

Capturing gender-specific understanding of landscape functions through participatory GIS

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Geographic information system (GIS) is a computer application that can create, store, manipulate, visualize and analyse spatial and temporal information. GIS can capture the social and institutional dimensions in space and time by involving local stakeholders in the generation of information included in the analysis—an approach we call participatory GIS (PGIS). PGIS has been applied in a wide range of contexts, including urban planning, conflict management over natural resources and land boundaries, and land use and natural resource planning and management.

In Manupali watershed, southern Philippines, we used participatory GIS to capture spatially explicit gendered understanding of landscapes and their linkages to environmental services and livelihoods, and gendered access and control over resources.

Materials

- Manila paper or flip chart
- Coloured marker pens
- Environmental services (ES) chart
- Google earth satellite image
- Flat styropor (polystyrene)
- Coloured pushpins
- Coloured markers
- Global positioning system (GPS)
- GIS software
- Audio recorder
- Camera



Study team

- Mixed gender team of interviewer and documenter
- GIS specialist

Steps

1. Preparing the landscape map

- Access Google Earth or other online map of the studied landscape (e.g. watershed, sub-watershed, village).
- Create a geographically referenced map of the studied landscape from the Google Earth image.
- Print the map in large format (decide on an appropriate scale).

2. Preparing for the household interview and mapping

- Identify at least three villages that represent an elevation gradient of the study site: upper, middle, lower.
- Decide on the number of farm household interviewees for each village.
- Randomly select desired farm households from the village population list. When able, other criteria aside from gender may be considered.
- Visit selected households to schedule the interview.

During the visit:

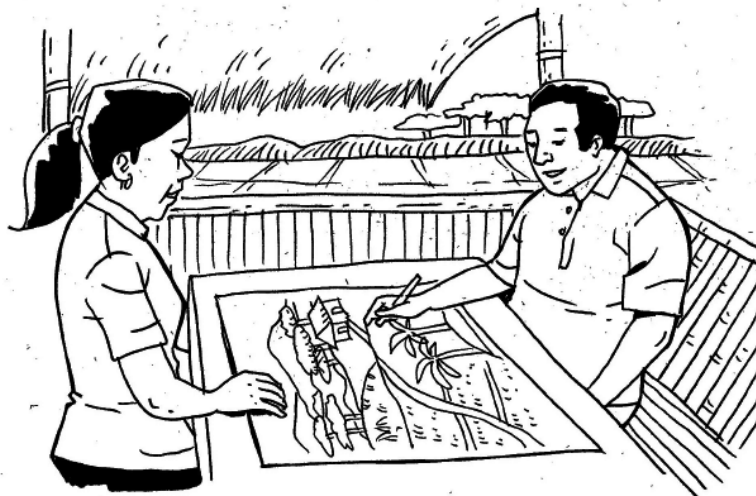
- Introduce yourself and explain the purpose of the interview.
- Ask if both husband and wife are willing to be interviewed individually and privately for approximately 1½ hours.
- If they agree, schedule the interview at their most convenient time and place.

3. Household interview with landscape mapping

- Introduce yourself and refresh the purpose of the study.
- Explain the interview mechanics. Explain that you need to talk to the wife first, followed by the husband.
- Start the interview and mapping.
 - Begin with a friendly conversation by asking the husband/wife simple questions, e.g. how many children do they have? How old are they?
 - Ask how the husband/wife understands 'landscape and ecosystem services'. Provide sufficient time for discussion.
 - On a drawing paper or flipchart, let the husband/wife draw their

Consideration

You may need to provide examples that facilitate understanding of the concept of landscape, environmental services, land use, access and control.



landscape, and identify and draw the ecosystem services provided on the map.

- Ask which part of the landscape the wife/husband or both have access and control.

- On the map, let them mark A for access to any part of the landscape or to a particular environmental service, and C for control.

4. Household interview with land use and livelihood mapping

- Ask the husband/wife to locate and draw their house and farm on the landscape map drawn earlier, including other resources (e.g. water pump, farm equipment).
- Ask the husband/wife to add their land uses on the map (e.g. tree crops, food crops, livestock, grassland), farming practices (e.g. contouring).
- If husband/wife is involved in non- or off-farm livelihood, ask them to draw these on the map, depicting the type and location of this livelihood (e.g., a store owned by the wife close or away from the farm).
- On the map, ask wife/husband to mark productive and unproductive areas of the farm and discuss the indicators of these areas.
- Discuss the links between productive and unproductive areas with available environmental service or spatial arrangement of farm resources and land uses.

5. Mapping environmental services

- Prepare an ES chart as shown below.

Table 1: Sample Environmental Services Chart

No. on map	What ES?	Current condition			What do you use this ES for?	Rank by degree of importance	Why?
		1 Excellent	2 Good	3 Poor			

- On the chart, ask husband/wife to assess whether ES are in excellent, good or poor condition, and also identify benefits for each service.
- Ask wife and husband to rank each ES by degree of importance to farming and other livelihood activities.
- Review the ES chart and discuss reasons for ranking.
- Display the landscape map. Provide sufficient time for wife/husband to understand the map.
- Using coloured pushpins or markers, ask wife/husband to locate different ES in the map. Take a photo of the map with the marked services. At this stage, the landscape map would have many features such as the farmhouse, land uses, ES, and non- or off-farm sources of livelihoods.
- The colour and number of pushpins on the landscape map represent the type and availability of ES (e.g. yellow for indigenous people's sacred ground).
- Ask for observed changes in specific landscapes, ES, land use and livelihood patterns in the study area, and if these changes had any effect on the landscape, ES needs, land use or livelihood.
- Discuss changes in access and control that are linked to changes in landscape, ES, land use and livelihood patterns.

Focus question

In the first map, you drew your landscape and the ES that you benefit from it. Can you see them on this map? If so, can you locate them on this map?

6. Recording GPS of productive and unproductive areas and GIS map creation

- Save the coordinates of household as waypoints.
- Walk with the husband/wife around the area that they identified as productive and unproductive part of the farm. Record GPS points of the husband/wife's track.
- Download GPS points, and create a GIS map of productive and unproductive areas.

7. Map creation

- Overlay ES map on Google earth landscape map.
- Digitize the ES map.
- Create ES map layer by gender.

Advantages

- PGIS enables women and men to visually assess landscape, ES and land use.
- It captures spatially explicit perceptions of landscapes, ES and land use by gender.
- The tool promotes interdisciplinarity.

Limitations

- Time consuming
- Can be complex for participants

Do's and don'ts

- If wife or husband is unable to draw, do ask the children to draw the landscape, ES and land use map based on their mother's or father's ideas.
- Do observe cultural taboos, such as excluding landscape features regarded sacred by indigenous people.
- Do ensure availability of GIS software and a team member skilled in using the software.
- Don't forget the tools needed for interviews and mapping (e.g. batteries for recorder and GPS).

Recommended readings

- Brown S. 2003. Spatial analysis of socioeconomic issues: gender and GIS in Nepal. *Mountain Research and Development* 23:4, p.338-344.
- Christie ME. 2006. Kitchenspace: gendered territory in central Mexico. *Gender, Place and Culture* 13:653–661.
- Fagerholm N, Kayhko N, Ndumbaro F, Khamis M. 2012. Community stakeholders' knowledge assessments – mapping indicators for landscape services. *Ecological Indicators* 18:421–433.
- Harman M, Christie ME. 2013. Gendered perspectives for conservation agriculture. Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program (SANREM CRSP) and Virginia Tech. <http://www.oired.vt.edu/sanremcrsp/professionals/research-activities/phase4/ccras/ccra7/> (Accessed 20 July 2013).