

Junior Scientists Tandems

Final Report

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Title: Designing and Testing a Discrete Choice Experiment to Value Forest-related Ecosystem Services in Meghalaya: A Pre-Test Study

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1. Introduction

My name is Ahana Saiyed, and I successfully completed my Master of Science in Environmental Governance at the University of Freiburg, Germany in September 2025 as a DAAD-EPOS Scholar. My research interests lie at the intersection of environmental governance, ecosystem services, and participatory approaches to sustainable development. Through the ATSAF Junior Scientists Tandem (JST) program, I undertook a research stay in India in collaboration with International Food Policy Research Institute (IFPRI) and Foundation for Ecological Security (FES). The research was focused on designing and piloting a discrete choice experiment (DCE) to assess how different stakeholder groups in Meghalaya value forest-related ecosystem services.

The master's thesis was conducted under the CGIAR Multifunctional Landscapes Science Program, specifically Work Package 7, which emphasises on research and innovation initiative focused on transforming landscapes to be biodiverse, productive, resilient, and low-emission, balancing environmental goals with human development needs. Dr. Thomas Falk, a Senior Fellow at IFPRI, was a key figure in mentoring this research remotely. Prof. Dr. Stefan Baumgärtner and Dr. Anna Saave from the Albert-Ludwigs-Universität Freiburg were registered as the first and second supervisors respectively.

The study was embedded in the context of increasing tourism and environmental pressures Meghalaya, Northeast India. Specifically, I designed and tested a discrete choice experiment to understand how different social groups—local residents, tourists, downstream communities, and nearby villages—value and prioritize forest-related ecosystem services. The study combined qualitative and quantitative methods to capture diverse perspectives and to pilot a survey tool for future large-scale research.

2. Research Background, Conceptual Framework and Methods

During my initial research, I found that Mawlynnong – Asia's Cleanest Village, though widely known as a model village for community-driven ecotourism, was facing growing pressures from rising tourism and the nearby villages also experiencing its spillover effects. At the same time, there was little understanding of how different social groups valued its ecosystem services. I observed that the absence of a framework to capture these diverse perspectives risked resource degradation and potential conflicts between local needs, ecological sustainability and tourist expectations. To address this gap, the thesis focused on developing and pre-testing a discrete choice experiment to systematically identify and quantify stakeholder preferences, trade-offs, and support for conservation. The pilot study helped me refine the design, address practical challenges, and improve the clarity of attributes and choice sets. Importantly, this process can be used to lay the groundwork for context-sensitive Payment for Ecosystem Services (PES) schemes in Meghalaya to achieve balance between ecological sustainability with tourism growth and community well-being.

Following were the research objectives of my master thesis:

1. To identify and categorize forest-related ecosystem services prioritized by diverse stakeholders in Mawlynnong and nearby villages using qualitative methods.
 2. To design a DCE tool based on stakeholder inputs.
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3. To conduct a DCE pre-test and examine participants' response patterns to better understand engagement and clarity of the design.
4. To analyze results from the DCE pre-test to identify design and implementation challenges, and to propose improvements in order to enhance the effectiveness of future DCE studies in Meghalaya.

Ecosystem services, understood as the wide range of benefits people derive from nature - including provisioning, regulating, cultural, and supporting services were used as the conceptual basis of this work, following the Millennium Ecosystem Assessment (2005). Recognizing that different groups assign different economic values to these services depending on their needs, roles, and dependencies, the study emphasized the importance of capturing this variation systematically by implementing a mixed-methods approach that combined qualitative and quantitative tools to analyze how different social groups in Mawlynnong and nearby villages valued ecosystem services. The qualitative part involved participatory rural appraisal (PRA) methods such as transect walks and resource mapping, along with focused group discussions and key informant interviews to identify and classify key services. The quantitative part focused on designing and piloting a discrete choice experiment survey, which collected data from respondents to examine preferences and trade-offs across ecosystem attributes. The DCE was grounded in random utility theory (RUT), which assumes that individuals choose the option that maximizes their utility from among a set of alternatives defined by attributes and levels. This method is widely applied in environmental economics and allowed me to simulate real-world decision-making through hypothetical scenarios. After conducting 4 FGDs and 14 KIIs, I developed the DCE survey using the orthogonal main effects plan (OMEP) which is based on a minimal column structure through *DoE.base* package in R. The DCE design concluded with 8 scenarios arranged into 4 sets of choice with two scenarios and one opt-out option in each set. Every set included a payment vehicle attribute to measure willingness to pay (WTP), and an "opt-out" option ensured realistic responses. Through this process, I was able to refine attributes and levels, test the clarity of choice sets and build a tool capable of quantifying stakeholder preferences for ecosystem services in a structured and comparable way.

3. Institutional and Collaborative Work

The key highlight of my six months stay in India was the opportunity to engage with scientists and researchers across three locations -

IFPRI, New Delhi: Dr. Muzna Alvi and Sonali Singh were exceptionally supportive in early days of the study, laying strong literary foundations about DCE. By the end of my time in New Delhi, I had developed the research framework for both, quantitative and qualitative parts of the study, including a stakeholder mapping exercise.

FES Headquarters, Anand (Gujarat): I spent part of my research stay at the Foundation for Ecological Security's (FES) headquarters in Anand, where I streamlined my research framework in collaboration with senior researchers namely Himani Sharma and Naveen Babu Isarapu. Through their contributions during this phase, I identified key stakeholder groups for the study, developed the structure of FGDs and KIIs, and designed guiding questions that would later be applied in the field. This preparatory stage was crucial in ensuring that the fieldwork in Meghalaya was methodologically robust and context appropriate.



Fieldwork in Meghalaya: With the support of FES's field staff, I engaged with communities, tourists, and institutions, which enabled a rich contextual grounding of my research. The FES teams organised a smooth access to village communities, facilitated field logistics and supported contextual as well as the language interpretation of the qualitative study and survey work. The fieldwork would not have been a success without Daiophika Thangkhiew's encouragement and Adrian Sawkmie's assistance in translation and interpretation because I do not speak the regional language Khasi.

4. Pre-test Results, Analysis and Implications

I conducted a pilot with about 25 respondents in different stakeholder groups. While the sample was small, the pre-test revealed several useful insights:

- Respondents sometimes struggled with hypothetical trade-offs, especially when abstract or less tangible ecosystem services were involved.
- Opt-out rates were relatively high in groups unfamiliar with choice experiments, suggesting a need to reduce complexity and improve respondent guidance.
- Certain attribute levels were rarely chosen or appeared dominated—suggesting redundancy or unrealistic design.
- Stakeholders appreciated visual aids and simplified language, confirming the value of context-adapted survey materials.

From this, I derived priors for a Bayesian-efficient experimental design, reducing respondent burden while preserving statistical efficiency. I iterated the survey instrument and attribute framing, incorporating feedback from Dr. Falk to ensure contextual relevance and understandability. The main outcome is a refined DCE tool that integrates stakeholder-grounded attributes with robust experimental design. This refined tool can be used in a larger-scale deployment, potentially contributing to ecosystem services valuation studies in Meghalaya, designing PES schemes, or assisting forest governance strategies that weigh cultural, provisioning, and regulating services.

The key methodological lessons I learnt include the importance of early and deep qualitative stakeholder engagement, the need to simplify experimental design for less experienced respondents, and the advantage of piloting not just the survey instrument but also respondent briefing materials and visual aids.

5. Conclusion and Outlook

My thesis research, supported through the JST program, successfully piloted a context-sensitive DCE tool for valuing forest-related ecosystem services in Meghalaya. The study generated both empirical insights into stakeholder priorities and practical lessons for instrument design in participatory valuation settings. Looking forward, the refined DCE instrument can be deployed in a larger sample across different villages and stakeholder groups in Meghalaya (and possibly other parts of Northeast India). With a larger-sample valuation study, the results could inform policy discussions around PES schemes, forest governance strategies, or ecotourism-linked conservation incentives.

6. Personal Reflection



The JST period was transformative. The support was invaluable in bridging high-level valuation methods with real-world community contexts. Navigating fieldwork in a culturally rich but linguistically and logistically complex environment sharpened my methodological reflexivity: valuation tools must be adaptive and co-constructed, not simply transferred. Navigating between rigorous quantitative valuation methods such as DCE and grounded participatory fieldwork challenged me intellectually and personally. I sharpened my skills in qualitative research, experimental design, and stakeholder engagement. I also learned to adapt my methods to local contexts—simplifying language, using visual cues, and ensuring that participants truly understood the trade-offs they were expressing.

Working in Meghalaya reinforced the idea that sustainable governance must be both scientifically informed and locally legitimate. Living in a rural eco-sensitive area broadened my appreciation of how communities negotiate trade-offs between tourism, livelihood needs, and ecological sustainability. I also witnessed how global valuation tools like DCE must be adapted to local realities in order to be effective.

Finally, collaborating with IFPRI and FES deepened my appreciation for operationalizing interdisciplinary research, emphasizing both empirical rigor and stakeholder relevance. The overall experience has strengthened my conviction that valuation tools must be co-designed with stakeholders to be meaningful and that researchers must remain flexible, responsive, and humble in multi-cultural settings.

7. Acknowledgements

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Finally, I thank ATSAF e.V. for the JST scholarship, which made this transformative journey possible. I am sincerely grateful to the ATSAF JST Program for granting me the opportunity to pursue this research. The program enabled me to connect academic theory with field-based practice, while also fostering collaboration with international institutions and local communities. This experience not only strengthened my academic and professional skills but also offered valuable personal insights, shaping the way I approach research and sustainability. I deeply appreciate ATSAF's commitment to supporting young researchers and creating a platform for meaningful, interdisciplinary engagement.
