

Article

# Raising the awareness on water related issues with a socio-hydrogeological approach: Inle Lake (Southern Shan State, Myanmar)

Viviana Re <sup>1</sup>, Myat Mon Thin <sup>2</sup>, Chiara Tringali <sup>3</sup>, Mya Mya <sup>4</sup>, Enrico Destefanis <sup>5</sup>, and Elisa Sacchi <sup>6\*</sup>

<sup>1</sup> Earth Sciences Department, University of Pisa, Via Santa Maria 53, 56126 Pisa, Italy; [viviana.re@unipi.it](mailto:viviana.re@unipi.it)

<sup>2</sup> Department of Physics, University of Mandalay, 73 Street, 05032 Mandalay, Myanmar; [demomyatmonthin.edu@gmail.com](mailto:demomyatmonthin.edu@gmail.com)

<sup>3</sup> Independent researcher, 34151 Trieste, Italy; [tringali.chiara.1@gmail.com](mailto:tringali.chiara.1@gmail.com)

<sup>4</sup> Yezin Agricultural University, 15013, Yezin, Zayarthiri Township, Nay Pyi Taw, Myanmar; [profmyamya.agri@gmail.com](mailto:profmyamya.agri@gmail.com)

<sup>5</sup> Department of Earth Sciences, University of Turin, Via Valperga Caluso, 35, 10125 Turin, Italy; [enrico.destefanis@unito.it](mailto:enrico.destefanis@unito.it)

<sup>6</sup> Department of Earth and Environmental Sciences, University of Pavia, via Ferrata 1, 27100 Pavia, Italy; [elisa.sacchi@unipv.it](mailto:elisa.sacchi@unipv.it)

\*Correspondence: [elisa.sacchi@unipv.it](mailto:elisa.sacchi@unipv.it)

Date (dd/mm/yy) \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Time \_\_\_\_

Site Name \_\_\_\_\_

Site Code \_\_\_\_\_

Name of location/village \_\_\_\_\_

Interview made by \_\_\_\_\_

In (indicate the language) \_\_\_\_\_

*By responding to this brief interview, you will help the researchers to better address local issues related to the protection and safeguard of water resources in your region. Information will be used for scientific purposes only and treated anonymously by the researchers.*

### ***Personal information (confidential)***

Name of person interviewed \_\_\_\_\_

☐ Male ☐ Female

☐ Well holder

☐ Land owner

☐ Other, Specify \_\_\_\_\_

Occupation \_\_\_\_\_

Age \_\_\_\_\_

Members in the household \_\_\_\_\_, of which \_\_\_\_\_ Male and \_\_\_\_\_ Female

Education level \_\_\_\_\_

Do you want to join the monitoring network? ☐ Yes ☐ No

Has the Informed Consent Form been signed? ☐ Yes ☐ No

### **Water use**

1. Does the household have water on the premises? ☐ Yes ☐ No

If the household has no water on the premises, which member of the household is responsible for the collection of water (M/F, age)? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2. What kind of water do you normally use for (PLEASE TICK ALL THAT APPLY)**

**Drinking**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ River/Canal Water ☐ Groundwater ☐ Bottled water

**House cleaning**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ River/Canal Water ☐ Groundwater ☐ Bottled water

**Personal washing**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ River/Canal Water ☐ Groundwater ☐ Bottled water

**Clothes washing**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ River/Canal Water ☐ Groundwater ☐ Bottled water

**Irrigation (if applicable)**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ River/Canal Water ☐ Groundwater ☐ Bottled water

For irrigation, please specify the total number of hectares irrigated: \_\_\_\_\_

**Animal husbandry (if applicable)**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ Surface Water ☐ Groundwater ☐ Bottled water

For Animal husbandry, please specify the total number of cattle \_\_\_\_\_

**3. Are you confronted with periods of shortage of water?**

☐ Yes ☐ Yes, only in certain periods ☐ No

If YES, please specify \_\_\_\_\_

**4. Are you confronted with periods with bad water quality?**

☐ Yes ☐ Yes, only in certain periods ☐ No

If YES, please specify \_\_\_\_\_

**5. Does the household have access to improved sanitation facilities? ☐ Yes ☐ No (If No, go to question number 7)**

**6. If yes, what type of sanitation facility? (see Annex I for associated images)**

- |  |  |
|--|--|
| A. Piped sewer system                    | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| B. Septic tank                           | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| C. Flush/pour flush to pit latrine       | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| D. Ventilated improved pit latrine (VIP) | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| E. Pit latrine with slab                 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| F. Composting toilet                     | <input type="checkbox"/> Yes <input type="checkbox"/> No |

**7. What kind of water do you use in your sanitation facility?**

☐ Tap water/public water supply ☐ Rainwater Harvesting ☐ River/Canal Water ☐ Groundwater ☐ Bottled water

## **Groundwater well features**

8. When was the well built?

\_\_\_\_\_ ☐ Don't know

9. What was the original depth?

\_\_\_\_\_ ☐ Don't know

10. Have you encountered any problems while using the well?

\_\_\_\_\_  
\_\_\_\_\_

11. What solution did you apply in case of problems?

\_\_\_\_\_  
\_\_\_\_\_

12. What is the degree of hardness<sup>1</sup> of your water?

☐ Soft

☐ Slightly Hard

☐ Moderately Hard

☐ Hard

☐ Very Hard

☐ Don't know

13. Has the hardness changed since you started using the well? ☐ Yes ☐ No ☐ Don't know

If yes, please specify how \_\_\_\_\_

14. Do you find incrustations in the pipes? ☐ Yes ☐ No (If NO go to question number 17)

15. If yes, what do you do to remove them?

☐ Chemical attack (e.g. acid)

☐ Physical removal (e.g. scratching)

☐ Other, please specify \_\_\_\_\_  
\_\_\_\_\_

<sup>1</sup> **NOTE:** respondents may not be familiar with this concept, hence if needed, try to better explain it in terms of carbonates deposits, incrustations in the pipes, or a feeling 'like a film of residue left on your hands' after having washed them with water and soap. Symptoms of hard water include: Stiff, dingy laundry; Mineral deposits on dishes and glassware; High soap usage & need for fabric softeners; Dry, itchy skin and scalp; Unmanageable hair; Extra work to remove soap curd on bathtubs & shower stalls. If necessary, show them the examples in Annex II. Remember to reassure the interviewees that hard water is not an health hazard (hard drinking water generally contributes a small amount toward the total calcium and magnesium needed in the human diet).

16. If yes, how often do you remove them?

- ☐ Once a month
- ☐ Twice a year
- ☐ Every year
- ☐ Every two years
- ☐ Every three years
- ☐ Every four years
- ☐ Once every five years

17. If you are using groundwater, do you know your average withdrawal rate? ☐ Yes ☐ No

If YES, please indicate the amount<sup>2</sup> \_\_\_\_\_

18. Purpose of groundwater withdrawal (PLEASE TICK ALL THAT APPLY)

☐ Irrigation

For irrigation, please specify the total number of hectares irrigated: \_\_\_\_\_

☐ Animal husbandry

☐ Drinking

☐ House cleaning

☐ Personal washing

☐ Other, Specify \_\_\_\_\_

19. Do you use alternative irrigation sources? ☐ Yes ☐ No

If yes, please specify \_\_\_\_\_

20. Who is responsible for water management in the household?

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<sup>2</sup> **NOTE:** respondents may not be able to quantify the amount of water in litres, but rather by type of container used (such as bucket or bottle). In this case, make an estimate of the quantity in litres, and explain how the calculation was done.

## **Agricultural practices**

**21. Kind of crops cultivated:**

Winter \_\_\_\_\_

Spring \_\_\_\_\_

Summer \_\_\_\_\_

Fall/Autumn \_\_\_\_\_

**22. Crops produced for:**

☐ Household consumption      ☐ Sale to the domestic market      ☐ Sale to the national market      ☐ Export

**23. Crop production methods**

\_\_\_\_\_  
\_\_\_\_\_

**24. Kind of irrigation techniques:**

☐ Floating gardens (no irrigation)

Kind of crops cultivated \_\_\_\_\_

☐ Flood Irrigation

Kind of crops cultivated \_\_\_\_\_

☐ Drip Irrigation

Kind of crops cultivated \_\_\_\_\_

☐ Spray Irrigation

Kind of crops cultivated \_\_\_\_\_

☐ Other

Kind of crops cultivated \_\_\_\_\_

**25. Kind of fertilizers used**

☐ Natural (manure)

Application rate<sup>3</sup> \_\_\_\_\_

☐ Other (please specify) \_\_\_\_\_

Application rate<sup>3</sup> \_\_\_\_\_

**26. Are you buying it by yourself?** ☐ Yes ☐ No

If NO, please specify \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

<sup>3</sup> NOTE: respondents may not be able to quantify the application rate. Try to kindly ask them to be as precise as possible and avoid answers like "many times a year", "when needed".

## **Awareness of water issues**

27. Are you aware of any water scarcity issues in your region? ☐ Yes ☐ No ☐ Don't know

If yes, please specify \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

28. What does "water scarcity" mean for you? (PLEASE TICK ALL THAT APPLY)

☐ No regular access to water for household consumption

☐ No regular access to water for agriculture

☐ Reduction of precipitation rates

☐ Shrinking of the open surface of the lake

☐ Groundwater level decrease

☐ Less water in rivers and ponds

☐ Other (please specify) \_\_\_\_\_

29. Do you consider you are living in a water scarce area?

*Completely agree*

*Completely disagree*

1

2

3

4

5

6

7

Why? \_\_\_\_\_  
\_\_\_\_\_

30. Do you know anything about Climate Change? ☐ Yes ☐ No

If yes, please specify \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

31. What does "Climate Change" mean for you? (PLEASE TICK ALL THAT APPLY)

☐ Temperature increase

☐ Less precipitation

☐ Changes in monsoon season

☐ Reduction of seasonal variations

☐ Crops needing more water

☐ Changes in intensity of flooding events

☐ Changes in periodicity of flooding events

☐ Other (please specify) \_\_\_\_\_

☐ Other (please specify) \_\_\_\_\_

☐ Other (please specify) \_\_\_\_\_

32. Is your area subject to periodical flooding? ☐ Yes ☐ No (if No, go to question 37)

33. If Yes, how do you see these events?

*Extremely positive*

*Irrelevant/Not important*

*Extremely negative*

1

2

3

4

5

6

7

34. Have you experienced any change in the periodicity of these floodings? ☐ Yes ☐ No

If yes, please specify \_\_\_\_\_

35. Have you experienced any change in the intensity of these floodings? ☐ Yes ☐ No

If yes, please specify \_\_\_\_\_

36. According you you which is the main cause of changes in flooding events?

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37. According to you, what are the main factors impacting on water resources in your region? (PLEASE TICK THE BOXES FOR ALL THAT APPLY)

- |   |       |
|---|-------|
| <input type="checkbox"/> Pesticides                   | _____ |
| <input type="checkbox"/> Fertilizers                  | _____ |
| <input type="checkbox"/> Hotels                       | _____ |
| <input type="checkbox"/> Boats                        | _____ |
| <input type="checkbox"/> Septic effluents             | _____ |
| <input type="checkbox"/> Other (please specify) _____ | _____ |
| <input type="checkbox"/> Other (please specify) _____ | _____ |
| <input type="checkbox"/> Other (please specify) _____ | _____ |

38. Using the lines on the right hand side of the page, please rank the items you have ticked in the above list in order of importance (STARTING WITH 1= MOST IMPORTANT).

39. Have you experienced any changes in groundwater quality related to recent contamination episodes?

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**40. Suggestions (if any) to improve water quality and availability (Please list your suggestions by importance)**

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**41. Do you know anything about Integrated Water Resources Management? ☐Yes ☐ No**

If yes, please specify

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### **Potential for participation**

**42. What role do you think you can have in terms of water resources protection and safeguard?**

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**43. According to you, what should be the main objective of the water management plan of your region?**

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**44. According to you, who should have main responsibility for groundwater quality protection in your region?**

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**45. According to you, what is the main issue associated with the agricultural development of your region?**

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**46. According to you, what is the role played by scientists in terms of water protection and management?**

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*Thanks for taking your time by answering to our questions. Your valuable contribution will help us to improve our work.*

*The research team*

**NOTES :**

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