

FINAL REPORT

**Research Project on Designing Local Frameworks
for Integrated Water Resource Management**

**The Research Institute for Humanity and Nature Japan
and**

Universitas Hasanuddin

March 2013



Activities of RIHN-C-09 Project

HASANUDDIN UNIVERSITY

1. Measurement of primary and secondary channel water debit

a. Observation of Flow Rate at the Beginning of Water Distribution

This activity took place on September 15, 2012, the beginning of the 2012's First Dry Planting. Flow Rate Observation was carried out, starting from Kampili Dam down to along Kampili Primary Channel.

Primary focus points of the observation were:

- Timing of water arrival at each building
- Surface height upon arrival at each observation point.

Observation results are displayed in Table 1 and Figure 1 and Figure 2

Table 1. Results of First Water Flow Rate at the Beginning of Dry Season Paddy of 2012

Time	Surface Height Measuring Station							
	DAM	BL.2	BL.3	BL.5	BL.7	BL.14	BL.16	BL.17
INITIAL SURFACE HEIGHT		5 Cm	5 Cm	20 Cm	20 Cm	20 Cm	0 Cm	0 Cm
DATE / HR								
06:40 WITA*	-							
06:58 WITA		10 Cm						
07:02 WITA			10 Cm					
07:20 WITA				25 Cm				
07:30 WITA					40 Cm			
11:00 WITA						120 Cm		
13:20 WITA							30 Cm	
13:50 WITA								30 Cm

Note: WITA is Central Indonesian Time, or UTC + 8

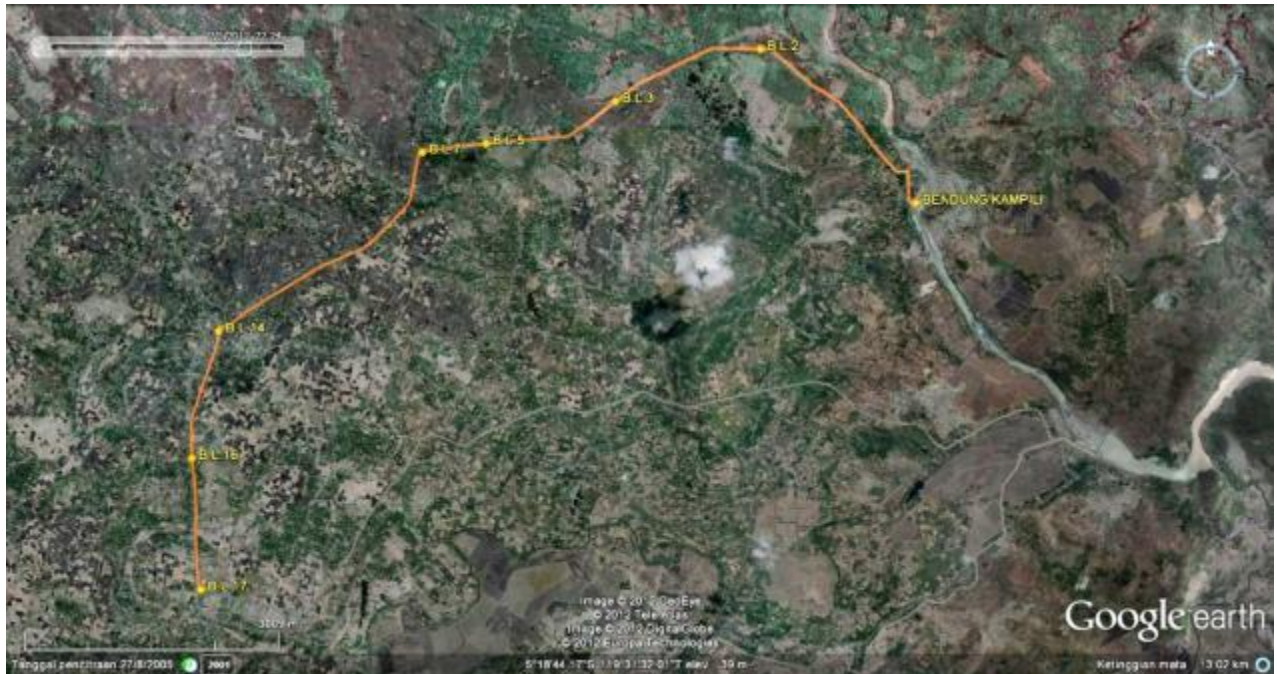


Figure 1. Observation and Measurement Sites



Figure 2. Initial Water Flow Rate Observation

b. Measurement along the Primary Channel

Objectives

Measurement of water debit during Ranny Season of 2012. Measurement is intended to determine waterflow conditions of primary channel during the First Dry

Planting Season of 2012, so that the data can be inputted and processed into basis for recommendation in primary channel water management.

Measurement Schedule

Measuring is Conducted once a week, the scope of which comprises the measurement of water debit along the length of Kampili Primary Channel. Measuring activities took place between September 15, 2012 and March 25, 2013.

Measurement Sites

Below are locations of measurement sites, presented in Table 2, Figure 3

Table 2. Measurement Sites of Primary Channel

NAMES	COORDINATES	
	S	E
BENDUNG (DAM)	5°16'39.30"S	119°30'47.70"T
BL.3	5°16'0.50"S	119°28'52.50"T
up BL.13	5°17'21.84"S	119°26'28.89"T
BL.16	5°18'16.60"S	119°26'10.00"T
BL.17	5°19'6.70"S	119°26'13.40"T



Figure 3. Water Debit Measurement Sites along Kampili Primary Channel

c. Measurement along the Secondary Channel

Measurement activities Conducted along secondary channel, the scope of which comprises measuring:

1. Flow rate
2. Surface height

Flow rate measurements were Conducted along Pammase Secondary Channel, while the surface height measurements were Conducted along the Majannang and Pammase Secondary Channel.

Objectives

To determine waterflow conditions along secondary channel, which would be then inputted and processed into basis for recommendation in managing irrigation.

Measurement Schedule

- Measuring activities were Conducted once per week. The activities took place between December 25, 2012 and March 13, 2013.
- Surface height were Conducted daily, between December 25, 2012 and March 13, 2013.

Measurement Sites

- The measuring of flow rate were Conducted along Pammase Secondary Channel, on 14 measurement points. The points are are presented below in Table 3, and the sites are presented in Figure 4.

Table 3. Water Flow Rate Measurement Points along Secondary Channel

NAMES	COORDINATES	
	S	E
B.PM.1	5°19'4.25"S	119°26'6.95"T
UP B.PM.2	5°19'4.10"S	119°26'6.67"T
DOWN B.PM.2	5°19'3.71"S	119°26'5.50"T
UP B.PM.3	5°19'1.50"S	119°25'42.01"T
B.PM.3	5°19'1.01"S	119°25'40.78"T
DOWN B.PM.3	5°19'0.47"S	119°25'40.68"T
UP B.PM.4	5°18'48.53"S	119°25'35.12"T
B.PM.4	5°18'48.22"S	119°25'34.44"T
DOWN B.PM.4	5°18'47.89"S	119°25'33.38"T
UP B.PM.5	5°18'38.42"S	119°25'25.47"T
B.PM.5	5°18'38.18"S	119°25'24.76"T
DOWN B.PM.5	5°18'38.01"S	119°25'23.94"T
UP B.PM.6	5°18'33.43"S	119°25'6.54"T
DOWN B.PM.6	5°18'34.03"S	119°25'5.38"T

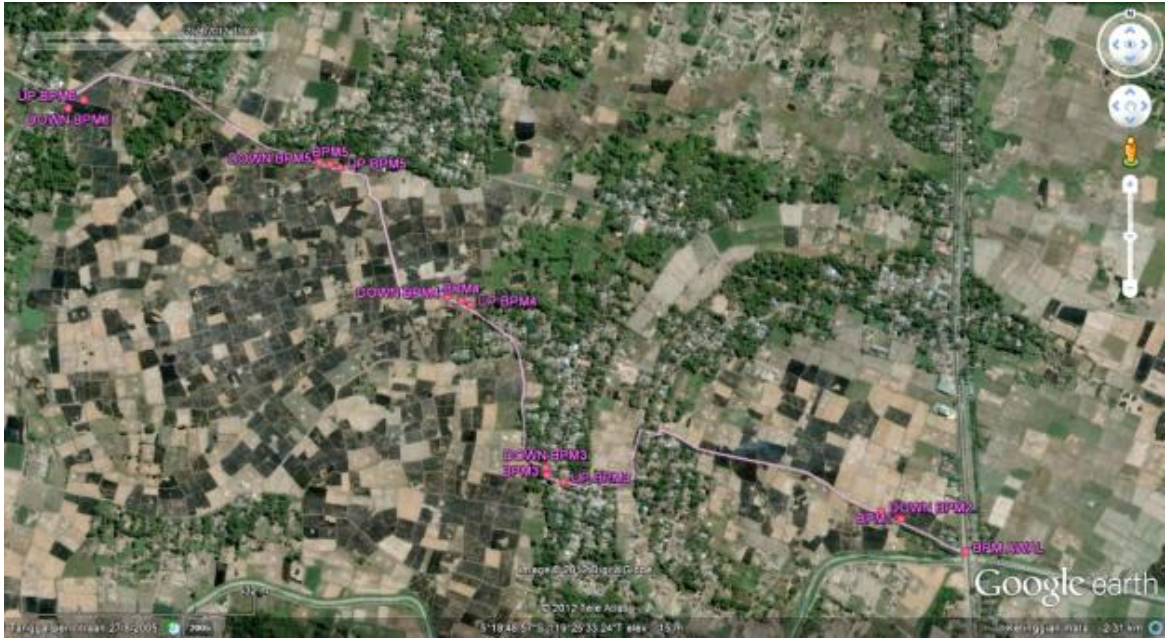


Figure 4. Measurement Sites along Secondary Channel

- Surface height measurement was Conducted along Borong Boddi Secondary Channel in the Kampili Irrigation Area. Measurement sites are indicated in Table 4 and locations are indicated in Figure 4.

Table 4. Water Flow Rate Measurement Points along Borong Boddi Secondary Channel

NAMES	COORDINATES	
	S	E
B.Bor 4 up	5°19'33.02"S	119°25'55.88"T
B.Bor 4 down	5°19'33.79"S	119°25'52.80"T



Figure 7. Pictures of Measuring Activities along Secondary Channel

2. Crop-cut Activity at each WUA

Re-identification was Conducted at five model WUAs: Kolasa, Tangke Balla, Tunirannuang, Binabbasa dan Renggang. The activity included updating the WUA membership roll.

Objectives

The objective of this activity was to obtain inputs on land identification methodology, and to implement WUA membership update. Subsequently, FWUA/WUA work guidelines and manuals on land re-identification may be formulated.

Schedule

Crop-cut activities were Conducted between March 1, 2012 and April 30, 2012.

Location

Re-identification activities were Conducted at five of JICA's Model WUAs: WUAs Kolasa, Tangke balla, Tunirannung, Renggang dan Binabbasa.

All five WUAs are administratively located in the Bajeng and West Bajeng Subdistricts of Gowa District.

Results

Attachment 4. List of Members of WUAs of Kolasa, Tangke balla, Tunirannung, Renggang and Binabbasa. Year 2012.



Figure 8. Pictures of the Re-identification Activities

3. Facilitating FWUA Meeting

FWUA meeting was carried out on June 8, 2012 at Tanabangka Village, Bajeng Subdistrict, Gowa District. The meeting was called by FWUA Sirannuang, inviting 18 members of WUAs under FWUA Sirannuang's area, to discuss water distribution schedule upon entering First Dry Planting Season of 2012.

Meeting Agenda was as follows:

- Welcoming speech by Head of FWUA Sirannuang
- Inputs and suggestions from Head of Village
- Inputs and suggestions from Pelangi Foundation
- Discussion and Q&A
- Establishing water distribution schedule

Invitation, Presence List, Minutes of Meetings, and resulting water distribution schedule of FWUA Sirannuang is available in Attachment 5.



Figure 9. Pictures of FWUA Sirannuang Meeting

7. Interview with Water Masters

Management of irrigation at WUA level is carried out by Water Masters. History and social data of the Water Master is required in managing the WUA.

Objectives

To obtain information on:

- History of the Water Master
- Socio-economic condition of the Water Master

Questionnaire utilized in the interview is available in Attachment 6.

Interview Schedules

Interviews were carried out in starting from February to August, in the following three irrigation areas:

1. Kampili Irrigation Area
2. Bissua Irrigation Area
3. Bili-Bili Irrigation Area

Results

Number of targets interviewed was 304 interviewees. Details of interviewees, sorted by irrigation area, are presented in Table 5.

Table 5. Total Targets Interviewed at Each Irrigation Area

No.	FWUA	Dates of Interviews	Number of Days	Number of Interviews
Bili-Bili Irrigation Area				
1	Somba Opu	2, 9 August	2	6
2	Julukana	27 July, 2, 3 August	3	8
3	Baji minasa	27 July, 2 August	2	5
4	Parappunganta	27 July, 2, 12 August	3	5
Subtotal			10	24
Kampili Irrigation Area				
5	Minasa Baji	1, 7 March, 18 April, 29 May 27 July	5	8
6	Tubarania	2 March 3,11 May, 11 July	4	7
7	Assamaturu	2, 14, 21 March, 10 April, 3 May, 19, 20 June, 11, 12 July	9	17
8	Jatia	3, 11, 17, 19 April, 21 June , 23 June, 4, 10 July,	8	22
9	Pallangga	27 March, 5, 9 April 26, 28 June, 12 July	6	14
10	Kalukuang	5, 13, 20 April, 23. 27 June, 4, 6, 17, 18 July	9	17
11	Galesong Utara	9 February., 28 June, 12 July	3	7
12	Passereanta	10, 16 February, 29, 30 March, 12, 13, 20, 27 April, 22 June, 18 July	10	23
13	Paraikatte	3 February, 1, 21 March, 27 April	4	6
14	Sirannuang	1, 17 February, 1, 2, 4, 10, 16 May	7	19

No.	FWUA	Dates of Interviews	Number of Days	Number of Interviews
15	Sipakainga	1, 14 March, 26 April, 6, 20 June, 11 July	6	11
Subtotal			71	151
Bissua Irrigation Area				
16	Abbulosibatang	10 February, 7, 28 March, 24 May, 6, 19, 21, 26 July	7	13
17	Wiratani	8 February, 12, 13 July	3	10
18	Harapan Tani	14 June, 13, 19 July	3	6
19	Hasanuddin	2 February, 7 March, 12 June, 13, 16 July	5	10
20	Bontosallang	3, 14 February, 9, 13 March, 15 June, 12 July	6	18
21	Assamaturu I	7 February, 16, 20, 28 March, 10, 19, 26 April, 25 May	8	16
22	Abbulosibatang I	7, February, 28 March, 4, 20 April	4	5
23	Pantang Mundur	15 February, 6, 8 March, 7, 8 June	5	15
24	Pajonga Dg. Ngalle	7, 14, 15 March, 11, 17 April	5	8
25	Sitallassi	26 April, 29 May, 23 June, 3 July	4	11
26	Tunas Baru			
27	Tolawu	27 March, 5, 6 July	3	10
28	Mattompodalle	22 March, 18 June	2	7
Subtotal			55	129
Total			136	304



Figure 10. Pictures of Interview Activities

5. Research on Conditions of Irrigation of WUA Renggang

Daily water debit measurements are carried out along the tertiary channel. Measurements carried out are:

1. Measurement of water debit at Pm6Ka Tertiary Channel, from Box T1 to K2.
2. Measurement of daily rainfall rate
3. Measurement of rice field water surface height
4. Conduct observation on condition of rice plots of Pm6Ka. Rice field irrigation are carried out by means of pumping. Water management is carried out by WUA
5. Measurement of micro-climate
6. Measurement of rice plant (rice plant biomass)

Report on Research on Conditions of Irrigation of WUA Renggang is available in Attachment 8

7. Research on Physical Characteristics of Soils Bili-Bili, Kampili and Bissua Irrigation Areas

Attachment 9. Report on Research on Physical Characteristics of Soils Bili-Bili, Kampili and Bissua Irrigation Areas

8. Water Master Training Activities

Water Master Training started in January, and concluded in August. The training was intended for WUA/FWUA caretakers. Training targets were:

- Heads of FWUAs
- Water Masters

Training materials included Training of Formulating Water Distribution Schedule. Below are the summary of number of attendants in each training session (Table 6).

Table 6. Summary of Attendance in Training Sessions

Training	Dates	Number of Trainings	Total number of attendance (people)
I	18-30 January, 2013	8	180
II	6-15 February, 2013	8	176



Figure 11. Pictures of Training Activities

8. Collection of Secondary Data

a. Normal River Flow Debit Record Data in Kampili and Bissua Dams

Data collected are available in Table 7 and 8, which include:

1. Normal River Flow Debit Record Data in Kampili Dam (Book 2)
2. Normal River Flow Debit Record Data in Bissua Dam (Book 3)

Table 7. Normal River Flow Debit Record Data in Bissua Dam

SUMMARY OF NORMAL RIVER FLOW DEBIT OF BISSUA DAM											
YEAR 2012		YEAR 2011		YEAR 2010		YEAR 2009		YEAR 2008		YEAR 2007	
MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY
JANUARY I	available	JANUARY I	available	JANUARY I	available	JANUARY I	available	JANUARY I	available	JANUARY I	available
JANUARY II	available	JANUARY II	available	JANUARY II	available	JANUARY II	available	JANUARY II	available	JANUARY II	available
FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available
FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available
MARCH I	available	MARCH I	available	MARCH I	available	MARCH I	available	MARCH I	available	MARCH I	available
MARCH II	available	MARCH II	available	MARCH II	available	MARCH II	available	MARCH II	available	MARCH II	available
APRIL I	available	APRIL I	available	APRIL I	available	APRIL I	available	APRIL I	available	APRIL I	available
APRIL II	available	APRIL II	available	APRIL II	available	APRIL II	available	APRIL II	available	APRIL II	available
MAY I	available	MAY I	available	MAY I	available	MAY I	available	MAY I	available	MAY I	available
MAY II	available	MAY II	available	MAY II	available	MAY II	available	MAY II	available	MAY II	available
JUNE I	available	JUNE I	available	JUNE I	available	JUNE I	available	JUNE I	available	JUNE I	available
JUNE II	available	JUNE II	available	JUNE II	available	JUNE II	available	JUNE II	available	JUNE II	available
JULY I	available	JULY I	available	JULY I	available	JULY I	available	JULY I	available	JULY I	available
JULY II	available	JULY II	available	JULY II	available	JULY II	available	JULY II	available	JULY II	available
AUGUST I	available	AUGUST I	available	AUGUST I	available	AUGUST I	available	AUGUST I	available	AUGUST I	available
AUGUST II	not available	AUGUST II	available	AUGUST II	available	AUGUST II	available	AUGUST II	available	AUGUST II	available
SEPTEMBER I	not available	SEPTEMBER I	available	SEPTEMBER I	available	SEPTEMBER I	available	SEPTEMBER I	available	SEPTEMBER I	available
SEPTEMBER II	not available	SEPTEMBER II	available	SEPTEMBER II	available	SEPTEMBER II	available	SEPTEMBER II	available	SEPTEMBER II	available
OCTOBER I	not available	OCTOBER I	available	OCTOBER I	available	OCTOBER I	available	OCTOBER I	available	OCTOBER I	available
OCTOBER II	not available	OCTOBER II	available	OCTOBER II	available	OCTOBER II	available	OCTOBER II	available	OCTOBER II	available
NOVEMBER I	not available	NOVEMBER I	available	NOVEMBER I	available	NOVEMBER I	available	NOVEMBER I	available	NOVEMBER I	available
NOVEMBER II	not available	NOVEMBER II	available	NOVEMBER II	available	NOVEMBER II	available	NOVEMBER II	available	NOVEMBER II	available
DECEMBER I	not available	DECEMBER I	available	DECEMBER I	available	DECEMBER I	available	DECEMBER I	available	DECEMBER I	available
DECEMBER II	not available	DECEMBER II	available	DECEMBER II	available	DECEMBER II	available	DECEMBER II	available	DECEMBER II	available

Tabel 8. Normal River Flow Debit Record Data in Kampili Dam

SUMMARY OF NORMAL RIVER FLOW DEBIT OF KAMPILI DAM											
YEAR 2012		YEAR 2011		YEAR 2010		YEAR 2009		YEAR 2008		YEAR 2007	
MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY	MONTH	AVAILABILITY
JANUARY I	available	JANUARY I	available	JANUARY I	available	JANUARY I	available	JANUARY I	available	JANUARY I	available
JANUARY II	available	JANUARY II	available	JANUARY II	available	JANUARY II	available	JANUARY II	available	JANUARY II	available
FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available	FEBRUARY I	available
FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available	FEBRUARY II	available
MARCH I	available	MARCH I	available	MARCH I	available	MARCH I	available	MARCH I	available	MARCH I	available
MARCH II	available	MARCH II	available	MARCH II	available	MARCH II	available	MARCH II	available	MARCH II	available
APRIL I	available	APRIL I	not available	APRIL I	available	APRIL I	available	APRIL I	available	APRIL I	available
APRIL II	available	APRIL II	not available	APRIL II	available	APRIL II	available	APRIL II	available	APRIL II	available
MAY I	available	MAY I	not available	MAY I	available	MAY I	available	MAY I	available	MAY I	available
MAY II	available	MAY II	not available	MAY II	available	MAY II	available	MAY II	available	MAY II	available
JUNE I	available	JUNE I	available	JUNE I	available	JUNE I	available	JUNE I	available	JUNE I	available
JUNE II	available	JUNE II	available	JUNE II	available	JUNE II	available	JUNE II	available	JUNE II	available
JULY I	available	JULY I	available	JULY I	available	JULY I	available	JULY I	available	JULY I	available
JULY II	available	JULY II	available	JULY II	available	JULY II	available	JULY II	available	JULY II	available
AUGUST I	available	AUGUST I	available	AUGUST I	available	AUGUST I	available	AUGUST I	available	AUGUST I	available
AUGUST II	not available	AUGUST II	available	AUGUST II	available	AUGUST II	available	AUGUST II	available	AUGUST II	available
SEPTEMBER I	not available	SEPTEMBER I	available	SEPTEMBER I	available	SEPTEMBER I	available	SEPTEMBER I	available	SEPTEMBER I	available
SEPTEMBER II	not available	SEPTEMBER II	available	SEPTEMBER II	available	SEPTEMBER II	available	SEPTEMBER II	available	SEPTEMBER II	available
OCTOBER I	not available	OCTOBER I	available	OCTOBER I	available	OCTOBER I	available	OCTOBER I	available	OCTOBER I	available
OCTOBER II	not available	OCTOBER II	available	OCTOBER II	available	OCTOBER II	available	OCTOBER II	available	OCTOBER II	available
NOVEMBER I	not available	NOVEMBER I	available	NOVEMBER I	available	NOVEMBER I	available	NOVEMBER I	available	NOVEMBER I	available
NOVEMBER II	not available	NOVEMBER II	available	NOVEMBER II	available	NOVEMBER II	available	NOVEMBER II	available	NOVEMBER II	available
DECEMBER I	not available	DECEMBER I	available	DECEMBER I	available	DECEMBER I	available	DECEMBER I	available	DECEMBER I	available
DECEMBER II	not available	DECEMBER II	available	DECEMBER II	available	DECEMBER II	available	DECEMBER II	available	DECEMBER II	available

9. Monitoring of Irrigation Coverage in First Dry Planting Season of 2012

During the First Dry Planting Season of 2012, monitoring activities were carried out to determine the coverage of irrigation in FWUA Sirannuang Irrigation Area.

Objectives

- To obtain information on factors contributing to increase and decrease in irrigation coverage of the WUA area
- To obtain means and methods of monitoring of each WUA's irrigation coverage, as well as reporting methods, as inputs in formulating irrigation management work manual.

Time and Place

Monitoring of irrigation coverage began in May and concluded in August.

Location of monitoring: 18 work areas of members of FWUA Sirannuang.

Results of Monitoring

Results of monitoring are presented in Tables 9 and 10.

Table 9. Results of Monitoring of Irrigation Coverage of Majannang Secondary Channel

WUA	Tertiary Plots	Area Size (Ha)	Size of Irrigated Areas (Ha)	Size of Unirrigated Areas (Ha)
Campaga	Mg 1ka	15	13.8	1.2
	Mg 1 ki	15.6	2.6	13
Batang Kaluku	Mg 2 ki	35	24.4	10.6
Lompo Batua	Mg 3 ka	19.5	19.5	0
	Mg 5 ka	15.3	8.6	6.7
Sappaya	M g 3 ki	24.1	21.6	3.1
Kolasa/Tangkeballa	Mg 4 ki	59.71	45.21	14.5
Bontosunggu. R. Bone	Mg 6 ki	28.3	25.9	2.4
Baji Pamai	Mg 7 ka	51.6	46.4	5.2
Bontosunggu/ Bontoa	Mg 7 tgh	56.8	55.1	1.7
R. Bone/ Juluerotta	Mg 7 ki	61.3	5.3	56
Total		382.21	268.41	114.4

Percentage			70.23	29.93
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Tabel 10. Results of Monitoring of Irrigation Coverage of Pammase Secondary Channel

WUA	Tertiary Plots	Area Size (Ha)	Size of Irrigated Areas (Ha)	Size of Unirrigated Areas (Ha)
Tunikamaseang	Pm 1 ka	16.1	14.8	1.3
	Pm 2 ki	8.4	6.7	1.7
Borong Unti	Pm 3 ki	31.9	29.2	2.7
Sipakainga	Pm 4 ka	7.1	6.1	1
Tunirannuang	Pm 4 ki	53.6	48.2	5.4
Pammase	Pm 5 ki	25.2	24.7	0.5
Renggang	Pm 6 ka	88.5	59.7	28.8
Binabbasa	Pm 6 ki	87.2	13.4	73.8
Total		318	202.8	115.2
Percentage			63.77	36.23



Figure 12. Pictures of Survey of Irrigated Areas of FWUA Sirannuang