

# A different Gender integration in livestock and fish research kettle of fish?

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RESEARCH  
PROGRAM ON  
Livestock and Fish



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## 5 PUTTING GENDER ON THE MAP

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### Organizations

ILRI

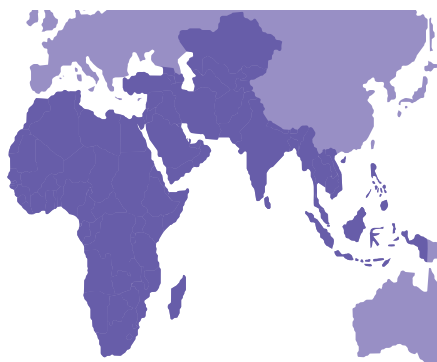
### Species



**Methods:** Use of existing quantitative datasets, big data, framework/tool

**Summary:** This project experiments with maps based on gender data on resource allocation, women's participation and institutions, to enable interventions to be better targeted.

### Locations



**M**AKING SILAGE is a good way to feed animals in the dry season in Uganda. The CGIAR Research Program on Livestock and Fish is doing a lot of research on this and is hoping to promote it widely. But will it work somewhere else – in Kenya, say, or Zambia?

Doing a set of experimental trials in many locations is expensive and time-consuming. So scientists try to choose where they target their innovations by looking at aspects like the climate, soils, and socio-economic characteristics such as poverty and market access. Maps can be used to show where a particular technology looks promising.

Gender can be a critical influence on the success of a particular intervention. A technology that works well in one place might fail completely in another because of different gender contexts. Stall-feeding, for example, takes a lot of time. It works well if women have sufficient time to collect and chop the feed. It is likely to fail in locations where women already have a high labour burden from their farming and household responsibilities. They will probably prefer to leave their animals out to graze even though this is less productive in terms of milk or meat output.

## Building a map

But how to get gender relations and constraints into this targeting? We need a set of maps that show various aspects of gender so we can judge where contexts are similar, and where they differ.

To create such maps, we followed four steps:

We first decided what types of information to include in the map.

1. We selected a large number of variables to reflect this information.
2. We built a new set of indicators, or factors, that summarize these variables.
3. We created a set of maps showing these factors.

## Deciding what information to include

We needed a framework that could reflect a whole range of transactions in agricultural value chains. The New Institutional Economics framework (Williamson, 2000) captures four levels: informal institutions, formal institutions, governance and resource allocations. For each of these levels, we identified the corresponding gender concepts. Informal institutions, for example, relate to gender norms such as inheritances being reserved to men (the first column in Table 5.1). We then chose a set of gender indicators to reflect how these gender concepts relate to value chains (the second column in the table).

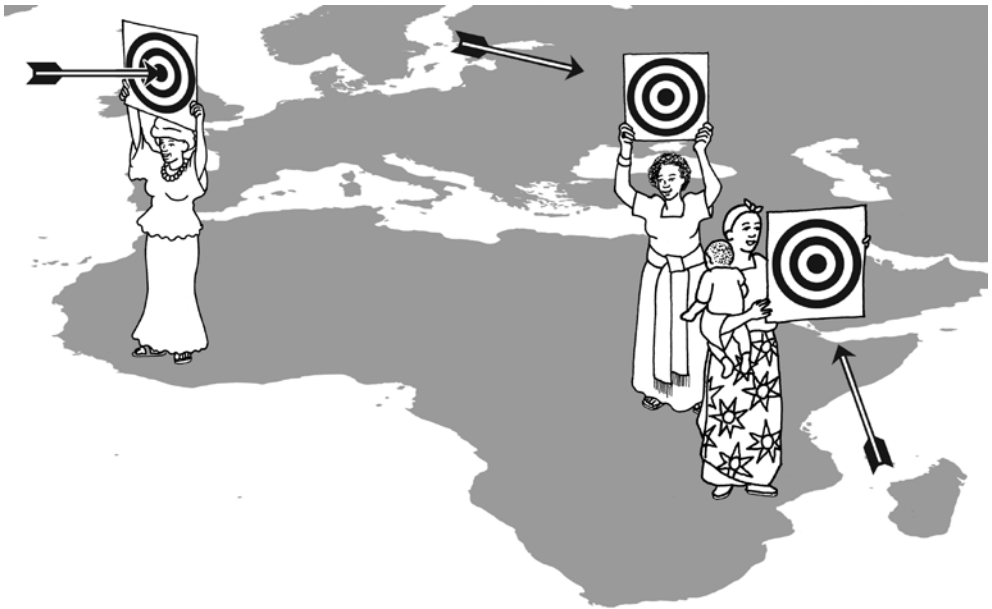


Figure 5.1 Targeting women

**Table 5.1 From gender concepts to value chain indicators**

Level in the New Institutional Economics framework (Gender concept)	Gender indicators for value chain	Data used	Source
1. Informal institutions (Gender norms)	Customary and law: access to resources and assets, civil liberties, physical integrity	Laws on domestic violence	OECD SIGI
2. Formal institutions (Law discriminating women or men)		Women have secure access to land	
		Women have secure access to non-land assets	
		Women have access to financial services	
		Women have access to public space	
3. Governance (Gender participation)	Power to contribute to value chain	Women's education level Women literacy Women reads newspapers or magazines Women listens to radio or watches TV Women have leadership (self-employment) Women's attitudes on acceptability of beating if a woman goes out without telling	DHS
4. Resource allocation (Intra household decision making and power over)	Capacity to allocate resources to value chain activities	Number of children under 5 Household size Women's attitudes on acceptability of beating if a woman neglects the children Women take decisions on large purchases in the household Women take decisions on what to do with money in the household Women own the household assets (house or land, alone or jointly) Women earns same or more than partner Early marriage	DHS

**Table 5.2 Factors emerging from the factor analysis for Africa**

<b>Factor</b>	<b>Variables (direction of correlation)</b>	<b>A high factor score can be interpreted as...</b>
1: Educated urban	Women's education (+) Women literacy: Can read a full sentence (+) Women literacy: Cannot read at all (–) Women read newspapers or magazines (+) Rural (–)	Women are mostly living in an urban setting, are educated, literate, and read newspapers or magazines
2: Urban poor	Women's education (+) Women own land or non-land assets (–) Women reads newspapers or magazines (+) Rural (–)	Women are mostly living in an urban setting, are educated, access news but don't own assets (and therefore are poor)
3: Legal discrimination for value chain policies	Women have access to finance (+) Women have access to public space (+) Women have protection against violence (+) Women have secure access to land (+) Women have secure access to non-land assets (+)	Women face legal or customary limitations in terms of the policies considered
4: Legal discrimination for access to assets	Women have secure access to land (+) Women have secure access to non-land assets (+)	Women face legal or customary limitations in legal access to land and non-land assets
5: High household labour	Number of children under 5 (+) Household size (+)	Women are likely to spend their time on household duties
6: Low decision-making power	Women listen to radio or watch TV (+) Women earn same or more than their partner (–) Partner takes household decisions (+) Laws on domestic violence (–)	Women have low decision-making power in their households, earn less than their partners, don't take decisions about money, yet have access to radio and TV. They live in countries that protect them against violence.

## Collecting the data

We wanted to compare across countries and if possible among regions within countries. We needed a large, existing dataset to make this possible. For levels 1 and 2 (formal and informal institutions), we used country-level data from the OECD social institution and gender index (SIGI) database, covering 160 countries. We selected five variables: laws on domestic violence, women's secure access to land, women's secure access to non-land assets, women's access to financial services, and women's access to public space. Each of these variables can take on a score from 0 to 1, where 0 means no discrimination, and 1 means legal discrimination. A score between 0 and 1 depends on experts' opinions on the extent of discrimination through customary law (bringing in the informal institutions).

For levels 3 (governance) and 4 (resource allocation), we used data from the Demographic Health Survey (DHS), which covers 90 countries in the developing world. These are individual-level data that cover a wide range of issues: ranging from educational level and access to information to decision-making within the household and ownership of assets. These data come from standardized interviews with a representative samples of women in each region within each country.

The OECD data are at a national level, while the DHS data are at an individual level. To use both in the same analysis, we had to make them compatible. We did this by assigning the OECD scores for the country to each individual in the DHS dataset.

## Factor analysis

The third step was to reduce our 20+ variables into a more manageable number. We did this by using factor analysis – a statistical technique that combines variables that are correlated with each other and identifies a set of factors that reflect the underlying meaning of the data.

We discovered that the data for countries in Africa and Asia were rather different, so we did separate factor analyses for the two continents. We focus here on Africa. Our analysis identified six factors; Table 5.2 shows these, the variables that contribute to each factor, and how we interpreted each one.

## Generating the maps

To produce maps from the factors, we aggregated the individual-level factors by grouping together women living in the same subnational region. We then plotted these data on a map of Africa. Figure 5.1 shows two of the six factors. Blanks are countries for which we had no DHS data. Factor 3 shows no variation within an individual country because the factor was drawn entirely on OECD data, which are national-level. Factor 6, on the other hand, shows variation

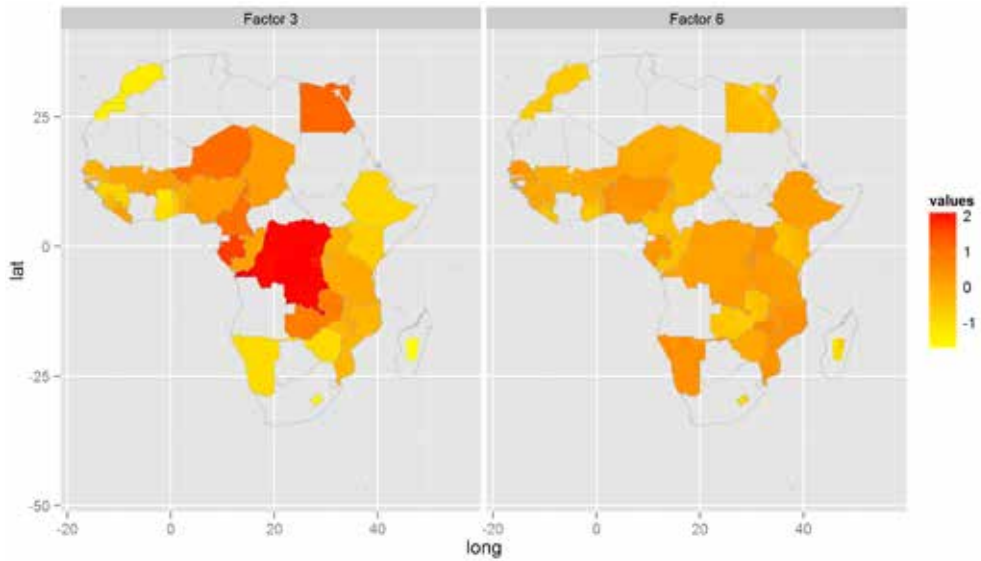


Figure 5.2. Gender context maps for factor 3 (Legal discrimination for value chain policies) and 6 (Low decision-making power).

within individual countries because the factor draws largely on DHS data, which are individual-level.

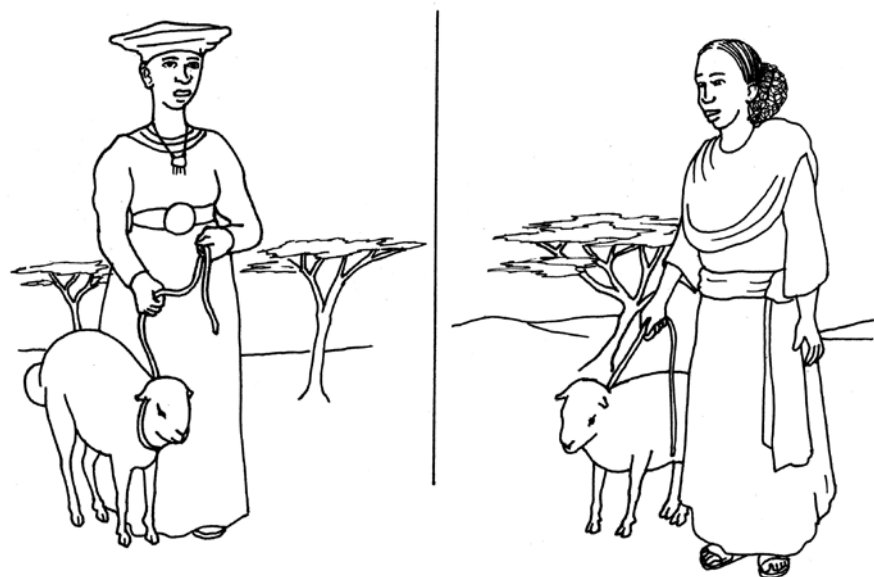
### What do we learn from the maps?

The left-hand map of Figure 5.2 shows that women in Zambia are subject to strong discrimination in terms of laws and customs compared to, say, Uganda. But Zambian women have more decision-making power within their households than do their sisters in Uganda.

To return to the question at the start of this section: if we are considering transferring a silage-making technique from Uganda to Zambia, we need to be careful: it may not work because women in Zambia do not own land. On the other hand, it might work because they have more power in their households and may be able to persuade their husbands to try out the new idea.

A serious researcher is obviously not going to make decisions just based on a set of such maps. She will also consult with specialists who know the area, look at other datasets and read the literature, before conducting small-scale trials in the new location. But the maps do provide useful information: they give a first indication for possible areas to consider – opportunities – and, they alert the researcher to potential problems.





*Figure 5.3 Botswana and Ethiopia: Similar biophysical conditions but different gender context. Will a technology work in both places?*

### **Which maps to use?**

It is important to understand what the maps are built for, and to use a framework that brings in the relevant gender concepts. Any exercise of this nature involves a series of choices: what framework to use, and what indicators to include (and exclude). Here we were interested in value chains, so chose the New Institutional Economics and a set of indicators related to it. For a study on another topic, such as livestock diseases, we might want to use a different framework, a different set of indicators, and a different dataset.

Another choice concerns how to measure indicators and how to treat missing data. An example: a woman's family may not own land because it is too poor. Or the family may own a lot of land, but it is not in the woman's name. In both cases she owns no land, but her situation is clearly different. We need to decide how to deal with this when selecting our variables. For the presented maps, we decided to use women's ownership of land and non-land asset regardless of their family situation, measuring the power a woman has over critical assets needed contribute to the value chain development.

All this means that a set of maps may be useful for one purpose but not for another. We can transfer the approach, but may need to generate new maps for different research topics. That may take time and require some recoding of the computer program that generates the maps.

## Next steps

We have shown it is possible to map gender in a meaningful way and to compare contexts within and between countries. Two issues remain:

**Do the maps reflect reality on the ground?** Validation is often a challenge for global maps. The Livestock and Fish programme has a lot of qualitative data that can be used to validate these maps. More case studies and detailed analysis are needed to understand better how accurate and useful the current maps are.

**What is the added value of gender context maps for targeting?** The maps have not yet been tested for targeting research or development activities. We do not yet have any evidence that they will be useful. We need to test them in targeting actual research activities and seeing if they provide any new recommendations. If they do – and if the recommendations are valid – then we can be confident that we have created a useful product.



*“Until today we looked at context mainly as biophysical – rainfall, soil quality. With these maps we have a new world opening up to us. We can also look at the gender context... and take this into account when we define what works well.”*

**Catherine Pfeifer**  
Spatial analyst, ILRI



<https://youtu.be/aDEN6WQKLY4>

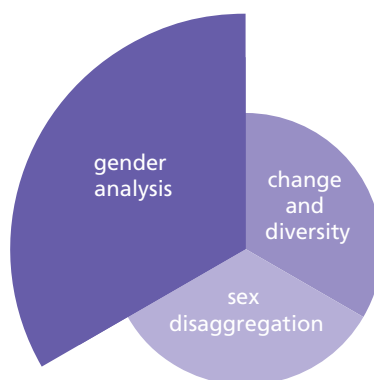
## Situating the research

*The project speaks to the gender integrated research agenda because the gender maps can be used to identify the gender characteristics of contexts to interventions. Gender characteristics are considered an important aspect of contexts that affect the uptake of technological and institutional innovations and solutions. Identifying these factors, and also identifying how contexts correspond or differ from other contexts on gender characteristics is helpful to see which innovations can be scaled out where, and what gender considerations merit consideration in implementing these innovations.*

*In terms of gender integration, this project:*

- *Uses sex-disaggregated data, and especially data in existing datasets that is collected from women*

- Captures several aspects of gender analysis, by looking at women's labour and work burden, access to and control over land, financial services and income, as well as decision-making on purchases. It also includes both formal laws and informal norms and attitudes on violence against women in its analysis.
- Engages with diversity among women, by differentiating how women are positioned differently, based on the factor analysis, and brings to the surface how gender relations differ for women in urban and rural areas, educational levels, or depending on the legal context.



## References

**Williamson, O.E.**, 2000. The New Institutional Economics: Taking stock, looking ahead. J. Econ. Lit. 38, 595–613.

## Links to data

**DHS:** [dhsprogram.com/](https://dhsprogram.com/)

**OECD SIGI:** [www.genderindex.org/](http://www.genderindex.org/)

All maps created for this project can be found on the author's personal blog, [www.catherinepfeifer.blogspot.com/p/materials-and-outputs.html](http://www.catherinepfeifer.blogspot.com/p/materials-and-outputs.html)