of irrigation buildings, heightening embankments/dikes/open channels, arrangement of ad hoc rescue units to help farmers survive, and supplies of water pumps, water pushing machines, and equipment to the endangered areas.

“Recovery” comprises of the aids to victim farmers through surveying and assessment of damages incurred by them. Help shall be given in terms of trouble relief with official advances or payments from the central budget; and special subsidies for farmer victims in 2011. Sixteen plans/projects for recovery and remedy to disaster victims has been set up: 12 for recovery of farmland and farmers’ careers, 1 for debt repayment, 1 for environmental recovery, and 2 for the repair/rehabilitation of 1,547 buildings/properties/irrigation systems.

In the case of the drought problems which are closely related with the flood problems in the overall water management in Thailand, especially in the greater Chap Phraya basin. The Plan suggests the potential drought risk-areas of 16.51 million rai covering 46 provinces, and also outlines the preventive measures and aids to drought victims as follows.

Drought problem

It is expected that the drought problem this year would not be severe as there is a relatively large volume of water stored throughout the country. However, drought in some areas has been monitored, especially in repetitious drought-risk areas and farming areas out of irrigation areas, during May and April as well as the discontinuity of rainfall from June to September.

It is apparent in the analysis of drought-risk areas that there are 46 provinces to be monitored, which cover the total area of 16.51 million rai.

Preventive measures and aids to drought victims

“Prevention” comprises of the setting up of disaster-risk data, the development of water resources to prevent and relieve the drought, and the developments of an information technology system to more efficiently forecast and raise the alarm of a drought.

“Preparedness” comprises the setting up of disaster-risk area data and provincial operations plan and supporting agencies for aids: five rainmaking centers with two operations teams, water allocation and dry-season vegetation planning. It is expected that the total required water for these operations is 31,900 million m³ for the target dry-season vegetation areas of 19.23 million rai (second crop paddy fields of 16.70 million rai and farm plants plus vegetables of 2.53 million rai), reservation of provisions for livestock and production requisites, livestock evacuation planning, and supporting air fleet of 28 airplanes for rainmaking, 1,611 water pumps, 249 water trucks, 48 trucks, public relations and supporting technical advices.

“Response” comprises of the alarming of drought situations and the use of public relations through mass media in central and provincial regions. Rainmaking operations will be performed as per the schedule and by request. Water management to solve drought and discontinuity of rainfall problems shall be adjusted corresponding to the water allocation plan, arrangement of timely water consumption rounds to relieve the drought impact, arrangement of ad hoc rescue units to survive the farmers, and supplies of livestock provisions in the drought areas.

“Recovery” comprises of the aids to victim farmers through subsidies and rehabilitation of damaged farmlands and organization training programs for the farmer victims.

The Plan also indicates the expected water situation and the resultant problem situation for the year 2012 as follows.

Water situation

The water situation in medium and large reservoirs over the country (recorded December 30, 2011) was 64,602 million m³ or 87% of the total storage, in which was usable water of 40,741 million m³ or 55% of the total storage, which was 11,335 million m³ more than that of the previous year (2010). At present, the flow of water into storage areas is 52.65 million m³ while the discharge is 159.13 million m³, so all the dams should gain 9,515 million m³ of water.

The water situation in large reservoirs (recorded December 30, 2011) was 61,231 million m³ or 87% of the total capacity of all large reservoirs, in which was usable water of 37,688 million m³ or 54% of the total storage, which was 11,299 million m³ more than that of the previous year (2010). At

present, the flow of water into the large reservoirs is 47.63 million m³ while the discharge is 175.86 million m³, so all the large dams should gain 8,926 million m³ of water.

Situation of problems

Thailand has continued facing a potential flood since the beginning of the past rainy season and enormous farmlands across the country were severely damaged, especially in the north, the northeast and the central part, and many of them are inundated with residual water, even up until now. During November and December 2012 there is a chance of some strong low pressure storms originating in the lower China Sea and they might become tropical depressions or typhoons that may then come across the Gulf of Thailand. Such storms would cause heavy to enormously heavy rain falls in some areas. The Gulf of Thailand regularly experiences strong winds and large waves and this may also occur with high tidal waves along the east coast of the southern part of Thailand.

It is expected that the rainy season of 2012 may cause floods in the same manner of the past years, especially when a depression passes through Thailand. The most probable tendency is that a depression will pass through the upper part of the country during August and September, and it may cause big floods in various areas. Due to the aforesaid data of current storage capability of the reservoirs, it could be determined that the storage capacities will already be at their maximum limits. Moreover, the amount of drainage that can be done is limited due to the changes of land uses. All these are constraints of water resources management. In case of continuous rainfall and the precipitation is higher than normal, the flood and inundation will be harshly repeated. It is expected that the drought this year will not be severe because the current storage levels of the large and medium dams throughout the country is rather high. However, drought may incur in some areas, especially in repetitious drought risk areas where farmlands are located outside the irrigation areas.

Threatening pest diseases are mealy bugs in cassavas, brown plant hoppers in paddies, and black-headed worms in coconuts. It is expected that the epidemic situation will be less because the weather conditions of this year does not favor the pests' reproduction cycle and the farmers have learned how to prevent and control pests. Nevertheless, continuous monitoring of pests and pestology shall be carried on, especially in the areas which have previously recorded infestations. This includes the epizooties and aquatic epizooties which occur seasonally.

Finally, the Plan presents the flood prevention and troubleshooting measures for 2012 and identifies the Task, Plan/Project/Activity, Target and Responsible agencies under each category of 2P's and 2R's respectively as follows.

In this plan, flood prevention and troubleshooting measures are indicated separately stage by stage as Prevention, Preparedness, Response and Recovery with the assigned tasks by each responsible agency. All this information (Including Attachments) is presented in the Appendix for ready

reference.

(4) Extracts from the MOAC Manual for Aids to Disaster Victims in Agricultural Sector (June 2008)

This practical manual was prepared by OPS of the MOAC for use by the concerned MOAC officials in the central offices as well as provincial and local-based offices, to guide in a uniformed manner, the officials in charge of aids to farmer victims in their offering/handling aids/assistances required. The Manual is composed of 3 parts and appendix as follows and indicates in detail the procedures, steps and criteria for damage determinations to follow in helping farmer victims who may have suffered from such disasters.

- Part I: Procedures and Steps to Help Agricultural Victims Troubled by Disasters
- Part II: Laws and Regulations
- Part III: Criteria for Damage Determinations
- Appendixes

For the Part I, the procedures and steps are clearly indicated in a table phase by phase including Before, During and After as follows.

BEFORE	DURING	AFTER
<p>Preparations for coping with coming disasters</p> <p>1. <u>Estimation of situation</u> Data analyses of weather, rainfall, surface water, soil, land utilization, agricultural production, areas of disaster risk and past disaster-affected areas.</p> <p>2. <u>Setting operations plans on:</u></p> <ul style="list-style-type: none"> • Vegetation • Livestock • Fisheries • Areas of risk • Water resources <p>3. <u>Joint management</u> Joint management by ministerial, departmental and provincial centers.</p>	<p>1. <u>Situation monitoring and alarming</u> Situation monitoring and alarming by ministerial, departmental and provincial centers.</p> <p>2. <u>Damage assessment and Survey</u> Damage assessment and survey by sub-district agricultural technology service and transfer centers (sub-district agriculture offices).</p> <p>3. <u>Aids</u> Provision of preliminary aids.</p> <p>4. <u>Performances of related government agencies:</u> Adjustment of water allocation plans, provision of water pumps and water trucks, royal rainmaking, supplies of livestock provisions, animals' medicines and health care.</p>	<p>1. <u>Monetary aid for mitigation to victims</u></p> <p>2. <u>Rehabilitation of agricultural areas</u></p>

All other details of the Part I , Part II, Criteria and Minor Practices on Aids to Disaster Victims of Agricultural Sector in Case of Emergency B.E. 2549 and Part III, Supporting Data in Agricultural Damage Assessment are presented in the Appendix.

(5) Measures taken by BAAC after the 2011 flood disaster

In compliance with the government policies to enhance possible assistance for the farmers who suffered from damages caused by natural disasters as in the 2011 floods as well as the unstable rainfall caused by the global warming, BAAC has taken the following measures and/or expanded the existing activities in the form of crop insurance.

1. Debt moratorium

Lately (As of April 2012), the Thai cabinet meeting voted for the resolution that in order to lessen the burden of small farmers as well as lower income earners who suffered from the flood damages in 2011, those standing debts could be cooled off for three (3) years by moratorium. The borrower customers of BAAC who would benefit from the said moratorium would account for as many as 2.94 million numbers with the total debt amounting to 394 Billion Baht. The net interest revenue expected for BAAC to earn from the said total debt is estimated at 12 Billion Baht of which the government would bear the burden by 50%, leaving the remaining burden by BAAC at 6 Billion Baht.

2. Crop insurance

At present in Thailand, there is one kind of crop insurance available and another that is under consideration by the Government of Thailand.

2.1 Climate index crop insurance (Existing)

This insurance is based on the rainfall index as the basis for considering disaster compensation. The coverage based on the cumulative rainfall that falls in the period covered by the insurance as compared with an index of the drought or severe drought. If the accumulated rainfall is at or below the specified index, it would be judged as a disaster. Farmers will receive compensation up to 40 % of the loan for insurance in the case of a severe drought. This insurance scheme was initiated at Khon Kaen province on an experimental basis around 2010 and in the year 2012. The scheme is to be expanded to cover as many as 9 provinces in the Northeast region. According to the BAAC, as many as 30,000 insurance policies are expected to be signed to cover as much as 150,000 rai this year. Below is an example of a compensation amount.

An example showing the compensation

Loans for cultivate Loan for Insurance Compensation in

Rice	Insurance	Premiums	Case of Drought	
			Drought	Severe drought
Bt 100,000	Bt 10,000	Bt 464	Bt 1,500	Bt 4,000

The benefit that a farmer will get from the crop insurance is explained by BAAC as follows.

- *In the case of drought, the farmer will get compensation which is enough to relieve the debt and substitution cost for next cultivation.
- *Guarantee and reduce the risk of rice cultivation.
- *To enhance the capacity of self-reliance.

To qualify for the insurance, the applicant shall be the borrower customer of a BAAC loan, aged 20 years or above and their rice plantations are located in the areas close to the station/monitor of the rainfall. Further, the crop insurance is conditioned with the general restrictions as follows.

- *Compensation will be based on rainfall index and not an evaluation of the damage of the plant that is insured.
- *When paying compensation to a company in case of drought, it is noted as the end of insurance.
- *When mixing the amount total during the period of insurance, it will not be more than 40 % of the loan amount of insurance as calculated by the rainfall index that was a true calculation at the main station for rainfall monitoring.

2.2 Paddy crop insurance (Under consideration)

As per the news report in the Bangkok Post dated the 6th of June, 2012, the Government (Ministry of Finance) sponsored paddy crop insurance scheme for the coming fiscal year could not be approved by the cabinet held on 5th of June, 2012. Due to the increase of insurance premium from 120 Baht/rai to 210 Baht/rai owing to the new coverage of crop damages by diseases, some cabinet members showed negative signs for approval by the cabinet. The paddy crop insurance is an insurance scheme to protect the farmers from the natural disaster risks including flood damages. For the previous years, farmers paid an insurance premium of 60 Baht/rai while the government subsidized the equivalent 60 Baht/rai. It is said that there have been claims for payment of insurance compensation for as large as 542,000 rai area and as much as 754.6 million Baht insurance money was paid up for the year 2011.

(6) Organization and Roles of Local Governments System under the Framework of Disaster Prevention Administration by RTG

In the following sections, more detailed discussion shall be made on the basic structure of disaster prevention and mitigation administration in Thailand like DDPM, DPM Act etc., and the major arrangements and actions taken recently in Thailand can be briefly noted as follows.

- In 2002, DDPM was established under the MOI as a part of overall government administrative reform implemented
- The DPM Act was promulgated in 2007 and the national level DPM plan was formulated.
- Based on the policies referred in the national plan, local level plans have been prepared. To date, all provincial DPM plans were completed and the lower level plan preparation are in progress.

Under the circumstances and the policies given, roles to be played by local government bodies are

substantially large and the DPM assigns provincial DPM officers for all 77 provinces. At the same time, the local administration organizations have a mandate to act for disaster prevention and mitigation as an inter-face of people in the area. Therefore, in formulating the organizations and institutional set-up for possible sustainable disaster prevention and mitigation, it is an essential need to grasp the prevailing situation and institutional features of the concerned local administration bodies. With this concern, it is noted that the local administration system applied in Thailand today is of two-tier structure with having the conventional administrative line in one way and the self-governing autonomous line on the other, which has being strengthened in recent years. Consequently, it is considered important to accurately grasp the prevailing local administration conditions in Thailand.

As to the key concerns as mentioned above, the study report by JICA project (Project for Disaster Management Capacity Building – Phase 2) provides sufficient information to the point, and the same shall be extracted, as presented in the Appendix. (Original version in Japanese was partly translated to English by the JST.)

(7) The Disaster Prevention and Mitigation Act (DPM Act 2007)

In Thailand during the recent decade covering 1990's and 2000's, there had been a common understanding shared by those politicians, government officials and citizens in general both in urban and rural areas that the occurrence of natural disasters has increased year by year with higher frequencies due to the negative effects of global warming as well as the change of life style of Thai people. It was the occurrence of Indian Ocean Tsunami disaster experienced in December 2004 that triggered the Government to have the subject DPM Act being effective at the soonest. The DPM Act was entered into force on the 6th of November, 2007, in a way to replace the outdated 1979 Civil Defense Act and the 1999 Fire Prevention and Suppression Act, with some additions in relation to natural disaster prevention. The Act stipulates that the Department of Disaster Prevention and Mitigation (DDPM) is the core agency in handling national disaster management work. Also the Act authorizes local governments to take responsibility of disaster management in their respective areas, in line with the provincial DPM Plan.

The DPM Act 2007 has the four (4) prominent features, three (3) disaster categories, three (3) policy-making levels and related committee organizations as indicated below:

- 1) Introducing 3 main policy – making and planning bodies including National, Provincial and Bangkok Metropolitan,
- 2) Having the Prime Minister or the designated Deputy Prime Minister as National Commander,
- 3) Empowering the Department of Disaster Prevention and Mitigation (DDPM) as the core government agency in handling national disaster management work, and
- 4) Authorizing local government to take responsibility for disaster management in their respective areas, in line with the Provincial Plan.

According to the new DPM Act, “disaster” can be classified into 3 categories namely:

- 1) Man-made or natural disaster;
- 2) Disaster resulting from an air raid during wartime; and
- 3) Disaster resulting from sabotage or terrorist attack.

In terms of policy making, there are 3 levels:

- 1) National, which is chaired by the Prime Minister or the designated Deputy Minister.
- 2) Provincial, which is chaired by Provincial Governor.
- 3) Bangkok Metropolitan Administration level, which is chaired by the Bangkok Governor.

Each of the three policy – making organs is composed of the committee as follows:

- 1) The National Disaster Prevention and Mitigation Committee (NDPMC).
- 2) The Provincial Disaster Prevention and Mitigation Committee.
- 3) The Bangkok Metropolitan Administration Committee.

(8) The Disaster Prevention and Mitigation Plan (2009)

In accordance with the provisions of the DPM Act 2007, the DDPM as the secretariat of the National DPM Committee devised the national level DPM Plan in the year 2009. This was done by conferring with a number of relevant government agencies, local administrations and private sectors.

Under the Plan, activities are divided into 3 phases of pre-during-post and descriptions cover the purposes, measures and even indices specified phase-wise. For the phase of pre-disaster for prevention activities, the plan includes programs on infrastructure development but it is not shown in the indices part, indicating generally limited content concerning the countermeasures by hard-ware structures. While the plan specifies main agencies as well as supporting agencies for each of countermeasure work planned as an attachment to the plan.

There are as many as 16 disasters categorized under the Plan. 8 out of 16 are natural disasters. The Plan requires DDPM to prepare for each disaster category, a national level master plan and operation plan (Action plans with specific period for implementation and associated budget needed). It was in 2009 that the master plan and operation plan were prepared in a set covering the categories of floods, cyclone and land-slides.

In view of the foregoing, it is considered worthy to present the part of the MOAC duties under the national level DPM Plan as shown in Chapter 8: Standing Orders and Disaster as follows.

Ministry of Agriculture and Cooperatives

This Ministry in addition to its normal responsibilities will perform the following duties:

1. Assess the agricultural disaster situation through the analysis of relevant data such as weather condition, amount of rainfall, water situation, land – use and agricultural product, including data on the areas likely to be affected.
2. Ensure the formulation of an action plan regarding vegetation, livestock, fishery, and agricultural areas likely to be affected and water resources to prevent and mitigate disaster.

3. Take the required steps for the development of water resources to prevent and mitigate flood and drought.
4. Develop a flood forecasting system and keep a close watch on the situation in order to make timely warnings.
5. Continue close monitoring of any agricultural disaster situation to ensure the timely warning of any outbreak of plant or animal epidemic, and conduct the agricultural disaster prevention and mitigation work through the Agricultural Disaster Monitoring and Management Center.
6. Through Tambon Agricultural Service and Technology Transfer Center, take the necessary steps to quantify the agricultural loss and damage for providing the required assistance according to the government regulations.
7. Arrange and dispatch the ad – hoc task force to the stricken areas to give advice and guidance to the farmers, carry out the royal rainmaking operations, adjust the water allocation plan etc.
8. Take the appropriate and legal steps to distribute cash compensation to the farmers in distress according to the Ministry of Finance Regulation on Disaster Relief Contingency Fund for Affected People Assistance BE 2546 (2003) and addendum. The time frame of distribution has been stipulated not to exceed 3 months. In addition, the rules and time frame for requesting assistance from the Central Fund have been as well stipulated.
9. Improve the affected agricultural area for the recovery and restoration of the affected farmers' livelihoods.

The Plan also indicates the planned countermeasure procedure as outlined in Part 2. Chapter 10 is specifically for the categories of flood and landslide, and the full text will be presented in the Appendix for reference purpose.

(9) Strategic National Action Plan for Disaster Risk Reduction (2010-2019)

Abstracts of major concern on flood disaster from the Strategic National

Action Plan (SNAP) for Disaster Risk Reduction 2010-2019

Since the occurrence of the Indian Ocean Tsunami disaster in December 2004, many countries in Asia Pacific have become acutely aware of potential natural disasters including drought and flooding, which can result in the enormous loss of life and assets. In January 2005 the World Conference on Disaster Reduction was held at Kobe, Japan with participation by 168 nations and resulted in a resolution for the implementation of permanent disaster reduction measures under the so-called Hyogo Framework for Action: 2005-2015 (HFA). Later in September 2005 it was resolved that countries in Asia should develop national action plans for disaster risk reduction to comply with the principles of HFA.

The subject SNAP 2010-2019 was prepared in September 2009 for the Government of Thailand by the Department of Disaster Prevention and Mitigation, Ministry of Interior so as to address the implementation of the HFA in the Kingdom of Thailand.

Thailand is located in a tropical zone and subject to the influences of monsoons and tropical depressions/typhoons and regularly suffers from such natural disasters as floods and droughts. Due to the economic development and rapid change of people's life style in one way and to the surely progressing climate change caused by the global warming in the other way, it is considered that the

disaster risk levels in Thailand may have been changing to higher ones. In order to be able to mitigate the existing and newly emerging risks, an updated disaster risk assessment is placed with higher priority activity under the subject SNAP.

The SNAP indicates the relative risks of hazards, vulnerability, level of management and disaster occurrence in Thailand as below, where the flood type is considered as one of the high risk disasters, especially in the scale of hazard and occurrence risk. Moreover, the flood type is ranked first in its numeric weight of disaster risk among the 11 types of disaster as shown.

Thailand suffers quite often from these disasters; the occurrences of which are becoming more often and more severe than the damages suffered before. Such details as the relative risks of disaster in Thailand, rank order of disaster risk in Thailand and other details are presented in the Appendix.

(10) M/P on Water Resource and Flood Management

Major Issues and Essential Points involved in the RTG's M/P on Water Resource Management

This is the Master Plan set up and publicly announced by the Strategic Committee for Water Resource Management (SCWRM) in January 2012 with due endorsement by the Office of the National Economic and Social Development Board and cabinet approval in due course. The M/P shows RTG's policy, after experiencing the 2011 flood disaster, on sustainable water resource management for both urgent and long term situations in order to ensure the continuity of the country's development even with future drought and flood. The SCWRM has adopted the King's initiatives and the Philosophy of "Sufficiency Economy" as guiding principles in drafting the Master Plan.

The M/P indicates the weakness and problems of water resource management in the past as the following 5 issues.

- *Degradation of watershed areas due to illegal encroachment
- *Incompetent management of water resource and the lack of a single command authority
- *Lack of a master plan on long-term water resource management, resulting in unclear direction and continuity in budgeting support
- *Unsystematic and outdated database
- *Obsolete laws and regulations relating to water resources

Next, the M/P is explained to consist of the following with further detailed plans and schedules.

- *8 major work plans
- *2 action plans
 - (1) Action plan of water management for urgency period
 - (2) Action plan of integrated and sustainable flood mitigation in the Chao Phraya floodplain

Rationales, Objectives and Targets are essential parts of the M/P and the full text of the same shall be referred hereafter.

Rationales

The overall water resource management should be implemented at the river basin level and cover all river basins countrywide from upstream, midstream to downstream. The management should ensure the participation of all stakeholders. The water resource management plan should be formulated for both urgent and the long-term periods in response to possible future floods. The concept of water resource management is customized to fit with each area. In the upstream area, the emphasis is on the retention of flood water and preventing severe runoff. In the midstream area, the focus is on water management in conjunction with water gate control and drainage to minimize damages from flood. Finally, the downstream, the highlight is on the fast drainage of water to the sea.

Objectives

- (1) Prevent and minimize losses and damages from medium to large scale floods
- (2) Improve the capacity of flood prevention system, urgency flood management and increase capacity in the warning system
- (3) Build confidence and stability, and at the same time, increase farmer, community and national income while managing water, land and forest for sustainable utilization

Targets

- (1) Short term: Reduction of losses and damages from a possible flood in 2012
- (2) Long term: Reformation of the flood management system aiming at integrated and sustainable manners

The M/P comprises of 8 work plans as follows.

1. Restoration and conservation of forest and ecosystem
2. Management of major water reservoirs and formulation of the national annual water management plan
3. Restoration and efficiency improvement of current and planned physical structures
4. Information warehouse as well as forecasting and disaster warning system
5. Preparedness to emergency situation in specific areas
6. Assigning water retention areas and recovery measures
7. Improving water management institutions
8. Creating understanding, acceptance and participation in large scale flood management from all stakeholders

As introduced above, the action plans responding to the above work plans are divided into 2 parts, one for the urgency period and the other for the Chap Phraya basin which are detailed in the tables shown in the following. (Including 3 maps)

The attachments, Action Plans involved and related maps are presented in the Appendix.

(11) Single Command Authority

Issues relevant to the Single Command Authority

Establishment of a responsible agency for overall national water management has long been a pending issue in Thailand. The matter was once discussed keenly among the majority of high ranking government officials of concerned agencies as well as parliament members for possible promulgation of Water Law and resultant formation of a new Ministry of Water Resources towards the possible administration reform. Due to the frequent political instabilities caused by the coup and the following unrests during the last decade, the advancement of the issue was suspended to remain the same as before.

In 2011 during the emergency situation caused by the disastrous flood, different authorities publicly announced different information which created unnecessary confusion among the people and the administration itself, and this led the present government to expedite as quick as possible this institutional reforming. As a matter of fact, the RTG confirmed the weakness and the problems in the M/P on Water Resource Management as finalized in January 2012:

*One of the weakness and problems of water resource management is incompetent management of water resource and the lack of a single command authority.

*Another weakness is obsolete laws and regulations relating to water resource

However, it may take a certain period of time to complete the reforming for permanent solutions to remedy the above-mentioned weakness and problems, and therefore, a single command authority was formally arranged in May 2012 in the form of 2 committee appointments and the establishment of a special office under the Prime Minister's Office to be ready for dealing with the countermeasures for possible flood disasters which might be occur in 2012 and the future..

The organization chart involving the NWFPC, WFMC and ONWFP, the strategic concept, and the appointment order of two (2) committees are as presented in the Appendix. The authorities given for each of the committees are also presented with for ready reference in the Appendix.

The chart clearly indicates the authorities and duties of each committee and the office as well as the relationships among the committees and the office.

*NWFPC is for policy making.

*WFMC is to take actions following the policies given.

*ONWFP is a secretariat to serve both committees.

Chair-persons of committees and the chief of the secretariat office nominated are presented on the chart with the work items assigned for each of organizations.

Based on the ordinance of the Office of the Prime Minister on appointment of the subject

committees as attached, the NWFPC is a large scale committee having 6 Advisors, 1 Chair, 2 Vice chairs and as many as 52 members representing all the corners of Thai society. The Secretary General of ONWFP serves as the committee secretary being concurrently a member of the committee.

While, the WFMC is formed with 3 Advisors, 1 Chair, 1 Vice chair and 13 members aimed at implementing the operation plan according to the NWFPC policy and performing activities relating to the NWFPC authorities. The Secretary General of the ONWFP also serves as the WFMC committee secretary.

In view of the above, it is considered that the formation of 2 high level committees are usual practice in handling a wide-range of countermeasures of an urgent nature to meet the required single command authority, but the formation of ONWFP is seemed to be a tentative arrangement only without having a sufficient number of permanent staff assigned, for which some additional arrangements for further strengthening of ONWFP shall be necessary.

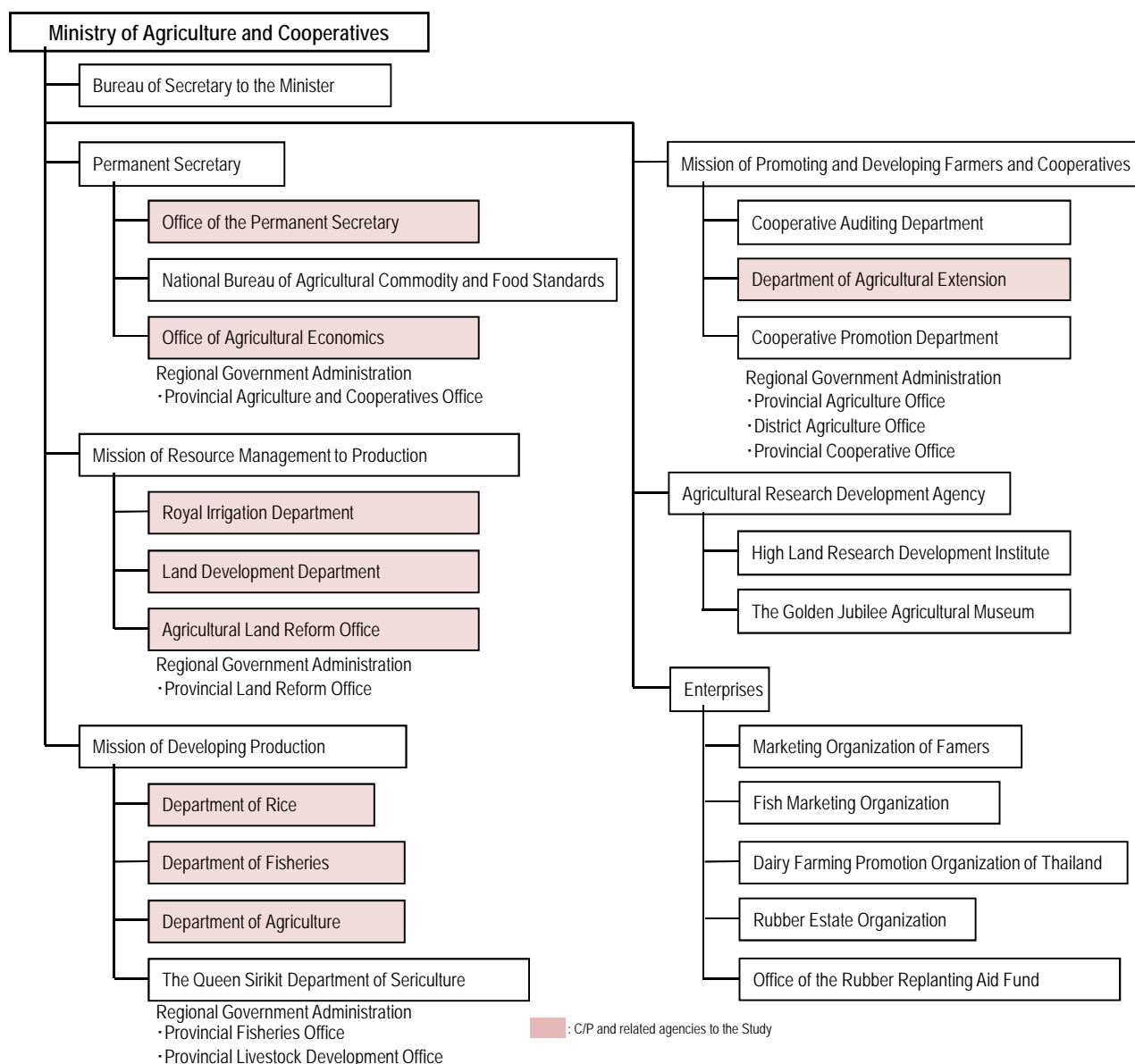


Figure: Organization Structure of Ministry of Agriculture and Cooperatives, MOAC

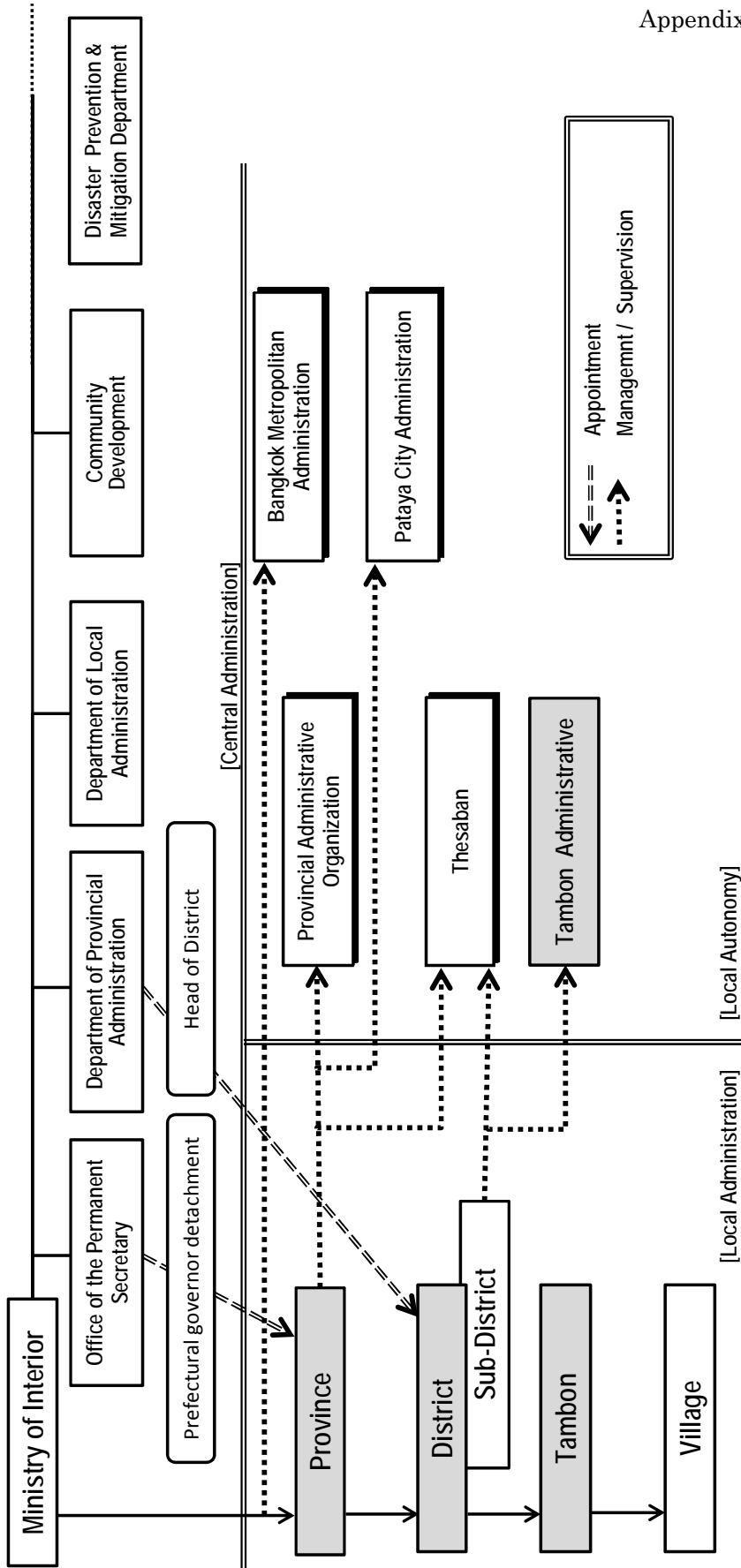
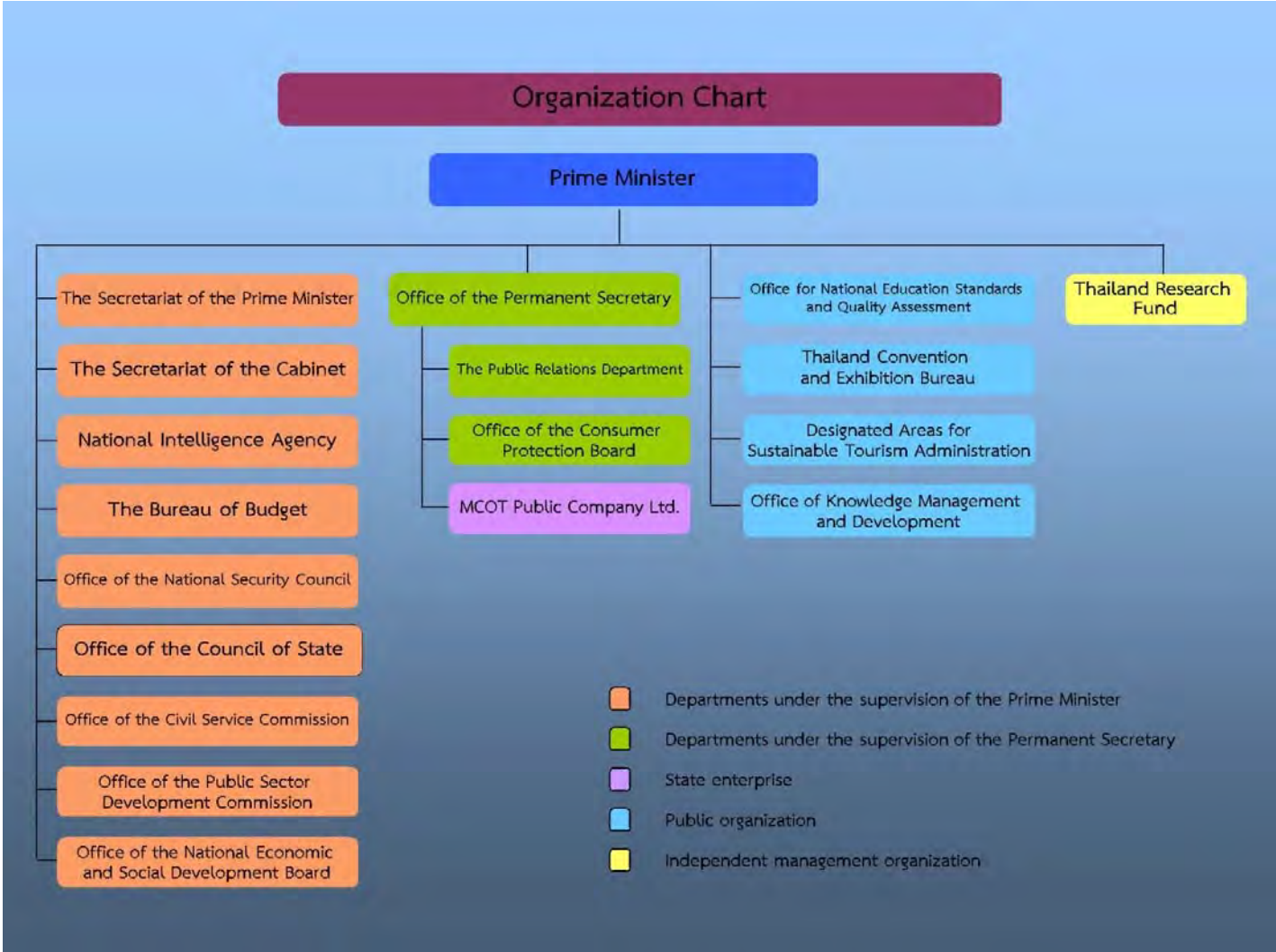
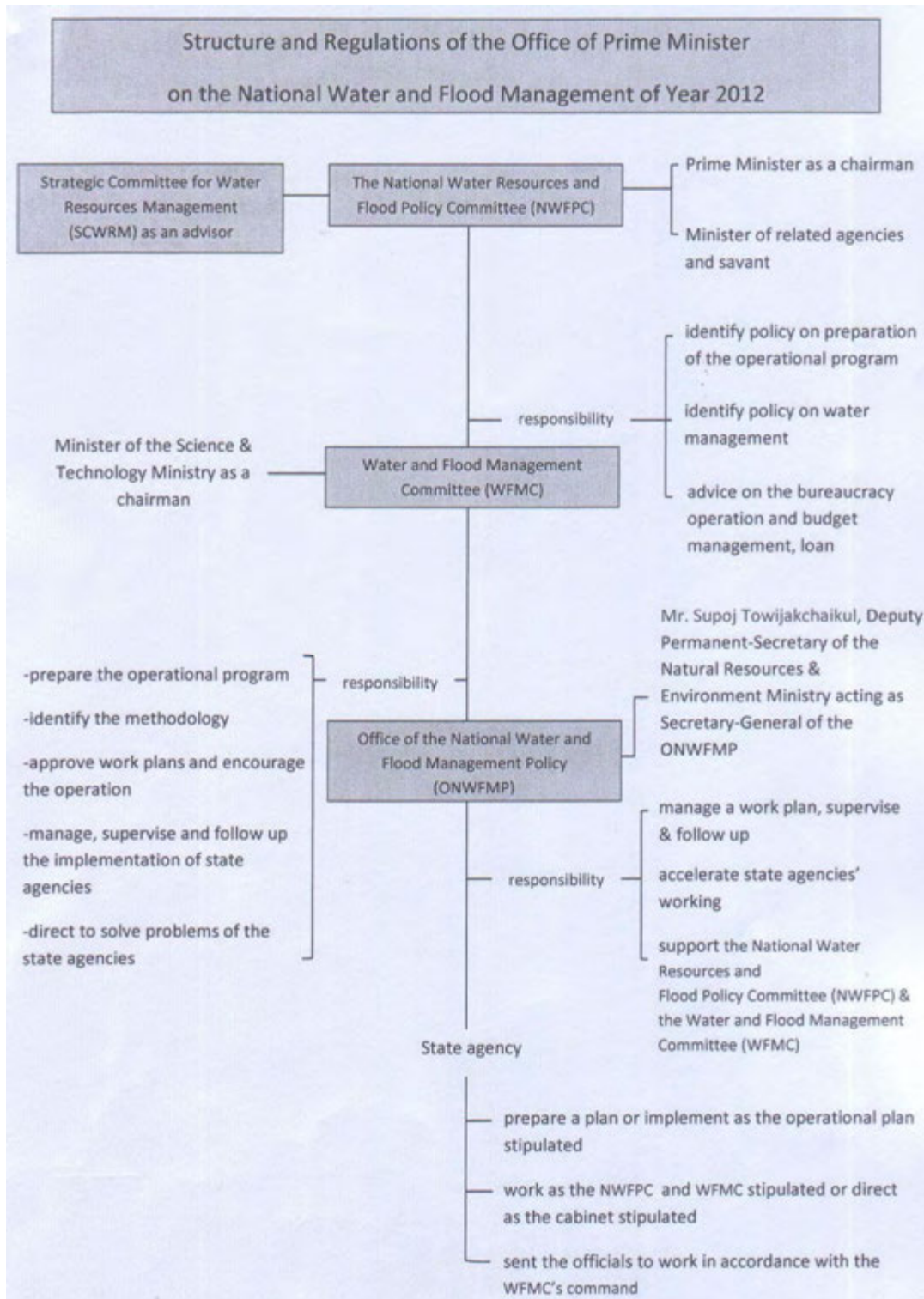


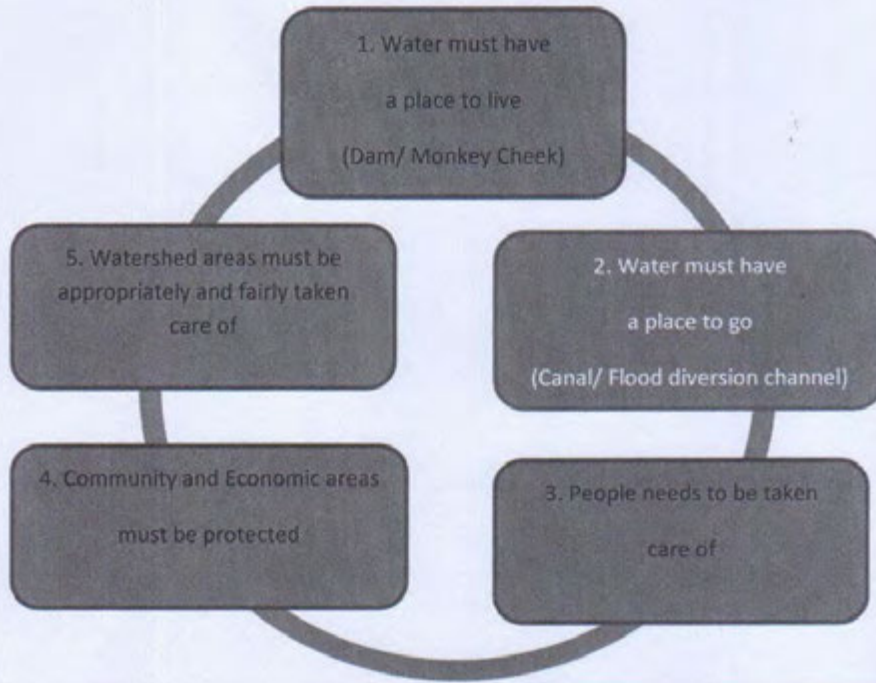
Figure Organizational Structure of Ministry of Interior and local : since Oct.



Single Command Authority



Strategy for Water and Flood Management



Thai - English translation

Official
Thai emblem

**Ordinance of the Office of the Prime Minister
No. 62/2555
Appointment of Committees Pursuant to
the Office of the Prime Minister Regulations
on the National Water and Flood Management B.E. 2555**

Whereas the Office of the Prime Minister Regulations on the National Water and Flood Management B.E. 2555 prescribes the National Water and Flood Policy Committee and the Water and Flood Management Committee in order that the water management, the flood prevention and troubleshooting, setting operations guidelines, instruction and solutions can be carried out in quick synchronic action corresponding to the single anti-flood command and management for all areas, aiming at sustainable water and flood management as a whole.

By virtue of clauses 5 and 10 of the Office of the Prime Minister Regulations on the National Water and Flood Management B.E. 2555, the Prime Minister therefore appoints two committees and assigns their authorities.

1. The National Water and Flood Policy Committee (NWFPCC)

1.1 The Committee shall be composed of:

- | | | |
|--------|---|-----------------------------------|
| 1.1.1 | Mr. Sumet Tantivejkul, | the Advisor |
| 1.1.2 | MRV. Disanadda Diskul, | the Advisor |
| 1.1.3 | Mr. Dissathorn Watcharothai, | the Advisor |
| 1.1.4 | Mr. Veerapong Ramangkoon, | the Advisor |
| 1.1.5 | Mr. Pitipong Puengboon Na Ayudhaya, | the Advisor |
| 1.1.6 | Mr. Kitja Phonphasi, | the Advisor |
| 1.1.7 | Prime Minister, | the Chairperson |
| 1.1.8 | Deputy Prime Minister
(Mr. Yongyuth Wichaidit), | the 1 st Vice Chairman |
| 1.1.9 | Deputy Prime Minister
(Mr. Kittirat Na Ranong), | the 2 nd Vice Chairman |
| 1.1.10 | Minister of the Prime Minister's Office
(Mr. Niwatthamrong Boonsongpaisarn), | the Member |
| 1.1.11 | Minister of Defense, | the Member |
| 1.1.12 | Minister of Finance, | the Member |
| 1.1.13 | Minister of Agriculture and Cooperatives, | the Member |
| 1.1.14 | Minister of Transport, | the Member |
| 1.1.15 | Minister of Natural Resources and Environ-
ment, | the Member |
| 1.1.16 | Minister of Information and Communication
Technology, | the Member |
| 1.1.17 | Minister of Interior, | the Member |
| 1.1.18 | Permanent Secretary, the Office of the Prime | |

	Minister,	the Member
1.1.19	Permanent Secretary, Ministry of Social Development and Human Security,	the Member
1.1.20	Permanent Secretary, Ministry of Interior,	the Member
1.1.21	Secretary-General of the Prime Minister,	the Member
1.1.22	Secretary-General of the Cabinet,	the Member
1.1.23	Secretary-General, Office of State Council,	the Member
1.1.24	Secretary-General, Office of the National Economic and Social Development Board,	the Member
1.1.25	Secretary-General, Office of the Public Sector Development Commission,	the Member
1.1.26	Secretary-General, Office of the Royal Development Projects Board,	the Member
1.1.27	Director, Bureau of the Budget,	the Member
1.1.28	Supreme Commander,	the Member
1.1.29	Commander-in-Chief, Royal Thai Army,	the Member
1.1.30	Commander-in-Chief, Royal Thai Navy,	the Member
1.1.31	Commander-in-Chief, Royal Thai Air Force,	the Member
1.1.32	Director-General, National Police Bureau,	the Member
1.1.33	Director-General, Pollution Control Dept.,	the Member
1.1.34	Director-General, Marine Department,	the Member
1.1.35	Director-General, Royal Irrigation Dept.,	the Member
1.1.36	Director-General, Department of Marine and Coastal Resources,	the Member
1.1.37	Director-General, Department of Water Resources,	the Member
1.1.38	Director-General, Department of Groundwater Resources,	the Member
1.1.39	Director-General, Royal Forest Department,	the Member
1.1.40	Director-General, Department of Disaster Prevention and Mitigation,	the Member
1.1.41	Director-General, Department of Public Works and Town & Country Planning,	the Member
1.1.42	Director-General, Meteorological Dept.,	the Member
1.1.43	Director-General, Department of National Parks, Wildlife and Plant Conservation,	the Member
1.1.44	Director, National Disaster Warning Center,	the Member
1.1.45	Director, Hydro and Agro Informatics Institute,	the Member
1.1.46	Director, Geo-Informatics and Space Technology Development Agency,	the Member
1.1.47	Governor, Metropolitan Waterworks Authority,	the Member
	Governor, Provincial Water Works Authority,	the Member
1.1.48	Governor, Electricity Generating Authority of Thailand,	the Member
1.1.49	Governor, Bangkok Metropolitan Administration,	the Member
1.1.50		the Member
1.1.51	Secretary-General, Office of the National Water and Flood Policy (ONWFP),	the Member and Secretary
1.1.52	Mr. Anon Sanitwong Na Ayudhaya,	the Member and Assistant Secretary

2. Water and Flood Management Committee (WFMC)

2.1 The Committee shall be composed of:

- | | | |
|--------|---|---------------------------------------|
| 2.1.1 | Mr. Kitja Phonphasi, | the Advisor |
| 2.1.2 | Mr. Pitipong Puengboon Na Ayudhaya, | the Advisor |
| 2.1.3 | Mr. Vira Wongsangnark, | the Advisor |
| 2.1.4 | Minister of Science and Technology, | the Chairman |
| 2.1.5 | Minister of the Prime Minister's Office
(Mr. Niwatthamrong Boonsongpaisarn), | the Vice Chairman |
| 2.1.6 | Permanent Secretary, Ministry of Interior, | the Member |
| 2.1.7 | Permanent Secretary, Ministry of Transport, | the Member |
| 2.1.8 | Permanent Secretary, Ministry of Agriculture
and Cooperatives, | the Member |
| 2.1.9 | Secretary-General, Office of State Council, | the Member |
| 2.1.10 | Director-General, Royal Irrigation Dept., | the Member |
| 2.1.11 | Director-General, Department of Disaster Pre-
vention and Mitigation, | the Member |
| 2.1.12 | Director-General, Department of Public Works
and Town & Country Planning, | the Member |
| 2.1.13 | Chief of Staff, Royal Thai Army | the Member |
| 2.1.14 | Governor, Bangkok Metropolitan Administra-
tion | the Member |
| 2.1.15 | Mr. Royon Chitdon, | the Member |
| 2.1.16 | Mr. Ampon Kittiampon | the Member |
| 2.1.17 | Secretary-General, Office of the National Wa-
ter and Flood Policy (ONWFP), | the Member and
Secretary |
| 2.1.18 | Mr. Anon Sanitwong Na Ayudhaya, | the Member and
Assistant Secretary |

Authorities given to NWFPC and WFMC are as follows:

1.2 NWFPC Authorities

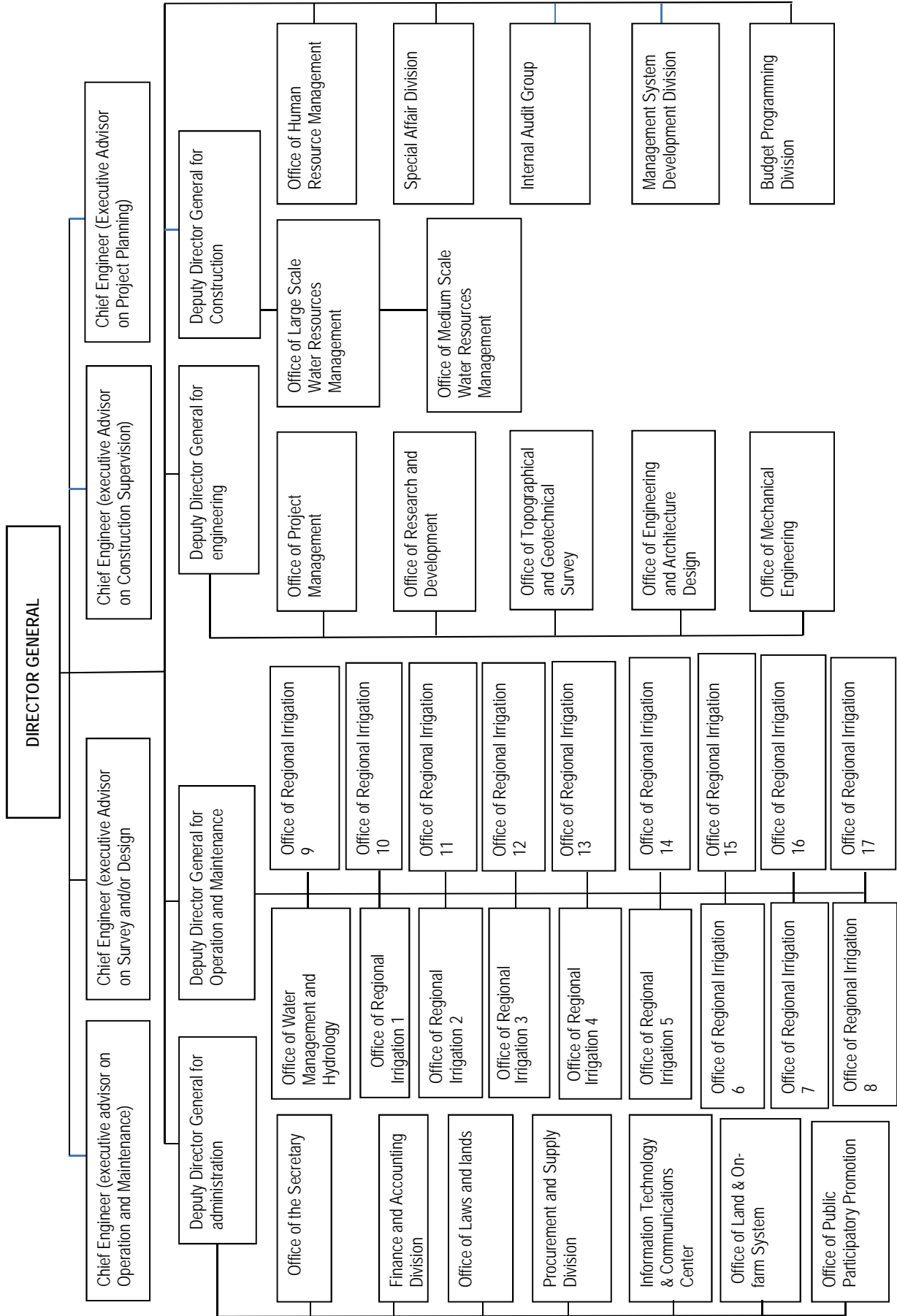
- 1.2.1 Setting the national policy for water management, flood prevention and troubleshooting;
- 1.2.2 Scrutinizing and specifying the systematic water and flood management for implementation of relevant government agencies;
- 1.2.3 Proposing the Cabinet to promulgate or amend the laws or regulations relating to water. Setting the guidelines in coordination between the Committees and government agencies relating to water management, as well as restructuring some water management organizations;
- 1.2.4 Proposing the Cabinet the criteria for indemnity pays to flood victims pursuant to the operations plan and instruction of the Water and Flood Management Committee;
- 1.2.5 Proposing the Cabinet to set the operation regulations of relevant government sector and the ONWFP for immediate and effective water and flood management;
- 1.2.6 Proposing the Cabinet to make resolutions on budgeting, administration and budget/loan expenditure corresponding to water and flood management;
- 1.2.7 Appointing the subcommittee(s) or assigning any person to assist or work for the NWFPC;
- 1.2.8 Taking any other necessary action for the effectiveness of water and flood management; and
- 1.2.9 Performing any other duty assigned by the Cabinet;

2.2 WFMC Authorities

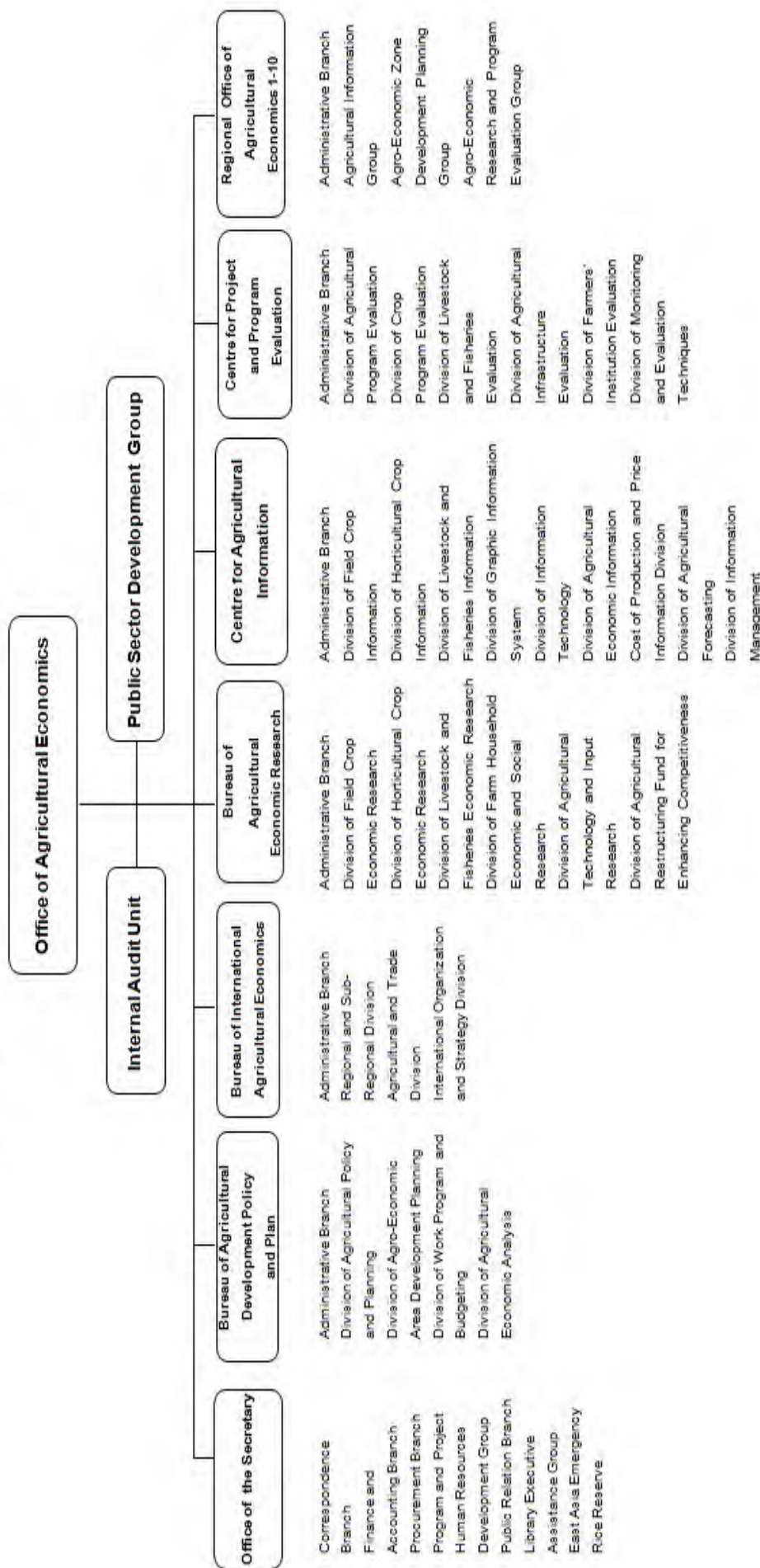
- 2.2.1 Establishing the operations plan and implementing the water and flood management according to the NWFPC policy, and doing other activities relating to the NWFPC authorities;
- 2.2.2 Setting the procedures for the relevant government agencies to prevent and solve the flood problems appropriately and conforming to the operations plan, and doing other activities for the sake of water management, preparedness for flood prevention and troubleshooting;
- 2.2.3 Approving the plans or the projects proposed by the relevant government agencies and approving the budget for expenditure, manpower, materials, equipment and resources to cope with the water and flood management;
- 2.2.4 Instructing the relevant government agencies to take any action responsible for water and flood management;
- 2.2.5 Directing, controlling, inspecting, following up and assessing the outcomes of the relevant government agencies responsible for water and flood management;
- 2.2.6 Appointing the subcommittee(s) or assigning any person to assist or work for the WFMC;
- 2.2.7 Conducting the performances of the ONWFP;
- 2.2.8 Taking any other necessary action for the effectiveness of water and flood management; and
- 2.2.9 Performing any other duty assigned by the Cabinet, the prime minister and the NWFPC.

Organization Structure of Royal Irrigation Department

Appendix A-4-5

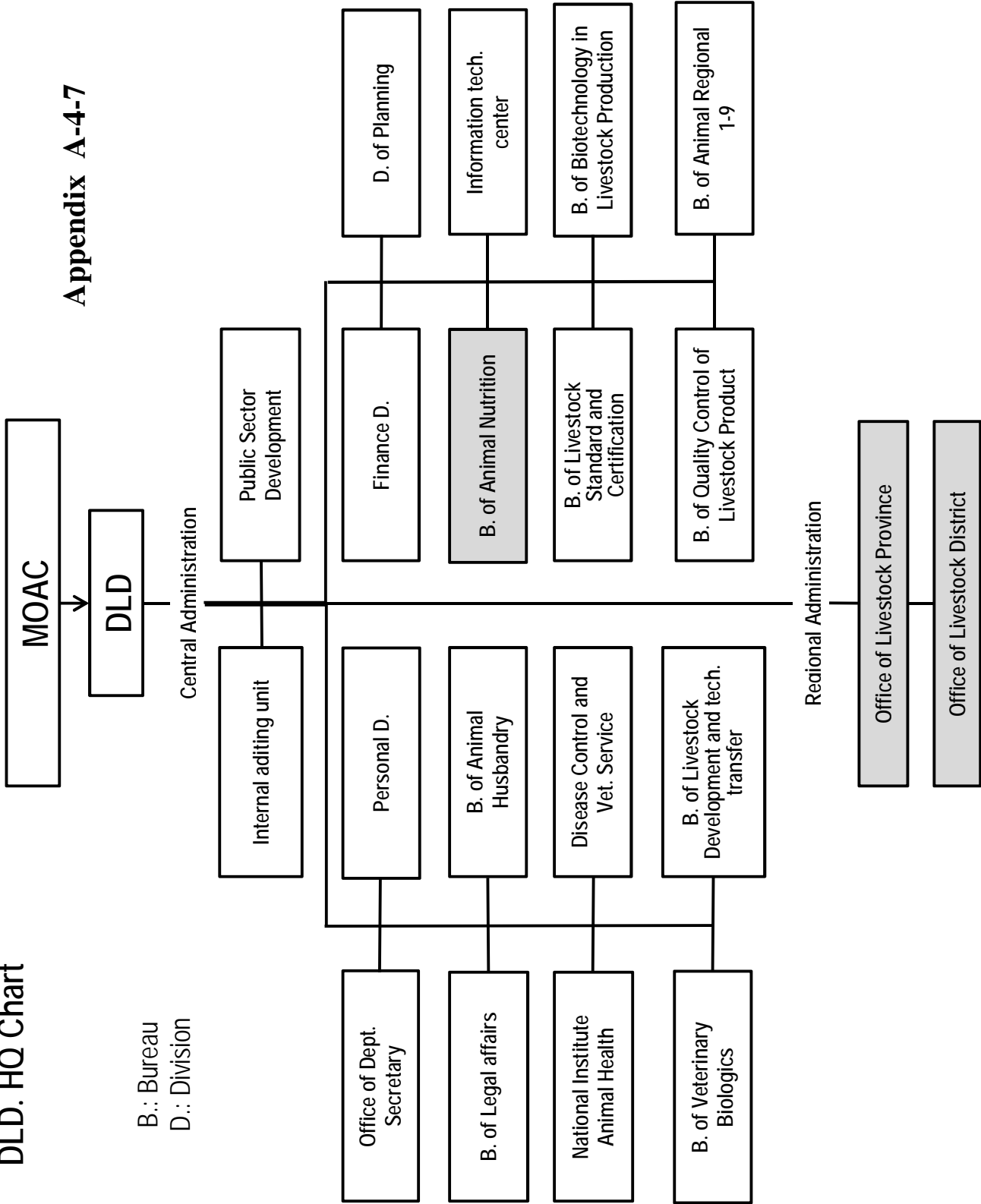


The Organization Structure of the Office of Agricultural Economics



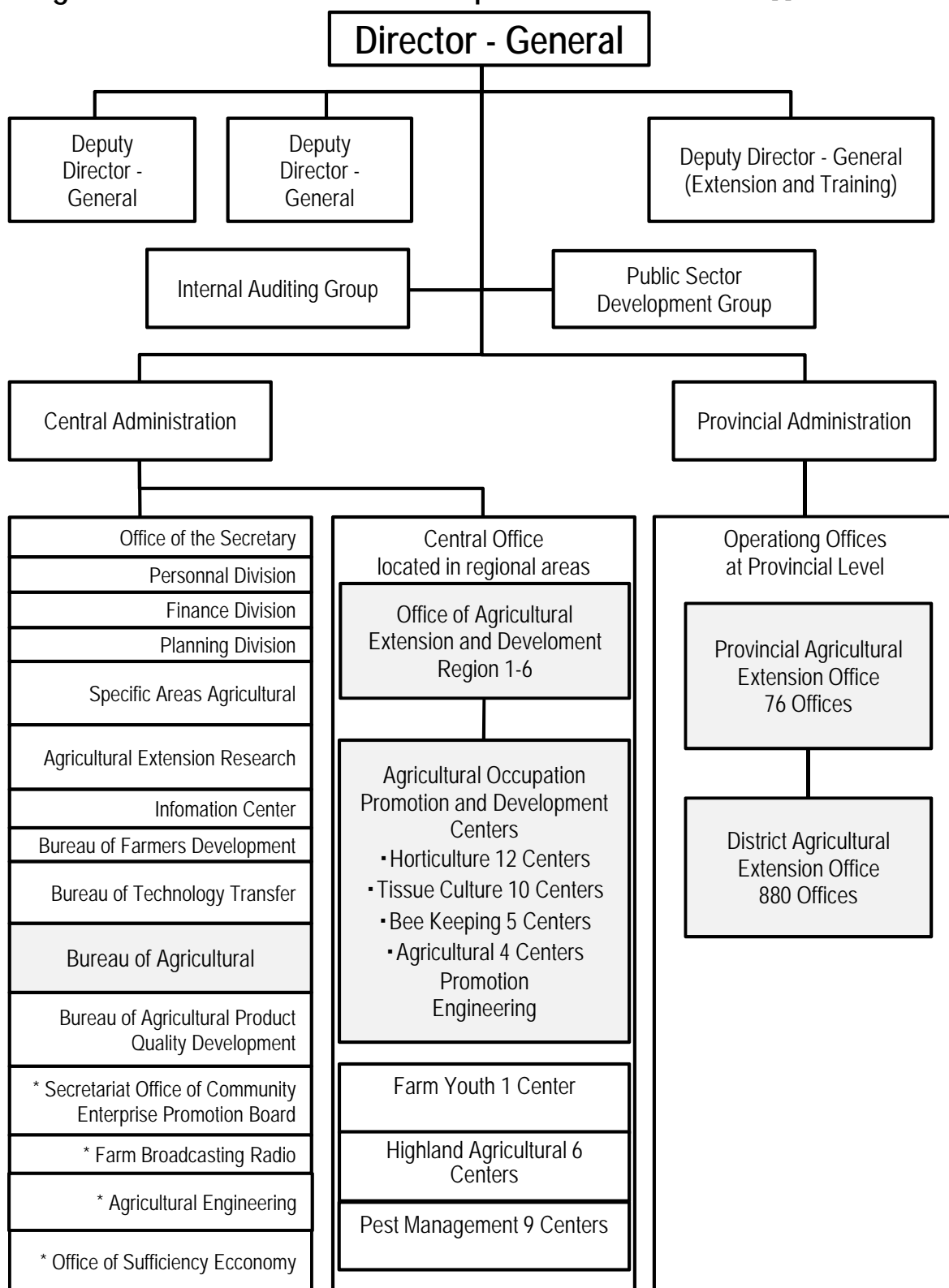
DLD. HQ Chart

Appendix A-4-7



Organizational Structure and Manpower

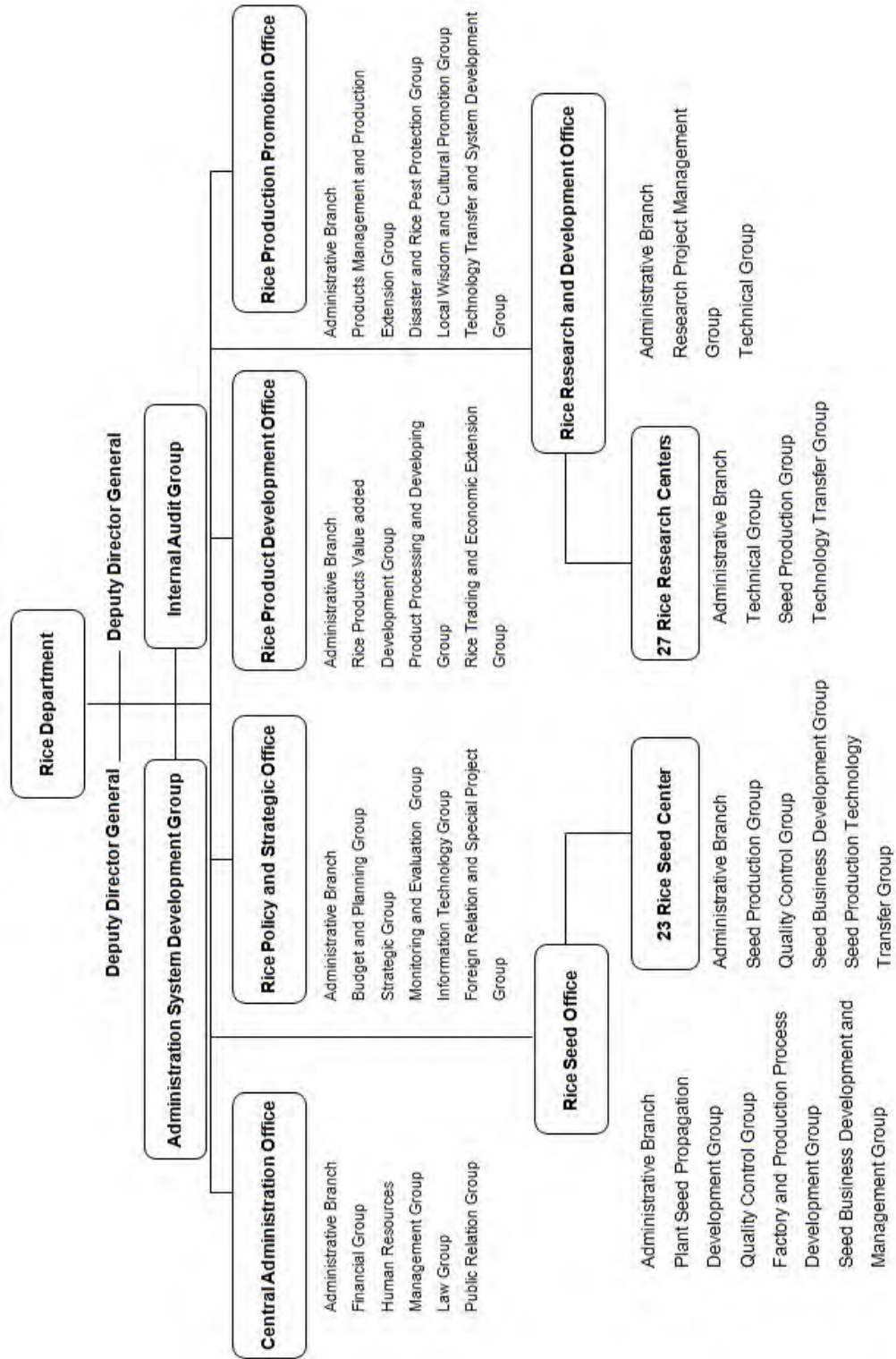
Appendix A-4-8



* Internal set-up offices

Figure Organization Structure for Department of Agricultural Extension

Organization Chart of Rice Department



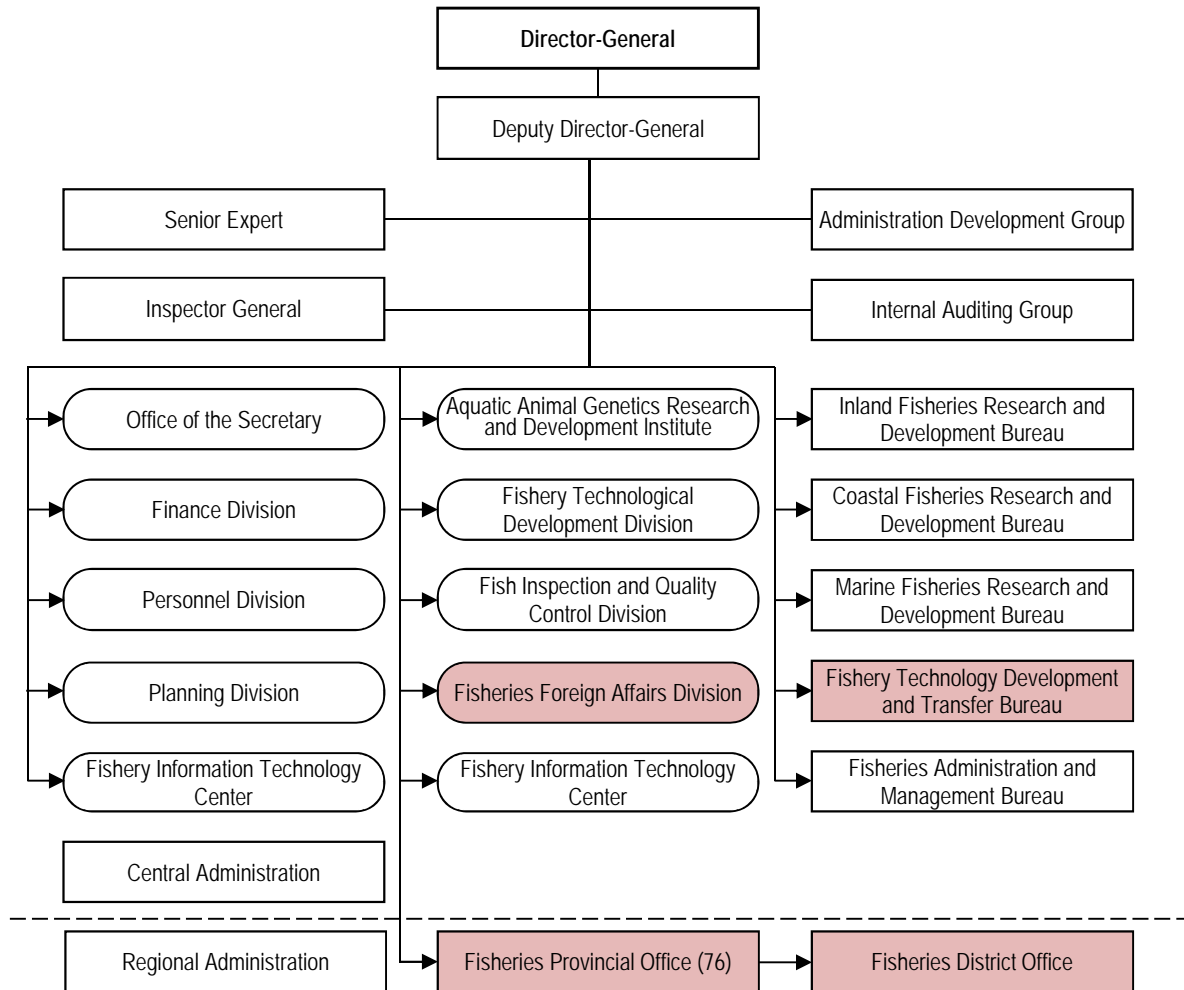


Figure: Organization Structure of Department of Fisheries, DOF

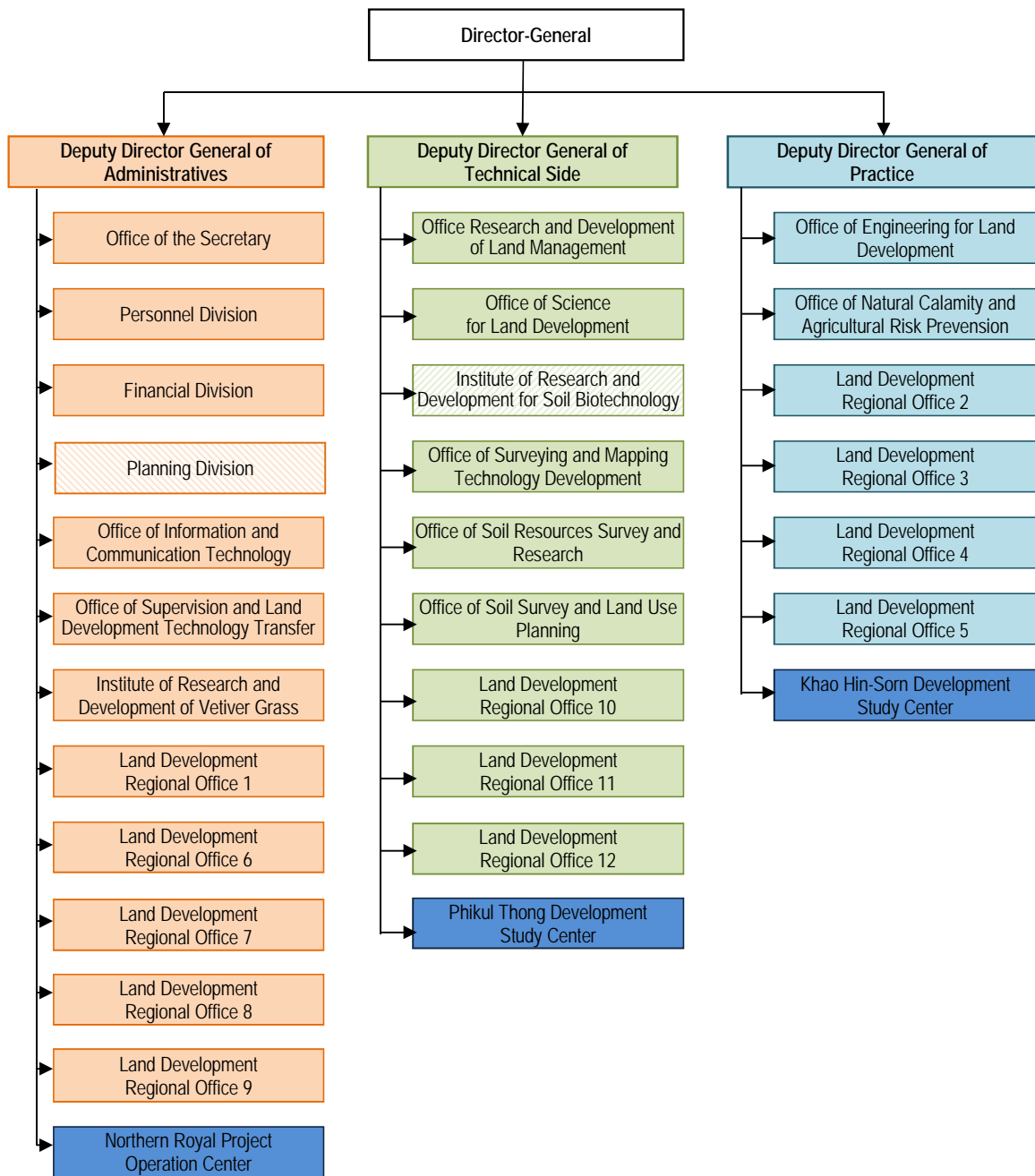


Figure: Organization Structure of Land Development Department, LDD

Local Administration System in Thailand Including the Relation with the Autonomous Body

National administration system in Thailand consists of the following 3 categories as per the 1991 Thai Government and Public Administration Act.

- Central administration (Ministries and Departments)
- Local administration (Provinces and Districts and etc.)
- Local autonomous bodies (Province, municipalities and sub-district levels)

Local offices of MOI, Ministry of Education and Ministry of Public Health and some of the Departments etc. are located at the provincial government offices and the district offices, and the officers stationed are sent down from the central offices of each Ministry and Department. The DDPM of MOI has their provincial offices in all the 77 provinces, though there is none of DDPM office at the District level. As discussed in the foregoing, the local administration in Thailand is simply being comprised of personnel from the central offices of Ministries and Departments, however in Thailand, they are considered as an independent entity, for which a juristic personality is granted. Provincial governors and District chief officers assigned by the MOI are given with the authorities to command and order to those officers sent from the central offices at the provincial and District level, respectively. In fact, however, the vertical relationship with the central office is given with higher priority than the horizontal collaborative relationship at the provincial office, showing the strongly-rooted sectionalism in the administrative system in Thailand even at the provincial as well as District level.

Concerning the local administration bodies under the District level, a District is composed of several Tambons (Sub-districts) and the Tambon is further divided into several Mubans (Villages). For Tambon and Muban, Kamnan (Chief Sub-district officer) and Phuyai Baan (Village Head) are appointed as the responsible person for the local administration at the respective levels. The village Head is to be elected directly by the people once in 5 years and the Kamnan is also directly elected by people among those candidates of village head once in 5 years as well. This implies that the kamnan and village head have a ground representing the people on one side and they are paid with their salaries by MOI having another ground being an agent of MOI. They are

responsible for local administrations including the registration of people, maintenance of security and communication of government's instruction to the people and so forth.

While for the local administration on autonomy basis, there are provincial autonomy body, Thesaban and Tambon Administration Organization (OBT or TAO). Those organizations are composed of the Chief officer and members of the assembly as directly elected by the people at each level. The figure below shows the two-tier structure of local administration in Thailand as discussed above. The co-existence of the administrative line and the autonomous line is the unique characteristics involved in the local administration organization in Thailand. To this end, it can be concluded that the local administration including the local autonomous line organization in Thailand is characterized by the strong-rooted centralized nature. However, at the levels of province and District which are arranged with the functional representatives, sectionalism by the Ministries and Departments concerned are quite persistent and as the results the authority and commanding system to the personnel concerned by the provincial governor and the District Chief are yet to be materialized in future.

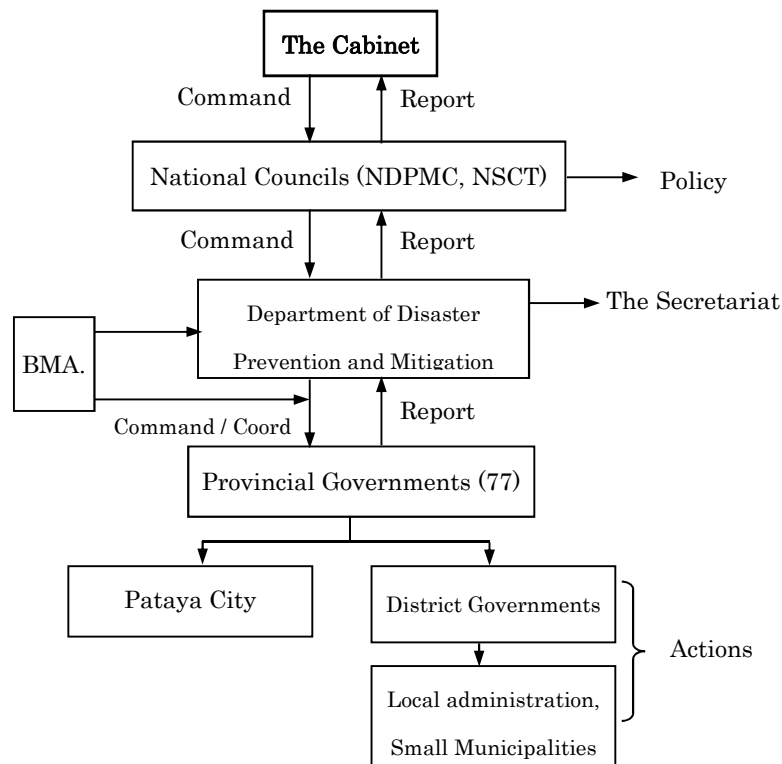


Figure: Disaster Management System

The Disaster Prevention and Mitigation Plan (2009)

Flood and Landslide

10.1 Introduction

Thailand has long been traditionally vulnerable to flood and landslide particularly during the monsoon season which lasts from May to September each year. During this time of the year, the heavy and continuous downpour has triggered the severe flood in both agricultural and inhabited areas which sometimes resulted in heavy casualties and always tremendous economic loss. As the consequence, water management has become the challenging issue for all concerned.

In addition to the natural cause, the anthropogenic activities such as community settlement, physical construction, slash and burned cultivation and deforestation have exacerbated flood situation. This exacerbation eventually causes the landslides in mountainous regions.

Recognizing the importance of preparedness arrangement for preventing and minimizing the impacts of these natural hazards on life and property as well as national economy, Department of Disaster Prevention and Mitigation has formulated "Flood, Tropical Cyclone and Landslide Management and Provision of Relief Assistance Master Plan" (5-Year Plan), and submitted for the Cabinet's approval on 25 September, 2007. This master plan has stipulated frameworks and guidelines to be taken by all agencies concerned for dealing with these natural hazards. And on 5 August, 2009, the Cabinet has approved the Plan along with the budget for putting it into motion.

10.2 Objectives

10.2.1 To prevent and mitigate the adverse impact of flood and mudslide on life and property of people.

10.2.2 To facilitate and ensure effective and timely provision of assistance to affected people as well as rehabilitation of the stricken areas to normalcy as soon as possible.

10.2.3 To identify the clear and integrative tasks and responsibilities to be taken by all government agencies as well as non-government network organizations concerned for dealing with flood and landslide hazards.

10.3 Terminology

10.3.1 **Flood** is defined as an overflow or accumulation of an expanse of water that submerges land. It is usually due to heavy rainfall events produce a large volume of water within a body of water such as river or canal, exceeding the total capacity of the body, and as a result, some of the water flows or sets outside of the normal perimeter of the body. In addition, human activities such as blocking the natural flow of water either intentionally or unintentionally can produce flood, often causing significant fatalities and material and environmental damage.

(1) **Inundation/Over Bank Flow**

Inundation is a gradually rising and spreading of water from continuous heavy downpour due to slow dissipation or ineffective drainage system. Whilst overbank flow is slow kind of flooding due to the large volume of rainfall navigated to a river at a too rapid speed beyond the coping capacity of a river channel. These floods mainly occur in the river basins, urban areas and in the lowest reach area of a river.

(2) **Flash flood** is a rapid or sudden flooding in the poorly absorbent areas and precipitous terrains due to the massive and sudden rainstorm. Flash flood can also occur after the significant and unexpected event such as a collapse of man-made structure such as dam, reservoir etc. Flash flood most often occurs in normally dry areas that have recently received precipitation, but may be seen anywhere down the stream from the source of precipitation, even the very long distance from the source. Flash flood is extremely dangerous due to its sudden nature and rapid flow that provide little protection or evacuation.

10.3.2 **Landslide or Mudslide or Debris Flow** is defined as the downslope movement of earth mass, rock or debris due to the force of gravity. Landslide can occur on any terrain given the right conditions of soil, moisture and the angle of slope. The rate of movement of a landslide can range from extremely slow or extremely rapid owing to the types of materials, gradient, environment and volume of rainfall. In addition to water related

factor, earthquakes and volcanic eruptions are other natural causes of landslide. Landslide causes severe property damage, injury, and death and adversely affects variety of resources.

10.4 Countermeasure Procedure

The operating procedure and countermeasures required to be taken by National Command Headquarters, Local Command Center of all levels, and all agencies concerned for preparing to deal with flood and landslide hazards in all aspects of disaster management cycle, have been identified as follows:

10.4.1 Pre-Disaster

(1) Prevention and Impact Reduction:

The designated disaster management mechanisms are required to take the following actions:

(1.1) Undertake risk assessment by analyzing potential flood and landslide hazard and evaluating existing conditions of vulnerabilities to reveal the probability of their occurrence. In addition, the concurrent flood and landslide impact study is required to achieve information which is important to help identify appropriate and tangible measures for handling flood and landslide hazards. The key implementing agencies include Department of Disaster Prevention and Mitigation, Department of Mineral Resources, Thai Meteorological Department, Land Development Department, Department of Water Resources, Royal Irrigation Department, Department of National Park, Wild Life and Flora, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(1.2) Review and update the existing data on flood and landslide prone areas as well as on safety area to accommodate the evacuees. The key implementing agencies include Department of Disaster Prevention and Mitigation, Department of Mineral Resources, Land Development Department, Thai Meteorological Department, Department of Water Resources, Royal Irrigation Department, Department of National Park, Wild Life and Flora, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(1.3) Create flood and landslide hazard map through the use of the same standardized format both in terms of the scale and detail of the map. The key implementing agencies include Department of Disaster Prevention and Mitigation, Department of Mineral Resources, Land Development Department, Department of Water Resources and Bangkok Metropolitan Administration.

(1.4) Survey, design, and construct relevant structural facilities or improve water resources or roads for the useful purpose of flood and landslide prevention and mitigation in the area under responsibility (**in compliance with guidelines identified in Chapter 4, item 4.4.4**). The key implementing agencies include Department of Water Resources, Department of Disaster Prevention and Mitigation, Royal Irrigation Department, Department of Highways, Department of Rural Roads, Provincial Government, District Office and Local Administration Organization.

(1.5) Create database on relevant personnel, mechanical equipments, rescue equipments, and supplies to ensure their immediate availability and serviceability in the event of disaster. The key implementing agencies include Department of Disaster Prevention and Mitigation, Royal Irrigation Department, Department of Mineral Resources, Department of Water Resources, Department of Public Works and Town & Country Planning, Department of Highways, Department of Rural Roads, Emergency Medical Institute of Thailand, Provincial Government, District Office, Local Administration Organization, Bangkok Metropolitan Administration, foundation and private sector.

(1.6) Develop flood and landslide interagency information sharing system. The key implementing agencies include The Office of Permanent Secretary for Ministry of Agriculture and Cooperatives, Department of Disaster Prevention and Mitigation, Thai Meteorological Department, Royal Irrigation Department, Land Development Department, Department of Mineral Resources, National Disaster Warning Center, Department of Water Resources, Department of Public Works and Town & Country Planning, Department of Highways, Department of Rural Roads, Geo-Informatics and Space Technology Development Agency, Department of National Park, Wild Life and Flora and Bangkok Metropolitan Administration.

(1.7) Organize public education training and campaign to raise awareness among all members of the community at risk and to deliver information to help them understand potential disaster as well as measures to be adopted for self-protection and safety (**in compliance with guidelines identified in Chapter 4,**

item 4.3.3). The key implementing agencies include The Office of Permanent Secretary for Ministry of Education, Department of Disaster Prevention and Mitigation, Department of Mineral Resources, Department of Water Resources, Land Development Department, Royal Irrigation Department, Thai Meteorological Department, Public Relations Department, Bangkok Metropolitan Administration and educational establishment.

(1.8) Summarize and document lessons learned from past major flood and landslide disasters to gain valuable information useful for reference and future management. The key implementing agencies include Department of Disaster Prevention and Mitigation, Department of Mineral Resources, Thai Meteorological Department, Royal Irrigation Department, Land Development Department, Department of National Park, Wild Life and Flora, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(2) Preparedness Arrangement

The designated disaster management mechanisms are required to take the following preparatory actions.

(2.1) Arrange the specific training programme and organize civil defence volunteer corps, village-based disaster warning volunteers, and search and rescue volunteers to provide assistance to government officials' efforts. The key implementing agencies include The Office of Permanent Secretary for Ministry of Public Health, Department of Disaster Prevention and Mitigation, Department of Mineral Resources, Department of Water Resources, Land Development Department, Provincial Government, District Office, Local Administration Organization, Bangkok Metropolitan Administration, and foundation.

(2.2) Organize the orientation training programme to promote and strengthen people involvement in disaster management by using community-based disaster risk management approach (**in compliance with guidelines identified in Chapter 5, item 5.3.3 (3.2)**). The key implementing agencies include The Office of Permanent Secretary for Ministry of Education, Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization, Bangkok Metropolitan Administration, Thai Red Cross Society and educational establishments.

(2.3) Prepare the particulars of the related field experts or the list of relevant personnel from all concerned agencies. The key implementing agencies include Department of Disaster Prevention and Mitigation, Royal Irrigation Department, Department of Water Resources, Department of Mineral Resources, Land Development Department, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(2.4) Take the required steps to formulate Flood and Landslide Prevention and Mitigation Integrated Action Plan at all levels in a way that it is compatible with National Disaster Prevention and Mitigation Plan and other relevant plans. The key implementing agencies include Department of Disaster Prevention and Mitigation, Royal Irrigation Department, Department of Water Resources, Department of Mineral Resources, Land Development Department, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(2.5) Develop flood forecasting system, install flood warning equipments in the areas at risk, and assign the officials to keep careful watch to ensure timely warning of potential flood and landslide. The key implementing agencies include Thai Meteorological Department, Department of Water Resources, Royal Irrigation Department, Department of Disaster Prevention and Mitigation, National Disaster Warning Center, Department of Mineral Resources, Hydrographic Department Royal Thai Navy, Department of National Park, Wild Life and Flora, Electricity Generation Authority of Thailand, Kasetsart University and Bangkok Metropolitan Administration.

(2.6) Arrange for the stock of basic necessities for immediate distribution to affected people in the event of disaster. The key implementing agencies include The Office of Permanent Secretary for Ministry of Public Health, The Office of Permanent Secretary for Ministry of Energy, Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization, Bangkok Metropolitan Administration and Thai Red Cross Society.

(2.7) Arrange for emergency stock of energy supplies (**in compliance with guidelines identify in Chapter 5, item 5.3.7**). The key implementing agencies include The Office of Permanent Secretary for Ministry of Energy, Petroleum Authority of Thailand and private sector.

(2.8) Arrange for the preparedness of main, auxiliary and standby communication systems and take all necessary steps to ensure the adequate availability and round the clock serviceability of communication equipments and supplies **(in compliance with guidelines identified in Chapter 5, item 5.3.8)**. The key implementing agencies include The Office of Permanent Secretary for Ministry of Information and Communication Technology, Royal Irrigation Department, Department of Water Resources, Department of Mineral Resources, Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(2.9) Arrange and earmark safety areas as well as indispensable public utilities for receiving the evacuees. The key implementing agencies include Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(2.10) Organize disaster exercise based on flood and landslide scenario **(in compliance with guidelines identified in Chapter 5, item 5.3.9)**. The key implementing agencies include Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

10.4.2 During Disaster

The designated disaster management mechanisms are required to take the following actions to handle disaster emergency situation.

(1) Upon obtaining confirmation of flood and slide, take the immediate steps to set up Emergency Operations Center of which level is compatible with the prescribed scale of disaster **(in compliance with guidelines identified in Chapter 6, item 6.3.2 (1) and (2))** and deploy personnel to base and perform the functions of the Center as identified in item 6.3.2 (3).

(2) In case of necessity to collect donations both in cash and in-kind from general public, Emergency Operations Center concerned is required to set up donations collection center. Further, it should coordinate with and consult government agencies concerned about the measures to be adopted for safeguarding donated cash and items, and for ensuring the proper, equitable, and timely distribution **(in compliance with guidelines identified in Chapter 6, item 6.3.13)**.

(3) In case of necessity to request for foreign assistance, Emergency Operations Center concerned is required to coordinate with Department of Disaster Prevention and Mitigation to further notify Ministry of Foreign Affairs to proceed. **(in compliance with guidelines identified in Chapter 4, item 4.2.6)**. The key implementing agency is Ministry of Foreign Affairs.

(4) Conduct identification of dead body **(in compliance with guidelines identified in Chapter 6, item 6.3.10)**. The key implementing agency is Royal Thai Police Forensic Science Bureau.

10.4.3 Post-Disaster

The designated disaster management mechanisms are required to take the following actions.

(1) Emergency Operations Center of which the stricken areas are under responsibility is required to conduct initial damage and needs assessment survey, prepare the lists of affected people and damaged property, and issue them letter of credentials as written verification for receiving relief and rehabilitation assistance **(in compliance with guidelines identified in Chapter 6, item 6.3.11)**.

(2) Take immediate steps to provide temporary shelter and basic necessities; improve and restore physical and mental health as well as livelihoods of affected people to normalcy as soon as possible. The key implementing agencies include The Office of Permanent Secretary for Ministry of Health, Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(3) Management of Dead Bodies

(3.1) Arrange temporary mortuary for the storage of dead bodies and facilities for conducting identification. The key implementing agencies include The Office of Permanent Secretary for Ministry of Public Health, Royal Thai Police, Provincial Government, District Office and Local Administration Organization.

(3.2) The identification of dead bodies must be conducted according to Agreement on Cooperation in Identification and Repatriation of Dead Bodies after Severe Disaster between Department of Disaster Prevention and Mitigation and Royal Thai Police **(in compliance with guidelines identified in Chapter 6, item 6.3.10)**.

(3.3) In case where transport of dead bodies is required, Emergency Operations Center concerned must collaborate with District Office and Provincial Government to direct the process. Ministry of Transport, Ministry of Public Health, Royal Thai Police and other agencies will provide support as needed.

(4) Take all measures required to prevent, keep close watch and control the outbreak of epidemic and disease that might affect the physical and mental well-beings of people. The key implementing agencies include Department of Disease Control, Department of Health, and Department of Mental Health.

(5) Take immediate steps to improve and restore physical and mental health and livelihood of affected people to normalcy as soon as possible (**in compliance with guidelines identified in Chapter 7, item 7.3.1**). The key implementing agencies include Ministry of Social Development and Human Security, The Office of Permanent Secretary for Ministry of Public Health, The Office of Permanent Secretary for Ministry of Labor, The Office of Permanent Secretary for Ministry of Agriculture and Cooperatives, Department of Disaster Prevention and Mitigation, Provincial Government, District Office, Local Administration Organization, Thai Red Cross Society and other agencies concerned.

(6) Rehabilitate, repair, and improve community environmental condition including waste water treatment system, garbage and waste disposal system, and deep wells disrupted by flood and landslide to resume their normal serviceability. The key implementing agencies include Pollution Control Department, Department of Groundwater Resources, Department of Health, Provincial Government, District Office, Local Administration Organization and Bangkok Metropolitan Administration.

(7) Ensure appropriate repair and maintenance of basic infrastructure facilities and public facilities to resume their normal functions such as government offices, school building, tourist attractions etc., as well as improvement of damaged environment and solution of pollution issues (**in compliance with guidelines identified in Chapter 7, item 7.3.2**). The key implementing agencies include The Office of Permanent Secretary for Ministry of Education, The Office of Permanent Secretary for Ministry of Information and Communication Technology (TOT Corporation Public Company Limited and CAT Telecom Public Company Limited), Department of Disaster Prevention and Mitigation, Department of Public Works and Town & Country Planning, Department of Highways, Department of Rural Roads, Royal Irrigation Department, Provincial Government, District Office, Local Administration Organization, Bangkok Metropolitan Administration, Provincial Electricity Authority and Metropolitan Electricity Authority, and Provincial Waterworks Authority and Metropolitan Waterworks Authority.

(8) Emergency Operations Center of which the stricken areas are under responsibility is required to carry out the primary disaster rehabilitation efforts by using budget of the local administration organization concerned. And in case of budget inadequacy, the aforesaid center has been entitled to request for Disaster Relief Contingency Fund by proceeding according to Ministry of Finance Regulation on Disaster Relief Contingency Fund for Affected People Assistance B.E. 2546 (2003) and addendum.

(9) Organize the studies of the impact of flood and landslide on life and property of the people to gain valuable information useful for reference and future flood and landslide management. The key implementing agencies include Department of Disaster Prevention and Mitigation, Royal Irrigation Department, Department of Water Resources, Department of Mineral Resources, Land Development Department, Department of National Park, Wild Life and Flora, Bangkok Metropolitan Administration and educational establishment.

Strategic National Action Plan for Disaster Risk Reduction (2010-2019)

Relative Risk of Disasters in Thailand

Types of Disaster	Hazard	Vulnerability	Management	Disaster Risk
Flood	high	moderate	Moderate	high
Typhoon/Hurricane	high	high	moderate	moderate
Earthquake	low	low	poor	moderate
Landslide	moderate	low	poor	moderate
Drought	high	moderate	moderate	moderate
Fire	high	moderate	moderate	moderate
Explosion	high	moderate	poor	high
Accident	high	moderate	poor	high
Epidemic	low	low	moderate	low
Pests	moderate	low	poor	moderate
Civil Unrest	low	low	poor	moderate
Refugee migration	moderate	Low	moderate	moderate

Rank Order of Risk of Disasters in Thailand

Type of Disasters	Subjective Rank	Numeric Weight
Flood	high	2.39
Accident	high	2.37
Explosive	high	2.34
Typhoon	moderate	2.31
Drought	moderate	2.24
Fire	moderate	2.20
Land slide	moderate	2.15
Earthquake	moderate	1.97
Civil Unrest/Refugee Influx	moderate	1.87
Pests	moderate	1.77
Epidemic	low	1.63

The SNAP explains the character and causes of floods in Thailand as follows.

Flooding in Thailand is caused by nature (rain, thunderstorms, tropical hurricanes, heavy rain in the mountain, high tides) and by humans (deforestation, urban area extension to low areas, buildings that block natural water flow, and poorly-drained road constructions). Although very huge floods occurred in Thailand in 1917 and 1942, flooding typically happens every year ; with big floods in some years and very minimal floods in some years. However, recently, floods have become a common disaster phenomenon. In 2001, severe damage resulted when the country was flooded 14 times-60 provinces felt the impact with 244 people were killed and damage costing 3,666 million baht. In 2005, when it flooded 6 times, 48 provinces felt the impact with 27 people killed and 4,700 million baht in damage costs.

The SNAP plan shows the Vision and Objectives as in the followings.

Vision

Thailand's vision for Disaster Risk Reduction is to enhance the safety and security arrangements in Thailand to meet international safety and security standards within a decade (by the year 2018) ; to be a leader in Disaster Risk Reduction in the region; and to establish an integrated nation-wide action plan for the people and agencies at all levels in Thailand, from the local level to national level, in order to achieve a coordinated collaborative strategy and approach to disaster risk reduction.

Objectives

Thailand's disaster risk reduction objectives are to :

- enhance and sustain the safety and security of the life and assets of Thai citizens and those of its visitors, in line with international safety standards ;
- mainstream disaster risk reduction into national and sectoral development plans and programmes ;
- demonstrate clearly the intentions of the Royal Thai government with regards to national disaster risk reduction ;
- develop and prepare a long term Strategic National Action Plan for Disaster Risk Reduction for Thailand, that is in line with the Hyogo Framework for Action 2005-2015 ; (4)
- establish a long term action plan for all relevant agencies in Thailand which will synergize all activities in a systematic integrated approach in the same direction ; and

As for the components of SNAP, the plan emphasizes the participation from all groups of stakeholders so that the plan can be comprehensive and lucid to all stakeholders to the plan with having their own action plans. The plan is comprised of the two following components with the definitions as follows.

- **Normal Action Plan** : The Normal Action Plan is implemented under the responsibility and authority of each respective agency in each fiscal year or designated period. Only the disaster risk reduction elements of the Normal Action Plan will become a part of SNAP ; and
- **Compulsory Action Plan**: The Compulsory Action Plan, which specifically addresses the requirements of the HFA, has to be complied with and implemented by all agencies and communities from 2010 to 2019, as detailed in Item 10.5.

While, the plan discusses the implementation framework as follows, where, relationship and responsibilities of each agency are stated.

All agencies should fully understand the national disaster management framework so as to be knowledgeable of their respective status and roles. This comprises the National Preparedness Policy, which comprises the National Disaster Prevention and Mitigation Plan of the Ministry of the Interior and the National Protection Plan of the Ministry of Defense, providing the framework for all agencies to prepare their own action plans. The National Preparedness Policy encompasses all agencies' emergency plans, which are organized by main sources and types of disasters. It also identifies the respective Ministries or Departments which should be the main agencies responsible for establishing the emergency plan that covers all severity levels and should play a systematic role in coordinating and supporting the National Disaster Prevention and Mitigation Plan, Bangkok Disaster Prevention and Mitigation Plan, District Disaster Prevention and Mitigation Plan, Municipal Disaster Prevention and Mitigation Plan and Muang Pattaya Disaster Prevention and Mitigation Plan, under the 2007 Act of Disaster Prevention and Mitigation. It should also be coordinated with and support the Ministry of Defence's National Protection Plan, and should include action plans for evaluation, improvement and development and public relation within the National Preparedness Policy.

Within the national disaster management framework, the SNAP 2010-2019 supports and substantiates the National Preparedness Policy. The Normal and Compulsory Action Plans under the SNAP will support and facilitate the Disaster Prevention and Mitigation Plan at all levels. The framework also includes elements of evaluation, revision/improvement/development and public relations, as detailed in Diagram 8.1 This diagram shows the relation between the SNAP and the National Preparedness Policy within the context of Economic and Social Development Plan, and the National Preparedness Plan.

For ready reference and clear understanding in demarcation as well as relationships between/among various plans, stakeholders concerned as well as the steps of actions/procedures, the SNAP plan provides the following charts.

1. NESDB Plan and 4 year Govt. Administrative Plan incorporating SNAP
2. SNAP Implementation and Revision Framework
3. SNAP Implementation Process

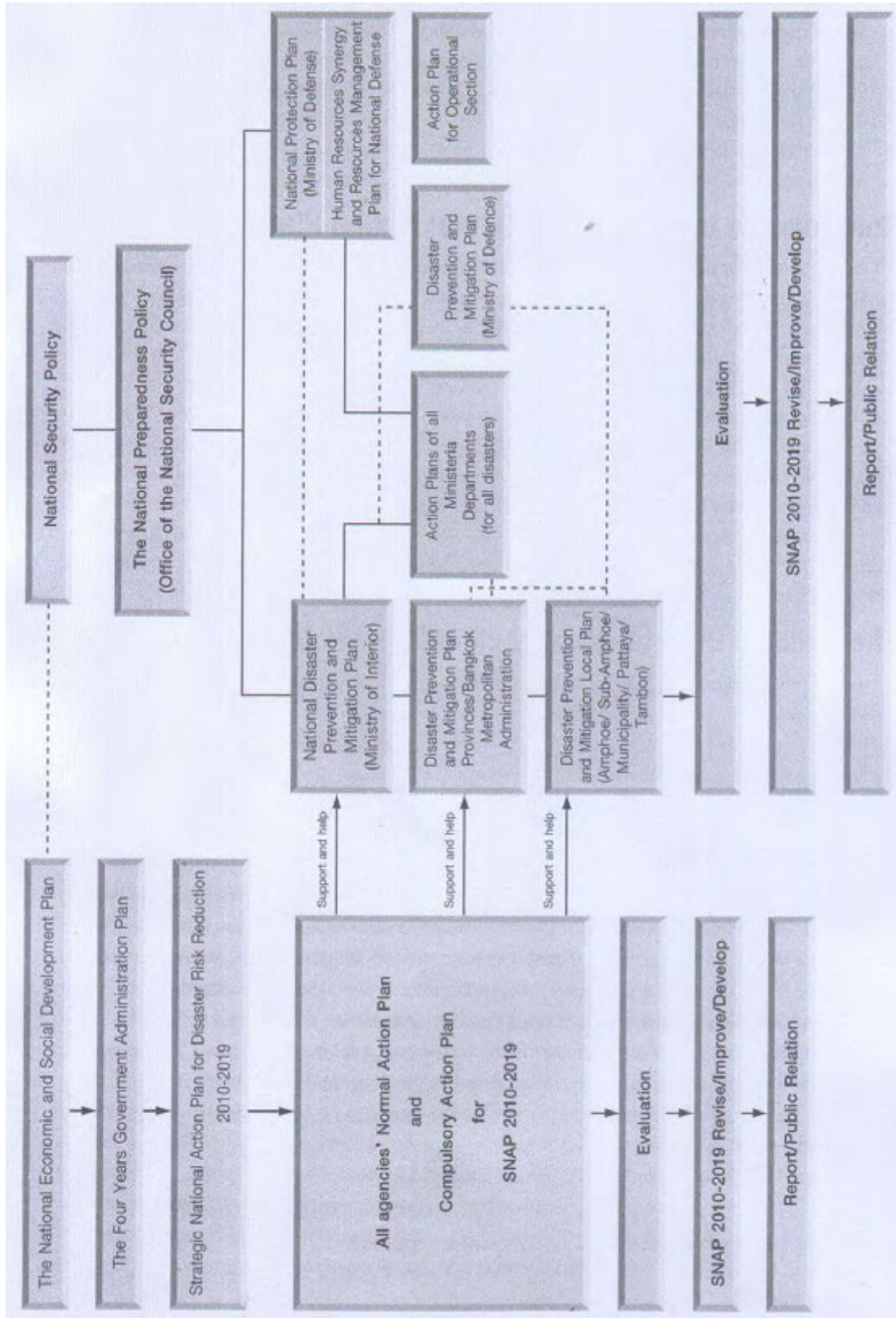


Diagram: The National Economic and Social Development Plan and Four-Year Government Administrative Plan incorporate the SNAP 2010-2019 and National Preparedness Policy

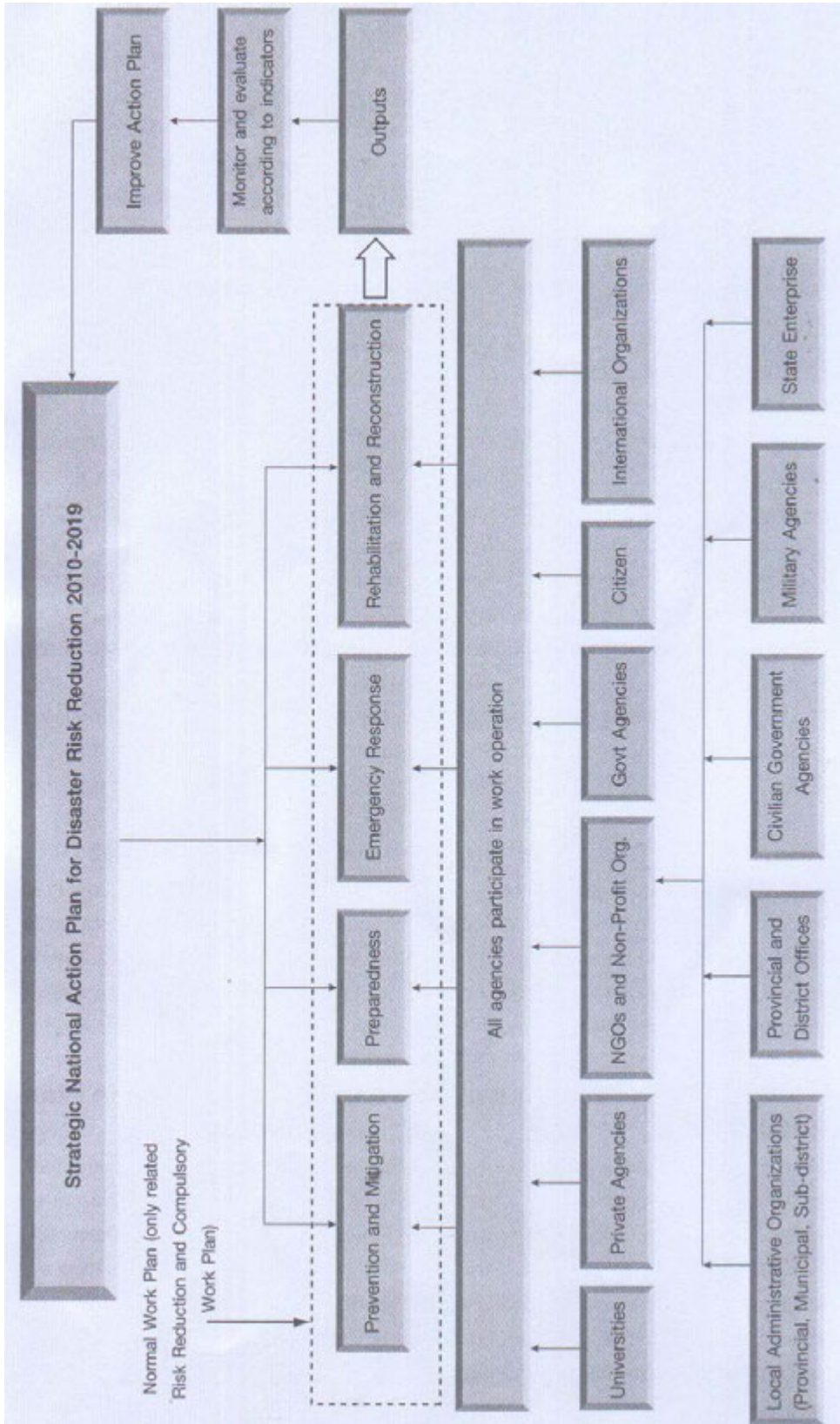


Diagram: SNAP Implementation and Revision Framework

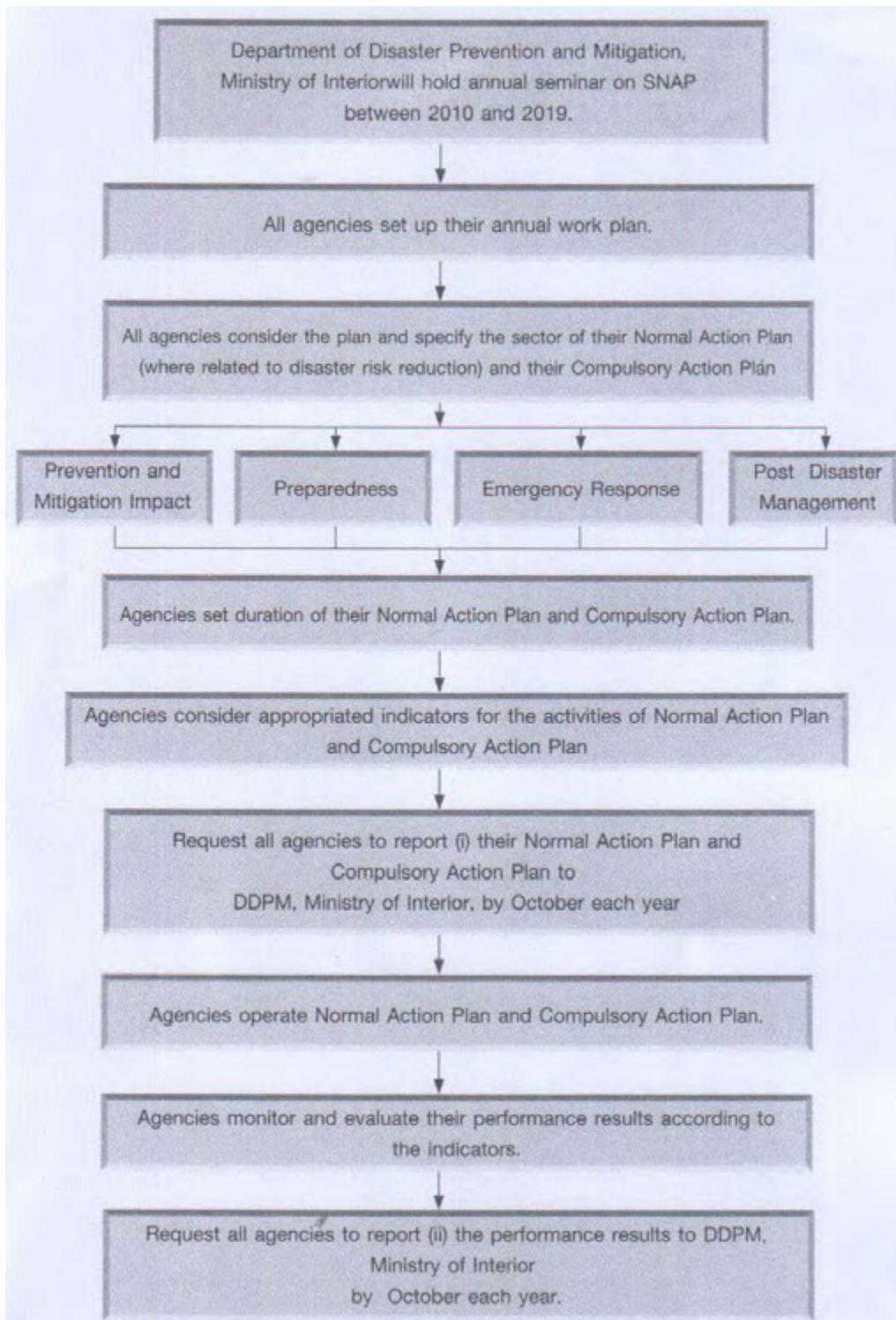


Diagram: SNAP Implement Process

M/P on Water Resource and Flood Management

Attachment 1

Action Plan of Water Management for the Urgency Period

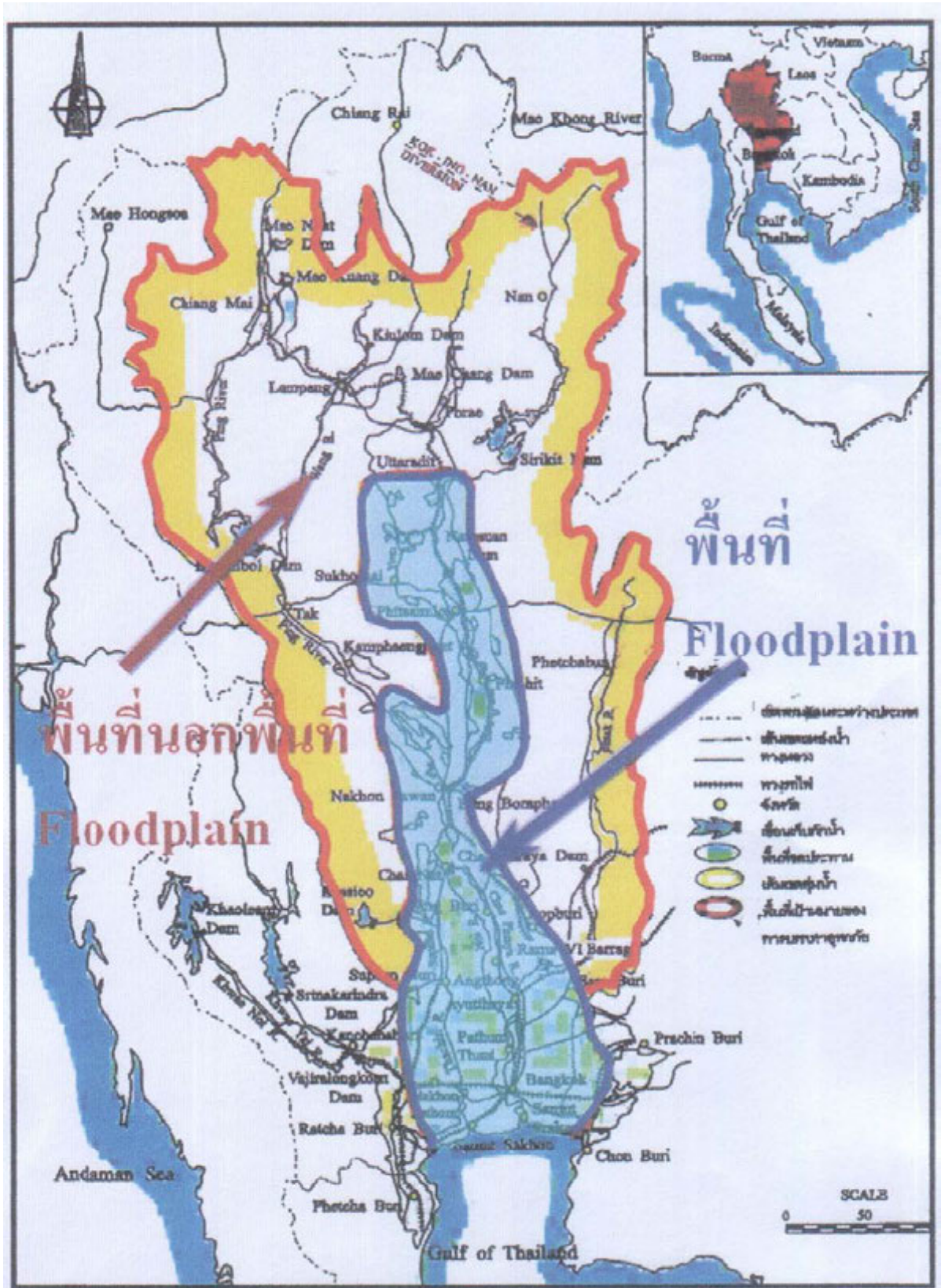
Work plan	Fiscal year 2012 (m฿)	Fiscal year 2013 (m฿)	Time frame	Authorities in charge
1. Work Plan for Management of Major Water Reservoirs and Formulation of Water Management	-	-	Report progress to SCWRM by Jan. 2012	Main: RID Support: EGAT, TMD, LAO, Sub-committee for Monitoring and Analysing Trends of Water Situation, and SCWRM
2. Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures	12,610.34	4,515.70	Projects finalised by Jan. 2012	Main : Subcommittee on Short-term Plan and Measures, Support: RID, HD, RRD, MD, MOI, BMA and SRT
- Renovation of dikes, dams, check dams and water drainage system for capacity increasing	7,062.82			
- Renovation of water drainage channel, digging canals, clearing canals and water drainage channels	1,695.27			
- Increasing capacity in water drainage and water run-off management	2,984.05			
- Strengthening dikes and carrying tasks recommended by King's initiative	868.20			
3. Work Plan for Information Warehouse, Forecasting and Disaster Warning System	4,500		Mar. 2012	Main: Dr Prodprasop Suraswadi and. RID Support MST, RTSD, RID, MOI, MNE, MI, Faculty of Engineering (CU), BMA, JICA and Dr Royol Chitradon
- Formulate Data Bank Plan/ Set-up National Data Centre				
- Formulate Forecasting System Upgrading Plan				
- Formulate Warning System Development Plan including Setting up CCTV System				
- Set up Water-Gate Remote Controlling System and Control Room				
4. Work Plan for Response to Specific Area	1,000	-	Mar. 2012	Main MOI, MoST, MoNRE, and MOD Support: MI, BMA, LAO, and communities in risk
- Develop flood protection system in important areas				

Work plan	Fiscal year 2012 (m฿)	Fiscal year 2013 (m฿)	Time frame	Authorities in charge
<ul style="list-style-type: none"> - Set up tool storing system - Formulate evacuation plan in case of flooding - Formulate plan for tackling polluted water from flood - Formulate plan for rehabilitation effected people - etc. 				areas
<p>5. Work Plan for Assigning Water Retention Areas and Recovery Measures</p> <ul style="list-style-type: none"> - Identify monkey cheek reservoirs in upper and lower Chao Phraya Water Basin - Formulate plan for channelling water to monkey cheek reservoirs - Identify measures of compensation to effected people 	-	-	Mar. 2012	Main MOAC Support: MOI
<p>6. Work Plan for Improving Water Management Institutions</p> <ul style="list-style-type: none"> - Arrange meeting between SCWRM and SCRFD to propose work plan for revising organization for water management - Set up ask force committee to monitor operation according to Action Plan of Water Management for the Urgency Period 	-	-	Jan. 2012	Main OCS Support: SCWRM SCRFD, MOI, MOAC, MoNRE, MOT, and OSCWRM .
Total	18,110.34	4,515.70		

Action Plan of Integrated and Sustainable Flood Mitigation in Chao Phraya River Basin

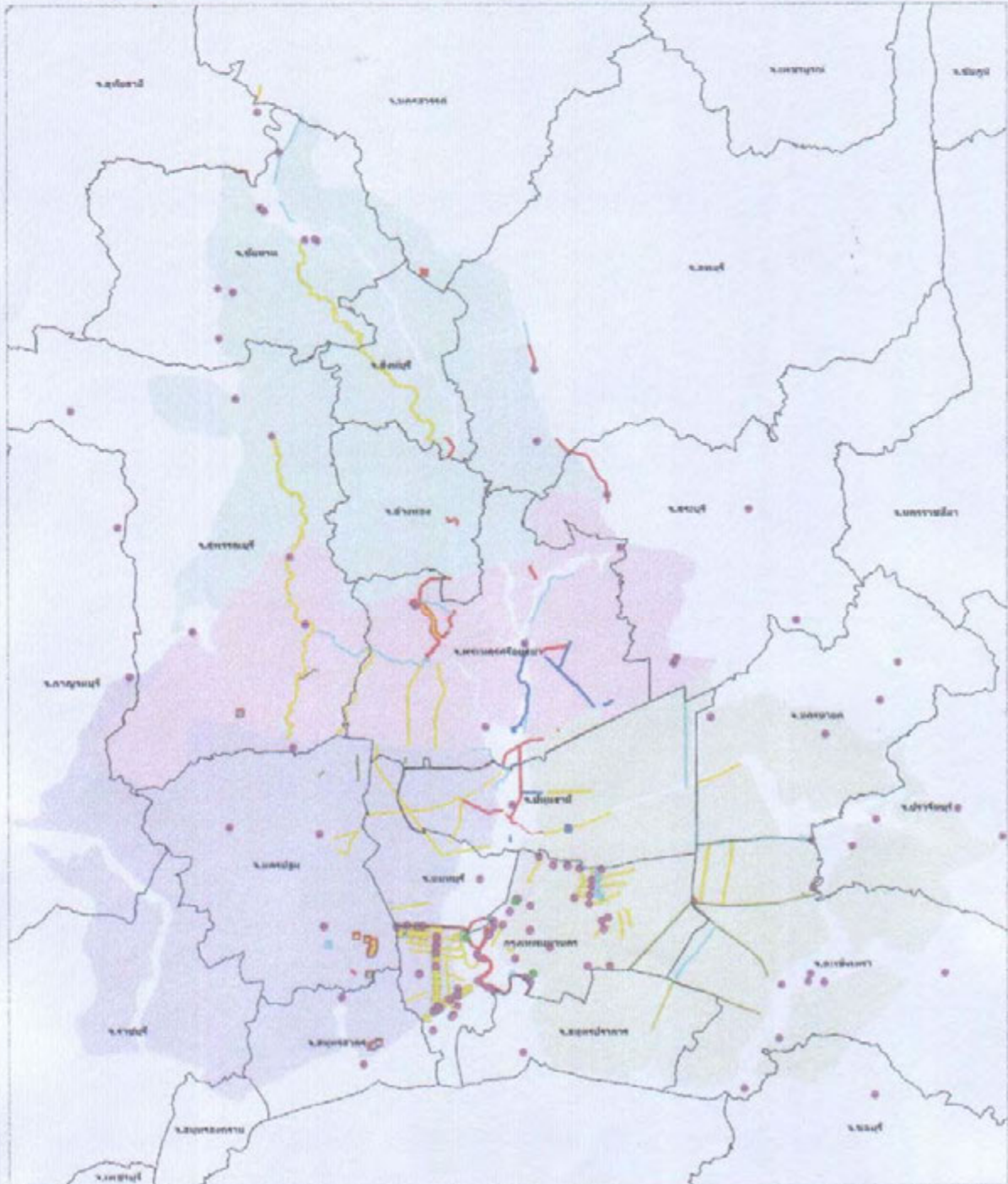
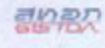
Work plan	Budget (m ฿)	Time frame	Authorities in charge
<p>1. Work Plan for Restoration and Conservation of Forest and Ecosystem</p> <p>Sample projects:</p> <ul style="list-style-type: none"> - Soil improvement and conservation in the upper river basin by reforestation and rehabilitation of forest areas in the river basin in Ping, Wang, Yom, Nan, Sakae Krung, Tha-Chin and Pa Sak - Reservoir construction in Yom, Sakae Krung, Nan, and Pa Sak water basin 	60,000	2012 onwards	MoNRE, MOAC, RiD
<p>2. Work Plan for Management of Major Water Reservoirs and Formulation of Water Management</p> <ul style="list-style-type: none"> - Formulation of water management plan in major dams and water management in various scenarios, as well as dissemination related information to the public 	-	2012 onwards	RiD and EGAT
<p>3. Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures</p> <p>Sample projects:</p> <ul style="list-style-type: none"> - Construction of flood ways or water channels roads, and dams and improvement of water dike, reservoir, water drainage and water gateway in order to deviate waters from Pa Sak and Chao-Praya rivers to the East or East and West efficiently. - Land use zoning and land utilization including setting up area protection system. - Improvement of quality of water in the main water channels and the remaining dikes. 	177,000	2012 onwards	MOAC, MOI, MoNRE, MOT, and OPM
<p>4. Work Plan for Information Warehouse and Forecasting and Disaster Warning System</p> <p>Sample project:</p> <p>Establishment of the database system, forecasting system, and warning system as well as setting up the institution, rules and regulations and enhancing the public participation.</p>	3,000	2012 onwards	OPM
<p>5. Work Plan for Response to Specific Area</p> <ul style="list-style-type: none"> - develop the system of flood prevention and mitigation in the important areas - set up the system of instrument and tool warehouse - negotiation with flood affected communities - treatment of polluted water due to flooding 	-	2012 onwards	MOI, MOAC, MoNRE, and MOT
<p>6. Work Plan for Selecting Water Retention Areas and Recovery Measures</p> <p>Project example</p> <ul style="list-style-type: none"> - Improving/adapting irrigated agricultural areas into retention areas (Monkey cheek reservoirs) of around 2 million rai to be able to grow second rice crop comprising of irrigated agricultural areas in 	60,000	2012 onwards	MOAC, MoNRE, and MOI

	Work plan	Budget (m ฿)	Time frame	Authorities in charge
	Phitsanulok, Ramsar Site and Greater Chao-Praya Project.			
7.	Work Plan for Improving Water Management Institutions <ul style="list-style-type: none"> - setting up the Task Force Committee for action plan management during urgency period. - setting up permanent integrated water management organizations. 	-	2012 onwards	OPM and related agencies
8.	Work Plan for Creating Understanding, Acceptance, and Participation in Large Scale Flood Management from all Stakeholders. <ul style="list-style-type: none"> - Increasing public awareness of the progress in water management carried out by the public sector as well as encouraging people participation on water management. 	-	2012 onwards	OPM and related agencies
	Total	300,000		

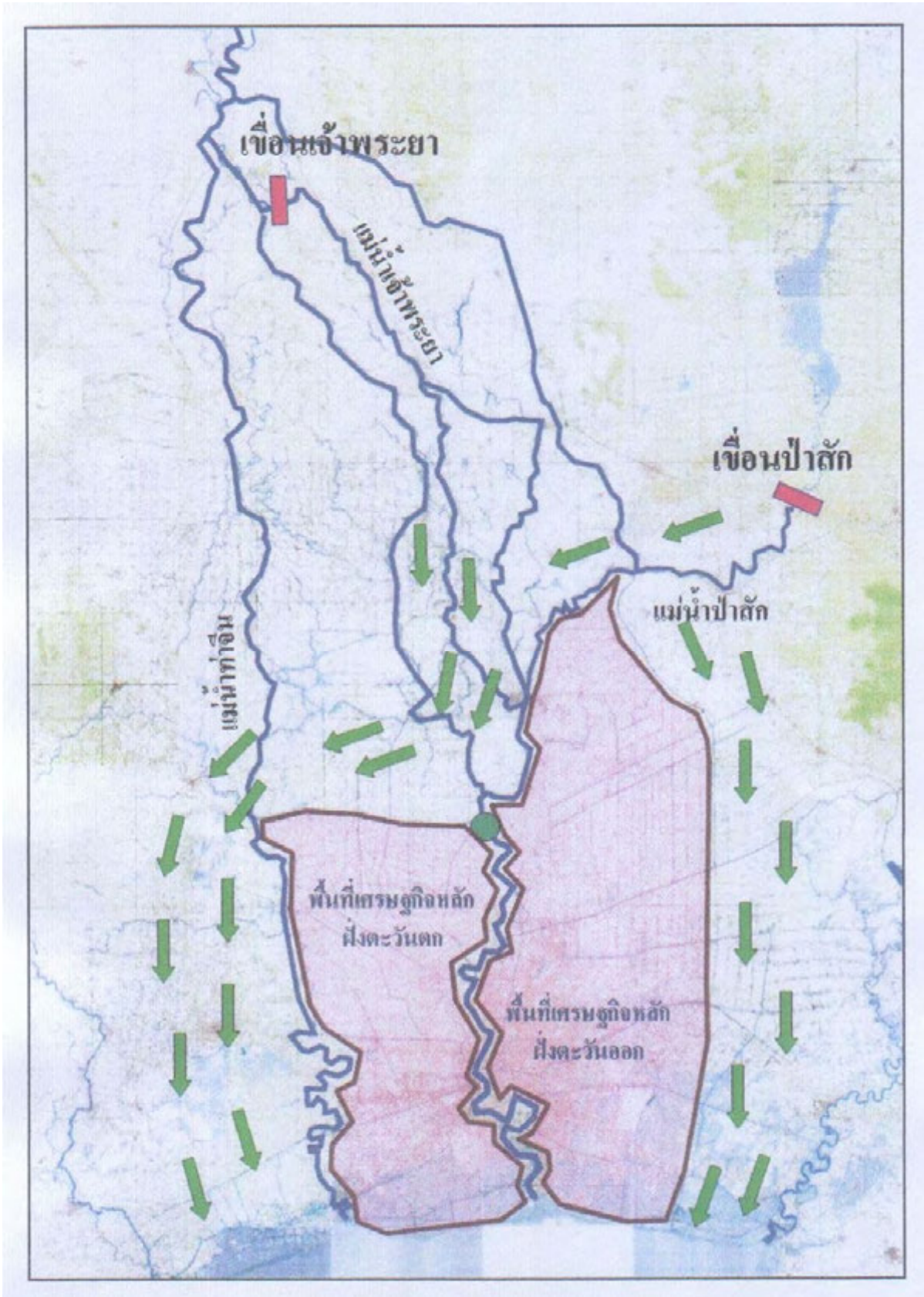




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- สัญลักษณ์**
- ศูนย์โครงการ
 - ▲ สถานีควบคุม
 - สถานีบริการ
- ประเภทโครงการ**
- งานติดตั้งโคมไฟส่องสว่าง
 - งานก่อสร้างระบบไฟฟ้า
 - งานติดตั้งกล้อง CCTV
 - งานติดตั้งระบบเสียง
- งานติดตั้งโคมไฟส่องสว่าง**
- งานติดตั้งโคมไฟส่องสว่าง
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- พื้นที่บริเวณ**
- zone 0
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 - zone 5
- สถานีโครงการ □ หน่วยป้องกัน



Supporting activities by JICA and other donors

(1) Project for Comprehensive Flood Management Plan for the Chao Phraya River Basin in Kingdom of Thailand

(a) Background

Because of the extra-ordinary rainfall from June to October in 2011, one third of the land in the whole country was inundated with water and Thailand suffered from severe flood damage. Since the flood affected Bangkok, industrial areas and agricultural land, serious losses have been reported. In the short term view, recovery of the facilities and infrastructure from the damage caused by the flood and countermeasures for the next rainy season is of urgent concern, in order to overcome the current critical economic situation. When viewing the situation in the long term, it is necessary to solve the constraints of the Chao Phraya river basin toward Bangkok and the industrial areas to prepare for floods expected to occur in the future.

Industrial and social development remains prioritized in Thailand, even after the inundation. Capacity development in disaster prevention and management has become an additionally prioritized area for the future. The government of Japan expressed the intention to support Thailand to recover from flood damage and prepare the countermeasures against any flooding in the future. This project commenced in December 2011 and is scheduled to be completed in May 2013. The project goals and outline of the project are summarized as follows.

(b) Goals

- (i) Emergency rehabilitation and urgent countermeasures will be implemented, and a comprehensive flood management plan for the Chao Phraya river basin will be reviewed and up-dated.
- (ii) Damage from flooding of the Chao Phraya river will be reduced.

(c) Outline of the Project

The project is a holistic project which consists of three (3) main components as follows.

Component 1: Comprehensive flood management plan considering the effect of climate change and land development. This component consists of two (2) sub-components as follows;

Sub-component1-1: Preparation of a detailed map necessary for reviewing the M/P of 1999.

Sub-component1-2: Review of the “Study on integrated plan for flood mitigation in the Chao Phraya River Basin” (hereinafter referred to as “M/P”).

Component 2: Outline design for Japanese Grant Aid for Disaster Prevention and Reconstruction

Component 3: Improvement of a plan of Flood Management System and its operation capacity

(2) The Project on Capacity Development in Disaster Management in Thailand (Phase II)

(a) Background

In response to the request from the Government of Thailand, Capacity Development in Disaster Management in Thailand (Phase-1), Project was implemented from Aug. 2006 to Aug. 2008. The following outputs were achieved by the Project.

- ♦ The collection, accumulation and utilization system on disaster and disaster risk management was established in the Department of Disaster Prevention and Mitigation (DDPM).
- ♦ Relations and communications between DDPM and other related organizations were strengthened through White Paper publishing and formulation of a National Disaster Prevention and Mitigation Plan.
- ♦ A training system for enhancing the capacity of DDPM staff on natural disaster management was strengthened.
- ♦ Capacities of DDPM staff and village people were enhanced to promote disaster management activities at community level.
- ♦ Capacities of MOE staff and teachers at model schools were enhanced to promote education for disaster preparedness at schools.

Even though the activities of the Phase-1 Project focused on natural and community levels, the involvement of provincial and local levels were insufficient. To improve and scale up disaster prevention and mitigation capacity in Thailand, it is essential to involve regions, provincials, local authorities, etc. in disaster management activities. The request of the Thai Government aimed at improving and up-scaling the outputs of the Phase-1, Phase-2 of the Project commenced in May 2010 and are scheduled to be completed in April 2014. Project purpose and outputs are summarized as follows.

(b) Project Goal and Purpose

Super Goal: Implementation of disaster risk management activities to be improved and scaled up throughout Thailand as well as damage caused by natural disasters are mitigated.

Overall Goal: Implementation of disaster risk management activities to be improved and scaled up.

Project Purpose: The capacity of DDPM is enhanced to scale up Disaster Prevention and Mitigation Action Plans, Community Based Disaster Risk Management (CBDRM) and disaster education, collaborating with concerned agencies at provincial and local levels.

(c) Outputs of the Project

Output 1: Disaster Prevention and Mitigation Action Plans with considerations for vulnerable people

are formulated by national, provincial and local authorities in the target provinces.

Output 2: Capacity of DDPM staff and facilitators on the implementation of Community Based Disaster Risk Management (CBDRM) is enhanced.

Output 3: Training curriculum at Disaster Prevention and Mitigation Academy (DPMA)

Output 4: Based on the natural disaster preparedness educational curriculum, schools have improved their preparedness for disaster.

(3) Support for Thailand's Flood Management Knowledge Forum

ADB in collaboration with the Office of the National Economy and Social Development Board, NESDB organized the captioned forum between the 19th and 20th of January, 2012. Flood management international experts and policy makers in Thailand participated in the forum and discussed flood management, prevention, preparedness, response and recovery in an effort to identify ways of strengthening water resource delivery and disaster risk management while improving the flood management system in Thailand.

Consistent with the on-going flood disaster efforts in Thailand, the following Technical Assistance was prepared and considered.

(i) Formulation of a Guideline of Monitoring and Evaluation for Flood Management Projects

Flood countermeasure projects are going and to be implemented at this time by related agencies concerned in Thailand but there are no monitoring and evaluation system so far. ADB will aim to support this issue and also project will be complemented by the revised JICA's Flood Mitigation Master Plan.

(ii) Study on Flood Management Plan in Yom river basin

Due to a lack of information concerning the flood as well as analysis so far, a flood management plan has not yet developed for the Yom river basin. ADB aims to contribute to flood countermeasures in the river. The study will draw attention to social fields such as the environment and ecosystem.

(iii) Disaster Management Program for Community Orientated base.

The program aims to implement small scale social development activities for disaster management at urban and rural community levels financed by Japan Fund for Poverty Reduction, JFPR. Lessons learnt from the pilot project implemented by the component 3 of the Project by JICA will be contributed to the program.

(4) FAO support for flood- affected livestock farmers in Thailand

FAO has implemented the emergency support for small livestock farmers affected by the 2011 flood

in collaboration with the Department of Livestock Development (DLD), MOAC from 2011 to 2012 under the *“TCP/THA/3306-Emergency Assistance to Support the Recovery of Agriculture-based Livelihood System of Flood-Affected Farmers”*

Some 2,500 poor and vulnerable livestock farmers in eight provinces namely Ayuthaya, Angtong, Chinat, Lopburi, Nakornpathom, Nakhonsawan, Saraburi and Sukhothai in the most affected regions were selected as the project beneficiaries. Each received 30 days of animal feed in the form of concentrate, minerals, vitamins and antiparasites aimed at improving the health conditions of the animals. In addition, 40 livestock farmers with 25 people each were provided with technical advice and training on animal health care and disaster preparedness. The training was very similar to the JICA support training. And 38 Governmental officers from DLD and Department of Disaster Prevention and Mitigation were trained as TOT for disaster preparedness including participatory planning and preparing future development proposals in Sukhothai.

In addition, FAO has implemented monitoring and evaluation since 2012. The project aims to follow-up the situation of use and management for provided materials and equipment and also to grasp the training evaluation, output, and impact to the farmers who participated in the training. In the next stage, provision of mowers, grass choppers, etc. and training will be planned

Appendix B

Government Operation Policy	Output
<p>General policies 3 policies 3.3 Economic Restructuring 3.3.1 Agricultural Sector 3. Potential of Livestock Development 3/1 Focus on safety food and environment.</p> <p>Remark: GAP (Good Agricultural practice) = farm management, animal health care and welfare of animal. GMP (Good Manufacturing Practice)= Safety food for people. HACCP (Hazard Analysis Critical Control)= to control hazard of plant/animal production. Compartment system Farmer/group participates, aware and control of disease including measure of bio-organic for commercial.</p> <p>3/2 Increasing potential of control, prevent and diagnosis for infection from animal to human.</p> <p>3/3 Developing animal bio-technology.</p> <p>3/4 Assistance to farmers affected by flood.</p>	<p>Output were as followed;</p> <ol style="list-style-type: none"> 1. Certificated for 8,023 farms of GMP. 2. GMP/HACCP certification of 100 animal feed producers. 3. GMP/HACCP certificated for 124 of slaughtering and processing. 4. Investigation and certification for 1,019 slaughters. 5. Certified for 227 butchers. 6. Certified for 3,353 of animal feed shop. 7. Certificated for 21 compartments. 8. Health certificate for 14189 letters, 164,864 tons, value is 22,752 million baht. 9. File the case of 4 cases on animal feed control, control 12,222 pigs. 10. Livestock goods analysis for 154,728 samples. <p>Animal Production Development</p> <ol style="list-style-type: none"> 1. Study and research on livestock for 85 researches. 2. Good animal production for 1.3062 million heads. 3. Animal nutrition produced for 41,284 tons. 4. Established 193 networks of livestock production. 5. Flagship project is ongoing/implementing step. Step on preparation for officer training for A.I. and find A.I. unit for service. <p>Extension and potential develop for farmer</p> <ul style="list-style-type: none"> - Transfer knowledge and technology on animal production for farmer by training, mobile unit service. - Supported The Royal Initiation project. - Organic animal production, sufficient economy. <p>Results</p> <ol style="list-style-type: none"> 1. Training for 45,486 small farmers. 2. Support 12,231 farmers under royal initiative project. 3. Support 51 schools under royal initiative project.

	<p>Animal Health Development</p> <p>To increase efficiency of prevention and control as well as diagnostic and eradication by awareness the symptom of animal in the area. Alert is also in the laboratory. Prevention of contagious disease through vaccination as well as treatment. Keep control of movable or transportation of animal. Animal disease control importing or exporting through international control low by;</p> <ol style="list-style-type: none"> 1. Vaccination to all animal of farmer at 10.4881 million heads. 2. Treatment and wormination to farmer's animal 2.6572 million head. 3. Treatment to the site that may take risk to contagious disease, especially to the small farmer holder of fowl and bird 774,967 sites. 4. Testify and diagnostic of disease at 352,015 sample. <ol style="list-style-type: none"> 1. Production of 57.17 million doses (cattle+ Buffalo are 6.87 million doses. Swine is 12.80 million doses and flow is 37.50 million doses. 2. Expanding vaccine producing to meet universal standard (GMP). Now on processing of lay out and construction (TOR). 3. Checking the vaccine quality produced by DLD 753 items as well as those imported 5 items. <ol style="list-style-type: none"> 1. To assist farmers by establish 4 temporary center with 7,274 heads. Serviced also for animal health 2,017,238 heads. Also move animal into a place that free from flood at 479,878 heads. 2. Arrangement on compensation lost to farmers. <ul style="list-style-type: none"> - Bureau of budget has allocated to 26,197 farmers at 176,435,721 baht. - A reserve fund under governor authority of 5,553 farmers at 9,169,407 baht. <p>In conclusion farmers have got compensation fund 31,750 households with total amount of 185,605,128 baht.</p> 3. Arrangement of forage crops to farmer at 6,968 tons and also opened free of 29 forage crop centers/stations to get grass for their cattle.
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Urgent Policy will operating in first year	Output
<p>1. Urgent Policy will operating in first year 1.5 Peace and safety life and property of people in red zone (3 provinces) in southern part of Thailand.</p> <p>1) Develop economy and social to keep away from poverty through by sufficient economy.</p>	<p>Plan</p> <ul style="list-style-type: none"> - To solve and development in the most southern provinces. <p>Project</p> <ul style="list-style-type: none"> - Extension, as well as promotion in area of agricultural career. <p>To promote and create the skillful of agricultural career to 8,264 farmers those are from most southern provinces.</p>

AppendixB-2 : Mandate of Units under the Central DLD

Department unit	Duties and Responsibilities	Remarks
Internal Auditing Unit	Auditing the management of budget, account system and properties - Give advice on financial information concerned to the Director General - Inspection of organization's accounts and finance according to the law and regulation concerned - Analyse and evaluate Auditing Service Unit - Examine and evaluate the project implementation under organization on budget spending procurement	
Administration Development Unit	Administration system improvement	
Office of Department Secretary	- General office works, library and legal duties - Cooperating with other government agencies - Communication affair - Other assignment	
4. Division of Personnel	- Conduct the personnel management system - Planning of human resource - Managing personnel information, assessment, appointment, resignation and discipline of the staff in organization - The personnel development system - Other assignment	
5. Division of Finance	- Managing and controlling of finance, accounts, budget, procurement, building and vehicle - Cooperating with other divisions and agencies in supporting the work concerned - Other assignment	
6. Division of Planning	Analyzing and preparing work plan and budget of DLD - Monitoring and evaluating the implementation of DLD work plan - Cooperating with other divisions and agencies in supporting the work concerned	
7. Division of Legislative affairs	Working involve laws, regulations, contacts and prosecution relevant to DLD Act - Solving the problems relevant to DLD Act - Cooperating with other division and agencies in supporting the work concerned.	
8. Division of Animal Husbandry	To study and research on animal breed, breeding selection and propagation - To study and research on farm management and transfer the technology - To conserve and develop domestic genetic resources for sustainable use and benefit sharing - To establish genetic standard	

Department unit	Duties and Responsibilities	Remarks
	of domestic breed for accreditation and reservation - To proceed under the Law of Animal Husbandry and other related legislation	
9. Division of Animal Nutrition	To study, research and develop on animal nutrition and feedstuff including transfer the technology	
10. Information Technology Center	- To develop database and network system - Center information system for DLD	
11. National Institute of Animal Health	- To study and research on animal diseases and health problems - To diagnose animal diseases - To develop the QA/QC system of DLD veterinary diagnostic laboratories - To study, utilize and conserve biodiversity of animal microbes and parasites - To research and produce prototype biologics for test and prevention of animal diseases	
12. Bureau of Veterinary Biologics	To study and research on veterinary biologics and substances for animal disease testing and production methods - To produce and provide veterinary biologics and substances for animal disease testing of international standard - To provide consultation and transfer technology on the matters	
13. Bureau of Disease Control and Veterinary Services	- To proceed under # Law of Animal Epidemics # Law of Animal Clinics # Law of Rabies # Other related legislations - To study and research on animal diseases, zoonosis & animal health problems in prevention, control, eradication & treatment - To develop animal health management system - To be national veterinary epidemiological centre - To provide consultation and transfer technology on animal health development	
14. Bureau of Livestock Development and Technology Transfer	- To study, research and develop on livestock production system and management - To study, research and develop on value-added livestock products - To study and research on livestock economics, domestic & foreign production and marketing	

Department unit	Duties and Responsibilities	Remarks
	<ul style="list-style-type: none"> - To develop and transfer appropriate technology to farmers and manufacturers - To conduct projects to the Royal Deliberation - To study, analyze and research on international livestock issues i.e. business, trade, technique, cooperation, agreements, impacts, rules & laws - To study, research, plan and produce audiovisual media for public relation on livestock development - To implement under the National Livestock Policy and Development Committee 	
15. Bureau of Quality Control of Livestock Products	<ul style="list-style-type: none"> - To inspect quality and safety standards for livestock products, animal feeds, veterinary drugs, and biological products - To study, analyze, research and develop quality control system, safety and standards for livestock products, animal feeds, veterinary drugs, and biological products - To inspect, supervise and accredit all DLD and private laboratories designated for livestock products inspection - To provide consultation and transfer technology on quality control, safety and standard inspection of livestock products, animal feeds, veterinary drugs, and biological products 	
16. Bureau of Livestock Standard and Certification	<ul style="list-style-type: none"> - To proceed under the Law of Feed Quality Control including veterinary drugs issue, and related agreements, regulations and legislations - To study, research and establish standards for livestock products, animal feeds, veterinary drugs and biologics, livestock farming and environment, slaughterhouse, etc - To develop QA/QC systems of livestock products, animal feed and drug manufacturing including to inspect and accredit such plants - To accredit livestock farming system - To certify quality of livestock products - To provide consultation and transfer technology on system development and product standard certification 	
17. Bureau of Biotechnology for Animal Production	<ul style="list-style-type: none"> - To study & research on animal biotechnology - To perform progeny test 	

Department unit	Duties and Responsibilities	Remarks
	and genetic evaluation - To develop and propagate livestock through biotechnology - To conserve and collect domestic species genetics rare breeds and endanger species - To establish semen and oval banks - To provide consultation and transfer technology on the matters	
18. Regional Bureau of Animal Health and Sanitary 1-9	- To study and research on animal health, hygiene & sanitation, veterinary epidemiology, in disease control, prevention, treatment & diagnosis - To study, research, develop and inspect livestock product quality in the region - To promote livestock environment - To study, research, develop and transfer technology on animal production, nutrition & feed, health, hygiene & sanitation in the region - To advise, provide consultation, plan & evaluate provincial animal health program - To supervise the DLD legislations i.e. Laws of Animal Epidemics, Animal Husbandry, Feed Quality control, Animal Clinics, Rabies, and related rules and regulations	

DLD's formats to concerning to fertilizer distribution

Form 1

Register of flood – affected farmers and pastures

Province _____ No.

Center/Station _____

1. Name (Mr., Mrs., Ms.)

2. Address No.

Village No.

Village

Tambol (sub-district)

Amphoe (District)

Province

3. Main Occupation

4. Arable land (rai)

5. Please indicating flood affected on your family (many possibility).

() 5.1 loss of life () 5.2 illness/injury () 5.3 house damage () 5.4 flooding land

() 5.5 loss of crop and agriculture () 5.6 loss of animals/injure/malnutrition

6. Please indicating flood affected on your livestock.

	Cattle/Buffalo (head)	Swine (head)	Poultry (birds)
6.1 Number before flood			
6.2 Mortality/loss			
6.3 Injure/ill			
6.4 Sold prior to flood ¹			

¹No. of animal sold at low price.

7. Flood affected on pasture and inputs need²

Type of pasture	Flood affected (rai)	Reestablish (rai)	Fertilizer 15-15-15 (kg)	Urea 46-0-0 (kg)
7.1 Paddy pasture				
7.2 Backyard pasture				
7.3 Fodder production pasture				
7.4 Communal pasture				

² Calculate input requirement

1.) Fertilizer 15-15-15 rate 50 kg/rai.

2.) Urea 46-0-0 rate 20 kg/rai.

Form 3
Evident of Acceptance Materials for Production
Flood Countermeasure year 2011 under the JICA Cooperation

Name
 Home address..... Home number Village
 number Sub-district number
 District Province Zip

Identification card number

Have received production materials

- | | | |
|----|---------------------------|-------------------------|
| 1. | fertilizer 15-15-15 | Compound
kg. |
| 2. | kg. | Urea fertilizer |
| 3. | | Ruzie grass seed
kg. |
| 4. | seed | Atratum grass
kg. |
| 5. | grass | Pangola seedling
kg. |
| 6. | Pak Chong 1 | Stalk of Napier,
kg. |

No requirement.

Signed by (Farmer)

()

Signed by..... (Hand over officer)

()

Form-4

Planned Date of Fertilizer Acceptance												
No.	Region	province	Center/Station	Total					Support of seed and seedling			
				Organization	Farmer	Damage area (rai)	15-15-15	46-0-0	NPK	Urea	Total	From Chainat Center
1	1	Bangkok	Chainat		55	111	5,550	1,110	111	22	133	April 1, 2012
2	1	Chainat	Chainat	1	248	1,401	70,050	14,010	1,401	280	1,681	April 1, 2012
3	1	Nonthaburi	Chainat		100	200	10,000	2,000	200	40	240	April 1, 2012
4	1	Pathumthani	Chainat		150	300	15,000	3,000	300	60	360	April 1, 2012
5	1	Ayutthaya	Suphanburi		494	1,175	58,750	11,750	1,175	235	1,410	April 6-10, 2012
6	1	Lopburi	Chainat		358	716	35,800	7,160	716	143	859	April 1, 2012
7	1	Saraburi	Chainat		12	119	5,950	1,190	119	24	143	April 1, 2015
8	1	Singburi	Chainat		38	387	19,350	3,870	387	77	464	April 1, 2012
9	1	Suphanburi	Suphanburi	1	850	3,277	163,850	32,770	3,277	655	3,932	April 6-10, 2012
10	1	Ang Thong	Suphanburi		413	1,282	64,100	12,820	1,282	256	1,538	April 6-10, 2012
11	2	Chachoengchao	Srakaeko		1	8	400	80	8	2	10	April 23, 2012
12	2	Srakaeko	Srakaeko	1	3	285	14,250	2,850	285	57	342	April 23, 2012
13	3	Chaiyaphum	Nakhonratchasima		11	64	3,200	640	64	13	77	May 1-3, 2012
14	3	Nakhonratchasima	Nakhonratchasima	1	16	823	41,150	8,230	823	165	988	May 1-3, 2012
15	3	Buriram	Buriram	1	3	172	8,600	1,720	172	34	206	May 4-6, 2012
16	3	Yasothon	Yasothon	1	45	269	13,450	2,690	269	54	323	May 4-6, 2012
17	3	Roi Ed	Roi Ed	1	51	342	17,100	3,420	342	68	410	May 4-6, 2012
18	3	Ubonratchathani	Yasothon		90	315	15,750	3,150	315	63	378	May 4-6, 2012
19	5	Kalasin	Kalasin	1	44	388	19,400	3,880	388	78	466	Not fix yet
20	4	Khonkaen	Khonkaen	1	22	293	14,650	2,930	293	59	352	Not fix yet
21	4	Nakhonphanom	Nakhonphanom	1	54	366	18,300	3,660	366	73	439	Not fix yet
22	4	Maharakham	Maharakham	1	78	445	22,250	4,450	445	89	534	Not fix yet
23	4	Mukdahan	Mukdahan	1	3	71	3,550	710	71	14	85	Not fix yet
24	4	Loei	Loei	1	1	85	4,250	850	85	17	102	Not fix yet
25	4	Sakonkakhon	Sakonkakhon	1	13	198	9,900	1,980	198	40	238	Not fix yet
26	4	Nongkhai	Nongkhai	1	5	160	8,000	1,600	160	32	192	Not fix yet
27	4	Nongbualamphu	Loei		16	60	3,000	600	60	12	72	Not fix yet
28	4	Udonthani	Udonthani	1	133	6,650	33,250	6,650	1,330	266	1,600	Not fix yet
29	5	Phrae	Phrae	1	3	215	10,750	2,150	215	43	258	April 24-26, 2012
30	5	Lampang	Lampang	1	64	838	41,900	8,380	838	168	1,006	April 9,11,17,19,24,26, 2012
31	5	Lamphun	Lampang		15	145	7,250	1,450	145	29	174	April 9,11,17,19,24,26, 2012
32	5	Uthathani	Pichit		12	25	1,250	250	25	5	30	April 23, 2012
33	6	Pichit	Pichit	1	92	459	22,950	4,590	459	92	551	April 23, 2012
34	6	Phisanulok	Sukhothai		104	366	18,300	3,660	366	73	439	April 24-28, 2012
35	6	Petchaboon	Petchaboon	1	11	446	22,300	4,460	446	89	535	April 3-5, 2012
36	6	Sukhothai	Sukhothai	1		266	13,300	2,660	266	53	319	April 24-28, 2012
37	7	Kanchanaburi	Phetburi		30	175	8,750	1,750	175	35	210	April 23-24, 2012
38	7	Nakornpathom	Phetburi		5	100	5,000	1,000	100	20	120	May 2, 2012
39	7	Prachuabkirkhan	Prachuabkirkhan	1	16	373	18,650	3,730	373	75	448	May 2, 2012
40	7	Petchaburi	Phetburi	1	35	398	19,900	3,980	398	80	478	May 2, 2012
41	7	Ratchaburi	Phetburi		1	10	500	100	10	2	12	May 2, 2012
42	8	Chumphon	Chumphon	1	3	210	10,500	2,100	210	42	252	Not fix yet
43	8	Nakhonsithanmarat	Suratthani		87	390	19,500	3,900	390	78	468	Not fix yet
44	8	Suratthani	Suratthani	1	10	482	24,100	4,820	482	96	578	Not fix yet
45	9	Trang	Trang	1	21	245	12,250	2,450	245	49	294	May 3-4, 2012
46	9	Narathiwat	Narathiwat	1	13	284	14,200	2,840	284	57	341	May 3-4, 2012
47	9	Phattalung	Phattalung	1	79	741	37,050	7,410	741	148	889	May 3-4, 2012
48	9	Songkhla	Satooon		39	45	2,250	450	45	9	54	May 3-4, 2012
49	9	Satooon	Satooon	1	12	342	17,100	3,420	342	68	410	May 3-4, 2012
Total				29	3,826	20,000	1,000,000	200,000	20,000	4,000	24,000	May 3-4, 2012

Form-5

The hand over fertilizer, seed and seedlings on the Flood Countermeasure in 2012 under JICA Cooperation plan

1. Paddy pasture project

No.	Group/Organization	Address	Number of farmer	Distribution Schedule (date/month)		
				Fertilizer	Seed	Seedling
1						
2						
3						
4						
5						

2. Small farmer holders pasture

No.	Group/Organization	Address	Number of farmer	Distribution Schedule (date/month)		
				Fertilizer	Seed	Seedling
1						
2						
3						
4						
5						

3. Land for producing of feed storage center/station

No.	Group/Organization	Address	Number of farmer	Distribution Schedule (date/month)		
				Fertilizer	Seed	Seedling
1						
2						
3						
4						
5						

4. Public pasture

No.	Group/Organization	Address	Number of farmer	Distribution Schedule (date/month)		
				Fertilizer	Seed	Seedling
1						
2						
3						
4						
5						

Please return to Bureau of Animal Nutrition Development within April 30, 2012.

Form-6

Report of Production Factor Support on the Flood Countermeasure in 2012 under JICA Cooperation

Center/Station name

Province

1. Paddy pasture project

	Unit	Plan	Result	Percent
1.1 Number of farmer	person			
1.2 Damage area	Rai			
1.3 Compound fertilizer 15-15-15	kg.			
1.4 Urea 46-0-0	kg.			
1.5 Ruzie seed	kg.			
1.6 Atratum seed	kg.			
1.7 Plicatulul seed	kg.			
1.8 Cavacade seed	kg.			
1.9 Purple Guinea seed	kg.			
1.10 Seedling of Pangola	kg.			
1.11 Seedling of Pak Chong 1	kg.			

2. Small farmer holders pasture

	Unit	Plan	Result	Percent
1.1 Number of farmer	person			
1.2 Damage area	Rai			
1.3 Compound fertilizer 15-15-15	kg.			
1.4 Urea 46-0-0	kg.			
1.5 Ruzie seed	kg.			
1.6 Atratum seed	kg.			
1.7 Plicatulul seed	kg.			
1.8 Cavacade seed	kg.			
1.9 Purple Guinea seed	kg.			
1.10 Seedling of Pangola	kg.			
1.11 Seedling of Pak Chong 1	kg.			

3. Land for producing of feed storage center/station

	Unit	Plan	Result	Percent
1.1 Number of farmer	person			
1.2 Damage area	Rai			
1.3 Compound fertilizer 15-15-15	kg.			
1.4 Urea 46-0-0	kg.			
1.5 Ruzie seed	kg.			
1.6 Atratum seed	kg.			
1.7 Plicatulul seed	kg.			
1.8 Cavacade seed	kg.			
1.9 Purple Guinea seed	kg.			
1.10 Seedling of Pangola	kg.			
1.11 Seedling of Pak Chong 1	kg.			

4. Public pasture

	Unit	Plan	Result	Percent
1.1 Number of farmer	person			
1.2 Damage area	Rai			
1.3 Compound fertilizer 15-15-15	kg.			
1.4 Urea 46-0-0	kg.			
1.5 Ruzie seed	kg.			
1.6 Atratum seed	kg.			
1.7 Plicatulul seed	kg.			
1.8 Cavacade seed	kg.			
1.9 Purple Guinea seed	kg.			
1.10 Seedling of Pangola	kg.			
1.11 Seedling of Pak Chong 1	kg.			

5. Total activities

	Unit	Plan	Result	Percent
1.1 Number of farmer	person			
1.2 Damage area	Rai			
1.3 Compound fertilizer 15-15-15	kg.			
1.4 Urea 46-0-0	kg.			
1.5 Ruzie seed	kg.			
1.6 Atratum seed	kg.			
1.7 Plicatulul seed	kg.			
1.8 Cavacade seed	kg.			
1.9 Purple Guinea seed	kg.			
1.10 Seedling of Pangola	kg.			
1.11 Seedling of Pak Chong 1	kg.			

Result of the Monitoring Survey

1. Disrubtion Plan

	Unit	1. Paddy pasture project		2. Small farm pasture		3. Land for producing		4. Public pasture		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1.1 Number of beneficiaries	person/place	1,082	27.9%	2,756	71.1%	28	0.7%	10	0.3%	3,876	100%
1.2 Damaged pasture	Rai	7,075	35.7%	5,976	30.2%	6,048	30.6%	698	3.5%	19,797	100%
1.3 Compound fertilizer 15-15-15	kg.	367,300	36.7%	298,800	29.9%	299,050	29.9%	34,900	3.5%	1,000,050	100%
1.4 Urea 46-0-0	kg.	70,800	35.9%	59,760	30.3%	59,800	30.3%	6,980	3.5%	197,340	100%
1.5 Ruzie seed	kg.	4,896	35.1%	5,114	36.6%	3,950	28.3%	0	0.0%	13,960	100%
1.6 Atratum seed	kg.	2,064	30.4%	1,184	17.4%	3,547	52.2%	0	0.0%	6,795	100%
1.7 Plicatum seed	kg.	1,362	35.0%	1,882	48.4%	643	16.5%	0	0.0%	3,887	100%
1.8 Cavacade seed	kg.	393	45.0%	210	24.1%	270	30.9%	0	0.0%	873	100%
1.9 Purple Guinea seed	kg.	172	31.5%	215	39.4%	159	29.1%	0	0.0%	546	100%
1.10 Seedling of Pangola	kg.	82,800	64.0%	45,000	34.8%	1,500	1.2%	0	0.0%	129,300	100%
1.11 Seedling of Pak Chong #1	kg.	18,300	1.7%	1,052,750	98.2%	1,000	0.1%	0	0.0%	1,072,050	100%
1.12 Bombaza seed	kg.	50	100.0%	0	0.0%	0	0.0%	0	0.0%	50	100%

Source. Result of the Monitoring Survey, JICA Study Team, June 2012

2. Result of the Distribution

	Unit	1. Paddy pasture project		2. Small farm pasture		3. Land for producing		4. Public pasture		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1.1 Number of beneficiaries	person/place	1,237	31.6%	2,507	64.1%	28	0.7%	139	3.6%	3,911	100%
1.2 Damaged pasture	Rai	7,100	34.3%	6,679	32.3%	6,048	29.2%	870	4.2%	20,696	100%
1.3 Compound fertilizer 15-15-15	kg.	370,733	37.1%	307,675	30.8%	296,900	29.7%	23,500	2.4%	998,808	100%
1.4 Urea 46-0-0	kg.	71,483	36.3%	61,535	31.2%	59,370	30.1%	4,700	2.4%	197,088	100%
1.5 Ruzie seed	kg.	4,748	34.6%	4,842	35.3%	3,924	28.6%	220	1.6%	13,734	100%
1.6 Atratum seed	kg.	1,881	28.5%	1,031	15.6%	3,377	51.3%	300	4.6%	6,589	100%
1.7 Plicatum seed	kg.	1,015	26.0%	2,069	53.0%	823	21.1%	0	0.0%	3,907	100%
1.8 Cavacade seed	kg.	393	44.5%	210	23.8%	280	31.7%	0	0.0%	883	100%
1.9 Purple Guinea seed	kg.	172	31.5%	215	39.4%	159	29.1%	0	0.0%	546	100%
1.10 Seedling of Pangola	kg.	87,400	92.1%	6,000	6.3%	1,500	1.6%	0	0.0%	94,900	100%
1.11 Seedling of Pak Chong #1	kg.	121,300	76.4%	31,500	19.8%	1,000	0.6%	5,000	3.1%	158,800	100%
1.12 Bombaza seed	kg.	50	100.0%	0	0.0%	0	0.0%	0	0.0%	50	100%

Source. Result of the Monitoring Survey, JICA Study Team, June 2012

3. Comparison Table of Plan and Result of Fertilizer/Seeds Distribution based on the Monitoring Survey

	Unit	1. Paddy pasture project		2. Small farm pasture		3. Land for producing		4. Public pasture		Total	
		Plan	Result	Plan	Result	Plan	Result	Plan	Result	Plan	Result
		1.1 Number of beneficiaries	person/place	1,082	1,237	2,756	2,507	28	28	10	139
1.2 Damaged pasture	Rai	7,075	7,100	5,976	6,679	6,048	6,048	698	698	19,797	20,525
1.3 Compound fertilizer 15-15-15	kg.	367,300	370,733	298,800	307,675	299,050	296,900	34,900	34,900	1,000,050	1,010,208
1.4 Urea 46-0-0	kg.	70,800	71,483	59,760	61,535	59,800	59,370	6,980	6,980	197,340	199,368
1.5 Ruzie seed	kg.	4,896	4,748	5,114	4,842	3,950	3,924	0	0	13,960	13,514
1.6 Atratum seed	kg.	2,064	1,881	1,184	1,031	3,547	3,377	0	0	6,795	6,289
1.7 Plicatum seed	kg.	1,362	1,015	1,882	2,069	643	823	0	0	3,887	3,907
1.8 Cavacade seed	kg.	393	393	210	210	270	280	0	0	873	883
1.9 Purple Guinea seed	kg.	172	172	215	215	159	159	0	0	546	546
1.10 Seedling of Pangola	kg.	82,800	87,400	45,000	6,000	1,500	1,500	0	0	129,300	94,900
1.11 Seedling of Pak Chong #1	kg.	18,300	121,300	1,052,750	31,500	1,000	1,000	0	0	1,072,050	153,800
1.12 Bombaza seed	kg.	50	50	0	0	0	0	0	0	50	50

Source. Result of the Monitoring Survey, JICA Study Team, June 2012

4. Comparison in percentage

	Unit	Total			Original Plan by DLD HQ
		Plan	Result	%	
1.1 Number of beneficiaries	person/place	3,876	3,911	100.9	3,826 farms
1.2 Damaged pasture	Rai	19,797	20,525	103.7	20,000 rai
1.3 Compound fertilizer 15-15-15	kg.	1,000,050	1,010,208	101.0	1,000,000kg (1,000ton)
1.4 Urea 46-0-0	kg.	197,340	199,368	101.0	200,000 kg (200ton)
1.5 Ruzie seed	kg.	13,960	13,514	96.8	Seeds:20 ton seedlings: 120ton
1.6 Atratum seed	kg.	6,795	6,289	92.6	
1.7 Plicatum seed	kg.	3,887	3,907	100.5	
1.8 Cavacade seed	kg.	873	883	101.1	
1.9 Purple Guinea seed	kg.	546	546	100.0	
1.10 Seedling of Pangola	kg.	129,300	94,900	73.4	
1.11 Seedling of Pak Chong #1	kg.	1,072,050	153,800	14.3	
1.12 Bombaza seed	kg.	50	50	100.0	

Source. Result of the Monitoring Survey, JICA Study Team, June 2012

5. Share of the Distributed Fertilizers

	1. Paddy pasture project	2. Small farm pasture	3. Pasture in center/station	4. Public pasture	Total
Compound fertilizer 15-15-15 (kg)	367,300	298,800	299,050	34,900	1,000,050
Urea 46-0-0 (kg)	70,800	59,760	59,800	6,980	197,340
Total	438,100	358,560	358,850	41,880	1,197,390
Share based on the Monitoring Result (%)	36.6	29.9	30.0	3.5	100.0
Share in the Original Distribution Plan (%)	36.9	29.1	29.8	4.2	100.0

Number of Sample Farmers

No.	Region	Station/center	Province	No. of Samples	No. of sample farmers per Center/Station	No. of Surveyors	Survey Priod (days)
	1	Chainat	Chainat	55	100	4	5
1	1		Bangkok	0			
3	1		Nontaburi	0			
4	1		Patunthani	0			
5	1		Lopburi	35			
6	1		Saraburi	5			
7	1		Singburi	5			
8	2	Srakaeo	Chacherngsao	5	10	1	2
9	2		Srakaeo	5			
10	1	Suphan Buri	Ayudthaya	30	120	4	6
11	1		Sphan Buri	60			
12	1		Angthong	30			
13	3	Nakhon Ratchasima	Chaiyaphum	5	10	1	2
14	3		Nakhon Ratchasima	5			
15	3	Buriram	Buriram	10	10	1	2
16	3	Roi-et	Roi-et	10	10	1	2
17	3	Yasothon	Yasothon	5	15	1	3
18	3		Ubonratchatani	10			
19	4	Kalasin	Kalasin	10	10	1	2
20	4	Khon Kaen	Khon Kaen	10	10	1	2
21	4	Mahasarakham	Mahasarakham	10	10	1	2
22	4	Mukdahan	Mukdahan	10	10	1	2
23	4	NaKkhon Phanom	NaKkhon Phanom	10	10	1	2
24	4	Loei	Loei	10	15	1	3
25	4		Nongbua Lamphu	5			
26	4	Sakon Nakhon	Sakon Nakhon	10	10	1	2
27	4	Nong Khai	Nong Khai	10	10	1	2
28	4		Udonthani	0			
29	5	Phrae	Phrae	10	10	1	2
30	5	Lampang	Lampang	10	15	1	3
31	5		Lamphoon	5			
32	5	Pichit	Uthaithani	5	15	1	3
33	6		Pichit	10			
34	6	Petchaboon	Petchaboon	10	10	1	2
35	6	Sukhothai	Pitsanulok	10	10	1	2
36	6		Sukhothai	0			
37	7	Petchaburi	Kanchaburi	5	20	1	4
38	7		Nakhon Pathom	5			
39	7		Petchaburi	5			
40	7		Ratchaburi	5			
41	7	Prachuab Kirikhan	Prachuab Kirikhan	10	10	1	2
42	8	Chumponoe	Chumponoe	10	10	1	2
43	8	Suratthani	Nakhon Srithammarat	10	15	1	3
44	8		Suratthani	5			
45	9	Trang	Trang	10	10	1	2
46	9	Narathiwat	Narathiwat	10	10	1	2
47	9	Pattalung	Pattalung	10	10	1	2
48	9	Satoon	SongKhla	5	10	1	2
49	9		Satoon	5			
Total				515	515	34	6

Monitoring Sheet on Distribution of Seeds and Fertilizer for **Beneficial Farmers**

Survey Date: _____ / _____ /2012 Name of Surveyor: _____

Changwat: _____ Amphoe: _____

Tambon: _____ Mhu-Baan: _____

1. General Information	
1. What kind of incomes does your family have?	<input type="checkbox"/> 1.Daily wage <input type="checkbox"/> 2.wage for temporary <input type="checkbox"/> 3.Merchant <input type="checkbox"/> 4.Rice sell <input type="checkbox"/> 5.Vegetable or Fruits sell <input type="checkbox"/> 6.Livestock sell, breeding, stock or its producers <input type="checkbox"/> 7.Pasture sell <input type="checkbox"/> 8.Others (_____)
2. How many animals do you have, now?	<input type="checkbox"/> 1.Buffalo (_____ head) <input type="checkbox"/> 2.Dairy cow (_____ head) <input type="checkbox"/> 3.Beef cattle (_____ head) <input type="checkbox"/> 4.Swine (_____ head) <input type="checkbox"/> 5.Goat (_____ head) <input type="checkbox"/> 6.Sheep (_____ head) <input type="checkbox"/> 7.Duck (_____ birds) <input type="checkbox"/> 8.Chicken (_____ birds)
3. How many rai of farm land do you have?	<input type="checkbox"/> 1.Paddy field (_____ rai) <input type="checkbox"/> 2.land for forage production (_____ rai) <input type="checkbox"/> 3.Other field (_____ rai)
4. What kind of farm machineries do you have?	<input type="checkbox"/> 1.Big tractor <input type="checkbox"/> 2.Small tractor <input type="checkbox"/> 3.Thresher <input type="checkbox"/> 4.Combine (cut & thresh) <input type="checkbox"/> 5.Mower <input type="checkbox"/> 6.Hay Spreader <input type="checkbox"/> 7.Plow <input type="checkbox"/> 8.Harrow <input type="checkbox"/> 9.Hay rake <input type="checkbox"/> 10.Hay baler <input type="checkbox"/> 11.Others(_____)
5.What kind of Agricultural machine do you or your labors use?	<input type="checkbox"/> 1.Big tractor <input type="checkbox"/> 2.Small tractor <input type="checkbox"/> 3.Thresher <input type="checkbox"/> 4.Combine (cut & thresh) <input type="checkbox"/> 5.Mower <input type="checkbox"/> 6.Hay Spreader <input type="checkbox"/> 7.Plow

	<input type="checkbox"/> 8.Harrow <input type="checkbox"/> 9.Hay rake <input type="checkbox"/> 10.Hay baler <input type="checkbox"/> 11.Others()
6. Do you have a storage space of barn for forage?	<input type="checkbox"/> 1.Yse (if yes, width _____ m, long _____ m, height _____ m) (if yes ,where: <input type="checkbox"/> near house, <input type="checkbox"/> near animal hut) <input type="checkbox"/> 2.No <input type="checkbox"/> 3.Others()
7. Do you stock forage?	<input type="checkbox"/> 1.Yes, rice straw <input type="checkbox"/> 2.Yes, Hay <input type="checkbox"/> 3.Yes, Silage <input type="checkbox"/> 4.No <input type="checkbox"/> 5.Others()
2. About pasture	
8. How many rai of pasture field do you have?	_____ rai
9. Where do you cultivate the forage?	<input type="checkbox"/> 1.Paddy(_____ rai) <input type="checkbox"/> 2.Upland field(_____ rai)
10. What kind of forage growing on the pasture	<input type="checkbox"/> 1.Pangola glass <input type="checkbox"/> 2.Pakchong #1 <input type="checkbox"/> 3.Ruzi glass <input type="checkbox"/> 4.Guinea glass <input type="checkbox"/> 5.Others()
11.How many times do you harvesting/cutting pasture grass per year	_____ times When()
12. When did you start to plant Pangola or other forages?	_____ years ago First planted year _____
13. What king of preservative forage do you use?	<input type="checkbox"/> 1.Hey <input type="checkbox"/> 2.Silage
14. Height of cutting grasses from the ground.	<input type="checkbox"/> 1.Pakchong#1 _____ cm <input type="checkbox"/> 2.Pangola glass _____ cm
15.Purposes of harvesting forages	<input type="checkbox"/> 1.for feeding own livestock, <input type="checkbox"/> 2.only for selling, <input type="checkbox"/> 3.both for selling and feeding own livestock,
16. Did you reseed on the damaged pasture after flooding?	<input type="checkbox"/> 1.Yes, <input type="checkbox"/> 2.No,
17. Do you use communal land for grazing?	<input type="checkbox"/> 1.Yes, <input type="checkbox"/> 2.No,
3.About Flood Situation in 2011	
18. Number of animals you lost in the 2011 flood.	<input type="checkbox"/> 1.Buffalo(_____ head), <input type="checkbox"/> 2.Dairy cow(_____ head), <input type="checkbox"/> 3.Beef cattle (_____ head),

	<input type="checkbox"/> 4.Swine(head), <input type="checkbox"/> 5.Goat(head), <input type="checkbox"/> 6.Sheep(head) <input type="checkbox"/> 7.Duck (birds), <input type="checkbox"/> 8.Chicken (birds)
19. How long your pasture was flooded in the 2011?	_____Days Highest water level_____m
20. How was the pasture damaged by the 2011 flood?	<input type="checkbox"/> 100%, <input type="checkbox"/> 80% to 90%, <input type="checkbox"/> 70% to 80%, <input type="checkbox"/> 60% to 70% , <input type="checkbox"/> 50%~60, <input type="checkbox"/> less than 50%, <input type="checkbox"/> No damage
4. About fertilizers and seeds/seedlings provided through DLD and JICA	
21. Were you provided chemical fertilizer under the JICA project?	<input type="checkbox"/> 1.Yes, <input type="checkbox"/> 2.No,
22. When did you get the fertilizer from JICA?	<input type="checkbox"/> Yes (when? / /2012), <input type="checkbox"/> No,
23. How did you get the fertilizer?	<input type="checkbox"/> 1.went to the animal nutrition center/station, <input type="checkbox"/> 2.DLD's center/station distributed it to your house, <input type="checkbox"/> 3.went to the district / provincial / governmental office <input type="checkbox"/> 4.other person went to take it <input type="checkbox"/> 5.Othtrs()
24. What kind of fertilizer were you provided under the JICA project?	<input type="checkbox"/> 15-15-15_____bags <input type="checkbox"/> Urea_____bags_____kg
25. Have you already used fertilizer for the pasture?	<input type="checkbox"/> 1.Yes (when? / /2012), <input type="checkbox"/> 2.No,
26. What do you think about the amount of fertilizer for reproduction pastures from JICA?	<input type="checkbox"/> 1.too many, <input type="checkbox"/> 2.many, <input type="checkbox"/> 3.enough, <input type="checkbox"/> 4.small, <input type="checkbox"/> 5.too small
27. If you think the amount of chemical fertilizer is small, why do you think so?	<input type="checkbox"/> 1.the flood damage is too serious, <input type="checkbox"/> 2.the pasture area is very large, <input type="checkbox"/> 3.the pasture needs more nutrition, <input type="checkbox"/> 4.the selection and distribution system to famers is not good, <input type="checkbox"/> 5.Others()
28. When did you get the seeds / seedlings from DLD?	<input type="checkbox"/> Yes, <input type="checkbox"/> No,
29. When did you receive the seed / seedling under JICA / DLD project?	<input type="checkbox"/> Yes (when? / /2012), <input type="checkbox"/> No,
30. How did you get the seeds / seedlings?	<input type="checkbox"/> 1.went to the animal nutrition center/station, <input type="checkbox"/> 2.DLD's center/station distributed it to your house,

	<input type="checkbox"/> 3.went to the district / provincial / governmental office <input type="checkbox"/> 4.other person went to take it <input type="checkbox"/> 5.Othtrs(_____)
31. What kind of seeds / seedlings were you provided through DLD under the JICA project?	<input type="checkbox"/> 1.Guinea grass _____ kg <input type="checkbox"/> 2.Rugi grass _____ kg <input type="checkbox"/> 3.others seed (name: _____ kg) <input type="checkbox"/> 4. Pakchong#1 _____ kg <input type="checkbox"/> 5.Pangola grass _____ kg <input type="checkbox"/> 6.others seedling (name: _____ kg)
32. Have you already used seeds / seedlings for the pasture?	<input type="checkbox"/> Yes (when? _____ / _____ /2012), <input type="checkbox"/> No,
33. What do you think about the amount of seeds / seedlings for reproduction pastures from DLD?	<input type="checkbox"/> 1.too much, <input type="checkbox"/> 2.much, <input type="checkbox"/> 3.enough, <input type="checkbox"/> 4.small, <input type="checkbox"/> 5.too small
34. Why do you think so?	<input type="checkbox"/> 1.the flood damage is too serious, <input type="checkbox"/> 2.the pasture area is very large, <input type="checkbox"/> 3.the pasture needs more seeds / seedlings, <input type="checkbox"/> 4.the selection and distribution system to famers is not good, <input type="checkbox"/> 5.Others(_____)
35. Have you ever received the supports for reproduction pastures?	<input type="checkbox"/> Yes(when? _____ from: _____) <input type="checkbox"/> No

The problem or trouble of your livestock raising and forage production during last year flooding:
(Please write in this box at least 3 comments)

Your countermeasures for flooding: (Please write in this box at least 3 comments)

AppendixB-7

Monitoring Sheet on Distribution of Seeds and Fertilizer for DLD Station/Center

Survey Date: / /2012 Name of the Center/Station: _____

Name of person in charge:_____ Phone No._____

Name of surveyor:_____ Phone No._____

Item	Status
1. When did the Center/station receive chemical fertilizer from JICA?	_____/_____/2012~_____/_____/2012 _____ times from Where_____
2. What kind of fertilizer was provided through JICA?	<input type="checkbox"/> Urea(46-0-0) (_____ ton, _____ sacks) <input type="checkbox"/> Compound fertilizer(15-15-15) (_____ ton, _____ sacks)
3.How many farmers will receive the chemical fertilizer from this Center / station	_____ farmers
4. When did the center / station distribute the chemical fertilizer?	From (_____/_____/2012~_____/_____/2012)
5. Did the center / station finish distributing the chemical fertilizer?	<input type="checkbox"/> Yes <input type="checkbox"/> Not yet
6. How the Center / station distribute the chemical fertilizer to farmers?	<input type="checkbox"/> 1.farmer came to the Center / station <input type="checkbox"/> 2.The center/station distributed it to district / provincial / governmental office <input type="checkbox"/> 3. The center/station distributed it to farmer's house <input type="checkbox"/> 4.Othtrs(_____)
7. When did the Center/station receive seed or seedling from DLD for distribute with JICA's chemical fertilizer?	_____/_____/2012~_____/_____/2012 _____ times from Where_____
8. What kind of seed or seedling did the center/station receive?	<input type="checkbox"/> 1.Pangola glass(_____ kg, _____ sacks) <input type="checkbox"/> 2.Pakchong #1(_____ kg, _____ sacks) <input type="checkbox"/> 3.Ruzi glass(_____ kg, _____ sacks) <input type="checkbox"/> 4.Guinea glass(_____ kg, _____ sacks) <input type="checkbox"/> 5.Others(_____ (_____ kg, _____ sacks))
9. How many farmers will receive the seed or seedling from this Center / station under this project	_____ farmers
10. When did the center / station distribute the seed and seedling?	From (_____/_____/2012~_____/_____/2012)
11. Did the center / station finish distributing the chemical fertilizer?	<input type="checkbox"/> Yes <input type="checkbox"/> Not yet
12. How did the Center / station distribute the seed or seedling to farmers?	<input type="checkbox"/> 1.farmer came to the Center / station <input type="checkbox"/> 2.The center/station distributed it to district / provincial / governmental office <input type="checkbox"/> 3. The center/station distributed it to farmer's house <input type="checkbox"/> 4.Othtrs(_____)

Participants Information

Information of the Participants in Khonkaen				Information of the Participants in Nakhon Sithammarat			
No. of participants	41			No. of participants	29		
No. and % of farmers raising milk cow	No.=	0	% = 0.0%	No. and % of farmers raising milk cow	No.=	0	% = 0.0%
No. and % of farmers raising beef cattle	No.=	33	% = 80.5%	No. and % of farmers raising beef cattle	No.=	18	% = 62.1%
No. and % of farmers raising buffalo	No.=	1	% = 2.4%	No. and % of farmers raising buffalo	No.=	1	% = 3.4%
No. and % of farmers raising pigs	No.=	1	% = 2.4%	No. and % of farmers raising pigs	No.=	1	% = 3.4%
No. and % of farmers raising goats	No.=	0	% = 0.0%	No. and % of farmers raising goats	No.=	3	% = 10.3%
No. and % of farmers raising sheep	No.=	0	% = 0.0%	No. and % of farmers raising sheep	No.=	0	% = 0.0%
No. and % of farmers owninig pasture	No.=	40	% = 97.6%	No. and % of farmers owninig pasture	No.=	28	% = 96.6%
Maximum and average pasture size in rai	Max=	25	Ave= 3.5	Maximum and average pasture size in rai	Max=	80	Ave= 13
No. and % of farmers damaged pasture	No.=	24	% = 58.5%	No. and % of farmers damaged pasture	No.=	26	% = 89.7%
% of damaged pasture	% =	63.4%	-	% of damaged pasture	% =	68.1%	-
Flooding period (days)	Max=	90	Ave= 41	Flooding period (days)	Max=	90	Ave= 21
Water depth of the flood in 2011 (m)	Max=	1.5	Ave= 0.6	Water depth of the flood in 2011 (m)	Max=	2	Ave= 0.75
No. and % of farmers cultivating Pangola grass	No.=	35	% = 85.4%	No. and % of farmers cultivating Pangola grass	No.=	0	% = 0.0%
Information of the Participants in Nakhon Ratchasima				Information of the Participants in Sakeo			
No. of participants	24			No. of participants	42		
No. and % of farmers raising milk cow	No.=	0	% = 0.0%	No. and % of farmers raising milk cow	No.=	35	% = 83.3%
No. and % of farmers raising beef cattle	No.=	14	% = 58.3%	No. and % of farmers raising beef cattle	No.=	9	% = 21.4%
No. and % of farmers raising buffalo	No.=	0	% = 0.0%	No. and % of farmers raising buffalo	No.=	0	% = 0.0%
No. and % of farmers raising pigs	No.=	0	% = 0.0%	No. and % of farmers raising pigs	No.=	1	% = 2.4%
No. and % of farmers raising goats	No.=	0	% = 0.0%	No. and % of farmers raising goats	No.=	0	% = 0.0%
No. and % of farmers raising sheep	No.=	0	% = 0.0%	No. and % of farmers raising sheep	No.=	0	% = 0.0%
No. and % of farmers owninig pasture	No.=	24	% = 100.0%	No. and % of farmers owninig pasture	No.=	39	% = 92.9%
Maximum and average pasture size in rai	Max=	30	Ave= 10.83	Maximum and average pasture size in rai	Max=	40	Ave= 12.64
No. and % of farmers damaged pasture	No.=	12	% = 50.0%	No. and % of farmers damaged pasture	No.=	33	% = 78.6%
% of damaged pasture	% =	18.8%	-	% of damaged pasture	% =	35.4%	-
Flooding period (days)	Max=	-	Ave= -	Flooding period (days)	Max=	120	Ave= 30
Water depth of the flood in 2011 (m)	Max=	-	Ave= -	Water depth of the flood in 2011 (m)	Max=	1	Ave= 0.53
No. and % of farmers cultivating Pangola grass	No.=	0	% = 0.0%	No. and % of farmers cultivating Pangola grass	No.=	0	% = 0.0%
Information of the Participants in Chainat				Information of the Participants in Lampang			
No. of participants	31			No. of participants	44		
No. and % of farmers raising milk cow	No.=	0	% = 0.0%	No. and % of farmers raising milk cow	No.=	7	% = 15.9%
No. and % of farmers raising beef cattle	No.=	20	% = 64.5%	No. and % of farmers raising beef cattle	No.=	16	% = 36.4%
No. and % of farmers raising buffalo	No.=	1	% = 3.2%	No. and % of farmers raising buffalo	No.=	1	% = 2.3%
No. and % of farmers raising pigs	No.=	0	% = 0.0%	No. and % of farmers raising pigs	No.=	3	% = 6.8%
No. and % of farmers raising goats	No.=	3	% = 9.7%	No. and % of farmers raising goats	No.=	0	% = 0.0%
No. and % of farmers raising sheep	No.=	0	% = 0.0%	No. and % of farmers raising sheep	No.=	0	% = 0.0%
No. and % of farmers owninig pasture	No.=	23	% = 74.2%	No. and % of farmers owninig pasture	No.=	41	% = 93.2%
Maximum and average pasture size in rai	Max=	41	Ave= 9.74	Maximum and average pasture size in rai	Max=	100	Ave= 15.66
No. and % of farmers damaged pasture	No.=	21	% = 67.7%	No. and % of farmers damaged pasture	No.=	35	% = 79.5%
% of damaged pasture	% =	92.4%	-	% of damaged pasture	% =	55.1%	-
Flooding period (days)	Max=	90	Ave= 45	Flooding period (days)	Max=	60	Ave= 9
Water depth of the flood in 2011 (m)	Max=	4	Ave= 1.26	Water depth of the flood in 2011 (m)	Max=	2	Ave= 0.53
No. and % of farmers cultivating Pangola grass	No.=	23	% = 74.2%	No. and % of farmers cultivating Pangola grass	No.=	36	% = 81.8%
Information of the Participants in Suphanburi				Information of the Participants in Pitsanulok			
No. of participants	42			No. of participants	38		
No. and % of farmers raising milk cow	No.=	3	% = 7.1%	No. and % of farmers raising milk cow	No.=	0	% = 0.0%
No. and % of farmers raising beef cattle	No.=	33	% = 78.6%	No. and % of farmers raising beef cattle	No.=	34	% = 89.5%
No. and % of farmers raising buffalo	No.=	0	% = 0.0%	No. and % of farmers raising buffalo	No.=	0	% = 0.0%
No. and % of farmers raising pigs	No.=	0	% = 0.0%	No. and % of farmers raising pigs	No.=	3	% = 7.9%
No. and % of farmers raising goats	No.=	1	% = 2.4%	No. and % of farmers raising goats	No.=	0	% = 0.0%
No. and % of farmers raising sheep	No.=	0	% = 0.0%	No. and % of farmers raising sheep	No.=	0	% = 0.0%
No. and % of farmers owninig pasture	No.=	36	% = 85.7%	No. and % of farmers owninig pasture	No.=	35	% = 92.1%
Maximum and average pasture size in rai	Max=	50	Ave= 8.98	Maximum and average pasture size in rai	Max=	27	Ave= 7.26
No. and % of farmers damaged pasture	No.=	28	% = 66.7%	No. and % of farmers damaged pasture	No.=	35	% = 92.1%
% of damaged pasture	% =	75.5%	-	% of damaged pasture	% =	83.1%	-
Flooding period (days)	Max=	120	Ave= 32	Flooding period (days)	Max=	120	Ave= 48
Water depth of the flood in 2011 (m)	Max=	2	Ave= 0.75	Water depth of the flood in 2011 (m)	Max=	1.5	Ave= 0.68
No. and % of farmers cultivating Pangola grass	No.=	31	% = 73.8%	No. and % of farmers cultivating Pangola grass	No.=	26	% = 68.4%

Problems and Countermeasures Discussed in Group

#1 Khon Kaen and #2 Mahasarakham province

No	Issue	Province		
		Khon Kaen	Mahasarakham	Kalasin
1	Flooded	Sep. – Dec. 2011	Oct. – Dec. 2011	Aug. – Sep.2011
2	Livestock Damaged Level	High	High	High
3	Paddy Pasture Damaged Level	High	High	High

Livestock (Mostly are beef cattle)

Problems/Threats	Countermeasures
1. Lack of feed and grass	1. Prepare all kind of feed (hay, silage and fresh grass)
2. Lack of drugs and medicines	2. Vaccination of all necessary disease
3. Lack of flood information	3. Try to save feed as best as possible by properly feeding
4. Foot and mouth disease (FMD)	4. Looking for the higher land to keep animal before flooding
5. Someone moving their animals too delayed	5. Sale some animals to reduce cost of feed and management
6. When flooded, cattle price very low	6. Training of practical animals raising

Paddy Pasture (Mostly are Pangola grass)

Problems/Threats	Countermeasures
1. Heavy flood caused to totally damaging the pastures (90 % of overall)	1. Select a suitable location for paddy pasture to reconstruct the pasture
2. Most of paddy pasture close to stream	2. Preparation of seed, seedlings and stalk before flooding
3. Harvesting grass too delayed	3. Preparation of manure and fertilizer
	4. Harvesting the grass soonest
	5. Water pump must ready to be used to empty the water in appropriate time
	6. If grass is totally damaged, require to establish soonest
	7. Request the slush fund as it is necessary (4,500 BTH per rai)

#3 Chainat Province

No	Issue	District		
		Sappaya	Wat Singha	Manorom
1	Flooded	Sep. – Oct.2011	Oct. – Nov.2011	Sep. – Oct.2011
2	Livestock Damaged Level	High	High	High
3	Paddy Pasture Damaged Level	High	High	High

1) Sappaya District for Livestock

Problems/Threats	Countermeasures
1. No shelter for livestock	1. Searching for non-flood area as for alternative place
2. Lack of feed	2. Prepare and reserve prompt feed during the rainy season
3. Animals become sick	3. Vaccination of Foot and mouth disease (FMD)
	4. Always keep in touch to livestock officers
	5. Keep minerals, vitamin or feed additive be ready

for Paddy Pasture

Problems/Threats	Countermeasures
1. Heavy flood caused to totally damaging the pastures	1. Water pump must ready to be used to empty the water in appropriate time
	2. Preparation of seed, seedlings and stalk
	3. Preparation of manure and fertilizer

2) Wat Singha District for Livestock

Problems/Threats	Countermeasures
1. Lack of feed, grass, hay or straw	1. Must reserve feed ahead of time
2. There is no facility to keep reserve feed	2. Reservation or storage of drugs or medicines for livestock or pets
3. Shortage mineral (lick salt)	3. Grass is advice to make silage
4. No keep place to animals	4. Or as well as hay

for Paddy Pasture

Problems/Threats	Countermeasures
1. Grass is totally damaged	1. Reconstruct the pasture
2. Cannot make use of grass for feeding	2. Manure and fertilizing practice

3) Manorom District for Livestock (Mostly are beef cattle)

Problems/Threats	Lines to accomplish
1. Lack of feed	1. Prepare all kind of feed ahead of time
2. Lack of shelter	2. Request the slush fund as it is necessary
3. Hoof and mouth disease	3. Sale some animals to reduce cost of feed and management
	4. Looking for the higher land to keep animal

	5. Vaccination of all necessary disease
	6. Confine the sick animals to the normal(animals)

for Paddy Pasture

Problems/Threats	Lines to accomplish
1. Flood-damaged all grass in the pasture	1. Harvesting the grass soonest
2. Cannot cut the grass for feeding due to high flood level	2. In case of little flood, pump out of water is required soonest
	3. After No. 2, one must apply fertilizer immediately
	4. If grass is totally damaged, require to establish soonest

#4 Suphanburi province

I. Samchook District

1. General Information

- Flooding started on October – November 2011
- Last long for 45 – 46 days
- Affected to;
 - Partly and totally damaged to paddy pasture
 - Lack of feed and feed supply from outsiders
 - Buffalo, cattle, some goat and sheep were sick by foot(hoof) and mouth disease
 - Lacking is also preservative feeds

2. Livestock

Affected on livestock (problems)	Ways to overcome (recommendations)
1. Short of feed	1. Should preserve feeds ahead of time as ample amount for a certain period of time
2. Animals were sick	2. Be ready to keep certain kind farm equipments animal gadgets or tools or especially drugs or medicines for animal
3. Lack of shelter or any reserve for temporary sites	3. Be ready on necessity of vaccination in certain of diseases
	4. Best advice is preparing for the alternative site for both human and animal

3. Paddy pasture

Affected on pastures (problems)	Ways to overcome (recommendations)
1. Flooding on pasture had taken rather long period of time	1. Try to drain the water out from the pasture as early as possible once having found that the flood is going to stay still or declining down
2. Animals were sick	2. Making the ridge or farm bun to protect the pasture from flooding as best as possible
3. Lack of shelter or any reserve for temporary sites	3. It is must to try to communicate the other group or unit concerned in flood countermeasure
	4. Be alert to evacuate the weeds or to deepen the drench or canal those block the passage of water
	5. Revitalization of paddy pasture, then must be practiced right after immediately

On behalf of Paddy Farming Group feel prides to JICA on what you have done for us and hold you all in high regards as always.”

Thanks a million

Suphanburi Paddy Pasture Farmer Group

II. Muang District

1. General Information

- Flooding was between November 10 – December 25, 2011 (approximately 45 days under the flood)

2. Livestock

Affected on livestock (problems)	Ways to overcome (recommendations)
1. No shelter for livestock	1. Must prepare available sites to move animals as well as people
2. Non feed available	2. Must prepare reserve feed for animal ahead of time
3. Caused to condition and their health	3. Taking care of animal health and treat the sick animals
4. Inconvenienced in communication	4. Must prepare boats or raft as for transportation or for communication

3. Paddy pasture

Affected on pastures (problems)	Ways to overcome (recommendations)
1. Cannot cut or make use of grass from the pasture	1. Keep all preservative hay or silage to sites where are not affected to flood
2. Seed, seedling or stalk were totally damaged	2. Revitalization of grass to grow up rapidly as draining or fertilizing as soon as possible

III. Donjedee District

1. General Information

- Flood began early of June – November 2011

- Flooding lasted for 5 months

2. Livestock

Affected on livestock (problems)	Ways to overcome (recommendations)
1. Cattle, buffalo, chicken were dead as well as sick or ill by wounded or disease	1. Must prepare hay or silage prior flooding
2. Lack of feed and medicines	2. Must prepare medicines
3. Could not ready to prepare in escapade such a flash flood , no plan had been set before	3. Need vaccination to livestock
4. Numerous of internal parasite come along with grass or grass leaves caused to the sickness the cattle	4. Must took for alternative place in case of flood

3. Paddy pasture

Affected on pastures (problems)	Ways to overcome (recommendations)
1. Pasture was totally damaged	1. Revitalization of grass to grow up rapidly as soon as possible
2. Lack of seed, seedling or stalks as well as fertilizer for the year to come	

#5 Nakhon Srithammarat province

I. Muang, Praprom, Cha-Ouad, Nasarn and Rornpiboon District

1. General Information

- The flood between November – December 2011 and last long for 15 days, brought about to.....

2. Livestock

Affected on livestock (problems)	Ways to overcome (recommendations)
1. Animals were sick of pneumonia and foot and mouth disease	1. Vaccination is badly needed as early as we can
2. Cattle were starved	2. Must prepare concentrate, hay or any preservative feeds
3. There were no place to stay	3. Evacuate animals to a higher land
4. Most of them died by lack of feed and drowned	4. Take good care to animals

3. Paddy pasture

Affected on pastures (problems)	Ways to overcome (recommendations)
1. All grass become rot or decayed and produced offensive smell both human and animals	1. Preparation of water pump to pump the water out of the land once level of water is still or declining down
2. Animal have no feed to eat	2. In order to save cost of expenditures, it is advice to wait until situation is clear
3. Many of them died by starvation	3. Must excavate all dirt, mud and weed in the canal, trench, pond or any passages of water
4. Required a lot of money to reproduce the pasture to become alive again	

Other proposals

1. Training to villagers how to overcome if flood may occur again
2. Be ready to prepare feed store for the animals
3. Need the government to compensate the lost
4. Need more the establishment for this type of group

II. Pipoon and Chawang District

1. General Information

- The flood between November – December 2011 and last long for 15

2. Livestock

Affected on livestock (problems)	Ways to overcome (recommendations)
1. There was no grass or any feed for cattle or goat after the flood of three months. This is due to the lack of knowledge to make or the store the feed ahead of times	1. Find some grass for then, even far apart. It is a must to do
	2. Put the molasses mix with banana trunk (chopped) or the inner soft part of a certain variety of palm tree (may be called Nipong palm) then feed direct to the cattle

	3. Inner part of top of palm and palm leaves is also good for animal
	4. Buy the feed for them

3. Paddy pasture

Affected on pastures (problems)	Ways to overcome (recommendations)
1. Napier grass decayed livestock, goat become worst	1. All grasses after flood must be eradicated
2. The whip grass was getting rot	2. Replant it
3. Landslide and mud slide were cost to the lost and damaged	3. Some may not completely damaged, washing off the mud is possible
4. The flood was stand still in a month time	4. Plow and plant it again
5. Mud and landslide blocked up and hard to work	5. Cut it close to the ground, spread it, then burn it
6. Weeds those tolerated to the flood also caused to the problem	6. If mud is covered, plow and renovate, then plant it again
7. Apply fertilizer did not help	
8. No land for pasture reproduction	
9. It was hard to sell when so many neighbors have the products in the same period	
10. There is no place to keep the grass those already produced	

III. Larnsaka and Muang District

1. General Information

- Flood is regular happened every year from November 20 - January
- Flooding lasted for 3 months
- Larnsaka District is the original area of water, then there have water flow every year. It hard to solve.

2. Livestock

Affected on livestock (problems)	Ways to overcome (recommendations)
1. When flood there is no feed for cattle	1. Prepare feed for animal

3. Paddy pasture

Affected on pastures (problems)	Ways to overcome (recommendations)
1. Grass those with mud stained from the mud, the cattle wound not touch it	1. Replant it again
2. During the flooding period, the golden apple snail (GAS), rice nature pest eat all of the grass leaves. Could not use for feeding.	2. Should to apply pesticide to control

#6 Srakaeo province

Grope A (Dao Kra Jay Group)

I. What kind of influence did you come under of the flood of the last year (2011)?

- To livestock because it lack of feed.
- To pasture (totally damaged).

1. Short of grass, hay and concentrate at about 4 month.
2. Animals become sick at legs and hooves. There were so skinny, it was so slim chance to get pregnant.
3. Because of the high level of flood, all grasses were dying out.
4. There was no shelter or housing for them to stay. Therefore (from4#), dairy cows became stress then brought about the decreasing of milk.
5. Lack of medicines.
6. Lack of shelter or rest area for animals.
7. Needed frequently visiting of the veterinarian as for animal health and treatment as well.

II. Guideline to overcome the problems.

- For livestock

1. Try to move them onto the upper areas.
2. Find and store pharmaceutical products in case of the need.
3. Take a good care at all time to the health of animals.
4. It is recommended that the government should also search some pieces of land for livestock in case of flood may arrive again.
5. Setting of slush fund for the multipurpose of the group.

- For pasture

1. Find certain variety of grass that can survive well in case of flood.
2. Find certain variety of grass that has a greater yield.
3. Must store the feeds enough when flooding happens to visit us again i.e. hay, silage and rice straw.

Grope B (Yim Soo Group)

I . Flooding was August – October 2011

1. Too long time of flooding caused to the total lost of pasture.
2. Decreasing of amount of milk was totally pain. (This was the main trouble to dairy farmers)
3. Sore leg and foot on the wet bedding was the main problem as well the lack of their shelter.

II . Guideline to overcome

- For Pasture

1. Would be much appreciate if grass we use can stand in the flood as considerable time.
2. The grass that can survive well on heavier grazing would be most desirable.
3. Needed a fast growing grass variety.

- For Livestock

1. Need pharmaceutical products as well as veterinarians.

2. Need to elevate the floor of the barn to be higher.
3. Need a plan for the future if the flood would visit us again i.e.
 - Move animals onto higher land.
 - Prepare preservative food for them.
 - Drugs or medicines for animals.

Grope C (The Macho Man Group/Jai Kla Group)

I. It was flooded from September – December 2011(4 months). It was about 1 meter deep for 1 month.

- For livestock

Dairy cattle

- Lack of grass.
- Mastitis, Foot and Mouth Disease.
- Milk decreased
- Wet and mudding floor.
- Numerous of tick and brought to tick fever. The numberless of fly and insect were found in any cattle pens or houses.
- Various kinds of worm were also found.
- Cattle had a lot of stress.
- Management was pretty hard, especially when cow gave birth the calf.

- For pasture

- Decay and rot of grass produce a very offensive smell in a huge area.
- Hard to move or to use the cutter or mower.
- Short of grass.
- The muddy soil stained in a vast area of the pasture.
- Grass diseases were practically seen, i.e. decay or rot at grassroots.

II. Way to overcome

- For dairy cattle

- Foot and Mouth is the main hazardous disease in term of milk production concerned needs help from veterinarian for a broad sense.
- Move all of livestock to the higher location would be best if we can.

- For pasture

- Should prepare and store the forages to be excelled the amount we normally used to have.
- Select a species of grass that can survive well in the wet or temporary flood area i.e. Paragrass (*Bracharia mutica*).
- Ask or request from the most nearest Animal Nutrition Center and/or the Station to get seed or seedling for our own reproduction of pasture.

- Need a high nutrition value of grass and especially fast growing species.

#7 LAMPANG province

◆ Grope A (Hang Chat District Group)

1. Was one month flood at July – August 2011
 - Flood depth was 100 – 120 cm. for 15 – 10 days.
2. - Both paddy and paddy pasture were totally damaged.
 - Lack of grass or feed for livestock.
 - Numerous of agriculture areas i.e. rice, living fence vegetable and orchards were destroyed.
3. - Land use for livestock was insufficiency available.
 - Shortage of feed, grass for animals.
 - Outbreak contagious disease i.e. Foot and Mouth Disease, Scour or Diarrhea and Internal Parasites and many happened to come after.
4. We ought to look or prepare the alternative site to evacuate the livestock in case of flood might come again.
5. The flood caused to the dead of grass in pasture. Pasture was damage and full of mud. Toxic of chemical agents were spread all over.
 - The best way out is simply to renovate the field and replant.
 - Looking for species that tolerate to the flood.
 - Looking for manure or fertilizer to bring the grass into normal condition and can maintain high quality as it used to be.

◆ Grope B (Muang and Sobprab District Grope)

1. Flood affected four month time since July 2011.
 - The height was 1.00 – 1.20 meters.
2. Caused to damage
 - All agricultural items.
 - Human assets.
 - Lost of livestock as well as their sickness and shortage of feed.
3. Total damaged of grass and pasture brought about to the severe shortage of feed.
4. It is recommended to looking an alternative site ready to move livestock when flood is coming again. This included the feed as well.
5. Long time flooding brought us to the lack of income from selling the grass or hay.
6. - Should ready to build the alternative passage way of water.
 - Reproduction of pasture i.e. cutting, fertilizing.
7. It is better to find the alternative higher land for pasturing by depending on season.

◆ Grope C (Ban Hong District Grope)

Ban Hong District is the original of Mae Nam Ping (The Mae Ping Triangle).

1. Flooding record

- On 28 May 2011, flooding last long for 7 days with 1.20 meters high.
 - On 15 June 2011, flooding last long for 10 days with 2.20 meters high.
2. - The weather forecast of The Department of Meteorology did not come earliest as it should be.
- Never have had in preparing to be ready if flooding arrives.
 - Number of people was dead vanished and vanished in the running water.
3. - Animals were dead.
- Lack of forage and feed.
 - Outbreak of diseases to many variety livestock.
4. - Should store the feed ready to be used.
- Evacuate all animals to a higher land.
 - Vaccination should be practice prior the flood arrives.
5. - Lost of all grass, pasture, all became rot and die.
- Pasture land had been cover up with mud and also shrub and tree.
 - The village road had been destroying to the most inconvenience to communicate.
 - It is a must to renovate the pasture.
 - No gain income in the family. Need to borrow some money for replanting.
6. - It is necessary to work closely with the sub-district council people to be ready if flood happens to come again.
- It is good to make a practice in well aware on weather forecast i.e. TV, radio or from
7. The Department of Meteorology.
- Need badly renovation of these flooded pastures.

#8 Phitsanulok Province

◆ Grope A (Phromphiram District Group)

1. Flood was August – October 2011, at height 0.50 – 1.50 meters last long for 3 months.
2. Never expected before then brought to a vast damaged.
3. Paddy field, orchard, livestock and paddy pasture were totally destroyed.
 - Those affected families must to start if again and back to square one.
 - Animals were drowned and also stuck up in the mud, some were sick and dead.
4. To be well aware of this trouble.
 - It is recommend to store all kind of feed enough for a certain period of time i.e. rice straw, hay.
 - One of the most important things is to have a permanent canal or passage of water.
5. - The main income of farmers faded away due to the vast damage of pasture.
 - The paddy pasture farmers became weak for they have to put more money for the investment of resilience the pasture as well as shelters.

Now, the all have to be the buyers, the grass for their cattle.
6. More money to put into the pasture reproduction.

Another thing, be ready and prepare the drainage way of flooding.

◆ Grope B (Bang Kra Thum District Group)

1. The flood was from August – November 2011 at 2.0 meters height.
2. Rice and pasture were damaged.
3. - Lost of animals for it was too fast to move them in time.
 - Right after there was a terrible outbreak of disease to animals.
4. Have tried to evacuate all animals onto the higher land as well as straw and hay.
5. Brought about the total damage of pasture.
6. It is advice to look for another variety of grass those can survive well in the water.

◆ Grope C (Bang Ra Kam District Grope)

1. The flood was August – November 2011 at 3 - 4 months long the water level was 1 meter high.
2. Rice field and pasture were damaged. Flood was over the cattle pen. None of reserve feed.
3. No place to keep the animals.
4. It would be better if we could keep them on the higher land and prepared the feed ahead of time.
5. Lost of all pastures because of rotting and decaying of grasses.
6. Need variety of grasses those process to stand in the long delay of flood. Need is also the suitable of grasses species in the higher land including in the common land. It is recommended to work together in a group in pasture production.

Evaluation comment by participants in Site A

- This training is the one of the most interesting training in this area, again and again.
- It would be also better to take us for study tour to nutrition center or somewhere.
- Your training strategy bring about to pull and exchange our ideas.
- Could gain a lot of knowledge from the lecturers to put into our practice for a better success.
- Please also to have more training like this again and again. We all learn more and gain more for our experiences.
- It is really a beautiful chance on learn more knowledge which we never have had before.
- Please, keep inform us again, if you have kind of training more and more.
- Thank you very much for Japanese Government (JICA) to providing your aid to all of us. We hold you all in high regards as always. Thanks a lot.
- We sure gained a lot of knowledge you offer to us.
- We sure also will pull it out with non-stop to make use all of what we learn.
- It is recommended to have such this training at twice a year, if possible.
- The training then will draw us into more attention and keep awake at all time. I certainly believe that if we toe in line by follow you advice or suggestion, we will be fine and could bring us to a more profits. Many things will come to us in many aspects.
- Oh! I learn a lot.
- We need this kind of training every six month.
- If possible, we need more training of agriculture especially livestock in this area.
- We love to learn new technologies that you provide to us.
- At present number of cattle is decline down a lot, especially cows as for foundation stock.
- If it is possible, the government should assist us to have house barn, hay storage barn, as well as silo for silage.
- We have a sense to believe that if the budget goes through the collect office (local organization), it would be hard to reach to farmers.
- Overall project concerned to livestock, it would be better to have livestock officers contact direct to group of farmers. Thank you very much.
- It is the state official whom approaches to farmers. It is a unique one.
- All is good for your questionnaire, but however we want to see you to have practical training is how to make silage.
- Help! We need such kind of training like this. At least once a year.
- Please demonstrate how to make hay, silage in details.
- It is recommended to have such training twice a year in order to such alert to us.
- Please, Animal Nutrition Center to recommend hay machines those concerned in feed preservation i.e. hay, silage.
- Need the practice demonstration how to make preservation feed, compose, biogas and how to improve the soil fertility.
- Required the training be arranged at least once o year in order to exchange the new technology or idea to overcome all the problem.

Evaluation comment by participants in Site B

- We need training like this again and again.
- The lecture and participant getting along well, no serious, good lecturers and talk fun, no sleepy.
- We are sure that we need to your training, please come back to see us again.
- We need to buy more fertilizer, seed and seedlings also.
- Great! I learned many good things.
- Very good.
- Thank you for your training, it's really great.
- I would like to say something for the lecture team to require having lectures take fun in some occasion. It can bring not take a nap or sleepy or stress.
- I feel pride to learn more on what I never knew it before.
- We need more training. The knowledge could us to know the call "prevention and care"
- We need more such training.
- I feel great on having this training.
- It would be good if you provide such the training again.
- We need more training, and please arrange more activities.
- We need more training because it is good for dairy farming.
- Absolutely good, Thank you.
- Excellent, Great, Thank you very much.
- We need shorter time lecture than this time.
- I'm glad to be beneficially.
- I'm glad, it is useful for us.
- This training is great, I hope to you bring something new for us.
- This is quite good training. I got a lot of things.
- Every subject is excellent and it hit to my intention.
- This kind of training was so great for farmers either dairy cow farmers and beef cattle farmers. We would be more than glad if you held it again and again.
- I got a lot of knowledge, the context is quite good. Need more training.
- Please arrange the meeting to our group to get together and exchange the idea.
- I am glad to have enhanced in participation of this training, I could learn a lot from this animal nutrition center.

Evaluation comment by participants in Site C

- Thanks a lot for supporting us to be able to stand on our legs.
- Thank you also giving us chemical fertilizer and training, we need more training.
- We need more fertilizer 46-0-0 than you gave me.
- We need this kind of training more often.
- We need more time to training and learn.
- Have gained a lot of experiences to put into practice in our daily life.
- The context of this training is great, beyond description. We will use these experiences in to practice. Thank you very much.
- If possible, I want such of training every year.
- All courses of training you offered to us, it certainly is full of knowledge and can put into practice of our career
- Please again to give us such a wonderful knowledge.
- We need practical training at least one or two days.
- I want to take such training every 3-6 month.
- We need more frequent training.
- I want more training, and I want to expand this technology and knowledge.
- Participants need to expansion of their ideas. The reason why the participants need to familiar each other.
- That is a great project. We need more training like this. I would like to say our relationship Japan and Thailand is great. It is really incredible.
- Need more training about animal contagious diseases.
- The training was interesting. We need yearly training in order to be upgrade for our farming. There is no training long time. You gave us a lot of knowledge.
- Please do such a good training again. It made me exciting.
- This training gave us a bright eye through a lot of knowledge. It is also bringing up for a better farming life.
- We need more Urea (46-0-0) but you gave us so little amount, and compound fertilizer (15-15-15) is not so much necessary.
- We obtained a lot of knowledge, the context was so good. Many things we never know before. We will put into practice.
- Please make such kinds of training frequently, it contribute a great benefit to farmer.
- I got much knowledge through the training. I will put them in to my practice. Please look for the grass market for us as well.
- Members need consecutively training.
- We need more frequent training for farming.
- We need often training so that we can brush up ourselves and become update.
- Need the training for forage production every year to brush up our experience.

Evaluation comment by participants in Site D

- Need assistant in livestock vaccination. Need the inseminator for cattle should kindly be on time.
- It is advisable to form a group of farmers for brainstorm. It is better if power point is more attractive with colors with more pictures because of majority of participant farmers are on age of 35-60 years old.
- Thank you for a lot of chemical fertilizer and consternation.
- Thanks a lot of give us knowledge.
- Thank you for training. I have gained a lot of knowledge. Thank you also to all trainers.
- Due to the training some days in training. I would be much more convenience to provide the place to study for us.
- Through the three days training, I got many things.
- I would like to say thank you for this training. I got a lot of things under this training.
- Need to have more training like this, especially to the livestock people. Glad to have such a knowledgeable person training on us. Need temporary training like this. We all will own potentially.
- This training is superb. We learned and we gained a lot. Need training like this.
- Need frequently training as possible. The training will bring us to put into our activities efficiently.
- The training period took a little bit long time. It is advice to take only two days. We believe the JICA will provide more and more training every year. Thank you for hold this training.
- Three days of training, the farmers has gained a lot of knowledge. Need training like this more.
- Great!
- Need bio-gas project of DLD continuously to all livestock farmers. I have applied in this project, thank you very much indeed.
- The past three days of training, we gain a lot of knowledge and can put into practice. Thank you.
- Require the Livestock market.

Sub-District (Tambon) on Forage Bank under the Royal Initiative Project

Department of Livestock Development- MOAC

Background

The year 2011, Thailand had the severe flood affect in a huge area of Chao Phaya River Basin of 63 provinces. It covered the area of 150 million rai. The 11-20 million rai is the area of agricultural land. Total affected to the livestock was 13.41 million heads. The estimation of the lost was as high as 1.44 million millions baht. It is the 4th rank of world disaster (Ministry of Interior 2011). The violence of the flood was very high and last long time. This happening were covered not only the yearling flood one but also to the area those never been flood before. The damaged and the lost caused to the trouble to farmers who own the livestock and short of feed for animals. It affect to the potential in Livestock production. The worst damage the totally damaged on pasture. Her Royal Highness, Princess Sirinthorn was so worry greatly to all farmers. She then asked Ministry of Agriculture and Cooperative to put the more weight onto this critical. The urgent support of forages and feed stuff had been practiced to all affected farmers. The revitalization and prevention in the long run would be sound. The Director General of Livestock Development took Her Royal's Comment by heart and put into practice of the Department of Livestock Development Policy. The Bureau of Animal Nutrition Development has direct responsibility on this project.

The BAND (The Bureau of Animal Nutrition Development) is now creating the Tambon (sub district) Forage Bank under Her Royal Highness Initiative concept in year 2012. The objective is to reserve the forages in the target areas those might happen again by flood. It must be the site which is not far from the affected area. Therefore one can abruptly take the forages from the bank to give to affected farmers in a short period of time. Nevertheless, one can also save a lot of expenditure as well as time to spend for some event may happen.

The Forage Bank will be build up to 59 sites throughout the country to secure either drought or flood. The Prime urgent as a pilot project will be built 10 forage banks in 10 provinces, as one Tambon in one province. These ten provinces are;

- | | |
|--------------|----------------|
| 1. Ayutthaya | 6. Nakornsawan |
| 2. Ang Thong | 7. Uthaithani |
| 3. Saraburi | 8. Phitsanulok |
| 4. Singburi | 9. Sukhothai |
| 5. Chainat | 10. Phichit |

It will be done through the integration of government sector, farmers sector and other private sectors to select the suitable site, which would be the nearest place which will be prompt to give the forages to farmer. It is the must, the local people concerned should share their capacity on care and management all activities concerned.

Objectives

- To establish the 58 Tambons (sub-district) Forage Bank under the Royal Initiative Scheme is simply to collect forage crops stored on the place where we can move to feed to livestock if flood attack. Totally of Forage Bank is 58 sites.

Target

1. To establish the forage banks under the royal initiative scheme in the area of responsibility of center or station of Bureau of Animal Nutrition Development 29 centers and stations. Each center or station has his responsibility to establish two forage banks. Totally is 58 banks.
2. Must reserve forage and forage stuff in each banks not less than 5000 kg/year.

Time frame

From October 2011 – May 2012

Procedure

1. To set up the project: The BAND will appoint the working committee to laid the plan to arrange the project and monitoring.
2. Coordination: The BAND will inform 29 centers/stations to cooperate with the provincial livestock officers, Tambon council and local council of responsible area to establish the forage bank in a Tambon under the Royal Initiative scheme by center/station at 58 banks.
3. Selecting the site to construct one forage bank. It is suggested to select the site that always got affect from the flood of quite frequent and repeatedly every year. The site should also be the congested area of livestock. The capacity of the barn should contain not less than 1000 bales of hay.

The body of forage bank must comprise of

- 3.1 Should have member not less than 20 households.
 - 3.2 Have cattle and buffalo not less than 100 heads.
 - 3.3 Be ready and alert to move animal for alternative site.
 - 3.4 Must have one group of appointed committee to look after the bank.
4. Administration of forage bank: in order to own security in this area. The people concerned have been appointed on the following persons.
 - (1) Head of district council (or sheriff or Thai say Nai Amphoe) as consultant
 - (2) Livestock district officer or someone who had got appointment as consultant
 - (3) The Chief of Tambon (sub-district) as consultant
 - (4) Chairman of forage bank 1 person
 - (5) Deputy of Chairman 1 person
 - (6) Committee (at least) 2 person
 - (7) Treasurer 1 person
 - (8) Secretary 1 person

Their responsibilities are as follow;

- 4.1 Management on gathering the forages for one forage bank. The amount of forages must not less than 15,000 kg/year through

(1) The BAND will provide 5,000 kg/year of 58 banks. This would be 290,000 kg/year. Delivering is included to every site.

Provision of Forages

As mention earlier BAND had provided 5,000 kg/site. The committee of the bank own their full authority to take the forages distribute to affect affected farmer when flood damage arrive. The provincial livestock officer, the chairman of sub-district council, the local council, group of farmers or representative of farmers must work together to hand over the forages under the said rule and regulation.

5. Management of Forage Bank: sources of supporting.

(1) Kindness of Her Royal Highness Princes Sirindhorn from Military Livestock Unit as a source for studying the forage feed for animal, Amphoe Kaengkoi, Saraburi.

The donation from Her Royal kindness is 10,000 kg/site. Totally is 100,000 kg.

(2) Band has also provided 5,000 kg/year/unit. Totally 58 site of 290,000 kg/year. Included transportation to right on the site.

(3) The management committee got to manage to fulfill in each to have not less than 15,000 kg/year and must be aware the shortage.

Duration

(1) The pilot of 10 Tambon, must finish everything ready within March 2012.

(2) The rest 48 must be finished on May 2012.

Monitoring program

(1) District livestock officer must follow up since the acceptance till the distribution.

(2) BAND center/station must report all about to head office, BAND.

Budget

1. The provided the budget of Tambon as the aim to establish the forage bank. There are cost of purchasing forages, cost of reparation of the barn and other expenditures on delivering the hay.

1.1 The 10 pilot banks have the budget of 20,000 baht each totally is 200,000 baht.

1.2 Forty Eight Forage Banks is 60,000 baht each, totally is 2,880,000 baht.

Grand total budget of 58 sites is 3,080,000 baht (Three million and eighty thousand baht).

2. The BAND has already provided all budget concerned included monitoring and coordination.

Expected result

1. Hope this forage bank can be an instant tool to assist 15,000 tons of hay/bank.

2. Would be the pilot plan to help the farmers if get flood affects in the future to come as a role model.

Detail of budget allocation under The Royal Initiation Project for establishment the forage bank of sub-district.

Table 1 Budget allocation under The Royal Initiation Project for establishment the forage bank of sub-district level, 10 pilots.

Item	Unit	Number	Price/Unit	Baht
Repairing of barn	Place	1	10,000	10,000
Transportation	bale	1,000	10	10,000
Total				20,000

10 pilots of the forage bank, the budget of each site is 20,000 baht. Total is 200,000 baht.

Table 2 Budget allocation under The Royal Initiation Projects for establishment 48 forage banks at sub-district level.

Item	Unit	Number	Price/Unit	Baht
Purchasing -hay	kg	10,000	4	40,000
Reparation, housing	Place	1	10,000	10,000
Transportation cost	bale	1,000	10	10,000
Total				60,000

48 forage banks, the budget of each site are 60,000 baht. Total is 2,880,000 baht.

Table 3 10 pilots project of forage bank at Tambon level.

Region	Center/Station	No.	Province	Forage bank (place)	Reserved forage (kg)	Budget (baht)
1	Chainat Center	1	Chainat	1	15,000	20,000
1	Suphanburi Station	2	Ayutthaya	1	15,000	20,000
		3	Ang Thong	1	15,000	20,000
3	Nakhonratchasima Center	4	Saraburi	1	15,000	20,000
		5	Lopburi	1	15,000	20,000
6	Phichit Station	6	Phichit	1	15,000	20,000
		7	Uthaithani	1	15,000	20,000
6	Phetchaboon Station	8	Nakhonsawan	1	15,000	20,000
		9	Phisanulok	1	15,000	20,000
6	Sukhothai Station	10	Sukhothai	1	15,000	20,000
Total				10	150,000	200,000

Table 4 Target area to be establish 48 Forage Bank

Region	Center/Station	No.	Province	Forage bank (place)	Reserved forage (kg)	Budget (baht)
2	Srakaew Center	1	Srakaew	1	15,000	60,000
		2	Prachinburi	1	15,000	60,000
3	Nakhonratchasima Center	3	Nakhonratchasima	1	15,000	60,000
3	Roi Ed Station	4	Roi Ed	1	15,000	60,000
3	Buriram Station	5	Sisaket	1	15,000	60,000
		6	Buriram	1	15,000	60,000
3	Yasothon Station	7	Surin	1	15,000	60,000
		8	Yasothon	1	15,000	60,000
		9	Amnatcharoen	1	15,000	60,000
4	Khon kaen Center	10	Khon Kaen	2	30,000	120,000
4	Mahasarakam Station	11	Mahasarakam	2	30,000	120,000
4	Kalasin Station	12	Kalasin	2	30,000	120,000

4	Udonthani Station	13	Udonthani	2	30,000	120,000
4	Loei Station	14	Loei	1	15,000	60,000
4	Mukdahan Station	15	Nongbualamphu	1	15,000	60,000
		16	Mukdahan	2	30,000	120,000
4	Nongkhai Station	17	Nongkhai	1	15,000	60,000
		18	Beungkan	1	15,000	60,000
4	Nakhonpanom Station	19	Nakhonpanom	2	30,000	120,000
4	Sakonnakon Station	20	Sakonnakon	2	30,000	120,000
5	Lampang Center	21	Lampang	1	15,000	60,000
		22	Chiang Mai	1	15,000	60,000
5	Phrae station	23	Phrae	1	15,000	60,000
		24	Nan	1	15,000	60,000
6	Sukhothai Station	25	Sukhothai	1	15,000	60,000
7	Phetchaburi Center	26	Phetburi	1	15,000	60,000
		27	Nakhonpathom	1	15,000	60,000
7	Prachuabkirikhan Station	28	Prachuabkirikhan	2	30,000	120,000
8	Suratthani Center	29	Suratthani	1	15,000	60,000
		30	Nakhonsithammarat	1	15,000	60,000
8	Chumporn station	31	Chumporn	1	15,000	60,000
		32	Ranong	1	15,000	60,000
9	Narathiwat Center	33	Narathiwat	1	15,000	60,000
		34	Pattani	1	15,000	60,000
9	Satoon Center	35	Satoon	1	15,000	60,000
		36	Songkhla	1	15,000	60,000
9	Trang Station	37	Trang	2	30,000	120,000
9	Phattalung Station	38	Phattalung	2	30,000	120,000
Total				48	720,000	2,880,000

The BAND has already reserve forage to The Forage Bank in 61 banks of 34 provinces, each province got 5,000 kg as shown in following;

1. Chainat TAO, T. Chainat, A.Sena, Phranakhonsiyutthaya province.
2. Lumpee TAO, T. Lumpini, A. Phranakhonsiyutthaya, Phranakhonsiyutthaya province.
3. Saraloi TAO, T.Saraloi A. Tharue, Phranakhonsiyutthaya province.
4. Songpeenong TAO, T. Songpeenong, A. Songpeenong, Suphanburi province.
5. Tambon Dongsing Municipal Forage Bank M.15, T.Dongsing, A.Changhan, roi Ed province.
6. Banmawa M.6 T.Beung Ngam, A. Thungkhaoluang, Roi Ed province.
7. Thungwang TAO M.4, T. Thungwang, A.Satuk, Buriram province.
8. Thungwang TAO M.6, T. Thungwang, A.Satuk, Buriram province.
9. Phromthep TAO M.5 T.Phromthep, A.Thatoom, Surin province.
10. Ginpal TAO, T.Nongginpal, A.Warinchamrab, Ubonratchathani province.
11. Khum Ngen, T. Khum Ngen, A.Mueng, Yasothon province.
12. Sriboonrueng TAO M.10, T.Sriboonrueng, A. Chonnabot, Khon Kaen province.

13. Muengphia Forage Bankn Banlawa M.6, T.Muengphia, A.Banphai, Khon Kaen province.
14. Hua Khang TAO, T.Hua Khang, A.Gosumphisai, Mahasarakam province.
15. Maka TAO, T.Maka, A.Kantharawichai, Mahasarakam province.
16. Gudsra Forage Bank, M.1, T.Gudsra, A.Mueng, Udonthani province.
17. Gudsra Forage Bank, M.3, T.Gudsra, A.Mueng, Udonthani province.
18. Bankokyai, M.7, Bankokyai, T.Nongbua, A.Nongkungsri, Kalasin province
19. Nongphai, M.3, Bannongphai, T.Saolao, A.Nongkungsri, Kalasin province
20. Srisongkam Forage Bank, T.Srisongkam, A. Srisongkam, Nakhonphanom province.
21. Laophattana TAO, T. Laophattana, A.Nawa, Nakhonphanom province.
22. Banphaenglangkao TAO T.Banphaeng, A. Banphaeng, Nakhonphanom province.
23. Natongwattana Forage Bank, Banpungnoi, M.4, T.Natongwattana, A.Phonnakaew, Sakonnakhon province.
24. Banpaen Forage Bank, Banpaen, M.5,10, T.Banpaen A.Phonnakaew, Sakonnakhon province.
25. Bannongphue Forage BAnk, M.4, T.Samakiphattana, A.Argad Am Nuay, Sakonnakhon province.
26. Ban Huay Sai Forage Bank, T.Phranphaow, A.Srichiangmai, Nongkhai province.
27. Banchoem Forage Bank, T.Banzoem A. Phonphisai, Nongkhai province.
28. Bangsainoi Forage Bank, T.Bangsainoi, A.Wanyai, Mukdahan province.
29. Dongluang Forage Bank, T. Dongluang, A.Wanyai, Mukdahan province.
30. Na Aor Forage Bank, M.1, T.Na Aor, A.Mueng Loei, Loei province.
31. Sawankalok Municipal TAO, A.Sawankalok, Sukhothai province.
32. Nongkhanan Forage Bank, M.1, T.Nongkhanan, AMueng, Phetburi province.
33. Tharaeng Aog Forage Bank, T.Tharaeng Aog, A.Banlaem, Phetchaburi province.
34. Thabsakae TAO, T. Thabsakae, A. Thabsakae, Prachuabkirikhan province
35. Khaodaeng TAO M.2, T.Khaodaeng, A.Kuiburi, Prochuabkirikhan province.
36. Laem TAO M.4, T.Leam, A.Huasai, Nakhonsithammarat province
37. BAnklang TAO, M.2, T.Banklang, A.Chiang Mai, Nakhonsithammarat province.
38. Chum Ko Forage Bank, T.Chum Ko, A. Prathiw, Chumporn province.
39. Tak Daed Forage Bank, T.Tak Daed, A.Mueng, Chumporn province
40. Kosit Forage Bank, M.4, T.Kosit, A.Takbai, Narathiwat province
41. Rue Sao Aog Forage Bank, M.2, T. Rue Sao, A. Rue Sao, Narathiwat province.
42. Muengphet Forage Bank, M.7, T. Namuengphet, A.Sikao, Trang province
43. Na Muen Sri Forage Bank, M.6, T.Na Muen Sri, A.Nayong, Trang province
44. BAnkuan Forage Bank, Moobanlupobatu, T.Bankuan, A.mueng, Satoon

45. Bankukhud, Banlaemwang, A.Sathingphra, Songkla province
46. Rong Forage Bank, M.4, T. Rong, A. Krasaesin, Songkhla province.
47. Rong Forage Bank, M.3, T. Choengsae, A. Krasaesin, Songkhla province.
48. Khaochaison TAO, M.14, T. Khaochaison, A. Khaochaison, Phattalung province
49. Khaobangkam TAO, T. Khaobangkam, A.Pakphayoon, Phattalung province
50. Mueng Forage Bank, A.Mueng, Phattalung province
51. Tamod Forage Bank, Ponoh School, A.Tamod, Phattalung province
52. Paphayom TAO, T.Paphayom, A. Paphayom, Phattalung province
53. Srinarin Forage Bank, Para-rubber Center, A. Srinakarin, Phattalung province
54. Kuankhanun, M.3,5, T.Makoknue, A.Kuankhanun, Phattalung province
55. Bangkaewkoksukonkao Forage Bank, A. Bangkaew, Phattalung province
56. Pabonchangkhao Forage Bank, T. Thungnaree, A. Pabon, Phattalung province
57. Pakphayoon Forage Bank, T. Donpradu, A. Pakphayoon, Phattalung province
58. Kongla Forage Bank, Phattalung Animal Nutrition development Station, A. Sribanphot, Phattalung province
59. Sribanphot Forage Bank, Phattalung Animal Nutrition development Station, A. Sribanphot, Phattalung province
60. Pantae TAO, A. Pantae, A.Kuankhanun, Phattalung province
61. Tanodduan Forage Bank, Municipal of Tanodduan, A.Kuankhanun, Phattalung province

Those donated by Her Royal Highness Princess Sirinthorn produced at A.Kaengkhoi, Saraburi province for 10 pilots of Forage Bank, 5,000 kg/ each bank on 19 July 2012 such as;

1. Krai Nok TAO Forage Bank, T.Krai Nok, A.Kongkairat, Suthothai province.
2. Bo Thong TAO Forage Bank, T. Bo Thong, A.Bangrakam, Phitsanulok province.
3. Yanmadtree TAO Forage Bank, T. Yanmadtree, A.Phayuhakiri, Nakhonsawan province.
4. Tanong TAO Forage Bank, T. Tanong, A.Photala, Phichit province.
5. Nongpaibaen TAO Forage Bank, T. Nongpaibaen, A.Mueng, Uthaithani province.
6. Nam Tao TAO Forage Bank, T. Nam Tao, A.Bangban, Phranakhonsiyutthaya province.
7. Thadindam TAO Forage Bank, T. Thadindam, A.Chaibadan, Lopburi province.
8. Hinzon TAO Forage Bank, T. Hinzon, A.Kaengkhoi, Saraburi province.
9. Phongphang TAO Forage Bank, T. Phongphang, A.Pamok, Ang Thong province.
10. Taluk TAO Forage Bank, T. Taluk, A.Sabphaya, Chainat province.

Appendix C

C-1 Construction drawings for typical prevention works and structures.

JICA consultant team conducted a sight survey of rehabilitation work being done by RID for flood recovery and Chao Phraya Irrigation Project supported by JICA. At the sight survey, JICA Study team has collected some drawings. The contents of drawings were heightening of river embankment by earthwork or concrete retaining wall as below.

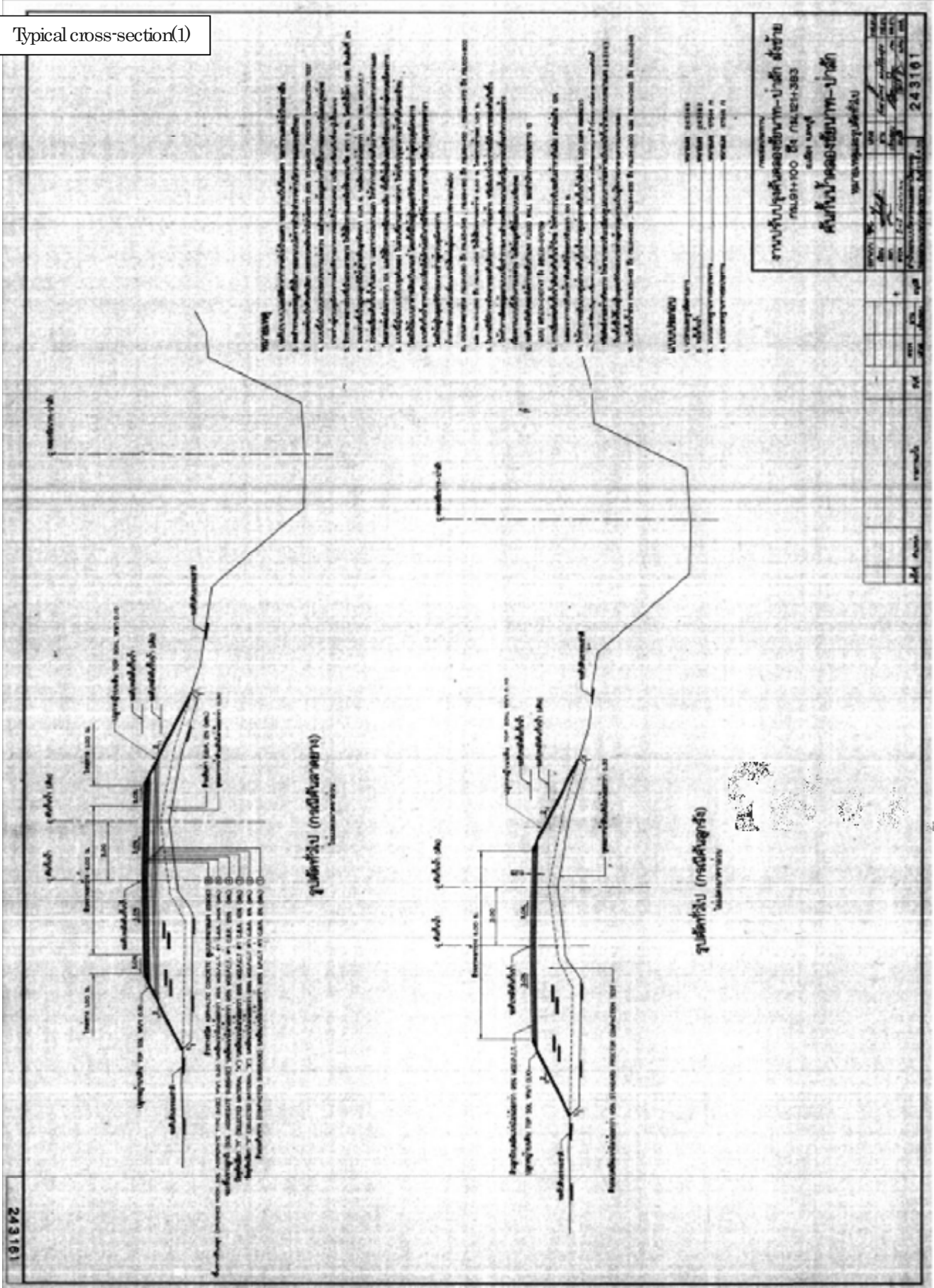
• Heightening embankment by earthwork

Before raising the land level, stripe existing ground not less than 30cm. After the embankment, the top of embankment will be paved with laterite or asphalt in order to pass for cars or people. Width of top of the dike is i) 6m for cars and 1m shoulder for both side in paved with asphaltic road, ii) 8m width in paved with laterite road. Gradient of slope is 1:2.0 and the slope will be covered with grasses.

• Construction of retaining wall

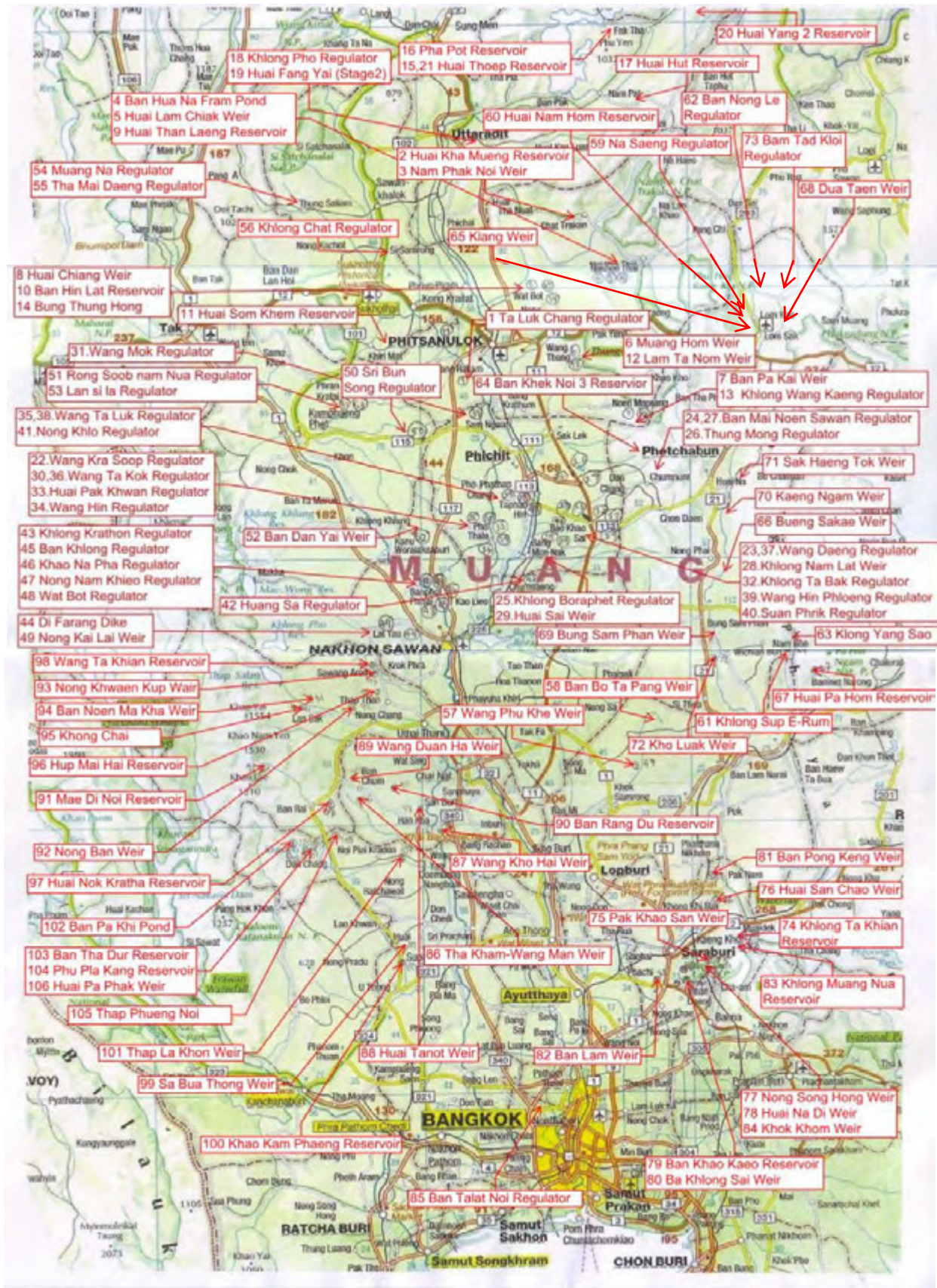
The shape of retaining wall is concrete reverse T shaped retaining wall. Top level of the retaining wall is set to 20cm higher than the high water level of 2011 flood. Height of retaining wall shall be at least 0.4m but not over 1.20m. Some basis of retaining wall has pile basement, the diameter is 15cm, length is 4.0m, and the interval of pile is 1.0m.

Typical cross-section(1)



C.2 SSIRP Inventory Survey

C.2.1 Location Map of SSIRP Inventory Survey



C.2.2 Method of SSIRP Inventory Survey

More than 4,000 irrigation facilities were constructed under the SSIP project from 1977 to 1985. Among these SSIP project, 570 facilities were repaired or improved under the SSIRP project from 1999 to 2000. The project team conducted the inventory survey of 106 facilities in the study area which were repaired or improved under the SSIRP project. Result of Inventory survey is listed in Appendix C-2-5. Detail information (Such as project location or repaired period) is shown in Appendix C-2-6. The survey was carried out from 14th June 2011 to 31st August 2011 cooperation with RID Bangkok Headquarter, RID Regional Office, Province Office and TAO. The degree of damage was assessed according to following category. The questionnaire used in the survey is shown in Appendix C-2-7.

➤ No damage

Definition: The facility has no or slightly damaged by 2011 flood. Repairmen for the felicities are unnecessary and can use for irrigation.

➤ Slightly damaged

Definition: The facility has damaged by 2011 flood and need to be repaired in prompt. Example of slightly damaged were listed as follow.

- i) Sediment was submerged in facilities but can use for irrigation.
- ii) Erosion has occurred in the embankment slope or the connecting channel.
- iii) Damage to wing wall, apron and riprap

➤ Seriously damaged

Definition: The facility has damaged by 2011 flood and need to be repaired or new construction. Example of seriously damaged were listed as follow.

- i) Damage to the major structures such as piers and gates.
- ii) Damage to the dam body such as settlement and leakage
- iii) Other damage has happen which affects the major functions of the facilities.

C.2.3 Analysis of SSIRP Inventory Survey Result

After the SSIP project, almost all facilities O&M has transferred to TAO, but some project such as constructed under the King's Project or have wide beneficially area (more than 4,000 rai according to hearing survey), RID still in charge of O&M. Among the 106 facilities which the project team conducted the survey, 7 facilities are still under RID O&M, and the other facilities, O&M have been handed over to TAO. 4 facilities in 106 have seriously damaged by 2011 flood and 7 facilities has slightly damaged. Details of damage are shown in after "(1) Seriously damaged". 80 facilities has no damage and 15 facilities cannot find in this survey. The rate of damaged degree is shown in following figure.

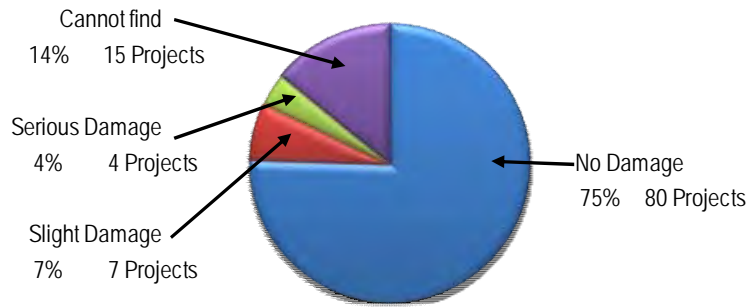


Figure C.2.2.1 Rate of damaged degree by 2011 flood

➤ **Seriously damaged**

4 facilities listed in under table has seriously damaged by 2011 flood

Table C.2.2.1 Seriously damaged facilities

No.	Project name	Province
10	Ban Hin Lat Reservoir	Phitsanulok
52	Ban Dan Yai Weir	Kampaeng Phet
66	Bueng Sakae Weir	Phetchabun
69	Bung Sam Phan Weir	Phetchabun

- i) No10 Ban Hin Lat Reservoir (Phitsanulok Province)
RID is in charge of O&M. Riprap, Slope in the reservoir were damaged in 2011 flood.



- ii) No.52 Ban Dan Yai Weir (Kampaeng Phet Province)
RID is in charge of O&M. Abutment has been eroded and leaking in rain season when the water level become high. The weir can stock water in rain season so they can use for irrigation but cannot stock water in dry season so they cannot use for irrigation in dry season. The downstream of the wear slope has eroded and collapsed

- iii) No.66 Bueng Sakae Weir (Phetchabun Province)
O&M has transferred to TAO. Downstream slope of the wear has eroded and collapsed in 2011 flood





No69 Downstream of the weir

iv) No.69 Bung Sam Phan Weir (Phetchabun Province)
O&M has transferred to TAO. Downstream slope of the wear (about 100m length) has eroded and collapsed in 2011 flood

➤ **Slightly damaged**

7 facilities listed in under table has slightly damaged by 2011 flood

Table C.2.2.2 Slightly damaged facilities

No.	Project name	Province
1	Ta Luk Chang Regulator	Phitsanulok
3	Nam Phak Noi Weir	Phitsanulok
6	Muang Hom Weir	Phitsanulok
8	Huai Chiang Weir	Phitsanulok
12	Lam Ta Nom Weir	Phitsanulok
13	Khlong Wang Kaeng Regulator	Phitsanulok
30	Wang Ta Kok Regulator	Phichit

All of the facilities on the above table, O&M has transferred to TAO.

Sediment was submerged in under listed facilities.

- No.1 Ta Luk Chang Regulator (Phitsanulok Province)
- No.3 Nam Phak Noi Weir (Phitsanulok Province)

In addition to the sediment, weeds obstruct the water flow in under listed facilities.

- No.6 Muang Hom Weir (Phitsanulok)
- No.8 Huai Chiang Weir (Phitsanulok)
- No.12 Lam Ta Nom Weir (Phitsanulok)
- No.13 Khlong Wang Kaeng Regulator (Phitsanulok)

Under facility had slightly damaged to earth dike and riprap.

- No.30 Wang Ta Kok Regulator (Phichit)

Cannot find

RID Regional office or TAO doesn't grasp 15 facilities situation because they lost the facility information in 2011 flood or the staff in charge of the facilities has changed or leaved their job.

C.2.4 Current Status of Recovery for Damaged Facilities by RID or TAO

➤ Current status of recovery for seriously damaged facilities.

- i) No10 Ban Hin Lat Reservoir (Phitsanulok Province)

RID is in charge of O&M. The facilities has already repaired (It cost 2 million bahts according to the hearing survey) and it is used for irrigation.

ii) No.52 Ban Dan Yai Weir (Kampaeng Phet Province)

RID is in charge of O&M. RID is going to start survey to repair the facility from October 2011.

iii) No.66 Bueng Sakae Weir (Phetchabun Province)

TAO is in charge of O&M. There is no expecting to repair the facility because TAO take priority to use the budget for repairing the infrastructure such as road.

iv) No.69 Bung Sam Phan Weir (Phetchabun Province)

There is no expecting to repair the facility because of the same reason as iii).

➤ Current status of recovery for slightly damaged facilities

Water Users Group (WUG) is dredging and repairing the facilities by man power. When they need machine power, TAO cooperate with UWG.

C.2.5 List of SSIRP Projects for Inventory Survey 6/4

Ser No.	Province	Project Name	O&M Office	Project Benefits		Location	Damage by Flood	Level of Damage	Current Problem
				Area(rai)	Households				
Regional Irrigation Office No.3									
1	Phitsanulok	Ta Luk Chang Regulator	TAO	1,000	1,034	Hill	The sediment was submerged in upstream and downstream of the gate.	Slight	No problem
2		Huai Kha Mueng Reservoir	TAO	500	100	Hill	No Damage	Not	No Problem
3		Nam Phak Noi Weir	TAO	3,000	601	Hill	The sediment was submerged in front of the weir.	Slight	No Problem
4		Ban Hua Na Fram Pond	TAO		30	Flat	No Damage	Not	No Problem
5		Huai Lam Chiak Weir	TAO	800	225	Hill	No Damage	Not	No Problem
6		Muang Hom Weir	TAO	1,000	50	Hill	The sediment was submerged in front of the weir.	Slight	In front of the weir is full of weeds, The weeds is the major obstruction of the water flow
7		Ban Pa Kai Weir	TAO	2,500	30	Hill	No Damage	Not	Regulator gate for the left weir canal was broken
8		Huai Chiang Weir	TAO	1,000	70	Hill	The sediment was submerged in front of the weir	Slight	In front of the weir is full of weeds, The weeds is the major obstruction of the water flow
9		Huai Than Laeng Reservoir	TAO	400	102	Hill	No Damage	Not	No Problem
10		Ban Hin Lat Reservoir	RID	1,000	102	Hill	Flood from Nan River flow into the Ban Hin Lat Reservoir, damage to Spillway, riprap, slope protection and irrigation system. RID has repair them already and the cost was 2,000,000 Baht.	Serious	No Problem
11		Huai Som Khem Reservoir	TAO	3,000	50	Hill	No Damage	Not	No Problem
12		Lam Ta Nom Weir	TAO	5,000	50	Hill	The sediment was submerged in front of the weir.	Slight	In front of the weir is full of weeds, The weeds is the major obstruction of the water flow
13		Khlomg Wang Kaeng Regulator	TAO	3,000	100	Hill	The sediment was submerged in front of the gate.	Slight	No Problem
14		Bung Thung Hong	TAO	2,000	100	Hill	No Damage	Not	No Problem
15	Uttaradit	Huai Thoep Reservoir	TAO	800	200	Hill	No Damage	Not	No Problem
16		Pha Pot Reservoir	TAO	500	257	Hill	No Damage	Not	No Problem
17		Huai Hut Reservoir	TAO	1,000	70	Hill	No Damage	Not	No Problem
18		Khlomg Pho Regulator	-	36,000	43	-	-	-	-
19		Huai Fang Yai (Stage 2)	-	500	100	-	-	-	-
20		Huai Yang 2 Reservoir	TAO	800	80	Hill	No Damage	Not	No Problem
21		Huai Thoep Reservoir	-	800	200	-	-	-	-
22	Phukhit	Wang Kra Soop Regulator	-			-	-	-	-
23		Wang Daeng Regulator	-	4,000	720	-	-	-	-
24		Ban Mai Noen Sawan Regulator	TAO	1,500	270	Flat	No Damage	Not	In front of the regulator is full of weeds. The weeds are the obstruction of the water flow
25		Khlomg Boraphet Regulator	TAO	1,500	270	Flat	No Damage	Not	Due to the flood before 2011, TAO just constructed the weir in the area, change the structure
26		Thung Mong Regulator	TAO	3,000	540	Flat	No Damage	Not	In front of the regulator is full of weeds the weeds is the obstruction of the water flow
27		Ban Mai Noen Sawan Regulator	TAO			Flat	No Damage	Not	In front of the regulator is full of weeds the weeds is the obstruction of the water flow
28		Khlomg Nam Lat Weir	TAO	1,000	101	Flat	No Damage	Not	No Problem
29		Huai Sai Weir	TAO	1,500	103	Flat	No Damage	Not	No Problem
30		Wang Ta Kok Regulator	TAO	5,000	800	Flat	Flooding in 2011, damage to Slope embankment, riprap and earth dike.	Slight	No Problem
31		Wang Mok Regulator	TAO	3,000	480	Flat	No Damage	Not	No Problem
32		Khlomg Ta Bak Regulator	TAO	1,000	160	Flat	No Damage	Not	No Problem
33		Huai Pak Khwan Regulator	TAO	8,000	1,280	Flat	No Damage	Not	No Problem
34	Wang Hin Regulator	TAO	5,000	800	Flat	No Damage	Not	No Problem	

C.2.5 List of SSIRP Projects for Inventory Survey 7/4

Ser No.	Province	Project Name	O&M Office	Project Benefits		Location	Damage by Flood	Level of Damage	Current Problem
				Area(rai)	Households				
35	Nakhon Sawan	Wang Ta Luk Regulator	TAO	5,000	800	Flat	No Damage	Not	Due to the enlarge the channel, TAO constructed Regulator 2-2.00x1.75m length 10.60m
36		Wang Ta Kok Regulator	TAO	5,000	800	Flat	No Damage	Not	No Problem
37		Wang Daeng Regulator	-	4,000		-	-	-	-
38		Wang Ta Luk Regulator	TAO	2,000	250	Flat	No Damage	Not	No Problem
39		Wang Hin Phloeng Regulator	-	1,500	240	-	-	-	-
40		Suan Phrik Regulator	TAO	1,500	240	Flat	No Damage	Not	In front of the Suan Phrik Regulator water, is full of the weed, grass, obstructed of the waterway in the channel
41		Nong Khlo Regulator	TAO	3,000		Flat	No Damage	Not	In front of the Nong Khlo regulator, was full weed, tree and so on, obstructed for waterway in the channel
42		Huang Sa Regulator	TAO	10,000	375	Flat	Flood water overtopped embankment but there was no particular damage to Huang Sa Regulator	Not	Due to the size of regulator is a narrow, RID Nakhon Sawan Provincial office proposed to enlarge the size of regulator in the future.
43		Khlong Krathon Regulator	TAO	4,000	200	Flat	Flood water overtopped embankment but there was no particular damage to Khlong Krathon Regulator	Not	No Problem
44	Di Farang Dike	TAO	5,000	300	Flat	No Damage	Not	No Problem	
45	Ban Khlong Regulator	TAO	10,000	670	Flat	Flood water overtopped embankment but there was no particular damage to Ban Khlong Regulator	Not	No Problem	
46	Khao Na Pha Regulator	TAO	15,000	400	Flat	Flood water overtopped embankment but there was no particular damage to Khao Na Pha Regulator	Not	Nakhon Sawan Province plan to enlarge the channel (length 150 m) for increasing quantity of the flood water	
47	Nong Nam Khieo Regulator	TAO	15,000	270	Flat	Flood water overtopped embankment but there was no particular damage to Nong Nam Khieo Regulator	Not	No Problem	
48	Wat Bot Regulator	TAO	10,000	375	Flat	Flood water overtopped embankment but there was no particular damage to Wat Bot Regulator	Not	No Problem	
49	Nong Kai Lai Weir	TAO	3,000		Flat	No Damage	Not	No Problem	
Regional Irrigation Office No.4									
50	Kamphaeng Phet	Sri Bun Song Regulator	RID	3,000	205	Flat	No Damage	Not	The regulator cannot control due to the broken of steel gate
51		Rong Soob nam Nua Regulator	TAO	700	260	Flat	No Damage	Not	The riprap of slope embankment downstream was damaged
52		Ban Dan Yai Weir	RID	4,477	163	Flat	In 2011, The body of weir leak, the right slope embankment collapse settlement, the Kamphaeng Phet Irrigation Projects repair and can use for irrigation only in rain season. RID planning to investigate the damage and repair the facilities from October.	Serious	The body of weir leak and cannot store water in dry season. The irrigation lined canal damage periodically, the length 300 m.
53	Lan si la Regulator	TAO	1,000	75	Flat	No Damage	Not	In front of the regulator, is full of weeds	
54	Sukhothai	Muang Na Regulator	RID	5,000	1,370	Flat	No Damage	Not	The RID Sukhothai Provincial constructed the irrigation system to irrigate for distribute to agricultural land
55		Tha Mai Daeng Regulator	RID	20,000	1,450	Flat	No Damage	Not	No Problem
56		Khlong Chat Regulator	TAO	1,500	200	Flat	No Damage	Not	No Problem
Regional Irrigation Office No.10									
57	Lopburi	Wang Phu Khe Weir	-	1,000	150	-	-	-	-
58		Ban Bo Ta Pang Weir	TAO	4,000	60	Flat	No Damage	Not	The downstream of weir was full of sediment and weed, obstructed for waterway
59	Phetchabun	Na Saeng Regulator	TAO	1,500	120	Hill	No Damage	Not	In 2008, flood occurred and damage the regulator due to the current canal is narrow. In front of the regulator, is full of weeds
60		Huai Nam Hom Reservoir	TAO	500	102	Hill	No Damage	Not	The boundary of the Huai Nam Hom reservoir is full of weeds
61		Khlong Sub E-Rum	TAO	1,500	150	Hill	No Damage	Not	The bottom of the khlong Sup E-Rum is full of sediment
62		Ban Nong Le Regulator	TAO	1,000	900	Hill	No Damage	Not	No problem

C.2.5 List of SSIRP Projects for Inventory Survey 8/4

Ser No.	Province	Project Name	O&M Office	Project Benefits		Location	Damage by Flood	Level of Damage	Current Problem
				Area(rai)	Households				
63	Sarnaburi	Khlong Yang Sao	TAO	1,000	150	Hill	No Damage	Not	No problem
64		Ban Khek Noi 3 Reservoir	TAO			Hill	No Damage	Not	No problem
65		Klang Weir	TAO	18,000	202	Hill	No Damage	Not	No problem
66		Bueng Sakae Weir	TAO	2,000	101	Hill	Masonry and riprap in the tail structure damaged due to flow the flood	Serious	Damage by 2011 flood , masonry and riprap in the tail structure damaged due to flow the flood
67		Huai Pa Hom Reservoir	TAO	1,200		Hill	No Damage	Not	The site Huai Pa Hom Reservoir stay inner the National park Tat Mok
68		Dua Taen Weir	TAO	12,000	160	Hill	No Damage	Not	No problem
69		Bung Sam Phan Weir	TAO	1,800		Hill	Masonry and riprap in the tail structure (about 100m length) damaged due to flow the flood	Serious	2011 Flood has been eroded in the tail structure and damaged the slope of the embankment.
70		Kaeng Ngam Weir	TAO	1,400		Hill	No Damage	Not	No problem
71		Sak Heaeng Tok Weir	TAO	2,000	7,000	Hill	No Damage	Not	No problem
72		Kho Luak Weir	-	5,000	100	-	-	-	-
73		Ban Tad Kloie Regulator	TAO	1,500		Hill	No Damage	Not	Downstream of the regulator, is full of sediment in the bottom of the canal
74		Khlong Ta Khian Reservoir	TAO	500	64	Flat	Flood water overtopped dam crest but there was no particular damage to dam body	Not	Water leakage at dam body. Farmer constructed house in the tail of spillway.
75		Pak Khao San Weir	TAO		40	Flat	No Damage	Not	No problem
76		Huai San Chao Weir	TAO	1,500	20	Flat	No Damage	Not	No problem
77	Nong Song Hong Weir	TAO	2,000	82	Flat	No Damage	Not	In front of Nong Song Hong Weir is full of weeds and sediment. Water is leaking from weir body.	
78	Huai Na Di Weir	TAO	2,000	35	Flat	No Damage	Not	In front of Huai Na Di Weir is full of weeds and sediment. Water is leaking from weir body.	
79	Ban Khao Kaeo Reservoir	TAO	1,500	112	Hill	No Damage	Not	No problem	
80	Ban Khlong Sai Weir	TAO	1,000	112	Flat	No Damage	Not	The downstream of Ban Khlong Sai Weir full of weeds and sediment	
81	Ban Pong Keng Weir	TAO	500	85	Flat	No Damage	Not	Water in the natural canal is dry, downstream of the weir is full of weeds	
82	Ban Lam Weir	TAO	2,000	85	Flat	No Damage	Not	The weir was broken and TAO didn't construct a new weir.	
83	Khlong Muang Nua Reservoir	TAO		80	Hill	No Damage	Not	No problem	
84	Khok Khom Weir	TAO	2,000	100	Flat	No Damage	Not	In front of the Khok Khom weir and downstream was full weeds and sediment, obstructed for water flow in the channel. Water is leaking from weir body.	
Regional Irrigation Office No.11									
85	Nonhaburi	Ban Talat Noi Regulator	municipality Pak Kret	500	350	Flat	No Damage	Not	No problem
Regional Irrigation Office No.12									
86	Chabunt	Tha Kham-Wang Man Weir	-	4,000	250	-	-	-	-
87		Wang Kho Hai Weir	TAO	9,400	300	Flat	No Damage	Not	No problem
88		Huai Tanot Weir	TAO	3,000	60	Flat	No Damage	Not	No problem
89		Wang Duan Ha Weir	TAO	7,500	400	Flat	No Damage	Not	No problem
90		Ban Rang Du Reservoir	TAO	5,000	150	Hill	No Damage	Not	Water leakage of dam body and flood in the agriculture land, TAO constructed the culvert 2 -1.50 + 2.00 m. for drainage.
91	Uthai Thani	Mae Di Noi Reservoir	TAO	2,500	200	Hill	No Damage	Not	No problem
92		Nong Ban Weir	-	3,000	220	-	-	-	-
93		Nong Khwaen Kup Weir	-	1,000	500	-	-	-	-
94		Ban Noen Ma Kha Weir	TAO	2,000	150	Flat	No Damage	Not	No problem
95		Khong Chai Weir	TAO	4,000	1,200	Flat	No Damage	Not	No problem
96		Hup Mai Hai Reservoir	TAO	1,500	120	Hill	No Damage	Not	No problem

C.2.5 List of SSIRP Projects for Inventory Survey 9/4



Ser No.	Province	Project Name	O&M Office	Project Benefits		Location	Damage by Flood	Level of Damage	Current Problem
				Area(rai)	Households				
97	Saphanburi	Huai Nok Kratha Reservoir	TAO	1,500	330	Hill	No Damage	Not	No problem
98		Wang Ta Khian Reservoir	-	1,000	40	-	-	-	-
99		Sa Bua Thong Weir	TAO	1,500	80	Flat	No Damage	Not	No problem
100		Khao Kam Phaeng Reservoir	TAO	3,000	200	Hill	No Damage	Not	No problem
101		Thap La Khon Weir	TAO	1,500	500	Flat	No Damage	Not	No problem
102		Ban Pa Khi Pond	-	500	300	-	-	-	-
103		Ban Tha Dur Reservoir	RID	550	150	Hill	No Damage	Not	No problem
104		Phu Pla Kang Reservoir	RID	2,500		Hill	No Damage	Not	No problem
105		Thap Phueng Noi Weir	TAO	1,000	100	Flat	No Damage	Not	The downstream slope protection damaged due to the flooding before 2011
106		Huai Pa Phak Weir	-	2,000	90	-	-	-	-

C. 2. 6. Result of SSIRP Inventory Survey

(1) Phitsanulok



Inventory of SSIRP Project

1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	1	
2. Project name	Ta Luk Chang Regulator	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Bang Rakum	Tambon: Chum Saeng Songkhram
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 14,446,000 Baht	
	3) Project benefit: 1,000rai 7 villages 1,034 households 5,077 population	
	4) Main crops: Rice	
5. Main facilities	Small scale regulator(3-2.00x2.00 m) with - Culvert 2-Ø 1.00m 4 sites - Culvert 3-Ø 1.00m 2 sites	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 993,219
	3) Rehabilitation year: 2000	
	4) Work items: Repair protection riprap, gate&hoist	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	The sediment was submerged in upstream and downstream of the gate.	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation	
11. Photos		
	2012/6/28, Ta Luk Chang Regulator and outlet	2012/6/28, Ta Luk Chang Regulator

Inventory of SSIRP Project

1. Survey date & weather: 29 June, 2012 Cloudy
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	2	
2. Project name	Huai Kha Mueng Reservoir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Chat Trakan	Tambon: Pa Daeng
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 3,176,000 Baht	
	3) Project benefit: 500rai 1 village 100 households 400 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale reservoir(earth dam $V=164,000 \text{ m}^3$, dam length=175 m height=8.00 m with outlet valve $d=60\text{cm}$)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,843,241
	3) Rehabilitation year: 2000	
	4) Work items: Improve distribution system 2,040 m.(concrete lined canal)	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/6/29, Huai Kha Mueng Reservoir and outlet</p> </div> <div style="text-align: center;">  <p>2012/6/29, Huai Kha Mueng Reservoir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 29 June.2012 Cloudy
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	3	
2. Project name	Nam Phak Noi Weir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Chat Trakan	Tambon: Pa Daeng
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 3,662,943 Baht	
	3) Project benefit: 3,000rai 50 villages 601 households 700 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale weir (masonry weir, length 33.20 m, height 4.30 m) with - Head regulator for the right main canal (1-Ø1.00m) - Flume (length 77.25m, width 1.50m)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht):2,833,995
	3) Rehabilitation year: 2000	
	4) Work items: Improve distribution system 1,714 m.(concrete lined canal)	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	The sediment was submerged in front of the weir.	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation	

11. Photos





2012/6/29, Nam Phak Noi Weir and outlet



2012/6/29, Nam Phak Noi Weir



Inventory of SSIRP Project

1. Survey date & weather: 29 June, 2012 Cloudy
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	4	
2. Project name	Ban Hua Na Fram Pond	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Nakhon Thai	Tambon: Noen Phoem
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 992,000 Baht	
	3) Project benefit: 1 village 30 households 120 population	
	4) Main crops: -	
5. Main facilities	Pond 65.0x80.0x3.0 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,211,235
	3) Rehabilitation year: 1999	
	4) Work items: plastic blanket	
7. Current O&M	The current condition of O&M is transferred to TAO. In the beginning, after the community colleges Nakhon Thai have been constructed and include Ban Hua Na Farm Pond	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	The current condition is unavailable due to Ban Hua Na Farm Pond stay inner community colleges Nakhon Thai	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/6/29, Ban Hua Na Fram Pond and outlet</p> </div> <div style="text-align: center;">  <p>2012/6/29, Ban Hua Na Fram Pond</p> </div> </div>	



Inventory of SSIRP Project

1. Survey date & weather: 29 June, 2012 Cloudy
2. Surveyed by: : Mr. Apinon Sonthayanon
3. Guided by: : RID Phitsanulok Provincial office

1. Project serial number	5	
2. Project name	Huai Lam Chiak Weir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Nakhon Thai	Tambon: Yang Klom
4. Project outline	1) Initial construction year: 1995	
	2) Initial project cost: 2,692,000 Baht	
	3) Project benefit: 800rai 5 villages 225 households 200 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale weir (masonry weir, length 35m, height 2.50m) with - Head regulator for the left main canal (1-Ø1.00) - Sand sluice (1.20x1.50m) with hoist	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 446,427
	3) Rehabilitation year: 2000	
	4) Work items: Repair up&downstream protection riprap	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/6/29, Huai Lam Chiak Weir and outlet		2012/6/29, Huai Lam Chiak Weir

Inventory of SSIRP Project

1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: : RID Phitsanulok Provincial office

1. Project serial number	6	
2. Project name	Muang Hom Weir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Wang Thong	Tambon: Ban Klang
4. Project outline	1) Initial construction year: 1977	
	2) Initial project cost: 1,764,000 Baht	
	3) Project benefit: 1,000rai 1 village 50 households 200 population	
	4) Main crops: Rice	
5. Main facilities	Small scale weir (masonry weir, length 22 m, height 4.0 m) with - Head regulator for the left main canal (1-Ø1.00m)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,359,432
	3) Rehabilitation year: 2000	
	4) Work items: Improve concrete lining 588.20 m. construct 1 tail regulator	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	The sediment was submerged in front of the weir.	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the weir is full of weeds, The weeds is the major obstruction of the water flow.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/6/28, Muang Hom Weir and outlet</p> </div> <div style="text-align: center;">  <p>2012/6/28, Muang Hom Weir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: : RID Phitsanulok Provincial office

1. Project serial number	7	
2. Project name	Ban Pa Kai Weir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Noen Maprang	Tambon: Sai Yoi
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 3,103,000 Baht	
	3) Project benefit: 2,500rai 1 village 30 households 320 population	
	4) Main crops: Rice	
5. Main facilities	Small scale weir (masonry weir, length 33.75 m, height 2.75 m) with - Head regulator for the right main canal (1-Ø1.00m) - Head regulator gate for the left main canal (1-1.70x3.15m)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 3,638,792
	3) Rehabilitation year: 2000	
	4) Work items: Improve distribution system 2,012 m. (concrete lined canal)	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	Regulator gate for the left weir canal was broken	
10. Special remark	Currently used for irrigation	

11. Photos





2012/06/2012, Ban Pa Kai Weir and outlet



2012/06/2012, Ban Pa Kai Weir



Inventory of SSIRP Project

1. Survey date & weather: 29 June, 2012 Cloudy
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	8	
2. Project name	Huai Chiang Weir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Wat Bot	Tambon: Khan Chong
4. Project outline	1) Initial construction year: 1988	
	2) Initial project cost: 2,677,600 Baht	
	3) Project benefit: 1,000rai 1 village 70 households 279 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale weir (masonry, length 17.50 m, height 2.50 m) with - Head regulator for the left main canal (1-Ø1.00m)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,373,345
	3) Rehabilitation year: 1999-2000	
	4) Work items: Improve distribution system(u-shape 1.00x1.00 m.) 1,650 m.	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	The sediment was submerged in front of the weir	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the weir is full of weeds, The weeds is the major obstruction of the water flow.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/6/29, Huai Chiang Weir and outlet</p> </div> <div style="text-align: center;">  <p>2012/6/29, Huai Chiang Weir</p> </div> </div>	



Inventory of SSIRP Project

1. Survey date & weather: 29 June, 2012 Cloudy
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	9	
2. Project name	Huai Than Laeng Reservoir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Nakhon Thai	Tambon: Ban Prao
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 2,280,000 Baht	
	3) Project benefit: 400rai 1 village 102 households 750 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale reservoir (V=97,000 m ³ dam Length 82.50 m, height 12.0 m)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,141,820
	3) Rehabilitation year: 1999	
	4) Work items: Repair spillway	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation	
11. Photos		
	2012/06/29, Huai Than Laeng Reservoir and outlet	2012/06/29, Huai Than Laeng Reservoir



Inventory of SSIRP Project

1. Survey date & weather: 29 June, 2012 Cloudy
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: : RID Phitsanulok Provincial office

1. Project serial number	10	
2. Project name	Ban Hin Lat Reservoir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphong: Wat Bot	Tambon: Hin Lat
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 3,424,000 Baht	
	3) Project benefit: 1,000rai 10 villages 102 households 900 population	
	4) Main crops: Rice	
5. Main facilities	Small scale reservoir(V=70,000 length 279m, height 9.30m with outlet valve d=30cm)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,003,115
	3) Rehabilitation year: 1999-2000	
	4) Work items: Improve distribution system(pipeline dia0.60 m.) 470 m.	
7. Current O&M	This is still under management of RID.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood from Nan River flow into the Ban Hin Lat Reservoir, damage to Spillway, riprap, slope protection and irrigation system. RID has repair them already and the cost was 2,000,000 Baht.	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/06/29, Ban Hin Lat Reservoir and outlet</p> </div> <div style="text-align: center;">  <p>2012/06/29, Ban Hin Lat Reservoir</p> </div> </div>	



Inventory of SSIRP Project

1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	11	
2. Project name	Huai Som Khem Reservoir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Muang Phitsanulok	Tambon: Don Thong
4. Project outline	1) Initial construction year: 1996	
	2) Initial project cost: 20,397,000 Baht	
	3) Project benefit: 3,000rai 1 village 50 households 200 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale reservoir (V=444,000 m ³ dam length 298 m, height 11.30 m with outlet valve 30 cm.)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 3,027,882
	3) Rehabilitation year: 2000	
	4) Work items: Improve spillway, distribution system (pipeline dia0.30 m.)	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/06/28, Huai Som Khem Reservoir and outlet</p> </div> <div style="text-align: center;">  <p>2012/06/28, Huai Som Khem Reservoir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	12	
2. Project name	Lam Ta Nom Weir	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Wang Thong	Tambon: Ban Klang
4. Project outline	1) Initial construction year: 1980	
	2) Initial project cost: 1,573,218 Baht	
	3) Project benefit: 5,000rai 1 village 50 households 200 population	
	4) Main crops: Rice in rainy season, Maize in dry season	
5. Main facilities	Small scale weir (masonry weir, length 18.0 m, height 2.10 m, regulator 1-dia. 1.00 m)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 449,772
	3) Rehabilitation year: 2000	
	4) Work items: Repair weir protection, redredging, gate&hoist	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	The sediment was submerged in front of the weir.	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the weir is full of weeds, The weeds is the major obstruction of the water flow.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/6/28, Lam Ta Nom Weir and outlet</p> </div> <div style="text-align: center;">  <p>2012/6/28, Lam Ta Nom Weir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	13	
2. Project name	Khlung Wang Kaeng Regulator	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Noen Maprang	Tambon: Ban Noi Sum Khi Lek
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 1,086,000 Baht	
	3) Project benefit: 3,000rai 1 village 100 households 400 population	
	4) Main crops: Rice	
5. Main facilities	Regulator 1-2.00x2.00 m, 2-canal regulator 1-dia1.00 m (Right main canal and left main canal)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 198,000
	3) Rehabilitation year: 2000	
	4) Work items: Repair up & downstream protection	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	The sediment was submerged in front of the gate.	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation only in rainy season.	

11. Photos





2012/06/28, Khlung Wang Kaeng Regulator and outlet



2012/06/28, Khlung Wang Kaeng Regulator

Inventory of SSIRP Project



1. Survey date & weather: 28 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phitsanulok Provincial office

1. Project serial number	14	
2. Project name	Bung Thung Hong	
3. Project location	RID Region Office: 3	Province: Phitsanulok
	Amphon: Muang Phitsanulok	Tambon: Ban Pha
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 14,242,000 Baht	
	3) Project benefit: 2,000rai 1 village 100 households 400 population	
	4) Main crops: Rice	
5. Main facilities	Canal length 1,134 m, regulator 1-dia. 0.8 m	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,790,268
	3) Rehabilitation year: 2000	
	4) Work items: Improve distribution system 1,553 m. (concrete lined canal)	
7. Current O&M	The current condition of O&M is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problem	
10. Special remark	Currently used for irrigation in some areas, the often change of land use for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/06/28, Bung Thung Hong and outlet</p> </div> <div style="text-align: center;">  <p>2012/06/28, Bung Thung Hong</p> </div> </div>	

(2) Uttaradit



Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Uttaradit Provincial office

1. Project serial number	15	
2. Project name	Huai Thoep Reservoir	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Fak Tha	Tambon: Song Khon
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 5,245,000 Baht	
	3) Project benefit: 800rai 2 villages 200 households 1000 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Length 105 m, height 15.0 m., outlet Ø 0.60 m., spillway 20.0 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 5,894,063
	3) Rehabilitation year: 2000	
	4) Work items: Improve spillway distribution system 259 m. (pipeline dia0.3 m.)	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos		
	2012/7/27, Huai Thoep Reservoir	2012/7/28, Irrigation system of Huai Thoep Reservoir



Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: : RID Uttaradit Provincial office

1. Project serial number	16	
2. Project name	Pha Pot Reservoir	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Fak Tha	Tambon: Ban Sieo
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 3,966,000 Baht	
	3) Project benefit: 500rai 1 village 257 households 1059 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Length – m., height 15.0 m., outlet Ø 0.60 m. spillway 10.0 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 2,060,519
	3) Rehabilitation year: 2000	
	4) Work items: Repair spillway	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/28, Pha Pot Reservoir</p> </div> <div style="text-align: center;">  <p>2012/7/28, Spillway of Pha Pot Reservoir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Uttaradit Provincial office

1. Project serial number	17	
2. Project name	Huai Hut Reservoir	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Nam Pat	Tambon: Saen To
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 3,558,000 Baht	
	3) Project benefit: 1,000rai 1 village 70 households 200 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Length – m., height 12.0 m., outlet Ø 0.60 m., spillway 10.0 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 306,216
	3) Rehabilitation year: 1999	
	4) Work items: Repair spillway	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/28, Huai Hut Reservoir</p> </div> <div style="text-align: center;">  <p>2012/7/28, Spillway of Huai Hut Reservoir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Uttaradit Provincial office

1. Project serial number	18	
2. Project name	Khlong Pho Regulator	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Muang Uttaradit	Tambon: Tha It
4. Project outline	1) Initial construction year: 1998	
	2) Initial project cost: 5,000,000 Baht	
	3) Project benefit: 36,000rai 1 village 43 households 136 population	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-1.50x1.50 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 8,766,006
	3) Rehabilitation year: 1999-2000	
	4) Work items: Improve bank protection	
7. Current O&M	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
10. Special remark	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
11. Photos No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field		


Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Uttaradit Provincial office

1. Project serial number	19	
2. Project name	Huai Fang Yai (Stage 2)	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Muang Uttaradit	Tambon: Khun Fang
4. Project outline	1) Initial construction year: 1996	
	2) Initial project cost: 5,111,000 Baht	
	3) Project benefit: 500rai 1 village 100 households 360 population	
	4) Main crops: Rice	
5. Main facilities	Length 38.5 m., height 2.10 m., Left head Regulator	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 895,461
	3) Rehabilitation year: 2000	
	4) Work items: Improve distribution system 228 m. (U-shape 0.7x0.6 m.)	
7. Current O&M	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
10. Special remark	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
11. Photos	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	

Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Uttaradit Provincial office

1. Project serial number	20	
2. Project name	Huai Yang 2 Reservoir	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Ban Khok	Tambon: Bobia
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 4,566,500 Baht	
	3) Project benefit: 800rai 1 village 80 households 400 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Embankment length 110.0 m., Height 14.80 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,811,419
	3) Rehabilitation year: 2000	
	4) Work items: improvement distribution system 592 m. (pipeline dia0.3&0.2 m.)	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark		
11. Photos		
	2012/7/28, Huai Yang 2 Reservoir	2012/7/28, Huai Yang 2 Reservoir

Inventory of SSIRP Project

1. Survey date & weather: 28 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Uttaradit Provincial office

1. Project serial number	21	
2. Project name	Huai Thoep Reservoir	
3. Project location	RID Region Office: 3	Province: Uttaradit
	Amphon: Fak Tha	Tambon: Song Khon
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 5,255,000 Baht	
	3) Project benefit: 800rai 2 villages 200 households 1000 population	
	4) Main crops: Rice	
5. Main facilities	Embankment length 105.0 m., Height 15.0 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 5,315,555
	3) Rehabilitation year: 1999-2000	
	4) Work items: Improve distribution system 1,422 m. (U-shape 0.8x0.8 m.)	
7. Current O&M	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
10. Special remark	No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field	
11. Photos No detail, The engineer of the Uttaradit Provincial Irrigation Office cannot find details data and site of the project in the field		

(3) Phichit

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	22	
2. Project name	Wang Kra Soop Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Pho Thale	Tambon: Bung Na Rang
4. Project outline	1) Initial construction year: 1975	
	2) Initial project cost: Baht	
	3) Project benefit:	
	4) Main crops: Rice	
5. Main facilities	Regulator 5-2.90x3.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 4,743,004
	3) Rehabilitation year: 2000	
	4) Work items: Install 5 gate & hoist (2.90x3.00 m.)	
7. Current O&M	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
10. Special remark	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
11. Photos No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field		



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	23	
2. Project name	Wang Daeng Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Thap Khlo	Tambon: Khao Sai
4. Project outline	1) Initial construction year: 1990	
	2) Initial project cost: 3,393,000 Baht	
	3) Project benefit: 4,000rai 720 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 3- <input type="checkbox"/> 2.00x2.00m. Length 12m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 3,335,169
	3) Rehabilitation year: 2000	
	4) Work items: Repair protection, Improve embankment length 2,160 m.	
7. Current O&M	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
10. Special remark	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
11. Photos No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field		


Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	24	
2. Project name	Ban Mai Noen Sawan Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Wang Sai Phun	Tambon: Nong Pla Lai
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 989,000 Baht	
	3) Project benefit: 1,500rai 270 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2- 1.50x1.50m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,467,347
	3) Rehabilitation year: 1999-2000	
	4) Work items: Construct new regulator 2-2.00x2.00 m.	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the regulator is full of weeds. The weeds are the obstruction of the water flow.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Ban Mai Noen Sawan Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, downstream of Ban Mai Noen Sawan Regulator</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: : RID Phichit Provincial office

1. Project serial number	25	
2. Project name	Khlung Boraphet Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Bang Munnak	Tambon: Wang Ngiu
4. Project outline	1) Initial construction year: 1992	
	2) Initial project cost: 5,994,000 Baht	
	3) Project benefit: 1,500rai 6 villages 270 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-  2.90x3.00m. Length 52.50m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 399,855
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	Due to the flood before 2011, TAO just constructed the weir in the area, change the structure	
10. Special remark	Currently used for irrigation	

11. Photos





2012/7/17, Khlung Boraphet Regulator



2012/7/17, Khlung Boraphet Regulator



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	26	
2. Project name	Thung Mong Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Wang Sai Phun	Tambon: Wang Sai Phun
4. Project outline	1) Initial construction year: 1981	
	2) Initial project cost: 2,284,000 Baht	
	3) Project benefit: 3,000rai 540 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2- <input type="checkbox"/> 1.75x1.50 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 395,785
	3) Rehabilitation year: 1999-2000	
	4) Work items: Repair slope protection, gate & hoist	
7. Current O&M	The current condition of O&M is transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the regulator is full of weeds the weeds is the obstruction of the water flow.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Thung Mong Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, downstream of Thung Mong Regulator</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	27	
2. Project name	Ban Mai Noen Sawan Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Wang Sai Phun	Tambon: Nong Pla Lai
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: Baht	
	3) Project benefit:	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-1.50x1.50 m., canal regulator 1-Ø1.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 295,709
	3) Rehabilitation year: 1999-2000	
	4) Work items: Repair protection, gate & hoist	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the regulator is full of weeds the weeds is the obstruction of the water flow.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Ban Mai Noen Sawan Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, Downstream of Ban Mai Noen Sawan Regulator</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	28	
2. Project name	Khlung Nam Lat Weir	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Thap Khlo	Tambon: Khao Sai
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 1,807,000Baht	
	3) Project benefit: 1,000rai 30 villages 101 households 820 population	
	4) Main crops: Rice	
5. Main facilities	Length 20.00 m., height 3.35 m., canal regulator 2- Ø 1.0 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 495,020
	3) Rehabilitation year: 1999-2000	
	4) Work items: Repair protection	
7. Current O&M	The Project was transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos





2012/7/28, Khlung Nam Lat Weir



2012/7/28, Canal regulator 2- Ø 1.0 m.



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	29	
2. Project name	Huai Sai Weir	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Bang Munnak	Tambon: Wang Ngiu
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 1,652,000 Baht	
	3) Project benefit: 1,500rai 103 households 910 population	
	4) Main crops: Rice	
5. Main facilities	Length 12.10 m., height 1.00 m., 1-canal regulator	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 398,066
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The Project was transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Upstream of Huai Sai Weir</p> </div> <div style="text-align: center;">  <p>2012/7/17, Downstream of Huai Sai Weir</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	30	
2. Project name	Wang Ta Kok Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Pho Thale	Tambon: Thanong
4. Project outline	1) Initial construction year: 1980	
	2) Initial project cost: 1,638,000 Baht	
	3) Project benefit: 5,000rai 800 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2- 2.00x2.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 392,255
	3) Rehabilitation year: 1999-2000	
	4) Work items: Repair protection, gate & hoist	
7. Current O&M	The Project was transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flooding in 2011, damage to Slope embankment, riprap and earth dike.	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Wang Ta Kok Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, Canal Regulator 1-Ø1.00m</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	31	
2. Project name	Wang Mok Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Vachira Barama	Tambon: Wang Mok
4. Project outline	1) Initial construction year: 1982	
	2) Initial project cost: 2,725,000 Baht	
	3) Project benefit: 3,000rai 480 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2- <input type="checkbox"/> 2.40x2.40m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 492,595
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection, redredging, gate & hoist	
7. Current O&M	The project transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos



2012/7/17, Wang Mok Regulator



2012/7/17, Downstream of Wang Mok Regulator

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	32	
2. Project name	Khlung Ta Bak Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Thap Khlo	Tambon: Thap khlo
4. Project outline	1) Initial construction year: 1988	
	2) Initial project cost: 987,000 Baht	
	3) Project benefit: 1,000rai 160 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2- <input type="checkbox"/> 2.00x2.00m. Length 13m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 237,980
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection, gate & hoist	
7. Current O&M	The project transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos






2012/7/17, Khlung Ta Bak Regulator



2012/7/17, Khlung Ta Bak Regulator




Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: : Mr. Apinon Sonthayanon
3. Guided by: : RID Phichit Provincial office

1. Project serial number	33	
2. Project name	Huai Pak Khwan Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Bung Na Rang	Tambon: Bang Lai
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 1,707,000 Baht	
	3) Project benefit: 8,000rai 1280 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-  2.00x2.00m. Length 16m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 298,866
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The project was transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Huai Pak Khwan Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, Huai Pak Khwan Regulator</p> </div> </div>	



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	34	
2. Project name	Wang Hin Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Pho Thale	Tambon: Thai Nam
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 2,000,000 Baht	
	3) Project benefit: 5,000rai 800 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-  2.00x2.00m. Length 17m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 296,392
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The project transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark		
11. Photos		
	2012/7/17,Upsteam of Wang Hin Regulator	2012/7/17,Downsteam of Wang Hin Regulator

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	35	
2. Project name	Wang Ta Luk Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Taphan Hin	Tambon: Tha Pho
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 1,114,000 Baht	
	3) Project benefit: 5,000rai 800 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-  2.00x1.75m. Length 10.60m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,220,694
	3) Rehabilitation year: 1999-2000	
	4) Work items: Construct head regulator 2-1.50x1.50 m.	
7. Current O&M	The project transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	Due to the enlarge the channel, TAO constructed - Regulator 2-  2.00x1.75m length 10.60m	
10. Special remark	Currently used for irrigation	

11. Photos






2012/7/17, Wang Ta Luk Regulator



2012/7/17, Wang Ta Luk Regulator

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	36	
2. Project name	Wang Ta Kok Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Bung Na Rang	Tambon: Huai Kaew
4. Project outline	1) Initial construction year: 1980	
	2) Initial project cost: 1,638,000 Baht	
	3) Project benefit: 5,000rai 800 households	
	4) Main crops: Rice 2 crops in Rainy and Dry season	
5. Main facilities	Regulator 2-  2.00x2.00m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,877,649
	3) Rehabilitation year: 1999-2000	
	4) Work items: Construct head regulator 1-1.50x1.50 m., Canal redredging	
7. Current O&M	Transfer to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Wang Ta Kok Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, Head regulator Wang Ta Kok Regulator</p> </div> </div>	



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	37	
2. Project name	Wang Daeng Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Thap Khlo	Tambon: Khao Sai
4. Project outline	1) Initial construction year: 1989	
	2) Initial project cost: 3,393,000 Baht	
	3) Project benefit: 4,000rai	
	4) Main crops: Rice	
5. Main facilities	Regulator 3-2.00x2.00 m., Canal regulator 2-dia1.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 769,478
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection, Redredging	
7. Current O&M	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
10. Special remark	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
11. Photos No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field		

Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	38	
2. Project name	Wang Ta Luk Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Taphan Hin	Tambon: Thung Pho
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 1,114,000 Baht	
	3) Project benefit: 2,000rai 2 villages 250 households 1,000 population	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-2.00x1.75 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 292,480
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The project transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Wang Ta Luk Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, Wang Ta Luk Regulator</p> </div> </div>	



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	39	
2. Project name	Wang Hin Phloeng Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Thap Khlo	Tambon: Khao Sai
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 4,000,000 Baht	
	3) Project benefit: 1,500rai 240 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 2- 2.00x2.00m. Length 10.42m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 236,142
	3) Rehabilitation year: 1999-2000	
	4) Work items: Repair protection, gate & hoist	
7. Current O&M	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	
10. Special remark		
11. Photos	No detail, The engineer of the Phichit Provincial Irrigation Office cannot find data details and site of the project in the field	



Inventory of SSIRP Project

1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phichit Provincial office

1. Project serial number	40	
2. Project name	Suan Phrik Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Thap Khlo	Tambon: Thap Khlo
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 1,669,000 Baht	
	3) Project benefit: 1,500rai 240 households	
	4) Main crops: Rice	
5. Main facilities	Regulator 3- <input type="checkbox"/> 2.00x2.00m. Length 7m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 182,035
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The Project was transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the Suan Phrik Regulator water, is full of the weed, grass, obstructed of the waterway in the channel	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Suan Phrik Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, Upstream of Suan Phrik Regulator</p> </div> </div>	

Inventory of SSIRP Project


1. Survey date & weather: 17 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: : RID Phichit Provincial office

1. Project serial number	41	
2. Project name	Nong Khlo Regulator	
3. Project location	RID Region Office: 3	Province: Phichit
	Amphon: Taphan Hin	Tambon: Dong Takhop
4. Project outline	1) Initial construction year: 1989	
	2) Initial project cost: 774,000 Baht	
	3) Project benefit: 3,000rai	
	4) Main crops: Rice	
5. Main facilities	Regulator 1-1.75x1.75 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 236,885
	3) Rehabilitation year: 2000	
	4) Work items: Repair protection, gate & hoist, redredging	
7. Current O&M	The Project was transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the Nong Khlo was regulator, was full weed, tree and so on, obstructed for waterway in the channel	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/17, Nong Khlo Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/17, downstream of the canal regulator</p> </div> </div>	

(4) Nakhon Sawan

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	42	
2. Project name	Huang Sa Regulator	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Chum Saeng	Tambon: Bang Khian
4. Project outline	1) Initial construction year: 1987	
	2) Initial project cost: 5,251,000 Baht	
	3) Project benefit: 10,000rai 375 households 1,250 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Small scale regulator 3-  2.90x3.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 4,324,785
	3) Rehabilitation year: 2000	
	4) Work items: downstream protection(gabion), temporary embankment	
7. Current O&M	The current operation and maintenance is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped embankment but there was no particular damage to Huang Sa Regulator	
9. Current problems (O&M, structures, facilities, functions, etc.)	Due to the size of regulator is a narrow, RID Nakhon Sawan Provincial office proposed to enlarge the size of regulator in the future.	
10. Special remark	Currently used for irrigation	

11. Photos




2012/8/7, Huang Sa Regulator with gear motor



2012/8/7, Downstream of Huang Sa Regulator

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	43	
2. Project name	Khlong Krathon Regulator	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Banphot Phi Sai	Tambon: Hu Kwang
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 1,067,000 Baht	
	3) Project benefit: 4,000rai 2 villages 200 households 950 population	
	4) Main crops: Rice	
5. Main facilities	Regulator 2-  2.00x2.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,632,364
	3) Rehabilitation year: 2000	
	4) Work items: Construct new regulator 1-1.50x1.50 m.	
7. Current O&M	The current operation and maintenance transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped embankment but there was no particular damage to Huang Sa Regulator	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos





2012/8/7, Khlong Krathon Regulator



2012/8/7, New regulator 1- 1.50x1.50 m


Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	44	
2. Project name	Di Farang Dike	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Latyao	Tambon: Nong Yao
4. Project outline	1) Initial construction year: 1980	
	2) Initial project cost: 970,000 Baht	
	3) Project benefit: 5,000rai 5 villages 300 households 1,500 population	
	4) Main crops: Rice	
5. Main facilities	Small scale dike 650m length 6.00m width 2.00m high	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 943,968
	3) Rehabilitation year: 2000	
	4) Work items: Increase embankment height, construct regulator 1-1.50x1.50 m.	
7. Current O&M	The current operation and maintenance transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/8/7, Di Farang Dike</p> </div> <div style="text-align: center;">  <p>2012/8/7, Regulator of Di Farang Dike</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	45	
2. Project name	Ban Khlong Regulator	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Banphot Phi Sai	Tambon: Ang Thong
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 2,164,464 Baht	
	3) Project benefit: 10,000rai 5 villages 670 households 2,500 population	
	4) Main crops: Rice	
5. Main facilities	Small scale regulator (4-  2.40x2.40m) with <ul style="list-style-type: none"> - Head regulator for the right main canal(2- Ø1.00m) - Division structure (width 2.00m, length 6.00m) - Dike length 346m height 2.05m width 5.00m - Canal length 170m 	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 896,761
	3) Rehabilitation year: 2000	
	4) Work items: Repair downstream protection	
7. Current O&M	The current operation and maintenance transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped embankment but there was no particular damage to Ban Khlong Regulator	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos




2012/8/7, Ban Khlong Regulator



2012/8/7, Head regulator for the right main canal

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	46	
2. Project name	Khao Na Pha Regulator	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Banphot Phi Sai	Tambon: Tha Ngiu
4. Project outline	1) Initial construction year: 1978	
	2) Initial project cost: 743,000 Baht	
	3) Project benefit: 15,000rai 2 villages 400 households 1,500 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Small scale Regulator (2-  2.40x2.40m with embankment above regulator width 8.00m height 2.00m length 105m)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,224,453
	3) Rehabilitation year: 2000	
	4) Work items: Redredging	
7. Current O&M	The current operation and maintenance transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped embankment but there was no particular damage to Khao Na Pha Regulator	
9. Current problems (O&M, structures, facilities, functions, etc.)	Nakhon Sawan Province plan to enlarge the channel (length 150 m) for increase quantity of the flood water	
10. Special remark	Currently used for irrigation	

11. Photos





2012/8/7, Upstream of Khao Na Pha Regulator



2012/8/7, Downstream of Khao Na Pha Regulator

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	47	
2. Project name	Nong Nam Khieo Regulator	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Banphot Phi Sai	Tambon: Tha Ngiu
4. Project outline	1) Initial construction year: 1981	
	2) Initial project cost: 478,000 Baht	
	3) Project benefit: 15,000rai 5 villages 270 households 1,350 population	
	4) Main crops: Rice	
5. Main facilities	Small scale regulator (2- Ø1.00m, length 645m) with <ul style="list-style-type: none"> - Spillway 28.00m - Head regulator for the left main canal (1- Ø1.00m) - Construct new regulator 1- 2.00x2.00m 	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,496,105
	3) Rehabilitation year: 2000	
	4) Work items: Construct new regulator 1-2.00x2.00 m.	
7. Current O&M	The current operation and maintenance is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped embankment but there was no particular damage to Nong Nam Khieo Regulator	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/8/7, Upstream regulator 1 - 2.00x2.00 m</p> </div> <div style="text-align: center;">  <p>2012/8/7, Downstream of regulator 1 - 2.00x2.00 m</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	48	
2. Project name	Wat Bot Regulator	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Banphot Phi Sai	Tambon: Bang Kaeo
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 1,118,000 Baht	
	3) Project benefit: 10,000rai 5 villages 375 households 1,250 population	
	4) Main crops: Rice in rainy season and dry season	
5. Main facilities	Small scale regulator(2- <input type="checkbox"/> 2.00x2.00m - New regulator 2- Ø1.00m	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 887,370
	3) Rehabilitation year: 2000	
	4) Work items: Construct new regulator 2-Ø 1.00 m.	
7. Current O&M	The current operation and maintenance transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped embankment but there was no particular damage to Wat Bot Regulator	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos



2012/8/7, Wat Bot Regulator



2012/8/7, Downstream of regulator

Inventory of SSIRP Project

1. Survey date & weather: 7 August, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nakhon Sawan Provincial office

1. Project serial number	49	
2. Project name	Nong Kai Lai Weir	
3. Project location	RID Region Office: 3	Province: Nakhon Sawan
	Amphon: Lat Yao	Tambon: Lat Yao
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 3,110,000 Baht	
	3) Project benefit: 3,000rais	
	4) Main crops: Rice	
5. Main facilities	Small scale weir (Concrete weir heighth 2.0m, 30m length regulator 1- <input type="checkbox"/> 1.75x1.75m) - Construct new right head regulator 3- <input type="checkbox"/> 1.75x1.75m	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 5,226,262
	3) Rehabilitation year: 2000	
	4) Work items: Construct new right head regulator 3- <input type="checkbox"/> 1.75x1.75 m.	
7. Current O&M	The current operation and maintenance is transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	

11. Photos



2012/8/7, Nong Kai Lai Weir





2012/8/7, Right head regulator 3- 1.75x1.75 m.

(5) Kamphaeng Phet



Inventory of SSIRP Project

4. Survey date & weather: 16 June, 2012 Sunshine
5. Surveyed by: Mr. Apinon Sonthayanon
6. Guided by: RID KamPaeng Phet Provincial office

1. Project serial number	50	
2. Project name	Sri Bun Song Regulator	
3. Project location	RID Region Office: 4	Province: Kamphaeng Phet
	Amphon: Sai Ngam	Tambon: Nong Thong
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 734,000 Baht	
	3) Project benefit: 3,000rai 205 households 2,000 population	
	4) Main crops: Rice, sugar cane and rubber	
5. Main facilities	Regulator 2-2.00x2.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 971,693
	3) Rehabilitation year: 2000	
	4) Work items: Construct 2 head regulator 1-dia 1.00 m.	
7. Current O&M	The current O&M is still under management of RID with cooperate water user Group (WUG)	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The regulator cannot control due to the broken of steel gate	
10. Special remark	Currently used for irrigation and change some land use, such as change the cotton to rubber	
11. Photos	 	
	2012/6/16, Sri Bun Song Regulator and outlet	2012/6/16, Sri Bun Song Regulator


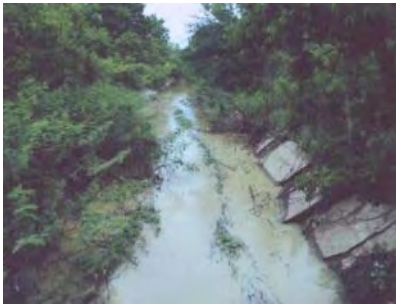
Inventory of SSIRP Project

1. Survey date & weather: 16 June, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID KamPaeng Phet Provincial office

1. Project serial number	51	
2. Project name	Rong Soob nam Nua Regulator	
3. Project location	RID Region Office: 4	Province: Kamphaeng Phet
	Amphon: Muang Kamphang Phet	Tambon: Nakhon Chum
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 1,936,000 Baht	
	3) Project benefit: 700rai 3 villages 260 households 800 population	
	4) Main crops: Rice, sugar can and cassava	
5. Main facilities	Regulator 2-2.00x2.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht):142,344
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The current O&M transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The riprap of slope embankment downstream was damaged	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/6/16, Rong Soob nam Nua Regulator and outlet		2012/6/16, The downstream of Rong Soob nam Nua Regulator



Inventory of SSIRP Project

1. Survey date & weather: June 16, 2012
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: KamPaeng Phet Irrigation Project

1. Project serial number	52	
2. Project name	Ban Dan Yai Weir	
3. Project location	RID Region Office: 4	Province: Kamphaeng Phet
	Amphon: Khanu Woralaksaburi	Tambon: Khong Phai
4. Project outline	1) Initial construction year: 1983	
	2) Initial project cost: 2,552,075 Baht	
	3) Project benefit: 4,477rai 7 villages 163 households	
	4) Main crops: In Rainy and dry season rice cultivation 84%, sugar cane 16%	
5. Main facilities	Concrete weir Length 50.0 m. base width 5.5 m., height 4.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 14,628,907
	3) Rehabilitation year: 2000	
	4) Work items: Repair weir structure, lined canal 3,120 m.	
7. Current O&M	This is still under management of RID	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	In 2011, The body of weir leak, the right slope embankment collapse settlement, the Kamphaeng Phet Irrigation Projects repair and can use for irrigation only in rain season. RID planning to investigate the damage and repair the facilities from October.	
9. Current problems (O&M, structures, facilities, functions, etc.)	The body of weir leak and cannot store water in dry season. The irrigation lined canal damage periodically, the length 300 m.	
10. Special remark	The current of land used for irrigation, 84% rice cultivation 16% sugar cane	
11. Photos		
	2012/6/16, Ban Dan Yai Weir	2012/6/16, The irrigation canal of Ban Dan Yai Weir

Inventory of SSIRP Project


1. Survey date & weather: June 16, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID KamPaeng Phet Irrigation Provincial office

1. Project serial number	53	
2. Project name	Lan si la Regulator	
3. Project location	RID Region Office: 4	Province: Kamphaeng Phet
	Amphon: Muang Kamphang Phet	Tambon: Na Bo Kham
4. Project outline	1) Initial construction year: 1996	
	2) Initial project cost: 6,135,936 Baht	
	3) Project benefit: 1,000rai 3 villages 75 households 3,350 population	
	4) Main crops: Rice, Maize, sugar can and cassava	
5. Main facilities	Regulator 2-2.40x2.40 m., 2-Canal regulator 1-dia1.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 132,440
	3) Rehabilitation year: 2000	
	4) Work items: Repair embankment and protection	
7. Current O&M	The current O&M transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the regulator, is full of weeds	
10. Special remark	Currently used for irrigation	
11. Photos		
	2012/6/16, Lan si la Regulator and outlet	2012/6/16, Lan si la Regulator

(6) Sukhothai

Inventory of SSIRP Project

7. Survey date & weather: 18 July, 2012 Sunshine
8. Surveyed by: Mr. Apinon Sonthayanon
9. Guided by: RID Sukhothai Provincial office

1. Project serial number	54	
2. Project name	Muang Na Regulator	
3. Project location	RID Region Office: 4	Province: Sukhothai
	Amphon: Thung Saliam	Tambon: Klang Dong
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 9,176,000 Baht	
	3) Project benefit: 5,000rai 3 villages 1,370 households 5,000 population	
	4) Main crops: Rice, in rainy season and dry season	
5. Main facilities	Regulator 3-  2.90x3.00m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht):2,961,560
	3) Rehabilitation year: 2000	
	4) Work items: Improve bank protection, install electrical hoist, construct right head regulator	
7. Current O&M	This is still under management of RID	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The RID Sukhothai Provincial constructed the irrigation system to irrigate for distribute to agricultural land	
10. Special remark	Currently used for irrigation	

11. Photos






2012/7/18, Muang Na Regulator



2012/7/18, Irrigation system of Muang Na Regulator




Inventory of SSIRP Project

1. Survey date & weather: 18 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Sukhothai Provincial office

1. Project serial number	55	
2. Project name	Tha Mai Daeng Regulator	
3. Project location	RID Region Office: 4	Province: Sukhothai
	Amphon: Thung Saliam	Tambon: Thai Chana Suk
4. Project outline	1) Initial construction year: 1997	
	2) Initial project cost: 9,820,516 Baht	
	3) Project benefit: 20,000rai 7 villages 1,450 households 7,250 population	
	4) Main crops: Rice, 19,000rais, sugar cane 1,000rais	
5. Main facilities	Regulator 4 -  2.90x3.00m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 9,810,516
	3) Rehabilitation year: 2000	
	4) Work items: Improve protection(gabion & mattress), construct left head regulator	
7. Current O&M	This is still under management of RID	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/7/18, Tha Mai Daeng Regulator</p> </div> <div style="text-align: center;">  <p>2012/7/18, downstream of Tha Mai Daeng Regulator</p> </div> </div>	

Inventory of SSIRP Project

1. Survey date & weather: 18 July, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Sukhothai Provincial office

1. Project serial number	56	
2. Project name	Khlong Chat Regulator	
3. Project location	RID Region Office: 4	Province: Sukhothai
	Amphon: Si Samrong	Tambon: Wang Yai
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 10,782,248 Baht	
	3) Project benefit: 1,500rai 1 village 200 households 800 population	
	4) Main crops: Rice 10%, Palm 90%	
5. Main facilities	Regulator 5-  2.40x2.40m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 10,784,248
	3) Rehabilitation year: 1999-2000	
	4) Work items: Construct new regulator 5-2.40x2.40 m.	
7. Current O&M	The current condition of O&M is transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No Problems	
10. Special remark	Currently used for irrigation	
11. Photos	 	
	<p>2012/7/18, Khlong Chat Regulator</p> <p>2012/7/18, downstream of Khlong Chat Regulator</p>	

(7) LopburiInventory of SSIRP Project

1. Survey date & weather: July 19, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Lopburi Provincial office

1. Project serial number	57	
2. Project name	Wang Phu Khe Weir	
3. Project location	RID Region Office: 10	Province: Lopburi
	Amphon: Kok Samrong	Tambon: Ko Kaeo
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 3,662,000 Baht	
	3) Project benefit: 1,000 rai 2 villages 150 households	
	4) Main crops:	
5. Main facilities	No detail, The engineer of the Lopburi Provincial Irrigation Office can not find detail data and site of the project in the field	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,780,022
	3) Rehabilitation year: 1999-2000	
	4) Work items: Repair weir protection, canal regulator, distribution system (earth canal)	
7. Current O&M	No detail, The engineer of the Lopburi Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Lopburi Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Lopburi Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Lopburi Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Lopburi Provincial Irrigation Office can not find detail data and site of the project in the field		

Inventory of SSIRP Project

1. Survey date & weather: July 19, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Lopburi Provincial office

1. Project serial number	58	
2. Project name	Ban Bo Ta Pang Weir	
3. Project location	RID Region Office: 10	Province: Lopburi
	Amphon: Nong Muang	Tambon: Yang Thon
4. Project outline	1) Initial construction year: 1989	
	2) Initial project cost: 4,599,000 Baht	
	3) Project benefit: 4,000 rai 1 village 60 households 300 population	
	4) Main crops: Sugarcane, Maize, Cassava and Peanuts	
5. Main facilities	Length 25.0 m., height 3.0 m., Canal regulator 1 – Ø 0.80 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 343,400
	3) Rehabilitation year: 1999	
	4) Work items: Repair canal embankment	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The downstream of weir was full of sediment and weed, obstructed for waterway	
10. Special remark	Currently used for irrigation	

11. Photos



2012/7/19, Ban Bo Ta Pang Weir



2012/7/19, Downstream of Ban Bo Ta Pang Weir

(8) Phetchabun

Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	59	
2. Project name	Na Saeng Regulator	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Lomsak	Tambon: Fai Na Sang
4. Project outline	1) Initial construction year: 1995	
	2) Initial project cost: 5,605,697 Baht	
	3) Project benefit: 1,500 rai 2 villages 120 households 500 population	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	Small scale Regulator 3- <input type="checkbox"/> 2.40x2.40 m., length 10.75 m., Canal regulator 1-Ø.1.00 m., Maximum drainage 35.00 m ³ /sec	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 270,246
	3) Rehabilitation year: 2000	
	4) Work items: Construct Log Boom	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In 2008, flood occurred and damage the regulator due to the current canal is narrow. In front of the regulator, is full of weeds	
10. Special remark	Currently used for irrigation	

11. Photos





2012/07/10 Na saeng Regulator



2012/07/10 downstream of Na saeng Regulator



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	60	
2. Project name	Huai Nam Hom Reservoir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Lomsak	Tambon: Bung Nam Tao
4. Project outline	1) Initial construction year: 1983	
	2) Initial project cost: 2,904,000 Baht	
	3) Project benefit: 500 rai 50 villages 102 households 1,750 population	
	4) Main crops: Rice and upland crops	
5. Main facilities	Small scale Reservoir embankment width 4.0 m., Length 71.36 m., Height 9.90 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,424,455
	3) Rehabilitation year: 1999	
	4) Work items: Repair spillway and outlet	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The boundary of the Huai Nam Hom reservoir is full of weeds	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/07/10 Spillway of Huai Nam Hom Reservoir		2012/07/10 Huai Nam Hom Reservoir



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	61	
2. Project name	Khlong Sub E-Rum	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Wichian Buri	Tambon: Nam Ron
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 8,823,000 Baht	
	3) Project benefit: 1,500 rai 3 villages 150 households 460 population	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	canal length 7 km.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 6,943,922
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Construct 2 check regulator (2- <input type="checkbox"/> 1.95x4.8 m., 2- <input type="checkbox"/> 1.45x4.8 m.)	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The bottom of the khlong Sup E-Rum is full of sediment	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/07/10 upstream of Khlong Sub E-Rum		2012/07/10 downstream of Khlong Sub E-Rum



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	62	
2. Project name	Ban Nong Le Regulator	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Lomkao	Tambon: Hin Hao
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 8,204,475 Baht	
	3) Project benefit: 1,000 rai 10 villages 900 households 4,500 population	
	4) Main crops: Rice, Tobacco and Green beans	
5. Main facilities	Small scale Regulator 3- <input type="checkbox"/> 2.90x3.00 m. with waterway in the left side and construct outlet structure 1-Ø 1.50 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 4,374,852
	3) Rehabilitation year: 2000	
	4) Work items: Construct spillway and drainage channel	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/07/10 Drainage channel of Ban Nong Le Regulator		2012/07/10 Ban Nong Le Regulator



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	63	
2. Project name	Khlong Yang Sao	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Wichian Buri	Tambon: Yang Sao
4. Project outline	1) Initial construction year: 1996	
	2) Initial project cost: 12,211,926 Baht	
	3) Project benefit: 1,000 rai 1 villages 150 households 750 population	
	4) Main crops: Rice and Maize	
5. Main facilities	Irrigation system with bed width = 4.00 m. length = 5.00 m., and construct the outlet structure 8 site and culvert Ø 1.00 m. and road culvert 1.50 x 1.50 m. 8 site	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 5,464,896
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Improve the irrigation system with Construct 2 check regulator (2-□ 1.55x3.8 m., 2 -□ 1.55x5.8 m.)	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/07/10 upstream of Khlong Yang Sao		2012/07/10 downstream of Khlong Yang Sao



Inventory of SSIRP Project

1. Survey date & weather: August 01, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	64	
2. Project name	Ban Khek Noi 3 Reservoir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Khao Kho	Tambon: Khek Noi
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: Baht 2,014,000	
	3) Project benefit: for consumption	
	4) Main crops: Rice, Maize, Ginger and upland crops	
5. Main facilities	Small scale Reservoir (earth down, V = 122,000 m ³ , Length 690.70 m., Height 10.50 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 792,071
	3) Rehabilitation year: 1999	
	4) Work items: Repair spillway	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for consumption in the Hmong hill tribe village	
11. Photos		
		
2012/08/01 Ban Khek Noi 3 Reservoir	2012/08/01 Spillway of Ban Khek Noi 3 Reservoir	



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	65	
2. Project name	Klang Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Lomsak	Tambon: Nam Chun
4. Project outline	1) Initial construction year: 1979	
	2) Initial project cost: 1,548,740 Baht	
	3) Project benefit: 18,000 rai 50 villages 202 households 1,300 population	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	Small scale weir Length 29.90 m., height 2.30 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,862,712
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Construct sand sluice, Embankment	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation, TAO initiate to construct the flume to irrigate the farmland	
11. Photos		
		
2012/07/10 Downstream of Klang Weir		2012/07/10 Steel gate control of Klang Weir



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	66	
2. Project name	Bueng Sakae Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Bung Sam Phan	Tambon: Nong Chaeng
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 2,936,000 Baht	
	3) Project benefit: 2,000 rai 50 villages 101 households 900 population	
	4) Main crops: Rice and upland crops	
5. Main facilities	Small scale weir (width 18 m., Length 87.0 m., height 2.10 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,127,124
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Damage by 2011 flood , masonry and riprap in the tail structure damaged due to flow the flood	
9. Current problems (O&M, structures, facilities, functions, etc.)	Flood in 2011 has been eroded in the tail structure and damaged the slope of the embankment	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/07/10 upstream of Bueng Sakae Weir		2012/07/10 downstream of Bueng Sakae Weir with slope of embankment



Inventory of SSIRP Project

1. Survey date & weather: August 01, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	67	
2. Project name	Huai Pa Hom Reservoir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Muang Phetchabun	Tambon: Na Pa
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 4,000,000 Baht	
	3) Project benefit: 1,200 rai	
	4) Main crops: Rice and upland Crops	
5. Main facilities	Small scale Reservoir Embankment (Capacity 105,000 m ³ , width 5.00 m., Length 101.50 m., Height 15.0 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 547,185
	3) Rehabilitation year: 1999	
	4) Work items: Repair spillway and protection Riprap	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The site Huai Pa Hom Reservoir stay inner the National park Tat Mok	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/01 Huai Pa Hom Reservoir		2012/08/01 Spillway of Huai Pa Hom Reservoir



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	68	
2. Project name	Dua Taen Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Lomsak	Tambon: Huai rai
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 3,600,000 Baht	
	3) Project benefit: 12,000 rai 2 villages 160 households 780 population	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	Small scale weir (wide 29 m., Length 46 m., height 2.5 m., Canal Regulator 1 – Ø 1.00 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 393,700
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir and right head regulator protection	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation, water user group cooperate to clean and take the weeds from the canal	
11. Photos		
		
2012/07/10 Dua Taen Weir		2012/07/10 Downstream of Dua Taen Weir



Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	69	
2. Project name	Bung Sam Phan Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Bung Sam Phan	Tambon: Sap Samo Thot
4. Project outline	1) Initial construction year: 1987	
	2) Initial project cost: 3,362,000 Baht	
	3) Project benefit: 1,800 rai	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	Small scale weir (wide 45 m., Length 36.0 m., height 1.58 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,538,341
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Damage by 2011 flood , masonry and riprap in the tail structure (about 100m length) damaged due to flow the flood	
9. Current problems (O&M, structures, facilities, functions, etc.)	2011 Flood has been eroded in the tail structure and damaged the slope of the embankment	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/7/10, Bung Sam Phan Weir		
		2012/7/10, downstream of Bung Sam Phan Weir

Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	70	
2. Project name	Kaeng Ngam Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Muang Phetchabun	Tambon: Nam Ron
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 3,000,000 Baht	
	3) Project benefit: 1,400 rai	
	4) Main crops: Rice and Maize	
5. Main facilities	Small scale weir (Length 44.0 m., height 2.90 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 374,453
	3) Rehabilitation year: 1999	
	4) Work items: Repair protection riprap	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/01, Kaeng Ngam Weir		2012/08/01, The regulator of Kaeng Ngam Weir

Inventory of SSIRP Project

1. Survey date & weather: August 01, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	71	
2. Project name	Sak Heaeng Tok Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Muang Phetchabun	Tambon: Chon Phrai
4. Project outline	1) Initial construction year: 1996	
	2) Initial project cost: 21,994,000 Baht	
	3) Project benefit: 2,000 rai 3 villages 7,000 households 35,000 population	
	4) Main crops: Rice, Maize	
5. Main facilities	Length 35 m., height 5.0 m., Canal regulator	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 457,361
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir and left head Regulator protection riprap	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	

11. Photos



2012/08/01, The Body of Sak Heaeng Tok Weir



2012/08/01, Outlet of Sak Heaeng Tok Weir

Inventory of SSIRP Project



1. Survey date & weather: August 01, 2012 Sunshine
4. Surveyed by: Mr. Apinon sonthayanon
5. Guided by: RID Phetchabun Provincial office

1. Project serial number	72	
2. Project name	Kho Luak Weir	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Wichain Buri	Tambon: Sra pradu
4. Project outline	1) Initial construction year: 1979	
	2) Initial project cost: 100,000 Baht	
	3) Project benefit: 5,000 rai 60 village 100 households 350 population	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	Length 16.0 m.height 2.5 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 764,531
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir protection	
7. Current O&M	No detail, The engineer of the Phetchabun Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Phetchabun Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Phetchabun Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Phetchabun Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Phetchabun Provincial Irrigation Office can not find detail data and site of the project in the field		

Inventory of SSIRP Project

1. Survey date & weather: July 10, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Phetchabun Provincial office

1. Project serial number	73	
2. Project name	Ban Tad Kloi Regulator	
3. Project location	RID Region Office: 10	Province: Phetchabun
	Amphon: Lomkao	Tambon: Tatkloi
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 7,043,000 Baht	
	3) Project benefit: 1.500 rai	
	4) Main crops: Rice, Maize and Tobacco	
5. Main facilities	Small scale Regulator (3 - <input type="checkbox"/> 2.40x2.40 m. length 21.5 m.)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht):3,896,599
	3) Rehabilitation year: 2000	
	4) Work items: improve gate and protection riprap	
7. Current O&M	The current transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	Downstream of the regulator, is full of sediment in the bottom of the canal	
10. Special remark	Currently used for irrigation	

11. Photos
<div style="border: 1px solid red; padding: 2px; display: inline-block;">Regulator 3-<input type="checkbox"/> 2.40 x 2.40 m.</div>

<div style="border: 1px solid red; padding: 2px; display: inline-block;">Sediment</div>

2012/07/10 Ban Tad Kloi Regulator
2012/07/10 Downstream of Ban Tad Kloi Regulator

(9) Saraburi

Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	74	
2. Project name	Kham Ta Khian Reservoir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Muak Lek	Tambon: Mittaphap
4. Project outline	1) Initial construction year: 1961	
	2) Initial project cost: 1,505,000 Baht	
	3) Project benefit: 500 rai, 1 village 64 households, 500 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Reservoir (V=226,000 m ³ , Width 10.50 m., Length 290.25 m., height 8.5m.)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,621,111
	3) Rehabilitation year: 1999-2000	
	4) Work items: 4-Reservoir plug and redredging	
7. Current O&M	The current O & M transferred to TAO.	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	Flood water overtopped dam crest but there was no particular damage to dam body	
9. Current problems (O&M, structures, facilities, functions, etc.)	Water leakage at dam body. Farmer constructed house in the tail of spillway.	
10. Special remark	Currently not used for irrigation due to change of land use	

11. Photos





2012/08/01, Regulator of Kham Ta Khian Reservoir



2012/08/01, Spillway of Kham Ta Khian Reservoir



Inventory of SSIRP Project

1. Survey date & weather: August, 30 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	75	
2. Project name	Pak Khao San Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Muang Saraburi	Tambon: Pak Khao San
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 18,208,000 Baht	
	3) Project benefit: 1 village 40 households, 800 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 22 m., height 2.50 m.)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 2,445,011
	3) Rehabilitation year: 1999-2000	
	4) Work items: Improve canal embankment	
7. Current O&M	The current O & M transferred to TAO Pak Khao San, Water user Group keep the canal in regular maintenance such as sediment dredging	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/30, Pak Khao San Weir		2012/08/30, Pak Khao San Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 30 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	76	
2. Project name	Huai San Chao Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Phraphut Thabat	Tambon: Huai Pa Wai
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 3,851,000 Baht	
	3) Project benefit: 1,500 rai 1 village 20 households 55 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 12.40 m., height 2.8 m., 2 Canal regulator 1- Ø 0.80 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 320,776
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir slope protection and embankment	
7. Current O&M	The current O & M transferred to TAO Huai Pa Wai	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/30, Huai San Chao Weir		2012/08/30, Huai San Chao Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	77	
2. Project name	Nong Song Hong Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Kaeng Khoi	Tambon: Huai Haeng
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 3,630,000 Baht	
	3) Project benefit: 2,000 rai 1 village 82 households 312 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 18.00 m., height 2.30 m., 2 Canal regulator 1- Ø 0.80 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 453,784
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir slope protection and Embankment	
7. Current O&M	The current O & M transferred to TAO Huai Haeng	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of Nong Song Hong Weir is full of weeds and sediment. Water is leaking from weir body.	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/01, Upstream Nong Song Hong Weir		2012/08/01, Downstream Nong Song Hong Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	78	
2. Project name	Huai Na Di Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Kaeng Khoi	Tambon: Huai Haeng
4. Project outline	1) Initial construction year: 1982	
	2) Initial project cost: 3,140,000 Baht	
	3) Project benefit: 2,000 rai 7 villages 35 households 125 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 15.00 m., height 2.50 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 190,085
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir slope protection and Embankment	
7. Current O&M	The current O & M transferred to TAO Huai Haeng	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of Huai Na Di Weir is full of weeds and sediment. Water is leaking from weir body.	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/01, Upstream of Huai Na Di Weir		2012/08/01, Downstream of Huai Na Di Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	79	
2. Project name	Ban Khao Kaeo Reservoir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Wihan Daeng	Tambon: Khlong Rua
4. Project outline	1) Initial construction year: 1983	
	2) Initial project cost: 3,170,000 Baht	
	3) Project benefit: 1,500 rai 1 village 112 households 144 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Reservoir (V=135,000 m ³ Length 427.50 m., height 8.00 m. spillway 6 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 143,194
	3) Rehabilitation year: 1999	
	4) Work items: Repair spillway	
7. Current O&M	The current O & M transferred to TAO Khlong Rua	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/01, Khao Kaeo Reservoir		2012/08/01, Spillway of Khao Kaeo Reservoir



Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	80	
2. Project name	Ban Khlong Sai Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Wihan Daeng	Tambon: Khlong Rua
4. Project outline	1) Initial construction year: 1983	
	2) Initial project cost: 4,000,000 Baht	
	3) Project benefit: 1,000 rai 1 village 112 households 148 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 18 m., height 2.20 m., Canal regulator 1- Ø 1.00 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 316,639
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir protection and Embankment	
7. Current O&M	The current O & M transferred to TAO Khlong Rua	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The downstream of Ban Khlong Sai Weir full of weeds and sediment	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/01, Ban Khlong Sai Weir		2012/08/01, Downstream of Ban Khlong Sai Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 30 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	81	
2. Project name	Ban Pong Keng Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Wang Muang	Tambon: Wang Muang
4. Project outline	1) Initial construction year: 1993	
	2) Initial project cost: 7,477,000 Baht	
	3) Project benefit: 500 rai 1 village 85 households 151 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 27.40 m., height 3.50 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 329,929
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir protection and Embankment	
7. Current O&M	The current O & M transferred to TAO Wang Muang	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	Current problems, water in the natural canal is dry, downstream of the weir is full of weeds	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/30, Ban Pong Keng Weir		2012/08/30, Ban Pong Keng Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	82	
2. Project name	Ban Lam Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Wihan Daeng	Tambon: Ban Lam
4. Project outline	1) Initial construction year: 1982	
	2) Initial project cost: 3,973,400 Baht	
	3) Project benefit: 2,000 rai 5 villages 85 households 130 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 16 m., height 1.50 m.)	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 275,448
	3) Rehabilitation year: 1999	
	4) Work items: Repair weir protection and Embankment	
7. Current O&M	The current O & M transferred to TAO Ban Lam	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The weir was broken and TAO didn't construct a new weir.	
10. Special remark	Currently not used for irrigation due to the weir was broken	
11. Photos		
		
2012/08/01, Ban Lam Weir		2012/08/01, Ban Lam Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 30 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	83	
2. Project name	Khlung Muang Nua Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Muak Lek	Tambon: Lamphaya Klang
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 6,870,000 Baht	
	3) Project benefit: 2 villages 80 households 1,500 population	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Reservoir (v=41,000,000 m ³ , Length 16 m., height 1.50 m., 1 spillway, 2 outlets)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 3,889,597
	3) Rehabilitation year: 2000	
	4) Work items: Improve downstream	
7. Current O&M	The current O & M transferred to TAO Lamphaya Klang	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently used for irrigation	
11. Photos		
		
2012/08/30, Khlung Muang Nua Weir		2012/08/30, Khlung Muang Nua Weir

Inventory of SSIRP Project

1. Survey date & weather: August, 01 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Saraburi provincial office

1. Project serial number	84	
2. Project name	Khok Khom Weir	
3. Project location	RID Region Office: 10	Province: Saraburi
	Amphon: Kaeng Khoi	Tambon: Huai Haeng
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 3,515,000 Baht	
	3) Project benefit: 2,000 rai 1 village 100 households 1,000 rai	
	4) Main crops: Rice in rainy season and Sugar cane in dry season	
5. Main facilities	Small scale Weir (Length 20 m., height 1.40 m., 2 Canal regulators)	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,096,697
	3) Rehabilitation year: 2000	
	4) Work items: Improve weir protection	
7. Current O&M	The current O & M transferred to TAO Huai Haeng	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	In front of the Khok Khom weir and downstream was full weeds and sediment, obstructed for water flow in the channel. Water is leaking from weir body.	
10. Special remark	Currently used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>2012/08/01, Upstream of Khok Khom Weir</p> </div> <div style="text-align: center;">  <p>2012/08/01, Downstream of Khok Khom Weir</p> </div> </div>	

(10) Nonthaburi

Inventory of SSIRP Project

1. Survey date & weather: June, 27, 2012 Sunshine
2. Surveyed by: Mr. Apinon Sonthayanon
3. Guided by: RID Nonthaburi Provincial Office

1. Project serial number	85	
2. Project name	Bang Talat Noi regulator	
3. Project location	RID Region Office: 11	Province: Nonthaburi
	Amphon: Pak Kret	Tambon: Pak Kret
4. Project outline	1) Initial construction year: 2000	
	2) Initial project cost: 4,000,000 Baht	
	3) Project benefit: 500 rai for irrigation, 350 households	
	4) Main crops: No farmland due to change of land use for community and Housing estste	
5. Main facilities	Small scale Regulator (1-2.00x2.00m.) with pumping station (0.5 m ³ /sec)	
6. Work done by SSIRP	1) Type of work: construct pumping	2) Actual cost (Baht): 3,978,749
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Construct pumping station 0.5cms. with 1 regulator 2x2 m.	
7. Current O&M	The current O & M transferred to municipality Pak Kret (Local authority)	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No Damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently not used for irrigation due to change of land use for community and housing estste, water management for Bang Talat Noi Regulator run by municipality Pak Kret (local government) for prevent flooding from the area	

11. Photos



2012/7/19, Bang Talat Noi regulator



2012/7/19, Downstream of Bang Talat Noi regulator



(11) ChainatInventory of SSIRP Project

1. Survey date & weather: August, 08 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Chainat provincial office

1. Project serial number	86	
2. Project name	Tha Kham-Wang Man Weir	
3. Project location	RID Region Office: 12	Province: Chainat
	Amphon: Wat Sing	Tambon: Wang Mun
4. Project outline	1) Initial construction year: 1987	
	2) Initial project cost: 2,134,000 Baht	
	3) Project benefit: 4,000 rai, 3 Villages, 250 households, 1,500Population	
	4) Main crops:	
5. Main facilities	Regulator 3-2.00x2.25 m., 2 Canal regulator 1- Ø 1.00	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 33,360,060
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Construct 11 regulator 3-2.0x2.0 m.	
7. Current O&M	No detail, The engineer of the Chainat Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Chainat Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Chainat Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Chainat Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Chainat Provincial Irrigation Office can not find detail data and site of the project in the field		



Inventory of SSIRP Project

1. Survey date & weather: August, 08 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Chainat provincial office

1. Project serial number	87	
2. Project name	Wang Kho Hai Weir	
3. Project location	RID Region Office: 12	Province: Chainat
	Amphon: Noen Kham	Tambon: Noen Kham
4. Project outline	1) Initial construction year: 1980	
	2) Initial project cost: 1,230,000 Baht	
	3) Project benefit: 9,400 rai 3 villages 300 households 1,650 population	
	4) Main crops: Rice in dry season and rainy season	
5. Main facilities	Former small scale weir (length=25 m, Height=1.5 m) rehabilitated under SSIRP was broken and abandoned. 2) TAO constructed new weir for the replacement and currently in operation.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 779,906
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Repair Down stream Protection	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No. problems	
10. Special remark	Currently in operation	
11. Photos		
		
2012/08/08, Wang Kho Hai Weir		
		2012/08/08, Wang Kho Hai Weir (New weir constructed by TAO)



Inventory of SSIRP Project

1. Survey date & weather: August, 08 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Chainat provincial office

1. Project serial number	88	
2. Project name	Huain Tanot Weir	
3. Project location	RID Region Office: 12	Province: Chainat
	Amphon: Hankha	Tambon: Phri Nok Yung
4. Project outline	1) Initial construction year: 1979	
	2) Initial project cost: 603,970 Baht	
	3) Project benefit: 3,000 rai 1 village 60 households 240 population	
	4) Main crops: Rice in dry season and rainy season	
5. Main facilities	Length 20.0 m., height 3.0 m. and RID constructed the weir, duck bill	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 593,819
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Repair Down stream Protection and right embankment	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No. problems	
10. Special remark	Currently in operation	
11. Photos		
		
2012/08/08, Huain Tanot Weir, duck bill		2012/08/08, Regulator of Huain Tanot Weir



Inventory of SSIRP Project

1. Survey date & weather: August, 08 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Chainat provincial office

1. Project serial number	89	
2. Project name	Wang Duan Ha Weir	
3. Project location	RID Region Office: 12	Province: Chainat
	Amphon: Hankha	Tambon: Phri Nok Yung
4. Project outline	1) Initial construction year: 1982	
	2) Initial project cost: 3,345,200 Baht	
	3) Project benefit: 7,500 rai 3 villages 400 households 2,100 population	
	4) Main crops:	
5. Main facilities	Length 70.0 m., height 3.00 m., outlet Ø 1.00 m., 2- canal outlet Ø 0.30 m. and RID constructed the weir, duck bill	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,429,243
	3) Rehabilitation year: 1999 - 2000	
	4) Work items: Repair embankment and Head regulator	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No. problems	
10. Special remark	Currently in operation	
11. Photos		
		
2012/08/08, Wang Duan Ha Weir, duck bill		2012/08/08, Downstream of Wang Duan Ha Weir

Inventory of SSIRP Project

1. Survey date & weather: August, 08 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Chainat provincial office

1. Project serial number	90	
2. Project name	Ban Rang Du Reservoir	
3. Project location	RID Region Office: 12	Province: Chainat
	Amphon: Hankha	Tambon: Phri Nok Yung
4. Project outline	1) Initial construction year: 1983	
	2) Initial project cost: 3,412,500 Baht	
	3) Project benefit: 5,000 rai 2 villages 150 households 1,000 population	
	4) Main crops:	
5. Main facilities	Length 18.0 m., height 3.00 m., outlrt Ø 1.00 m., spillway 25 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 707,037
	3) Rehabilitation year: 1999	
	4) Work items: Repair embankment	
7. Current O&M	The current O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	Water leakage of dam body and flood in the agriculture land, TAO constructed the culvert 2 - □ 1.50 + 2.00 m. for drainage.	
10. Special remark	Currently not used for irrigation.	
11. Photos		
		<div style="border: 2px solid red; padding: 5px; text-align: center;"> TAO constructed the culvert 2 - □ 1.50 + 2.00 m. </div> 
2012/08/08, Ban Rang Du Reservoir		2012/08/08, TAO constructed the culvert 2 - □ 1.50 + 2.00 m.

(12) Uthai Thani

Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	91	
2. Project name	Mae Di Noi Reservoir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Ban Rai	Tambon: Kaen Makrut
4. Project outline	1) Initial construction year: 1982	
	2) Initial project cost: 5,000,000 Baht	
	3) Project benefit: 2,500 rai 1 village 200 households 800 population	
	4) Main crops: Sugar cane and Cassava in Dry Season and Rainy Season	
5. Main facilities	Length 200.0 m., height 8 m., outlet 1 Ø 0.30 m., spillway 30 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 2,659,227
	3) Rehabilitation year: 1999 – 2000	
	4) Work items: Repair outlet and redredging reservoir	
7. Current O&M	This is still under management of RID	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	

11. Photos



2012/7/18, Mae Di Noi Reservoir



2012/7/18, Spillway of Mae Di Noi Reservoir

Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	92	
2. Project name	Nong Ban Weir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Nong Chang	Tambon: Nong Chang
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 1,008,000 Baht	
	3) Project benefit: 3,000 rai ² villages 220 households 980 population	
	4) Main crops:	
5. Main facilities	Length 12.50 m., height 1.65 m., 2 canal regulator 1- Ø 1.00 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 490,689
	3) Rehabilitation year: 2000	
	4) Work items: Repair protection and canal embankment	
7. Current O&M	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field		



Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	93	
2. Project name	Nong Khwaen Kup Weir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Sawang Arom	Tambon: Phluang Song Nang
4. Project outline	1) Initial construction year: 1983	
	2) Initial project cost: 1,765,000 Baht	
	3) Project benefit: 1,000 rai 3 villages 500 households 2,450 population	
	4) Main crops:	
5. Main facilities	Length 57.00 m., height 1.80 m., regulator 3- Ø 10. M.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 1,216,871
	3) Rehabilitation year: 2000	
	4) Work items: Repair weir body and side protection	
7. Current O&M	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find data and site of the project in the field	
10. Special remark	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field		



Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	94	
2. Project name	Ban Noen Ma Kha Weir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Lan Sak	Tambon: Nam Rop
4. Project outline	1) Initial construction year: 1985	
	2) Initial project cost: 2,394,000 Baht	
	3) Project benefit: 2,000 rai 1 village 150 households 450 population	
	4) Main crops: Rice in Dry Season and Rainy Season	
5. Main facilities	Length 24.10 m., height 1.70 m., 2 canal regulator 1-Ø 0.80 M.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 460,021
	3) Rehabilitation year: 1999	
	4) Work items: Redredging, protection	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
		
2012/7/18, Ban Noen Ma Kha Weir	2012/7/18, Downstream of Ban Noen Ma Kha Weir	



Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	95	
2. Project name	Khong Chai Weir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Lan Sak	Tambon: Lan Sak
4. Project outline	1) Initial construction year: 1981	
	2) Initial project cost: 2,106,000 Baht	
	3) Project benefit: 4,000 rai 3 villages 1,200 households 4,960 population	
	4) Main crops: Rice in Dry Season and Rainy Season	
5. Main facilities	Length 65.0 m., height 3.50 m., canal regulator 2-Ø1.00 M.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 421,834
	3) Rehabilitation year: 1999	
	4) Work items: Repair Protection and Canal embankment	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
		
2012/7/18, Khong Chai Weir		2012/7/18, Downstream of Khong Chai Weir



Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	96	
2. Project name	Hup Mai Hai Reservoir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Thap Than	Tambon: Khok Mo
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 8,996,000 Baht	
	3) Project benefit: 1,500 rai 1 village 120 households 380 population	
	4) Main crops: Rice in Dry Season and Rainy Season	
5. Main facilities	small scale reservoir (V=500,000 m ³ , dam length=257 m, Height=15.2 m) with outlet gate valve and emergency spillway.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 10,346,690
	3) Rehabilitation year: 2000	
	4) Work items: Improve clay blanket	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
		
2012/7/18, Hup Mai Hai Reservoir		2012/7/18, Spillway of Hup Mai Hai Reservoir

Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	97	
2. Project name	Huai Nok Kratha Reservoir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Ban Rai	Tambon: Nong Chok
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 1,778,565 Baht	
	3) Project benefit: 1,500 rai 1 village 330 households 350 population	
	4) Main crops: Sugar cane and Cassava in Dry Season and Rainy Season	
5. Main facilities	Length 568 m., height 6 m., outlet 1 Ø 1.0 m., spillway 30 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 3,728,814
	3) Rehabilitation year: 2000	
	4) Work items: Reservoir redredging, spillway and 2 regulator protection riprap	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
		
2012/7/18, Huai Nok Kratha Reservoir		2012/7/18, Embankment of Huai Nok Kratha Reservoir

Inventory of SSIRP Project

1. Survey date & weather: July 18, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Uthai Thani Provincial office

1. Project serial number	98	
2. Project name	Wang Ta Khian Reservoir	
3. Project location	RID Region Office: 12	Province: Uthai Thani
	Amphon: Sawang Arom	Tambon: Sawang Arom
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 8,361,000 Baht	
	3) Project benefit: 1,000 rai 1 village 40 households 200 population	
	4) Main crops:	
5. Main facilities	Length 30.8 m., height 3.5 m., outlet 1 Ø 3x3x12 m.	
6. Work done by SSIRP	1) Type of work: Tmprovement	2) Actual cost (Baht): 2,354,245
	3) Rehabilitation year: 2000	
	4) Work items: Construct new Distribution System 1.3 m. (earth canal), huai yut sai canal redredging	
7. Current O&M	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Uthai Thani Provincial Irrigation Office can not find detail data and site of the project in the field		

(13) Suphanburi

Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	99	
2. Project name	Sa Bua Thong Weir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Uthong	Tambon: Ban Koeng
4. Project outline	1) Initial construction year: 1986	
	2) Initial project cost: 1,505,000 Baht	
	3) Project benefit: 1,500 rai 6 villages 80 households 350 population	
	4) Main crops: Rice, sugar cane and maize	
5. Main facilities	Small scale weir (earth fill, length=20 m, Height=2.0 m, 2 weir gates currently removed) rehabilitated under SSIRP, currently in operation	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 211,578
	3) Rehabilitation year: 1999	
	4) Work items: Repair 1 weir	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	

11. Photos

Weir





2012/7/17, Sa Bua Thong Weir



2012/7/17, Upstream of Sa Bua Thong Weir



Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	100	
2. Project name	Khao Kam Phaeng Reservoir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Uthong	Tambon: Don Kha
4. Project outline	1) Initial construction year: 1987	
	2) Initial project cost: 4,353,000 Baht	
	3) Project benefit: 3,000 rai 9 villages 200 households 750 population	
	4) Main crops: Rice, sugar cane and maize	
5. Main facilities	Small scale reservoir (V=250,000 m ³ , dam length=420 m, dam Height=10 m, outlet valve d=30 cm, spillway w=13 m) rehabilitated under SSIRP, currently in operation	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 690,414
	3) Rehabilitation year: 2000	
	4) Work items: Improve embankment, Reservoir redredging	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
		
2012/7/17, Khao Kam Phaeng Reservoir		2012/7/17, Embankment of Khao Kam Phaeng Reservoir

Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	101	
2. Project name	Thap La Khon Weir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Doem Bang Nang Buat	Tambon: Nong Krathum
4. Project outline	1) Initial construction year: 1989	
	2) Initial project cost: 5,138,000 Baht	
	3) Project benefit: 1,500 rai 5 villages 500 households 2,000 population	
	4) Main crops: Rice, sugar cane and maize	
5. Main facilities	2 wier, Length 36 m., height 1.70 m. and length 31 m., height 2.14 m.	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 667,132
	3) Rehabilitation year: -	
	4) Work items: Repair downstream protection	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid red; padding: 2px;">Upstream</div> <div style="border: 1px solid red; padding: 2px;">Weir</div> </div> 	
	2012/7/17, Thap La Khon Weir	2012/7/17, Downstream of Thap La Khon Weir



Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	102	
2. Project name	Ban Pa Khi Pond	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Dan Chang	Tambon: Huai Khamin
4. Project outline	1) Initial construction year: 1994	
	2) Initial project cost: 1,000,000 Baht	
	3) Project benefit: 500 rai 7 villages 300 households 500 population	
	4) Main crops:	
5. Main facilities	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
6. Work done by SSIRP	1) Type of work: Repair	2) Actual cost (Baht): 473,706
	3) Rehabilitation year: 2000	
	4) Work items: Repair inlet and outlet structure	
7. Current O&M	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field		



Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	103	
2. Project name	Ban Tha Dur Reservoir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Dan Chang	Tambon: Huai ka Mint
4. Project outline	1) Initial construction year: 1982	
	2) Initial project cost: 4,627,000 Baht	
	3) Project benefit: 550 rai 3 villages 150 households 500 population	
	4) Main crops: Rice, sugar cane and maize	
5. Main facilities	Width 6 m., Length 400 m., height 8 m., Outlet Ø 0.50 m., Spillway 30.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,969,173
	3) Rehabilitation year: 2000	
	4) Work items: Reservoir redredging. Double surface treatment road	
7. Current O&M	This is still under management of RID	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
	2012/7/17, Ban Tha Dur Reservoir	2012/7/17, Spillway of Ban Tha Dur Reservoir



Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	104	
2. Project name	Phu Pla Kang Reservoir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Dan Chang	Tambon: Dan Chang
4. Project outline	1) Initial construction year: 1984	
	2) Initial project cost: 6,127,451 Baht	
	3) Project benefit: 2,500 rai 6 villages	
	4) Main crops: Rice, sugar cane and maize	
5. Main facilities	Width 6 m., Length 286 m., height 11 m., Outlet Ø 0.40 m., Spillway 30.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 4,187,912
	3) Rehabilitation year: 2000	
	4) Work items: Reservoir redredging. Downstream Spillway protection	
7. Current O&M	This is still under management of RID	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	No problems	
10. Special remark	Currently in used for irrigation	
11. Photos		
 <p>Water way of spillway</p>		
2012/7/17, Water way of spillway of Phu Pla Kang Reservoir		2012/7/17, Phu Pla Kang Reservoir

Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	105	
2. Project name	Thap Phueng Noi Weir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Dan Chang	Tambon: Wang Khan
4. Project outline	1) Initial construction year: 1991	
	2) Initial project cost: 13,363,000 Baht	
	3) Project benefit: 1,000 rai 3 villages 100 households 400 population	
	4) Main crops: Rice, sugar cane and maize	
5. Main facilities	Width 6 m., Length 70 m., height 1 m., Outlet f0.40 m., Spillway 30.00 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 1,887,105
	3) Rehabilitation year: 2000	
	4) Work items: Reservoir redredging, Downstream Spillway protection	
7. Current O&M	The current condition of O & M transferred to TAO	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No. damage	
9. Current problems (O&M, structures, facilities, functions, etc.)	The downstream slope protection damaged due to the flooding before 2011	
10. Special remark	Currently in used for irrigation	
11. Photos		
		
2012/7/17, Thap Phueng Noi Weir		2012/7/17, Downstream of Thap Phueng Noi Weir

Inventory of SSIRP Project

1. Survey date & weather: July 17, 2012 Sunshine
2. Surveyed by: Mr. Chanin Damrisranoy
3. Guided by: RID Suphanburi Provincial office

1. Project serial number	106	
2. Project name	Huai Pa Phak Weir	
3. Project location	RID Region Office: 12	Province: Suphanburi
	Amphon: Dan Chang	Tambon: Nikhom Krasieo
4. Project outline	1) Initial construction year: 1992	
	2) Initial project cost: 5,613,250 Baht	
	3) Project benefit: 2,000 rai 7 villages 90 households 450 population	
	4) Main crops:	
5. Main facilities	Length 25.0 m., height 1.80 m.	
6. Work done by SSIRP	1) Type of work: Improvement	2) Actual cost (Baht): 692,301
	3) Rehabilitation year: 2000	
	4) Work items: Downstream protection riprap	
7. Current O&M	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
9. Current problems (O&M, structures, facilities, functions, etc.)	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
10. Special remark	No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field	
11. Photos No detail, The engineer of the Suphanburi Provincial Irrigation Office can not find detail data and site of the project in the field		

C.2.7 Questionnaire of SSIRP Inventory Survey

1. Survey date & weather: _____

2. Surveyed by: _____

3. Guided by: _____

1. Project serial number		
2. Project name		
3. Project location	RID Region Office:	Province:
	Amphon:	Tambon:
4. Project outline	1) Initial construction year: 2) Initial project cost: 3) Project benefit: 4) Main crops:	
5. Main facilities		
6. Work done by SSIRP	1) Type of work:	2) Actual cost:
	3) Rehabilitation year:	
	4) Work items:	
7. Current O&M		
8. Damage by 2011 flood (dam body, earth dike, embankment, masonry, riprap, steel gate, canal, spillway, others)		
9. Current problems (O&M, structures, facilities, functions, etc.)		
10. Special remark		
11. Photos		