

SUPPLEMENTARY MATERIAL

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Appendix S1

Questionnaire on Stakeholder perception of Payments for Watershed Ecosystem Services (PES)

You are invited to participate in a research survey on Payments for Ecosystem Services (PES) in Sri Lanka, with a focus on watershed ecosystems. This study is being conducted by Researcher A, a PhD candidate affiliated with Institutions B and C.

The purpose of this survey is to better understand how PES is perceived, implemented, and received by different stakeholders across Sri Lanka. Your input will directly contribute to academic research aimed at informing the design of more effective, equitable, and locally appropriate PES schemes.

- The survey will take approximately 10–15 minutes to complete.
- Participation is entirely voluntary, and you are free to skip any question or withdraw at any time.
- All responses will be treated with strict confidentiality, and data will be fully anonymized before being used in analysis or publication.
- All information will be stored securely and processed in accordance with applicable data protection regulations.

If you have any questions do not hesitate to contact: xxx@xxx.com

By continuing with this survey, you confirm that you have read the information above and agree to participate in this research.

1. Name of your organization/association

2. Your role in the organization/association

3. Your main training/educational background

4. Years of experience in the respective field

Less than 1 year	☐
1 to 5 years	☐
6 to 15 years	☐
More than 15 years	☐

5. What is the level of importance in providing following ecosystem services in your opinion?

	Very low importance	Low importance	Neutral	High importance	Very high importance
<u>Provisioning Services</u>					
Provision of clean drinking water	☐	☐	☐	☐	☐
Groundwater recharge	☐	☐	☐	☐	☐
<u>Regulating Services</u>					
Reduction of flood risk	☐	☐	☐	☐	☐
Reduction of soil erosion	☐	☐	☐	☐	☐
Buffering and filtering pollutants from surface water	☐	☐	☐	☐	☐
<u>Supporting Services</u>					
Provision of habitats	☐	☐	☐	☐	☐
Maintenance of the diversity of the ecosystem	☐	☐	☐	☐	☐
<u>Cultural Services</u>					
Aesthetic Values	☐	☐	☐	☐	☐
Recreation and Tourism	☐	☐	☐	☐	☐

6. Considering the water related ecosystem services included in the provisioning, regulating, supporting, and cultural service categories (Question 8), how would you compare their relative importance based on your experience?

Services	More Important	Equal	Less Important
Provisioning vs. Regulating services	☐ Provisioning ☐ Regulating	☐	☐ Provisioning ☐ Regulating
Provisioning vs. Supporting services	☐ Provisioning ☐ Supporting	☐	☐ Provisioning ☐ Supporting
Provisioning vs. Cultural services	☐ Provisioning ☐ Cultural	☐	☐ Provisioning ☐ Cultural
Regulating vs. Supporting services	☐ Regulating ☐ Supporting	☐	☐ Regulating ☐ Supporting
Regulating services vs. Cultural services	☐ Regulating ☐ Cultural	☐	☐ Regulating ☐ Cultural
Supporting services vs. Cultural services	☐ Supporting ☐ Cultural	☐	☐ Supporting ☐ Cultural

7. What does the term “Payments for Ecosystem Services (PES)” mean to you?

8. Have you seen or participated in any programs that offer compensation for environmental protection? What were they like?

9. What concerns do you have about how environmental, or compensation programs are managed in your region?

10. What kind of oversight or accountability would make you more confident in participating in a PES scheme?

11. Who tends to benefit most from environmental programs in your experience? Who is often left out?

12. Do you feel your voice is heard when decisions are made about land and resource use in your area?

13. What would make a PES scheme feel fair and relevant to your community's needs?

14. Do you think focusing on one ecosystem service can create tradeoffs and reduce the ability of providing other ecosystem services in a watershed.

Yes ☐

No ☐

15. To what extent do you believe trade-offs among ecosystem services should be considered when designing a PES framework focused on a specific service?

16. Have you seen a situation where an environmental project had unintended side effects or trade-offs?

17. What is the relevance of the following aspects in the implementation of PES schemes, in your opinion?

	Very low importance	Low importance	Neutral	High importance	Very high importance
Bundling of services (Tradeoffs among services considered)	☐	☐	☐	☐	☐

Multi-level governance (Local knowledge incorporated in the decision- making process)	☐	☐	☐	☐	☐
Shared values for services (Ethical values of services in different societal groups understood)	☐	☐	☐	☐	☐

18. PES are frequently criticized with both positive and negative assumptions. Specify if you agree or disagree with the following.

	Strongly disagree	Slightly disagree	Neutral	Slightly agree	Strongly agree
PES provides expanded financial options for natural resource management	☐	☐	☐	☐	☐
Instead of modifying anything, PES only restructure certain current initiatives	☐	☐	☐	☐	☐
PES offers only short-term solutions to some challenges	☐	☐	☐	☐	☐
PES risk producing unfair consequences, by benefitting only some groups	☐	☐	☐	☐	☐
PES aids delivery of multiple benefits	☐	☐	☐	☐	☐
There will never be enough information to design effective PES projects	☐	☐	☐	☐	☐
PES raises awareness of the diversity of ways in which nature benefits society	☐	☐	☐	☐	☐
PES worsens the challenge of managing sustainably over the long-term	☐	☐	☐	☐	☐
PES offers the ability to improve sustainability in the longer term	☐	☐	☐	☐	☐

19. Most people believe that PES entails people or organizations ('buyers') paying other people or organizations ('sellers') who manage natural resources to produce desired goods and services.

The following is a list of characteristics that are associated with PES. Tick the box next to each characteristic to indicate if you believe it is an essential or optional component of PES initiatives.

If you believe it should not be included in PES, choose 'incompatible.'

	Essential	Optional	Incompatible	Don't know
The PES initiative will be firmed up and/or administered by an intermediary.	☐	☐	☐	☐
Payments to the seller are contingent on them doing specific steps.	☐	☐	☐	☐
Buyers are the government or a public body	☐	☐	☐	☐
Buyers are a private entity (e.g. NGOs, individuals)	☐	☐	☐	☐
Both buyers and sellers participate in setting the price	☐	☐	☐	☐
Payments are paid periodically rather than a one-off payment	☐	☐	☐	☐
Sellers payments must be more than the compensation for costs incurred	☐	☐	☐	☐
New service must be provided by PES additional to the already existing services	☐	☐	☐	☐

Thank you very much for your support!

Appendix S2

Equations

The formula used for the Kruskal-Wallis test is provided in Equation (S1).

$$H = \frac{12}{N(N+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1) \quad (S1)$$

Where:

N = Total number of observations across all groups

k = Number of groups

R_i = Sum of ranks in the i^{th} group

n_i = Number of observations in the i^{th} group

The pairwise comparison matrix A is structured as shown in Equation (S2)

$$A = \begin{bmatrix} 1 & a_{12} & a_{13} & \cdots & a_{1n} \\ a_{21} & 1 & a_{23} & \cdots & a_{2n} \\ a_{31} & a_{32} & 1 & \cdots & a_{3n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & a_{n3} & \cdots & 1 \end{bmatrix} \quad (S2)$$

Where:

a_{ij} = Relative importance between two alternatives i and j

The weights of the alternatives are calculated by solving the eigenvalue problem shown in Equation (3)

$$Aw = \lambda_{\max} w \quad (3)$$

Where:

A = Pairwise comparison matrix

w = Vector of weights (importance) of each alternative

$\lambda_{\max}$ = Largest eigenvalue of the matrix

Appendix S3

Additional Results

Table S1: Distribution of respondents across buyers, sellers, and intermediaries according to years of professional experience and sectoral affiliation

Characteristics/Target group	Buyers (N=21)	Sellers (N= 29)	Intermediaries (N=43)
Years of expertise			
Less than 1 year	0.0%	0.0%	0.0%
1-5 years	14.3%	27.6%	9.3%
6-15 years	38.1%	34.5%	25.6%
More than 15 years	47.6%	37.9%	65.1%
Sector / Field			
Forestry	61.3%	70.1%	0.0%
Environmental science/engineering	0.0%	0.0%	68.8%
Water resource management/ engineering	28.7%	29.9%	0.0%
Public administration	0.0%	0.0%	31.2%

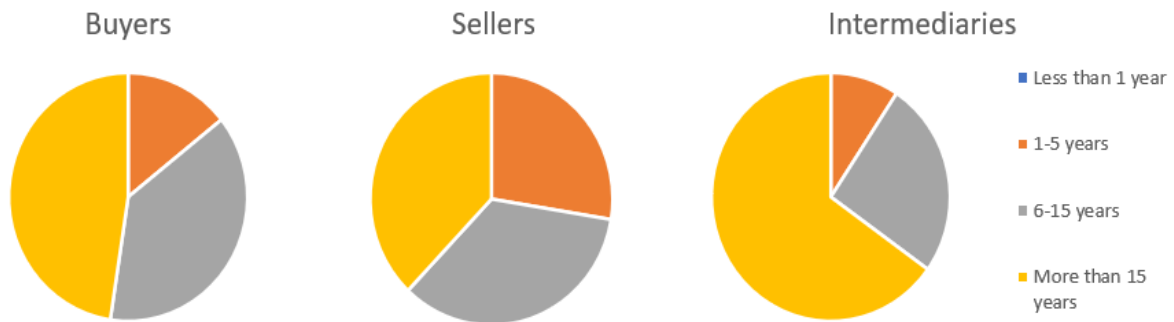


Figure S1: Distribution of years of professional experience among buyers, sellers, and intermediaries.