

Participatory identification of indicators for multicriteria evaluation of agroecological performance

Report on the LISP workshop in Fatick, Senegal

Elodie Richomme, Juliette Lairez, Patrice Kouakou, Modou Gueye Fall, Banna Mbaye, Cherif Syaka Assemblée Mane, Pape Bilal Diakhate, Aïcha Gueye, Koki Ba



September 13 and 14, 2023
Hôtel département de Fatick

This workshop brought together :

46 participants

including
34 farmers and food
processors
18 women (30%)

27 local

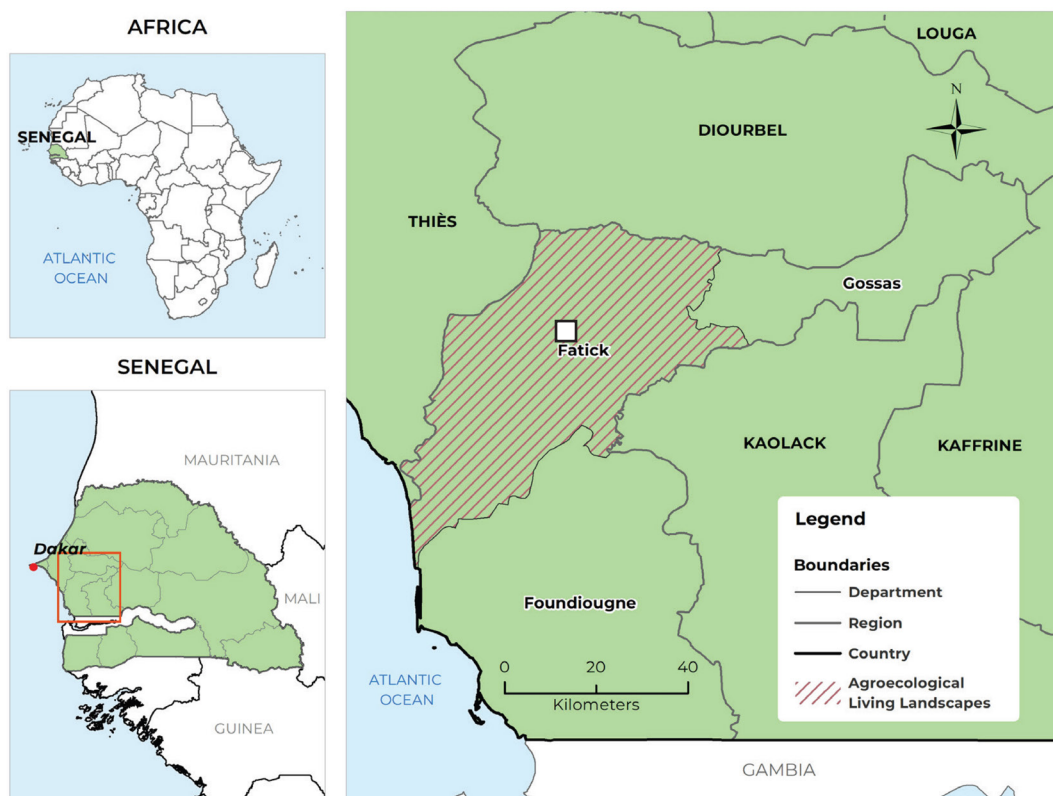
organizations

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Objective: to co-identify local indicators to assess the performance of agro-ecological practices in the Fatick department.

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Map 1. The ALL is located in Fatick Department, situated in West Central Senegal



Introduction

On September 13 and 14, 2023, a workshop was held in Fatick to localize indicators for the multi-criteria evaluation of the agroecological performance of the Living Landscape Agroécologique (LLA) in Fatick department. The workshop was part of the implementation of the Agroecology Initiative Project, funded by OneCGIAR.

One of the specific objectives of the initiative is to produce scientific evidence of the positive impact of agroecology, in order to encourage its large-scale development in the territories. This objective cannot be achieved without collecting data and evidence on the performance of agroecology.

To this end, the project is studying different farming systems and levels of integration of agroecology into production systems in eight countries, each with an LLA. This diversity makes it impossible to use a single, uniform agroecology performance assessment tool for all LLAs.

In order to produce locally relevant and globally comparable data on the impact of agroecology, the Initiative has developed the HOLPA (Holistic Localized Performance Assessment) framework. As a reminder, the HOLPA tool is designed to help determine which types of agricultural practices and approaches lead to sustainable outcomes, at different scales and in different contexts, along the entire food chain.

The aim of this workshop was to co-develop, with LLA stakeholders, a set of performance indicators that are relevant and adapted to the agricultural systems of the Fatick LLA (local indicators).

This workshop focused on determining such indicators at farm level. To this end, the workshop was guided by the following three questions:

- what environmental / agricultural / social / economic changes do we want to see thanks to agroecology?
- how will we know if we've reached our environmental / agricultural / social / economic goals with agroecology?
- What are the obstacles that could prevent us from achieving these goals? How can we assess them?

A number of producers (farmers and livestock breeders), processors, members of technical agricultural services, representatives and elected representatives of local authorities and organizations such as the departmental livestock service and Fatick's Dytael (dynamique pour un transition agroécologique locale), as well as researchers, took part in the workshop.

The workshop agenda included the following key points:

- Expression of the concepts of agroecology and the agroecological farm, and identification of perceptions of agroecology
- Clarification of the concept of indicators and their usefulness in the context of agroecology performance assessment,
- Identification of long lists of local indicators in groups and (iv) voting on the most relevant local indicators by stakeholders.

This report summarizes the work carried out during the workshop.

Figure 1. Agro-sylvo-pastoral system in Senegal



Expressing the concepts of agroecology and agroecological farms

After presenting the general objective of the workshop and its objectives (to determine indicators specific to the Fatick department in order to assess the performance of agroecology there), time was devoted to agroecology in order to define a common basis for understanding this concept.

To this end, the representative of the Fatick Dytael presented the vision of agroecology and the Dytael's objective: for the Fatick department to be, by 2035, "a territory resilient to the challenges of agriculture through the implementation of strategies for the adoption of agroecological practices".

Participants were then asked to write or draw their understanding of an agroecological farm. All their proposals were grouped into three main categories: definition of an agroecological farm, description of the processes for and the value chain approach of an agroecological farm.

Their ideas were discussed in order to establish a global vision of agroecology by the stakeholders, an essential prerequisite for the choice of indicators to evaluate it.

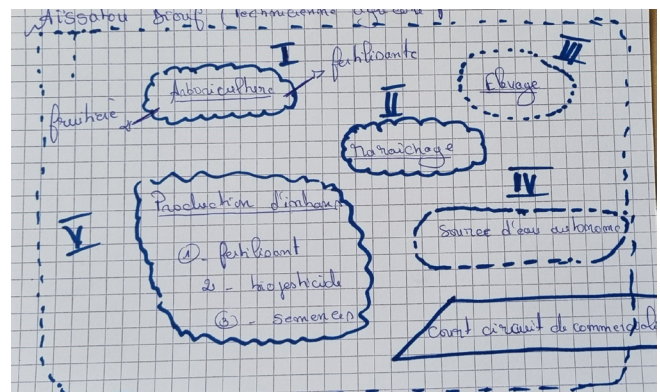
According to their ideas put forward by the various stakeholders in the Fatick area, their vision of an agroecological farm can be summarized as a diversified farming area combining a large number of interacting production types (cereals, market gardening, livestock, arboriculture) and aiming to be sustainable and equitable by targeting the fight against climate change, environmental protection and enhancing the social-economic aspects of agriculture and livestock farming.

To achieve this, producers use good farming practices, such as the use of organic fertilizers, fencing, farmer seeds, etc., and aim for self-sufficiency in their use of resources such as water.

It's worth noting that many of our stakeholders have adopted the more restricted framework of organic farming, excluding all chemical inputs (fertilizers, phytosanitary products, vaccines) from agrarian systems.

Last but not least, these agroecological farms are part of value chains that enable them to add value to their production through processing and sales outlets.

Figure 2. examples of participants proposal for defining an agroecological farm



Ferme Agro Écologique.
 une Espace qui a des :
 - Arbres fruitiers
 - Des animaux
 Exp : Vaches, poulet, Montons
 crevette, lapin etc...
 - l'agriculture maraîchère
 - l'agriculture vivrière
 Tout cela utiliser par le bio pas de chimique pas de vaccin Médicale.
 L'agriculture organique : l'aspect
 * Aliment naturel pour les animaux

Mr. DIOUF
 technicien
 Agronome de
 L'ONG CAREM
 de Fatick

une ferme est une exploitation des bonnes pratiques agricoles. L'écologie. L'est un produit chimique. L'est un produit chimique.

Agro Écologie
 Ferme Agro éco
 - Terre - Semences paysannes, Eau (eau pluviale et maraîchère et pour les animaux aussi)
 - Animaux (chèvres, moutons, vaches - mixte ovins)
 - Production de l'œuf : transformation traditionnelle ou moderne pour avoir du lait et de l'huile
 - Production de fourrage pour le bétail qui doit venir rester sur place.
 - Dans un processus de l'agriculture pour une et durable.

Clarifying the concept of indicators and their usefulness for agro-ecological performance assessment

In order to place the concept of indicators and their relevance in the context of Fatick department and agroecology, the concept of indicators was first defined.

- The evaluation dimensions were then presented. These dimensions are, as previously mentioned,
 - the environmental dimension,
 - the agronomic dimension (for which it was necessary to specify that we were interested in agriculture and livestock farming),
 - the social dimension
 - the economic dimension.

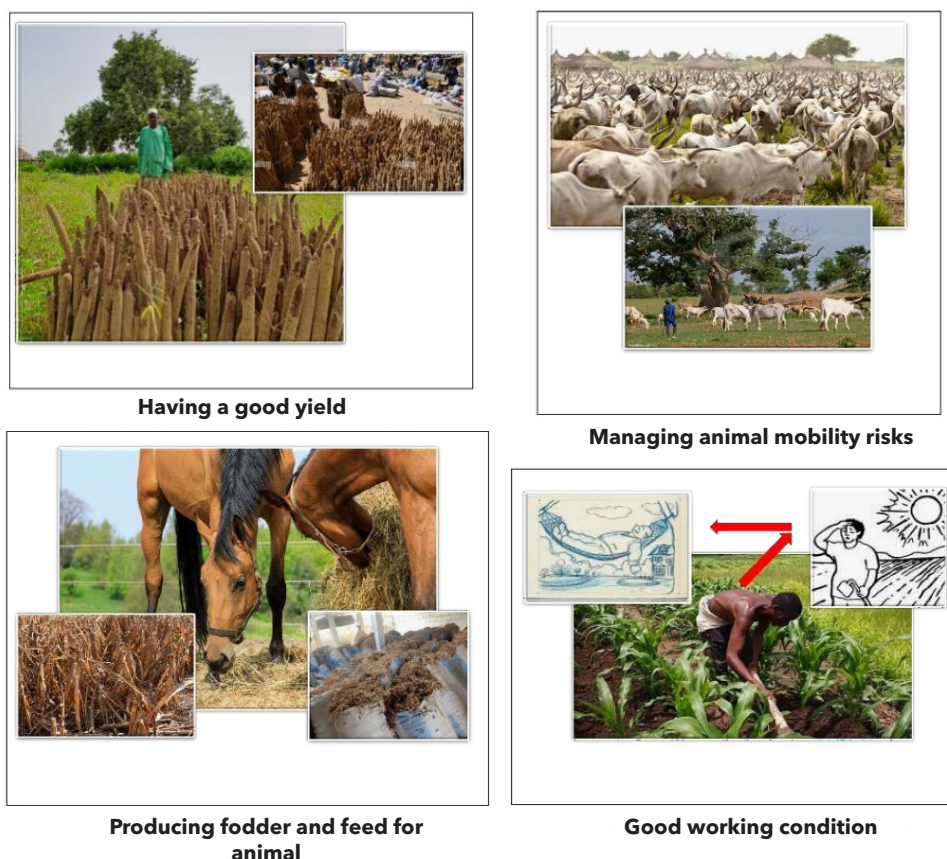
Examples of indicators were then presented.

The presentation of these four indicators (Figure 3), anchored in the workshop context, was intended to guide subsequent reflection on local indicators, specific to Fatick department, without unduly influencing participants.

Similarly, the global indicators of the HOLPA tool were deliberately not presented to participants, so as not to influence them or limit their thinking. Another advantage of this choice was to highlight the overlaps between HOLPA's global indicators and those proposed during the workshop.

These were some of the indicators selected as part of a FAIR Sahel project workshop held in Fatick.

Figure 3. Presentation of FAIR Sahel project indicators (source : A. Gueye)



Identifying local indicators

The identification of local indicators was carried out in three stages.

Firstly, each of the participants was asked to think individually about local indicators for evaluating the performance of agroecology in the context of Fatick's farming systems, and to fill them in on a piece of paper, specifying their areas of activity. This will serve as a basis for further reflection, and will help to highlight the important elements for each area of activity when studying these initial ideas.

The second phase was the world café. The participants were divided into four groups (as many groups as there were dimensions), the composition of which was determined so as to have in each group a homogeneity of gender (in order to let the women express themselves) and a heterogeneity of fields of activity and locality of origin. Because of the smaller number of women, only one all-women group was formed out of the four; the others were made up of men. A facilitator, whose role is to facilitate exchanges and ensure that all group members participate, was assigned to each group. Likewise, each dimension was handled by one (or more) facilitator and an expert whose role is to explain the dimension and answer any questions or redirections required during group discussions.

The World café proceeded as follows:

- initially, the groups were each assigned a different dimension, which was presented to them by the expert, and they brainstormed and proposed local indicators in their dimension of agroecology. This initial discussion lasted 30 minutes.
- Next, the groups turned to another dimension, and after this one and the previous group's proposals had been presented to them, they reflected on the local indicators for this dimension for 20 minutes.
- And so on, until all the groups had worked on all the dimensions.

At the end of this «world café», all the indicator proposals were collated and classified into dimensional sub-themes (e.g. for the environment: water, soil, trees), and the indicators that were identical or very similar to the HOLPA tool's global indicators (i.e. the indicators that are already scheduled to be assessed, the global KPIs) were identified.

In the third stage, the indicators proposed for each dimension were presented in plenary, specifying which were part of the global indicators and would therefore no longer be taken into account when voting on the local indicators. Stakeholders were invited to add to (and clarify) these long lists of indicators, providing additional information where necessary.

Figure 4. World café discussions



Table 1 - List of environmental indicators identified by stakeholders in Fatick

Dimension	Sub-theme	Indicators (Indicators in gray = indicators included in global indicators)
Environment	Trees	Tree density
Environment	Trees	Fertilizer/fertilizer tree density
Environment	Trees	Number of possible uses for the farm's trees (collection or on-farm?)
Environment	Water	Water availability (access)
Environment	Water	Water quality for irrigation (cattle?) *
Environment	Soil	Area regenerated using the ANR technique
Environment	Soil	Eroded surface
Environment	Soil	Soil quality: nutrient levels in the soil
Environment	Soil	Soil carbon sequestration rate
Environment	Soil	Area of salinated land
Environment	Soil	Length of windbreaks/shrubs (erosion control)
Environment	Soil	Risk of soil degradation caused by divagation (Proportion of parked animals)
Environment	Soil	Cultivated area
Environment	Soil	Biological soil quality
Environment	Biodiversity	Plant diversity
Environment	Biodiversity	Animal diversity
Environment	Biodiversity	Measures to reintegrate plant biodiversity/reintroduce local species that have disappeared
Environment	Biodiversity	Biodiversity loss rate
Environment	Pollution	Quantity of chemical pesticides used
Environment	Pollution	Level of plastic residues on the farm
Environment	Pollution	Proportion of area irrigated with photovoltaic energy

Figure 5. Presentation of indicators

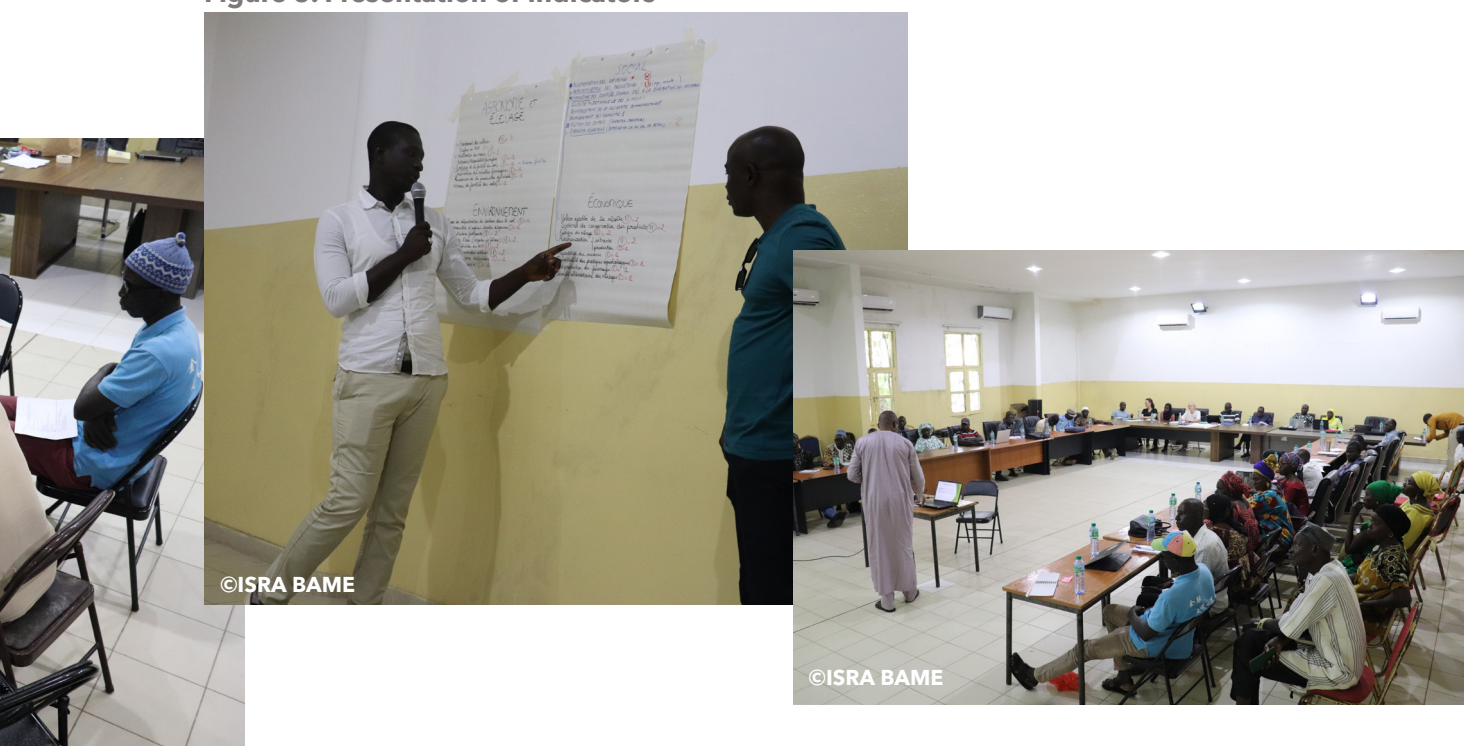


Table 2 - List of indicators identified by stakeholders in Fatick for the agronomic dimension

Dimension	Sub-theme	Indicators (Indicators in gray = indicators included in global indicators)
Agronomy	Productivity	Crop yields
Agronomy	Productivity	Number of animals raised
Agronomy	Productivity	Mortality rate
Agronomy	Productivity	Prolificity
Agronomy	Productivity	Use of artificial insemination
Agronomy	Productivity	Breed improvement (cross-breeding)
Agronomy	Productivity	Animal prophylaxis rate
Agronomy	Productivity	Level of integration of biological control of animal diseases
Agronomy	Productivity	Forage autonomy/availability
Agronomy	Productivity	Conservation of forage crops
Agronomy	Tree crops	Area under ANR
Agronomy	Tree crops	Integrating trees into cultivated areas
Agronomy	Tree crops	Silvicultural production yields
Agronomy	Water	Water quality (salt) *
Agronomy	Water	Water management (year-round water supply)
Agronomy	Soil	Soil fertility level
Agronomy	Soil	Changes in fertility (do practices improve fertility?)
Agronomy	High or cultivated biodiversity	Diversification of animal or plant species/varieties or breeds
Agronomy	Practices	Rate of mulching/soil covering (soil residues)
Agronomy	Practices	Area under combined crops
Agronomy	Practices	Type of fertilization and phytosanitary treatment
Agronomy	Pests	Farm's ability to cope with pests
Agronomy	Pests	Ability to control weeds (striga)

Figure 5. Millet in Senegal



Figure 6. Cattles in Senegal



Table 3 - List of indicators identified by stakeholders in Fatick for the social dimension

Dimension	Sub-theme	Indicators (Indicators in gray = indicators included in global indicators)
Social	Wellness	Wellness (health)
Social	Wellness	Increased revenues
Social	Wellness	Increased working hours
Social	Wellness	Cumbersome and arduous tasks
Social	Wellness	Producer empowerment
Social	Wellness	Social division of labor (division of tasks between young people/women/men)
Social	Work safety over time	Access to land
Social	Work safety over time	Farm insurance
Social	Work safety over time	Accessibility of external workforce
Social	Work safety over time	Quality of human resources (quality workforce)
Social	Work safety over time	Security dimension (demotivation in the face of cattle theft)
Social	Community aspect	Experience sharing (dissemination of practices among producers)
Social	Community aspect	Community work (strengthening organizational dynamics)
Social	Community aspect	Reduce conflicts related to animal roaming
Social	Community aspect	Strengthening community solidarity
Social	Community aspect	Conflicts linked to the denunciation of woodcutters
Social	Power supply	Food diversification
Social	Power supply	Nutritional quality of food
Social	Power supply	Rate of consumption/presence of organic [or agroecological] products in the diet
Social	Power supply	Artisanal (or small-scale industrial) processing with limited use of shelf-stable chemicals
Social	capabilities	Capacity building (access to training, number of courses)

Figure 7. Community based wellness



Figure 8. Natural based health



Table 4 - List of indicators identified by stakeholders in Fatick for the economic dimension

Dimension	Sub-theme	Indicators (Indicators in gray = indicators included in global indicators)
Economical	Cost containment strategy	Self-produced inputs (share or quantity of self-produced fertilizers used on the farm)
Economical	Cost containment strategy	Self-production of livestock feed (proportion of forage and other harvested products consumed by livestock compared with concentrated feed)
Economical	Cost containment strategy	Production costs (input prices, equipment maintenance/repair costs, transport, farm closure)
Economical	Cost containment strategy	Access to market information (input and output prices)
Economical	Profit maximization strategy	Profit or gross margin
Economical	Profit maximization strategy	Marketed production (share of marketed production)
Economical	Profit maximization strategy	Added value of harvest (Use of harvest for processing and valorization of by-products or residues)
Economical	Profit maximization strategy	Product storage system (fenced, unfenced or loose)
Economical	Profit maximization strategy	Market diversification (service stations, supermarkets)
Economical	Profit maximization strategy	FRA certificate obtained (authorization to manufacture and market)
Economical	Profit maximization strategy	Diversification of activities (agriculture, processing, fishing)
Economical	Profit maximization strategy	Access to more eco-demanding markets
Economical	Work	Yield (quantity of production, area farmed, quantity of inputs used)
Economical	Work	Lost production (due to roaming animals)
Economical	Work	Number of livestock on farm (small ruminants, large ruminants and poultry)
Economical	Work	Level of mechanization (Number of equipment used)
Economical	Work	Labor productivity (family and salaried)
Economical	Work	Business experience (number of years in business)
Economical	Work	Number of farm workers (evolution of farm equipment, evolution of animals used on the farm)
Economical	Work	Work arduousness (physical effort, etc.)

Figure 9. Some millet harvested



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Figure 10. Some milk



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Dimension	Sub-theme	Indicators (Indicators in gray = indicators included in global indicators)
Economical	Financing, debt, savings	Campaign self-financing (portion of own funds used for financing)
Economical	Financing, debt, savings	Distribution of income from farming (share of income going to women and young people)
Economical	Financing, debt, savings	Rate of satisfaction of household needs (education, food, care)
Economical	Financing, debt, savings	Household food security
Economical	Financing, debt, savings	Food security for livestock
Economical	Financing, debt, savings	Transfers, support and financial assistance or equipment received
Economical	Financing, debt, savings	Household savings (participation of family members in Tontines)
Economical	Financing, debt, savings	Level of indebtedness (cost of credit)
Economical	Financing, debt, savings	Repayment of loans in the event of economic or environmental shocks (animals or equipment sold)
Economical	Access to resources	Access to drinking water (distance from nearest source)
Economical	Access to resources	Access to plant material (seeds)
Economical	Access to resources	Access to irrigation water (distance from nearest source and depth of water table)
Economical	Access to services	Access to health post (physical and financial)
Economical	Access to services	Children's enrolment rate
Economical	Access to services	Adult literacy rate
Economical	Access to services	Access to veterinary services (distance to nearest vet, number of cattle vaccinated)
Economical	Access to services	Living environment (access to water, electricity and toilets)
Economical	Access to services	Access to support/advice/training services
Economical	Access to services	Knowledge of agro-ecological practices (transferability, etc.)

Figure 11. Transformation and added value



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Figure 12. Food marketing



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Stakeholder vote on the most relevant local indicators

In order to select the most relevant indicators, according to the participants, from all those proposed, an initial group voting stage was carried out.

During this stage, the world café groups were reformed and asked to choose the three most important indicators, dimension by dimension, from among those proposed that were not already taken into account in the overall indicators. At the end of this stage, the votes of all the groups were cumulated to highlight the most relevant local indicators according to the stakeholders (a maximum of 12 indicators per dimension), the overlapping opinions of the groups and the diversity of choices. For each dimension, between 7 and 9 indicator proposals were retained at this stage.

The results are based on the number of votes received and the feedback, reflections, and clarifications provided by all stakeholders and experts during the last plenary. The goal is to ultimately select three indicators per dimension. However, due to the accumulation of votes by various groups, it may not always be possible to have only three indicators per dimension as the final choice. Thus, at the end of the workshop, the stakeholders jointly determined three local indicators for evaluating the performance of agroecology by dimension.

A comparison of the proportion of votes finally retained in plenary compared with the votes of the groups didn't show a very marked difference between the sexes. On average, 49.50% of the votes cast by women were accepted, compared with 55.17% for the three groups of men combined (a difference that can be explained in part by a greater number of indicators having been classified as part of the overall indicators for which the women's group nevertheless voted). The proportion of votes cast by gender varies according to dimension.

The most notable difference between the votes cast for and those cast against the indicators concerns the social dimension, where women's votes were half as high.

They had voted for the following indicators:

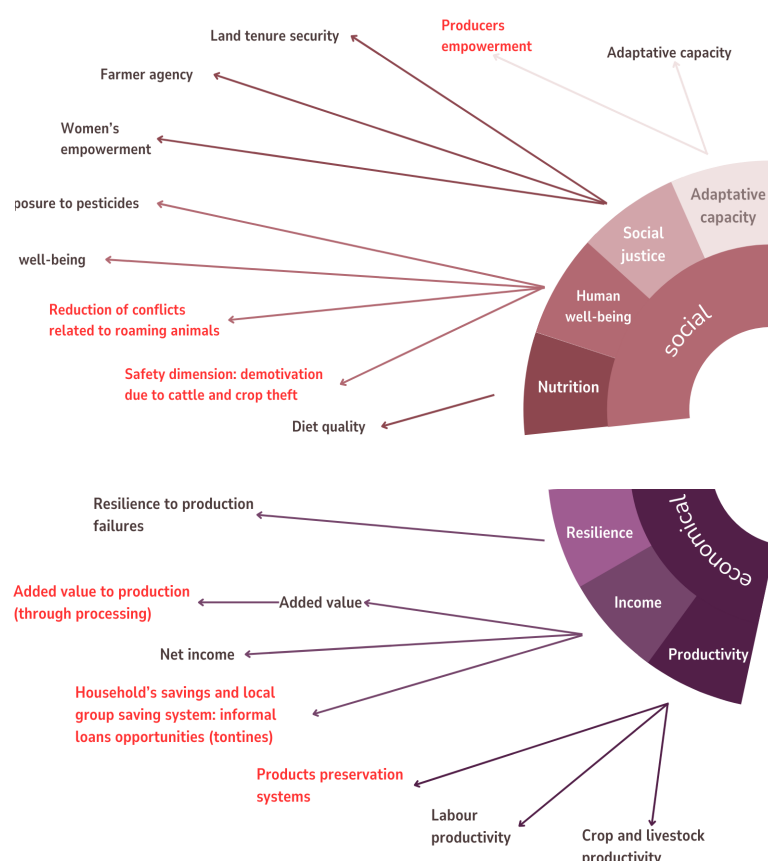
- the security dimension, which was retained,

and two indicators not retained:

- increasing incomes (which was moved to the economic dimension)
- capacity building (which is already partly in the global indicators).

However, for the latter, emphasis could be placed on the training aspect, as a great deal of importance has been attached to the transmission of knowledge.

Figure 13. Validated local indicators (red) and other local indicators (grey) in HOLPA framework



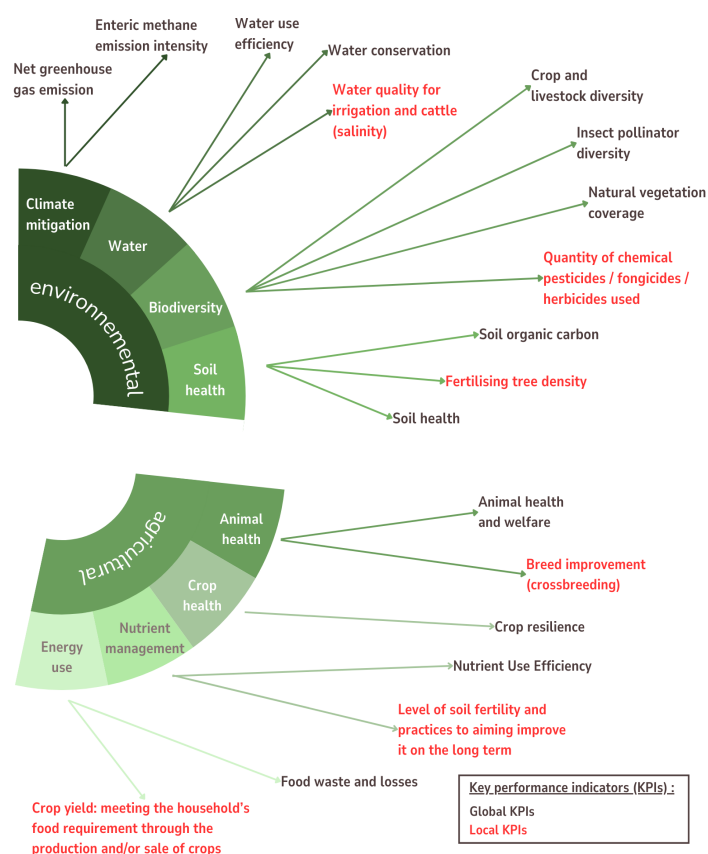
Conclusion

During this workshop, we achieved the objectives of identifying three key local agroecology performance evaluation indicators according to Fatick stakeholders by dimension (environmental, agronomic, social and economic) of agroecology and identifying what agroecology is for them were achieved.

What's more, this time of reflection and co-construction enabled a large number of stakeholders from a variety of fields to share their experiences, which was very enriching.

Table 5 - List of indicators validated (green) and not retained (white)

Dimension	Indicator	Votes	Selection
Environment	Quantity of chemical pesticides/fungicides/herbicides used	2	Yes
	Water quality for irrigation and cattle (salinity)	2	Yes
	Fertilizing tree density	2	Yes
	Area regenerated by assisted natural regeneration	2	No
	Level of carbon sequestration in the soil	1	No
	Measures/Actions of reintroduction of local biodiversity (local biodiversity that had disappeared)	1	No
	Share of salted soil on total land cultivated	1	No
	Number of local species that disappeared	1	No
Agronomy	Crop yield: meeting the household's food requirement through the production and/or sale of crop	3	Yes
	Breed improvement (through cross-breeding)	2	Yes
	Practices improving soil fertility in the long-term	1	Yes
	Level of soil fertility	1	
	Land area under assisted natural regeneration	1	No
	Fodder autonomy: quantity of fodder self-produced	1	No
	Conservation of fodder	1	No
	Silvicultural yield	1	No
Social	Farmer empowerment	3	Yes
	Reduction of conflicts related to roaming animals	2	Yes
	Security dimension: demotivation due to cattle and crop theft	2	Yes
	Increase of incomes	2	No
	Diet's nutritional quality	1	No
	Reinforcement of community solidarity	1	No
	Capacity reinforcement (access to formations, number of formation)	1	No
Economic	Production's added value (processing and valorisation of by-products or residues)	2	Yes
	Products preservation systems: fences (crop protection) and facilities to store and preserve the harvests	2	Yes
	Household's savings and local group saving system: informal loans opportunities (tontines)	2	Yes
	Self-production of inputs (share of fertiliser or manure produced and used at the farm)	2	No
	Level of autonomy for the farm production	1	No
	Distribution of the incomes from agricultural activities: portion destined to the women and to the young of the household	1	No
	Knowledge on agroecological practices (ability to pass on the knowledge, ...)	1	No
	Self-production of livestock food (share of self-harvested fodder consumed by the livestock compared to concentrate)	1	No
	Food security for the household	1	No



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