

Photovoice and Participatory Mapping for Ecosystem Services and Nature-based Solutions



Short description

An integrated participatory method that combines Photovoice and participatory mapping to explore how people perceive, experience, and value ecosystem services and Nature-based Solutions. Participants document local examples through photographs and narratives, and collaboratively map and discuss them, thereby generating experiential, spatial, and shared knowledge. The flexible approach can be used in research, university teaching and Living Lab activities.

Main target audience

Researchers; university teachers and students; Living Lab practitioners; local authorities; community organisations; environmental and landscape practitioners

The detailed methodology

1. Overview

Photovoice and participatory mapping are established participatory methods that have been applied in diverse contexts, including health research, rural sociology, community development, and participatory environmental research. Their use is increasingly extending to environmental and sustainability-related fields, where they can help capture local knowledge, lived experiences, and place-based perspectives.

Building on these established approaches, the [EcoServ project \(Ecosystem services assessment through a participatory approach for sustainable water resources management in Armenia\)](#) and the eNaBIS (*Education and Nature-Based Solutions: enable society to bend the curve for biodiversity*) project combined and adapted Photovoice and participatory mapping to explore how people perceive, experience, and value ecosystem services in rural areas of Armenia. The approach was further adapted and conceptually developed in the context of Nature-based Solutions (NBS).

The methodology is designed to capture forms of knowledge that may be difficult to identify through conventional surveys or expert-based ecosystem-service assessments, particularly experiential, cultural, and place-based knowledge. Participants document relevant places, features, or activities through photographs and short narratives. These observations are subsequently discussed and organised through participatory mapping and group reflection. The process connects individual experiences with spatial information and collective interpretation, while also creating opportunities for dialogue and shared understanding among participants.

The methodology can be used in university teaching, community-based research, Living Labs, stakeholder engagement, workshops for developing shared understanding, and transdisciplinary ecosystem-service or NBS assessments.

2. Objectives

The methodology can be used to:

- identify locally perceived ecosystem services and NBS;
- document people's experiences and relationships with particular places;
- capture experiential and place-based knowledge;
- stimulate discussion among participants with different backgrounds;
- connect qualitative observations with spatial information;
- develop a shared understanding of ecosystem services and NBS;
- identify similarities and differences between stakeholder perspectives;
- support co-learning and knowledge exchange;
- generate material that can inform further research, planning or Living Lab activities.

3. Conceptual basis

The approach builds on two complementary participatory methods:

- **Photovoice**

Photovoice enables participants to document places, practices, environmental features or experiences that they consider meaningful. Photographs are accompanied by short narratives explaining what is represented, why it is important and what participants associate with it.

This is particularly useful for capturing experiential and cultural dimensions of ecosystem services that may not be easily represented through predefined categories.

- **Participatory mapping**

Participatory mapping is used to spatially locate and organise the observations generated through Photovoice. Participants can identify where particular ecosystem services, NBS, environmental benefits, challenges or valued places occur.

Combining the two approaches allows participants to move from individual observation, through explanation and reflection, to spatialisation and finally to collective interpretation.

4. Recommended workflow

The methodology can be implemented as a one-off workshop or integrated into longer research, teaching or Living Lab process.

Stage 1 – Preparation and introduction

Introduce participants to:

- ecosystem services and/or Nature-based Solutions;
- the purpose of the activity;
- the Photovoice process;
- basic ethical considerations, including photography of people and private property;
- the mapping exercise and expected outputs.

Depending on the target group, a short introductory exercise can be used to establish a common understanding of the concepts.

Suggested duration: 30–60 minutes.

Stage 2 – Field observation and Photovoice

Participants work individually or in small groups and explore the selected area.

They photograph places, landscape features, activities or interventions that they associate with:

- ecosystem services;
- Nature-based Solutions;

- environmental benefits;
- recreational or cultural experiences;
- environmental problems or challenges.

Each photograph should be accompanied by a short narrative addressing questions such as:

1. What is shown in the photograph?
2. Why is this place or feature important?
3. What benefit, experience or function does it provide?
4. Who benefits from it?
5. What changes or challenges are associated with this place?

The activity can be conducted as an outdoor exercise, making it particularly suitable for field-based teaching and community engagement.

Stage 3 – Participatory mapping

The photographs and narratives are brought together and spatially organised.

Participants identify the location of the photographed places on a base map and discuss their relationships with relevant ecosystem services or NBS categories.

Depending on the context, maps can be produced using:

- printed maps;
- satellite or aerial imagery;
- large-format paper maps;
- digital mapping platforms.

The mapping process should remain participatory rather than being treated simply as a technical GIS exercise.

Participants can be asked to identify:

- where ecosystem services are experienced;
- where NBS are located;
- areas of particularly high importance;
- areas where benefits overlap;
- areas where conflicts or trade-offs occur;
- places requiring further attention or intervention.

Stage 4 – Group reflection and synthesis

Participants collectively review the photographs, narratives and maps.

The facilitator encourages discussion around questions such as:

- Which ecosystem services or NBS were identified most frequently?
- Which places are particularly important to participants?
- Do different participants perceive the same place differently?
- Which benefits are experienced individually and which are shared?
- Are there conflicts or trade-offs between different uses?
- Which aspects were difficult to represent on the map?
- What knowledge emerged that would not have been captured through a conventional assessment?

The aim is not necessarily to reach consensus, but to make different perspectives visible and stimulate collective learning.

Stage 5 – Validation and further use

Where community or stakeholder participants are involved, the results can be returned to participants for validation and discussion.

The resulting photographs, narratives and maps can subsequently be used as:

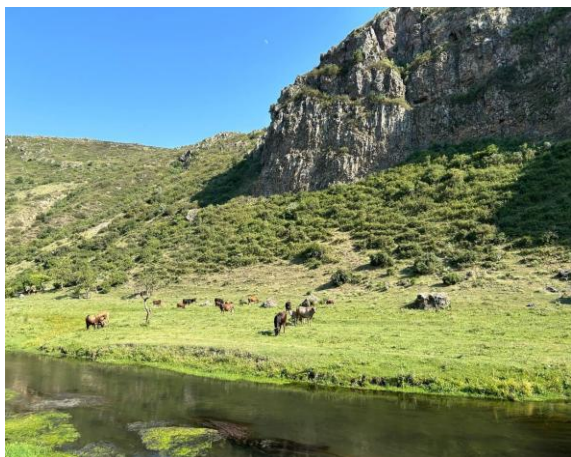
- qualitative research data;
- inputs to ecosystem-service assessments;
- teaching materials;
- Living Lab discussion material;
- stakeholder engagement tools;
- inputs to planning and decision-making;
- starting points for identifying NBS opportunities.

5. Example from EcoServ

The methodology was implemented and further developed during two Summer Schools in 2024 and 2025 in rural communities of the Hrazdan River basin, Armenia organised by the EcoServ Project. Students, teachers and local residents used participatory approaches to explore ecosystem services and their relationships with local landscapes and communities. The experience demonstrated the potential of combining visual, narrative and spatial methods to capture locally situated knowledge and connect different perspectives on ecosystem services.

The approach was particularly useful for exploring experiential and cultural dimensions of ecosystem services and for creating opportunities for interaction between students, researchers and local communities. For example:

Photovoice



Picture 1. Livestock grazing in the Hrazdan River floodplain.

A 65-year-old resident explained: *“For many village locals, cattle is the source of income. It provides milk; we make yoghurt and cheese, and it supports our living.”*



Picture 2. Agricultural landscapes, fish farms and irrigation practices in Bjni village, Armenia.

Residents explained that irrigation practices have changed over time due to economic conditions, infrastructure availability, and perceptions of water quality. A 50-year-old resident described changes compared with the Soviet period: *“In Soviet Union times, there were many pumps that transferred river water to agricultural lands. However, considering electricity consumption costs, we prefer to use self-flowing water from channels diverting water from Lake Sevan.”*

Participatory mapping

Provisioning ecosystem services were spatially associated with agricultural fields, orchards, grazing areas, mineral springs, forests, and resource extraction sites. Residents' narratives helped identify locations associated with everyday resource use. Figure 1 shows mineral water sources that residents identified as being used for irrigation, drinking water, industrial purposes, and recreation.



Figure 1. Participatory map showing ecosystem services and human–ecosystem interactions in Bjni and surrounding areas (Armenia).

6. Adaptation for Nature-based Solutions and Living Labs

This approach can be adapted to focus specifically on **Nature-based Solutions**.

Participants can be asked to identify and photograph examples of NBS in their surroundings and subsequently classify and map them according to locally relevant NBS categories.

The activity can be used as:

- a preparatory Living Lab workshop;
- an outdoor learning activity;
- a stakeholder engagement exercise;
- a co-creation activity;
- a method for developing a shared understanding of NBS;
- an entry point for discussing ecosystem services generated by NBS.

The same basic workflow can therefore be transferred across different geographical and institutional contexts while allowing the specific categories, questions and mapping procedures to be adapted to local needs.

7. Key strengths

- **Participatory:** Participants are not simply respondents but actively generate, interpret and spatially organise knowledge.
- **Place-based:** The methodology connects abstract concepts such as ecosystem services and NBS to specific places and everyday experiences.
- **Multimodal:** Photographs, narratives, maps and group discussion provide complementary forms of information.
- **Accessible:** The approach does not require advanced technical knowledge and can be implemented with relatively simple materials.
- **Flexible:** It can be used with students, researchers, community members, local authorities or mixed stakeholder groups.
- **Adaptable:** The questions, categories, mapping techniques and duration can be modified according to the research or educational context.
- **Suitable for transdisciplinary settings:** The approach creates a common activity through which participants with different forms of knowledge can contribute and learn from one another.

8. Suggested implementation

A basic implementation can be organised as a **1-3 days activity**:

Phase	Activity	Indicative duration
1	Introduction and preparation	60–120 min
2	Field observation and Photovoice	120 min–1 day
3	Participatory mapping	60 min–3 hours
4	Group discussion and interpretation	60 min–1 day
5	Reflection and synthesis	60–120 min

For university courses or Living Labs, the methodology can instead be distributed across several sessions.

9. Materials required

The approach can be implemented with relatively limited resources:

- smartphones or cameras;
- printed or digital maps;

- markers/stickers or digital mapping tools;
- photographs and narrative templates;
- facilitation materials;
- consent/ethical guidance where photographs include identifiable people.

10. Important considerations

The methodology should be understood as a tool for **exploration, learning and participatory knowledge generation**, rather than as a stand-alone comprehensive ecosystem-service valuation method.

Participant selection, facilitation and interpretation can influence the resulting observations. The method therefore benefits from combining different participant perspectives and, where appropriate, triangulating Photovoice and mapping results with other qualitative or quantitative approaches.

Particular attention should also be paid to informed consent, privacy and the ethical use of photographs.

11. Transferability

The methodology can be transferred to different geographical and thematic contexts.

- For ecosystem-service research, the focus can be placed on perceived benefits, values, experiences and relationships with landscapes.
- For NBS projects, participants can focus on identifying NBS, their perceived benefits and their spatial relationships with communities and ecosystems.
- For university teaching, the methodology can serve as an experiential learning exercise linking theoretical concepts to field observation.
- For Living Labs, it can provide an accessible starting point for stakeholder dialogue, co-learning and identification of locally relevant opportunities and challenges.

12. Expected outputs

Depending on the implementation, the activity can generate:

- a photographic dataset;
- participant narratives;
- thematic classifications;
- participatory maps;
- identified ecosystem services and/or NBS;
- stakeholder perspectives;

- discussion and reflection material;
- potential opportunities and challenges for further Living Lab activities.

Invitation to apply and adapt

We invite researchers, educators, and practitioners to apply and adapt this combined approach to different Nature-based Solutions and ecosystem-service contexts. Experiences from new applications can help further refine the methodology, reveal its potential across different social and environmental settings, and contribute to the development of more participatory, inclusive, and place-sensitive approaches to Nature-based Solutions.

References

- Berbés-Blázquez, M. (2012). A participatory assessment of ecosystem services and human well-being in rural Costa Rica using Photovoice. *Environmental Management*, 49(4), 862–875. <https://doi.org/10.1007/s00267-012-9822-9>
- Brundiers, K., Wiek, A., & Redman, C. L. (2010). Real-world learning opportunities in sustainability: From classroom into the real world. *International Journal of Sustainability in Higher Education*, 11(4), 308–324. <https://doi.org/10.1108/14676371011077540>
- Costanza, R. (2020). Valuing natural capital and ecosystem services toward the goals of efficiency, fairness, and sustainability. *Ecosystem Services*, 43, Article 101096. <https://doi.org/10.1016/j.ecoser.2020.101096>
- Evans, J., Jones, R., Karvonen, A., Millard, L., & Wendler, J. (2015). Living labs and co-production: University campuses as platforms for sustainability transitions. *Current Opinion in Environmental Sustainability*, 16, 1–6. <https://doi.org/10.1016/j.cosust.2015.06.005>
- Lim, V. C., Justine, E. V., Yusof, K., Wan Mohamad Ariffin, W. N. S., Goh, H. C., & Fadzil, K. S. (2021). Eliciting local knowledge of ecosystem services using participatory mapping and Photovoice: A case study of Tun Mustapha Park, Malaysia. *PLoS ONE*, 16(7), Article e0253740. <https://doi.org/10.1371/journal.pone.0253740>
- López-Rodríguez, M. D., Corbera, E., & Alcaraz, O. (2019). Photovoice: An integrated method for evaluating ecosystem services in cities. *Ecosystem Services*, 36, Article 100903. <https://doi.org/10.1016/j.ecoser.2019.100903>
- Malmborg, K., Enfors-Kautsky, E., Queiroz, C., Norström, A., & Schultz, L. (2021). Operationalizing ecosystem service bundles for strategic sustainability planning: A participatory approach. *Ambio*, 50(2), 314–331. <https://doi.org/10.1007/s13280-020-01370-y>
- Masterson, V. A., Mahajan, S. L., & Tengö, M. (2018). Photovoice for mobilizing insights on human well-being in complex social–ecological systems: Case studies from Kenya and South Africa. *Ecology and Society*, 23(3), Article 13. <https://doi.org/10.5751/ES-10259-230313>
- Molina-Urruela, J., Fernández, E., Castro, A. J., Expósito-Granados, M., Ovejero-Campos, A., Villasante, S., & Méndez-Martínez, G. (2024). Participatory mapping of uses and ecosystem services as a useful tool for the identification of conflicts in marine protected areas: The case of the Cíes Islands archipelago (NW Spain). *Ocean & Coastal Management*, 259, Article 107474. <https://doi.org/10.1016/j.ocecoaman.2024.107474>

All photographs: © EcoServ project.

©2026 eNaBIS Consortium. This work is licensed under a Creative Commons Attribution NonCommercial 4.0 International License (CC BYNC 4.0). To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc/4.0/>

