

Supplementary

Interviewer: Code:

Date of interview:

Coordinates: Longitude: Latitude:

Full name of interviewee:

Age: Ethnicity:

Address: Hamlet: Commune:

District: Province:

QUESTIONNAIRE

Project's title: Research on scientific and practical basis for additional issues of artificial groundwater from excess water in rainwater harvesting system in the Ca Mau province.

Introduction:

Our study entitled "Research on scientific and practical basis for additional issues of artificial groundwater from excess water in rainwater harvesting system in the Ca Mau province", aims to evaluate the amount of excess rainwater in rainwater harvesting systems, build a pilot model for using excess rainwater to supplement artificial groundwater, and determine the feasibility of artificial groundwater recharge for coastal provinces in the Vietnamese Mekong Delta.

To achieve this objective, we would like to gather information from the local community to understand the use of water for daily activities and essential production activities; the current situation of rainwater harvesting and use; the exploitation of groundwater and difficulties; and the willingness of households to increase the use of rainwater.

I. GENERAL

1. Information:

- Name:

- Age: Ethnicity:

2. Number of members in the family:

- Total.....; Male:; Female:;<18;>60

- Number of people living regularly:

3. Classification: ☐1. Poor; ☐2. Average; ☐3. Good.

4. Education: (of the person being interviewed)

☐1. Primary and below; ☐2. Secondary; ☐3. High school; ☐4. College and above.

5. Current job (main job of the household).

☐1. Worker; ☐2. Officer; ☐3. Trader; ☐4. Farmer;

☐5. Other (with multiple different main jobs):

.....

6. Residential conditions:

- Length of stay here:

- Average monthly family income: ☐1. Under 3 million VND; ☐2. From 3 - 10 million VND; ☐3. Above 10 million VND.

Stability:

- Average monthly living expenses of the family: ☐1. Under 3 million VND;

☐2. From 3 - 10 million VND; ☐3. Above 10 million VND.

7. Housing conditions:

Type of house: ☐1. Temporary. ☐2. Solid.

Grade of house

Area of house:

8. Area currently living in:

☐1. Freshwater area all year round; ☐2. Freshwater area seasonally; ☐3. Saline area.

II. WATER SOURCE AND USAGE

9. Conditions of surface water resources.

- Use of surface water: ☐1. Yes. ☐2. No. From (month) To

- Type of use: ☐1. River water resources; ☐2. River water within the dyke area; ☐

3. Public pond water; ☐4. Private pond water.

Note:

.....

Water quality:

.....

10. Conditions of groundwater source.

- Use of groundwater: ☐ 1. Yes. ☐ 2. No.
- Type of use: ☐ 1. Household individual use. ☐ 2. Common use for multiple households.
- Characteristics of well: Depth:m. Year of construction:
- Water quality:
 - + Rainy season:
 - + Dry season:
- Well history:
 - + Changes to well: ☐ 1. Yes. ☐ 2. No.
 - Reasons:.....
 -
 - + Changes in water pumping technology: ☐ 1. Yes. ☐ 2. No.
 - Reasons:.....
 -

11. Conditions of Tap water.

- Use of tap water: ☐ 1. Yes. ☐ 2. No.
- Amount of water used:m³/month. Usage time:.....
- Usage cost:
 - + Average: VND/month.
 - + Rainy season: VND/month.
 - + Dry season: VND/month.
- Water quality:
 - + Rainy season:
 - + Dry season:
- Water cost changes in the rainy and dry seasons:
 - ☐ 1. Yes. ☐ 2. No.
 - If (☒ Yes) by how much:.....VND/m³.

12. Water source for drought years (the year of 2016, 2020).

- Water source:
-
- Water cost: VND.
- Water quality:

13. Purpose of using the water sources:

No.	Type Purpose	<input type="checkbox"/> 1. Tap water	<input type="checkbox"/> 2. Ground water	<input type="checkbox"/> 3. Surface water	<input type="checkbox"/> 4. Rain water	<input type="checkbox"/> 5. Other (bottled water)
13.1	Water for drinking					
13.2	Water for cooking					
13.3	Water for kitchen washing					
13.4	Water for bathing and washing					
13.5	Water for toilets					
13.6	Water for essential production					

III. CAPACITY AND PURPOSE OF RAINWATER HARVESTING

14. Roof type, area, and area involved in rainwater harvesting

Roof type	Total area (m ²)	Area involved in rainwater harvesting (m ²)
<input type="checkbox"/> 1. Leaf roof		
<input type="checkbox"/> 2. Metal roof		
<input type="checkbox"/> 3. Tile roof		
<input type="checkbox"/> 4. Fibre cement roof		
<input type="checkbox"/> 5. Other roof:.....		

15. What type of water storage tank do you use for rainwater harvesting?

Tank type	Quantity	Capacity (m ³)	Water type stored
<input type="checkbox"/> 1. Water pot			
<input type="checkbox"/> 2. Prefabricated tank			
<input type="checkbox"/> 3. Concrete tank			
<input type="checkbox"/> 4. Other:			

16. What do you use the harvested rainwater for?

Rainy season:

- | | | |
|---|-------------------------------------|--|
| <input type="checkbox"/> 1. Drinking | <input type="checkbox"/> 2. Cooking | <input type="checkbox"/> 3. Kitchen washing |
| <input type="checkbox"/> 4. Bathing and washing | <input type="checkbox"/> 5. Toilets | <input type="checkbox"/> 6. Water for essential production |

Dry season:

- | | | |
|---|-------------------------------------|--|
| <input type="checkbox"/> 1. Drinking | <input type="checkbox"/> 2. Cooking | <input type="checkbox"/> 3. Kitchen washing |
| <input type="checkbox"/> 4. Bathing and washing | <input type="checkbox"/> 5. Toilets | <input type="checkbox"/> 6. Water for essential production |

17. Are you willing to increase the scale of rainwater harvesting in the future?

- ☐ 1. Yes. ☐ 2. No.

Why:.....

18. What difficulties are you currently facing in rainwater harvesting?

- | | |
|--|---|
| <input type="checkbox"/> 1. Lack of space. | <input type="checkbox"/> 2. Difficulty with water storage tanks |
| <input type="checkbox"/> 3. Lack of roof area | <input type="checkbox"/> 4. Lack of installation skills |
| <input type="checkbox"/> 5. Lack of water treatment skills | <input type="checkbox"/> 6. Other:..... |

19. If the government encourages increasing the scale of rainwater harvesting, would you be willing to participate?

- ☐ 1. Yes. ☐ 2. No.

If (☒ No), Why:.....

20. What support policies would you be willing to participate in?

- | | |
|--|--|
| <input type="checkbox"/> 1. Access to favorable loans. | <input type="checkbox"/> 2. Partial financial support. |
| <input type="checkbox"/> 3. Discount on purchasing installation materials. | <input type="checkbox"/> 4. Technical treatment support. |
| <input type="checkbox"/> 5. Installation technical support. | <input type="checkbox"/> 6. Other:..... |

21. Do you harvest rainwater for purposes other than domestic use?

- ☐ 1. Yes. ☐ 2. No.

How do you harvest rainwater:

- ☐ 1. Rooftop harvesting.
☐ 2. Groundwater harvesting.
☐ 3. Other:

22. How do you store rainwater for purposes other than domestic use:

	Type	Area (m ²)	Depth (m)	Capacity (m ³)	Note
<input type="checkbox"/>	Dug pond, water tank				
<input type="checkbox"/>	Constructed tank				
<input type="checkbox"/>	Other:.....				

23. What do you use the harvested rainwater for purposes other than domestic use?

- ☐ 1. Watering fruit trees ☐ 2. Watering vegetables, gardens
☐ 3. Preparing for the dry season ☐ 4. Other:

IV. RAINWATER HARVESTING AND USAGE TECHNIQUES

24. Do you care about the quality of rainwater?

- ☐ 1. Yes. ☐ 2. No.

How do you evaluate the quality of rainwater:

25. Is there any pollution in the rainwater in your area

- ☐ 1. Yes. ☐ 2. No.

+ What kind of phenomenon (Color, smell, taste):

+ When does the incident occur (Specific time):.....

26. According to you, is rainwater harvested from the roof clean?

- ☐ 1. Yes. ☐ 2. No.

27. Roof cleanliness issue:

Do you regularly clean the roof used for rainwater harvesting?

- ☐ 1. Yes. When:
☐ 2. No.

Do you regularly clean or inspect the storage tank, rainwater pipes

- ☐ 1. Yes. When:
☐ 2. No.

28. Do you discharge the first rainwater runoff?

- ☐ 1. Yes. ☐ 2. No.

+ Describe how you discharge the first runoff:

29. Do you filter the sediment in the rainwater?

- ☐ 1. Yes. ☐ 2. No.

+ Describe how you filter the sediment:.....

30. Do you treat rainwater before using it for drinking purposes?

- ☐ 1. Yes. ☐ 2. No.

How do you treat it?

- ☐ 1. Boiling.
☐ 2. Filtration (Self-made, purchased)
☐ 3. Using a water filter.
☐ 4. Other:

31. Apart from the solutions you have already implemented, are you willing to further improve the quality of rainwater now?

☐ 1. Yes. ☐ 2. No.

If ☒ Yes, what is the solution:.....
.....
.....

V. GROUNDWATER SITUATION

32. Do you care about the quality of groundwater?

☐ 1. Yes. ☐ 2. No.

In your opinion, what is the current quality of groundwater in the area?

☐ 1. Contaminated acidic water ☐ 2. Salinity
☐ 3. Polluted in color, odor, taste.... ☐ 4. Groundwater depletion.
☐ 5. Other:

33. The level of groundwater depletion by season?

+ Dry season:m + Rainy season:.....m

Describe the difference by season:

.....
.....
.....

34. What is the method of groundwater extraction that your family is currently using?

☐ 1. Manual pump ☐ 2. Machine pump without pressure increase
☐ 3. Machine pump with pressure increase ☐ 4. Air lift pump
☐ 5. Other:.....

35. Do you know the reasons for the depletion of groundwater levels?

☐ 1. Yes. ☐ 2. No.

If (☒ Yes), list the reasons:
.....

36. If the government bans groundwater extraction, what alternative water resources will you use?

☐ 1. Tap water ☐ 2. Bottled water ☐ 3. Purchased water
☐ 4. Rainwater ☐ 4. Pond, lake, river water ☐ 6. Other:.....

37. Is there any propaganda activity in the area you live in about "Replenishing groundwater", "Limiting groundwater exploitation", "No freshwater for shrimp farming", etc.?

☐ 1. Yes. ☐ 2. No.

38. If the government has a policy to encourage participation in rainwater harvesting to replenish groundwater, are you willing to participate?

☐ 1. Yes. ☐ 2. No.

If (☒ No), Why:

Interviewer's signature

Respondent's signature