

## **" TRAINING & IMPLEMENTATION OF PILOT RAINWATER HARVESTING PROGRAMME"**

### **3<sup>RD</sup> ADB PROJECT**

The programme with the objective to promote and demonstrate rainwater harvesting technology in three districts, Hambantota, Monaragala and Puttalam, was commenced on the 20<sup>th</sup> of July 2000 and is to be end on the 31<sup>st</sup> of August 2000.

The details of the progress of the above project will be given under each district.

## **HAMBANTOTA**

### **A. Field visit and site selections**

A field visit for the site selection was conducted by the resource person from LRWHF on 21/06/2000. Design of RWH tanks, an estimate for the tank stand was submitted to the District Manager/ NWSDB.

### **B. Awareness Program (Proposed output No. 4)**

Classroom sessions on awareness of rain water harvesting technology were conducted for technical assistants (TO, TA, CF, EA, CDA, PM) and masons of Partner Organizations working in relevant PS. Details of the sessions are as follows;

<b>Date</b>	<b>Pradeshiya Sabas</b>	<b>Category of Participants</b>	<b>No. of Participants</b>
23/06/2000	Ambalantota & Hambantota	TO, TA, CF, CDA, EA, PM	42
24/06/2000	Tangalle & Katuwana	TO, TA, CF, CDA, EA, PM	30
25/06/2000	All four PS	Trainee Masons & Trainers	16

Note: Only two trainees attended the training sessions from the Katuwana PS

### ***Resource materials for the awareness Programme***

*(Proposed output No. 1 & 3)*

Standard printed manual, which covers the design of constructions of RWH tanks, materials, general information on RWH technology (**annex i**), and an introductory leaflet on rain water harvesting were distributed among the participants (**annex ii**).

*(Proposed output No. 2)*

Special mason training manual on RWHT's (**annex iii**) and introductory leaflet on rain water harvesting was distributed among trainee masons.

*(Proposed output No. 5)*

Handout on Operation and Maintenance (**annex iv**), and informative leaflet about community awareness on RWH will be given to the donor agency to distribute to the three districts offices (**annex v**).

### ***Evaluation of the Awareness Program & Promotion of RWH Technology***

Two questions were given to the participants in order to evaluate the success of the program and to get their opinion on the successfulness of application of the technology in each respective PS at the end of the awareness programs. However, it was not compulsory to answer.

Questions forwarded to the participants and their responses are as follows;

1. Did you get useful information on RWH technology?
2. With available resources, is RWH a solution for the existing water problem in your area?

	<b>Day 2</b>		<b>Day 3</b>	
	Yes	No	Yes	No
Question No. 1	17 (47%)	19 (53%)	100%	0
Question No. 2	17 (47%)	17 (47%)*	87.5%	12.5%

Note: No questions were forwarded on day one.

\* Two participants did not answer

### **C. On the job training of masons (Proposed output No. 6 & 7)**

On-the-job training on construction of 5 m<sup>3</sup> above ground ferro-cement tanks with gutters, first flush and filters for rain water harvesting systems was given to the trainee masons through establishment of pilot demonstration facilities in schools in each of the Pradeshiya Saba's (PS) in the district. The names of the schools in each PS are as follows;

1. Wewegama Junior School at Hambantota PS
2. Mahawela Junior School at Ambalantota PS
3. Sudarshanagama Junior School at Tangalle PS
4. Gagulandeniya Primary School at Katuwana PS

Two resource persons (Trainers) conducted the on-the-job training programme of trainee masons in four PS. Each resource person was responsible for training the masons in the two PS.

### ***On- the-Job Training (construction) time frame***

Constructions were scheduled to start on the 26<sup>th</sup> of June 2000. However, due to delays in purchasing materials, constructions were delayed till the 27<sup>th</sup> of June 2000.

- |  |                     |
|--|---------------------|
| 1. Wewegama Junior School at Hambantota PS     | 27/06/00 to 5/07/00 |
| 2. Mahawela Junior School at Ambalantota PS    | 27/06/00 to 5/07/00 |
| 3. Sudarshanagama Junior School at Tangalle PS | 01/07/00 to 8/07/00 |
| 4. Gagulandeniya Primary School at Katuwana PS | 01/07/00 to 8/07/00 |

### ***Participation of Trainees for the on- the- job training programme***

Pradeshia Saba	Total No. of Days Worked	Total No. of Participants	100% participation	7 Days Participation	6 Days Participation	5 Days Participation	3 Days Participation
Hambantota	06	04	04	-	-	-	-
Ambalantota	08	04	01	01	01	-	01
Tangalle	07	06	01	-	01	02	02
Katuwana	07	04	03	-	-	01	-

#### **D. Supervision of Construction**

**Site visit 1:** Conducted by technical resource person from LRWHF on the 30/06/2000. Base and the stand of RWH tanks were completed at the Wewegama Junior School at Hambantota PS and Mahawela Junior School at Ambalantota PS.

**Site visit 2:** Conducted on 17/07/2000.

1. *Wewegama Junior School at Hambantota PS*
  - Construction of the ferro cement tank is to be completed
  - Cover slab (lid) of the ferro cement tank to be casted
  - Gutters to be provided
  - First flush system to be provided
  - Tap and end cap for the washout are to be installed
2. *Mahawela Junior School at Ambalantota PS*
  - Construction of the ferro cement tank is completed
  - Gutters to be provided
  - First flush system to be provided
  - Tap and end cap for the washout are to be installed
3. *Sudarshanagama Junior School at Tangalle PS*
  - No valance board available
  - Gutters to be provided
  - First flush system to be provided
  - Tap and end cap for the washout are to be installed
  - Inner plastering of the ferro cement tank to be completed (materials to be provided)
4. *Gagulandeniya Primary School at Katuwana PS*
  - No valance board available
  - Gutters to be provided
  - First flush system to be provided

- Tap and end cap for the washout are to be installed
- Construction of the ferro cement tank is completed

**Site visit 3 (Final):** Conducted on 31/07/2000

1. *Wewegama Junior School at Hambantota PS*
  - Gutters fixed
  - First flush system to be completed
  - Tap and end cap for the washout are to be installed
  - Filter materials need to be put in
2. *Mahawela Junior School at Ambalantota PS*
  - Gutters to be Fixed
  - First flush system to be fixed
  - Tap and end cap for the washout are to be installed
  - Filter materials need to be put in
3. *Sudarshanagama Junior School at Tangalle PS*
  - No valance board available
  - Gutters to be provided
  - First flush system to be provided
  - Tap and end cap for the washout are to be installed
  - Inner plastering of the ferro cement tank to be completed (materials to be provided)
4. *Gagulandeniya Primary School at Katuwana PS*
  - No valance board available
  - Gutters to be provided
  - First flush system to be provided
  - Tap and end cap for the washout are to be installed

A list of the materials, which were not available at the sites, and a list of work needed to be completed were given to the District Managers in each district.

## MONARAGALA

### A. Field Visit and Site Selections

Field visit for the site selections was conducted by the resource person from LRWHF on 25/06/2000. Design of the RWH tanks an estimate for tank stand and gutter system and the site plan were submitted to the District Manager/ NWSDB.

### B. Awareness Program (Proposed output No. 4)

Classroom sessions on awareness of rain water harvesting technology were conducted for the technical assistants (TO, TA, CF, EA, CDA, PM) and masons of Partner Organizations working in the relevant PS's. Details of the sessions are as follows;

Date	Pradeshiya Sabas	Category of Participants	No. of Participants
27/06/2000	Tanamalvilla & Buttala	TO, TA, CF, CDA, EA, PM	45
28/06/2000	Bibile & Siyabalanduwa	TO, TA, CF, CDA, EA, PM	49
29/06/2000	All four PS	Trainee Masons & Trainers	21

### ***Resource materials for the awareness Programme (Proposed out put No. 4)***

*(Proposed output 1 & 3)*

Standard printed manual, which covers the design of constructions of RWHT's, materials, general information of RWH technology (**annex i**), and introductory leaflet on RWH were distributed among the participants (**annex ii**)

*(Proposed output 2)*

Special mason training manual on RWHT (**annex iii**) and introductory leaflet on RWH was distributed among trainee masons.

*(Proposed output 5)*

Handout on Operation and Maintenance (**annex iv**) and informative leaflet about community awareness on RWH (**annex v**) will be given to the donor agency.

### ***Evaluation of Awareness Program & Promotion of the RWH technology***

Two questions were given to the participants in order to evaluate the successfulness of the program and to get their opinion on success of the application of the technology in each respective PS. However, it was not compulsory to answer.

Questions forwarded to the participants and their response are as follows;

1. Have you got useful information on RWH technology?
2. With available resources, is RWH a solution for the existing water problem in your area?

	Day 1		Day 2		Day 3	
	Yes	No	Yes	No	Yes	No
Question No. 1	31 (70%)	13 (30%)	41 (91%)	4 (8.8%)	17 (100%)	0
Question No. 2	29 (67%)	14 (33%)*	9 (20%)	36 (80%)	17 (100%)	0

\* One participant did not answer

### **C. On -the- Job Training of the Masons (Proposed output 6& 7)**

On-the-job training on construction of 5 m<sup>3</sup> above ground ferro-cement tanks and rain water harvesting system was given to trainee masons through the establishment of pilot demonstration facilities in schools in each of four pradeshiya Saba's (PS) in the district. The names of the schools of each PS are as follows;

1. Kongaspitiya School at Siyambalanduwa PS
2. Kahakurullan Palassa at Tanamalvila PS
3. Wegama School at Bibile PS
4. Gonagamara School at Buttala PS

Two resource persons (Trainers) conducted the on-the-job training programme of trainee masons in four PS's. Each resource person was responsible for training the masons in two PS's.

#### ***On- the- job training (construction) time frame***

Constructions were scheduled to start on the 30<sup>th</sup> of June 2000. However, due to delays in purchasing materials constructions were delayed till the 3<sup>rd</sup> of July 2000.

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|--|----------------------|
| 1. Kongaspitiya School at Siyambalanduwa | 03/07/00 to 12/07/00 |
| 2. Kahakurullan Palassa at Tanamalvila   | 03/07/00 to 12/07/00 |
| 3. Wegama School at Bibile               | 07/07/00 to 14/07/00 |
| 4. Gonagamara school at Buttala          | 07/07/00 to 14/07/00 |

#### ***Participation of Trainees for the on the job training programme***

Pradeshiya Saba	Total No. of Days Worked	Total No. of Participants	100% participation	07 Days Participation	06 Days Participation	05 Days Participation	03 Days Participation
Siyambalanduwa	07	04	04	-	-	-	-
Tanamalvila	08	05	01	01	01	-	03
Bibile	07	05	05	-	-	-	-
Buttala	13	05	01	02	01	-	01

## **E. Supervision of Construction**

**Site visit 1:** Conducted on 08 - 09/07/2000.

1. *Kongaspitiya School at Siyambalanduwa PS*
  - Tank constructed on ground level
  - External plastering of the RWHT was completed
2. *Kahakurullan Palassa at Tanamalvila PS*
  - Base and the stand were built
  - External plastering of the RWHT was completed
3. *Wegama School at Bibille PS*
  - Work has not commenced
4. *Gonagamara School at Buttala PS*
  - Base of the RWHT the stand of the RWHT was laid

**Site visit 2:** Conducted on 11/07/00

1. *Kongaspitiya School at Siyambalanduwa PS*
  - Not visited (This visit was mainly due to inspection of the Buttala site location)
2. *Kahakurullan Palassa at Tanamalvila PS*
  - Not visited
3. *Wegama School at Bibille PS*
  - Original location for the tank was changed
  - Excavation for the base was in progress
4. *Gonagamara school at Buttala PS*
  - No progress after the last site visit

**Site visit 3:** Conducted on 22 - 23/07/00

1. *Kongaspitiya School at Siyambalanduwa PS*
  - External plastering completed
  - Cover slab to be cast
  - No valance board available
  - Gutters not fixed
  - First flush system to be provided
  - Stand post for the tap to be built
  - Tap and end cap for the washout are to be installed

2. *Kahakurullan Palassa at Tanamalvila PS*

- Construction of the ferro cement tank is completed
- Cover slab to be cast
- Tap stand post built
- First flush system to be fixed
- Tap and end cap for the washout are to be installed
- Extra down pipes coming from the roof need to be block

3. *Wegama School at Bibille PS*

- The plastering work of the tank has been completed
- Cover slab to be cast
- Tap stand post built
- First flush system to be fixed
- Tap and end cap for the washout are to be installed

4. *Gonagamara School at Buttala PS*

- The thin layer of plaster was pasted to the chicken wire mesh
- Tank to be completed
- Cover slab to be cast
- Tap stand post built
- First flush system to be fixed
- Tap and end cap for the washout are to be installed

**Site visit 4 (final):** Conducted on the 01- 02/08/2000.

1. *Kongaspitiya School at Siyambalanduwa PS*

- Construction of the ferro cement tank is completed
- Cover slab to be cast
- Tap stand post to be built
- No valance board available
- Gutters to be fixed
- First flush system to be fixed
- Tap and end cap for the washout are to be installed
- Overflow pipe need to be extended

2. *Kahakurullan Palassa at Tanamalvila PS*

- Construction of the ferro cement tank is completed
- Cover slab to be cast
- First flush system to be fixed
- Connecting gutter or down pipe to be fixed
- Tap and end cap for the washout are to be installed
- Washout pipe to be buried and directed to the drain
- Extra down pipes coming from the roof need to be blocked



3. *Wegama School at Bibile PS*

- Construction of the ferro cement tank is over
- Cover slab to be cast
- Gutters to be fixed
- First flush system to be fixed
- Connecting gutter or down pipe to be fixed
- Tap to be installed
- Overflow pipe to be fixed

4. *Gonagamara school at Buttala PS*

- Construction of the ferro cement tank is completed
- Cover slab to be cast
- First flush system is fixed
- Tap to be installed

A list of the materials, which were not available at the sites and a list of work needed to be completed were given to the District Managers in each district.

## PUTTLAM

### A. Field Visit and Site Selections

Field visit for the site selection was conducted by the resource person from LRWHF on 01/07/2000 and 02/07/2000. Design of RWH tanks, an estimate for the tank stand and gutter systems and the site plan were submitted, along with the list of materials needed to the District Manager/ NWSDB.

### B. Awareness Program (Proposed output 4)

Classroom sessions on awareness of rainwater harvesting technology were conducted technical assistants (TO, TA, CF, EA, CDA, PM) and masons of Partner Organizations working in relevant PS's. Details of the sessions are as follows;

Date	Pradeshiya Sabas	Type of Participants	No. of Participants
01/07/2000	Anamaduwa, Chillaw & Wennapuwa	TO, TA, CF, CDA, EA, PM	38
02/07/2000	Karuwalagaswewa & Kalpitiya	TO, TA, CF, CDA, EA, PM	38
03/06/2000	Masons from four PS	Trainee Masons & Trainers	22

Note: Trainee masons from Kalpitiya PS did not attend the training session.

### ***Resource materials for the Awareness Programme***

*(Proposed output 1 & 3)*

Standard printed manual, which covers design of constructions of RWHT, materials, general information on RWH technology (**annex i**) and introductory leaflet on rain water harvesting was distributed among the participants (**annex ii**).

*(Proposed output 2)*

Special mason training manual on RWHT (**annex iii**) and introductory leaflet on RWH was distributed among trainee masons.

*(Proposed output 5)*

Handout on operation and maintenance (**annex iv**) and informative leaflet about community awareness on RWH (**annex v**) will be given to the donor agency.

### ***Evaluation of Awareness Program & Promotion of the RWH Technology***

Two questions were given to the participants in order to evaluate the success of the program and their opinion on success of the application of the technology in each respective PS. However, it was not compulsory to answer.

Questions forwarded for the participants and their response are as follows;

1. Did you get useful information on RWH technology?
2. With available resources, is RWH a solution for the existing water problem in your area?

	Day 1		Day 2		Day 3	
	Yes	No	Yes	No	Yes	No
Question No. 1	34 (94.4%)	2 (5.6%)	29 (93.5%)	2 (6.5%)	22 (95.6%)	1 (4.4%)
Question No. 2	25 (69.4%)	11 (30.6%)	13 (41.9%)	18 (58.1%)	22 (95.6%)	1 (4.4%)

### C. On-the-Job Training of the masons

On-the-job training on construction of 5 m<sup>3</sup> above ground ferro-cement tanks and rain water harvesting system was given to the trainee masons through the establishment of pilot demonstration facilities in selected schools in each of five Pradeshia Saba's (PS) in the district. The names in the schools in each PS are as follows;

1. Andigama Maha Vidyalaya at Anamaduwa PS
2. Muslim Maha Vidyalaya Pallivasalithurai at Kalpitiya PS
3. Suduwella Primary School at Chillaw PS
4. D. S. Senanayalaka Maha Vidyalaya at Karuwalagaswewa PS
5. St. Odaliya Vidyalaya at Wennapuwa PS

One resource person (Trainer) conducted on the job training programme of trainee masons in two PS 's and a second resource person was conducted the same programme in three PS's.

#### ***On- the -job training (construction) time frame***

Constructions were scheduled to start on the 04<sup>th</sup> of July 2000. However, due to delays in purchasing materials, construction was delayed till the 07<sup>th</sup> of July 2000.

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|--|-----------------|
| 1. Andigama Maha Vidyalaya at Anamaduwa PS                 | 07 - 16/07/2000 |
| 2. Muslim Maha Vidyalaya Pallivasalithurai at Kalpitiya PS | 07 - 16/07/2000 |
| 3. Suduwella Primary School at Chillaw PS                  | 11 - 18/07/2000 |
| 4. D. S. Senanayalaka Maha Vidyalaya at Karuwalagaswewa PS | 11 - 18/07/2000 |
| 5. St. Odaliya Vidyalaya at Wennapuwa PS                   | 20 - 27/07/2000 |

#### ***Participation of Trainees for the on the job training programme***

Pradeshia Saba	Total No. of Days Worked	Total No. of Participants	100% participation	05 Days Participation	03 Days Participation	02Days Participation	01Days Participation
Anamaduwa	NA						
Karuwalagaswewa	06	08	-	05	-	02	01
Chilaw	NA						
Kalpitiya	06	04	01		02	02	01
Wennapuwa	06	05	05	-	-	-	-

NA = Data not available

## **F. Supervision of Construction**

**Site visit 1:** Conducted on the 09/07/2000. Base of the RWHT's were completed at Andigama Maha Vidyalaya at Anamaduwa PS and Muslim Maha Vidyalaya, Pallivasalithurai at Kalpitiya PS. Tank was not constructed at the site earlier selected at Kalpitiya. The new location recommended by school principal, however, is less visible for outsiders.

### **Site visit 2:**

1. *Andigama Maha Vidyalaya at Anamaduwa PS*
  - Construction of the ferro cement tank is completed
  - Tap to be fixed
2. *Muslim Maha Vidyalaya Pallivasalithurai at Kalpitiya PS*
  - Construction of the ferro cement tank completed
  - End of the roof sheet extends projected out: too far; therefore fixing of gutters more complicated.
  - Gutters to be provided
  - First flush system to be provided
  - Tap and end cap for the washout are to be installed
3. *Suduwella Primary School at Chillaw PS*
  - Construction of the ferro cement tank completed
  - First flush system to be fixed
  - Tap and end cap for the washout are to be installed
4. *D. S. Senanayalaka Maha Vidyalaya at Karuwalagaswewa PS*
  - Construction of the ferro cement tank completed
  - Gutters to be fixed
  - First flush system to be fixed
  - Tap and end cap for the washout are to be installed
5. *St. Odaliya Vidyalaya at Wennapuwa PS*
  - Construction work has started

**Site visit 3 (final):** Conducted on 05/07/2000.

1. *Andigama Maha Vidyalaya at Anamaduwa PS*
  - Tap to be fixed and "T" joint is needed for wash out
  - Extra down pipes coming from the roof should be blocked
  - First flush is placed
  - Down pipe connecting to the tank to be propped up
2. *Muslim Maha Vidyalaya Pallivasalithurai at Kalpitiya PS*
  - Gutters to be fixed
  - Special gutter brackets to be made, since roof sheets projected far too out

- First flush system to be provided
  - Tap and end cap for the washout are to be installed
  - Base to be completed
  - Cover slab to be cast
3. *Suduwella Primary School at Chillaw PS*
- Down pipes are in place, first flush system to be fixed
  - Tap and end cap for the washout are to be installed
  - Extra down pipes coming from the roof should be blocked
  - Cover slab to be cast
4. *D. S. Senanayalaka Maha Vidyalaya at Karuwalagaswewa PS*
- Gutters to be fixed, but in progress
  - First flush system to be provided
  - Overflow pipe to be shortened
  - Tap and end cap for the washout are to be installed
5. *St. Odaliya Vidyalaya at Wennapuwa PS*
- Extra down pipes coming from the roof should be blocked

#### **Limitations from LRWHF**

1. Units of some of the material in the material list were not in SI units.
2. BOQ not complete
3. Some items were not included in the material list, eg. Nylon Mosquito net. However, provided by the LRWHF during the field visits.
4. Resource person who conducted the construction at and Anamaduwa PS was not satisfactory. However, these shortcomings were later remedied.

#### **Limitations and Constrains from the District Offices**

1. Poor attendance of trainee masons on the job training. In some PS, on some days, none of the trainee masons came to work. This could be due to the insufficiency (Rs. 150/= per day) and delays in payment. In some districts, the payments for the trainees has not been made even till the beginning of August.
2. Poor co-ordination between some District Managers and their Engineering Assistants as well as poor co-ordination between some District Managers and LRWHF.
3. No trainee masons from Kalpitiya PS in Puttlam attended the awareness programme held on the 03<sup>rd</sup> of July 2000.
4. Building materials were not available on the site at the correct time.
5. Some building materials were not enough. That could be due to poor quality of the materials eg. Sand with lots of rubble, or wastage during construction.

### **Extra items added which was originally not in the Proposal**

1. Certificate of participation was promised to the trainees who attended the full training course of constructing RWH ferro cement tanks.
2. Incentive of Rs. 300/= was promised to the trainees who have attended the full training course of constructing RWH ferro cement tanks.
3. More site visits were been conducted than proposed.
4. Some building materials were purchased by LRWHF to expedite the work.

### **Conclusion and Recommendations**

1. Thirteen demonstration rainwater harvesting systems with 5 m<sup>3</sup> ferrocement tank were completed in 13 schools in 13 PS 's in Hambantota, Moneragala and Puttlam districts.
2. 3<sup>rd</sup> ADB Project staff and the partner organisations in the three districts were instructed on the social and technical aspect of rain water harvesting. This can be further enhanced by distribution of leaflets and brochures.
3. Pool of mason competent on planning and construction of rainwater harvesting system was established in each PS of the 3 districts.
4. A system should be established within the schools for Operation and Maintenance of the rain water system. O&M leaflet provided by the project should be made available to the Schools and schools encouraged to participate in future monitoring & evaluation of the project.
5. The demonstration tanks should be monitored and evaluated for O&M, water quantity (available), water user pattern, impacts on the community etc. at least for a one year period.