INALL exchange visit between Senegal, Burkina Faso and Tunisia

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1. Context

To support the implementation and development of the agroecological transition locally, the Agroecology Initiative (AEI) relies on multi-actor systems called Agroecological Living Landscapes (ALL see definition below). To share experiences and strengthen the capacities of ALL stakeholders, the AEI supports the establishment of exchange visits between ALLs, with the prospect of creating an ALL network called INALL.

The Agroecological Living Landscapes of the three countries, Senegal, Burkina Faso, and Tunisia, are all based in semi-arid regions and face similar agroecological constraints and opportunities. An exchange visit with stakeholders in the three countries would allow us to learn about new technologies and ALL management strategies. A particular interest is given to crop-livestock integration and the development of forage and milk value chains, which are key in Tunisia and Burkina Faso, as well as small-scale machinery in Tunisia and Senegal.

What is an Agroecological Living Landscape? A space in which a diverse set of actors (e.g. farmers, collectors, processors, consumers and institutions), agree to engage in the agroecological transition, based on a shared vision of a desirable future to co-design/experiment with new agroecological production practices and business models, and to foster the emergence of an enabling institutional environment and the behavioral changes necessary to achieve this desirable future…

Adapted from : WP1 Global Team Navarrete-Cruz A, Bergamini N, Triomphe B, 2023. What are Living Labs? Reading Note 1. Inititiaive on Agroecology, CGIAR

1.1. Participants:

Each of the three ALL participated with (5 participants from Burkina Faso ALL, 9 participants from Tunisia, 8 participants from Senegal ALL and 3 from Cirad) participants from different organizations and institutions like national researchers, CG centers, farmers, private actors or governmental or non-governmental organizations implicated in the ALL.

1.2. Objectives

- ✓ Facilitate exchanges among Burkina Faso, Senegal, and Tunisia stakeholders on opportunities and challenges related to forage production, milk value chains, and small-scale mechanization.
- ✓ Enable Burkina Faso and Tunisia stakeholders to visit the Senegalese Agroecological Living Landscape (ALL) in Fatick and share experiences on ALL management practices.
- ✓ Foster collaboration by bringing together scientists and stakeholders from the three countries to meet with the DyTAES (Dynamic for Agroecological Transition in Senegal).

1.3. Program

Meetings were held over 4 days, according to the schedule below (table 1).

Table 1: INALL 2024 program

Date		Location	Activity
November 17	Pm	Baobab Soleil	Welcoming participants from Burkina Faso and Tunisia
18 November	Am	Baobab Soleil	Departure to Fatick
	Pm	Fatick	meeting with DyTAEL (presentation of its operations and results, presentation of dynamics in Tunisia and Burkina Faso, debate)
November 19	Am	Niakhar	Field trip for the livestock day (milk production, forage crops, etc.)
	Pm		
November 20	Am	Ndiob	Field trip for the agroecological intensification day
	Pm		Traditional meal on-site field visit + discussion: Integration AE; Gardening; Agroforestry; Salt control
November 21	Am	Niakhar	Visit an artisan bakery using local cereals
	Pm	Dakar	Round table at the "Statue de la Renaissance" as part of CIRAD's 40th-anniversary celebrations on the relationship between the Living Lab and agroecology

			(feedback from the 3 countries involved in the agroecology initiative), 2 representatives per country to present + Eric Vall
November 22	Am	Dakar/ISRA-Bame	Meeting Researchers + DyTAES
	Pm	Dakar	
November 23			Participants return from Dakar to their home country

2. Agenda of the exchange visit

The Burkina Faso and Tunisia delegations were welcomed at Blaise Diagne airport on November 17, 2024, and then taken to the Baobab Soleil Hotel, where they spent the night. The exchange visit program effectively began on November 18. After briefly reviewing the agenda, the participants were driven to Fatick to the Malango Hotel for a 3-day stay from November 18 to 21, 2024.

The opening ceremony was attended by Madame Oumy Gueye, representing the Mayor of Fatick, who welcomed participants to Fatick. She expressed satisfaction in hosting Fatick these exchange visits between the ALL of Tunisia, Burkina Faso, and Senegal. Finally, she hoped all delegations would benefit from the three-day visits and exchanges.

Following the representative of the Mayor, Mr. Ibrahima Faye, elected representative, continued in the same vein with words of welcome to the participants in Fatick and to the Malango hotel, which means "*lucky charm*" in the local language.

Following these speeches, the provisional program was presented and the participants went round the table to introduce themselves and express their expectations for these three days of visits and exchanges in the Fatick department.

2.1. Indoor presentations

2.1.1. Presentation of Fatick department

To better understand the region hosting the participants, an overview of the socio-economic, environmental and agricultural situation in Fatick was presented. The presentation of Marc Piraux (Cirad) highlighted the region's opportunities and challenges. In particular, it addressed several key points, including the following:

- Geographical and social features

He pointed out that Senegal is divided into administrative districts comprising 14 regions, 45 departments and 117 arrondissements. The local authorities are made up of 45 departments and 557 communes. The city of Fatick, regional and departmental capital, occupies a strategic position as a crossroads linking Mali and Gambia. Crossed by the Sine Saloum delta, the region faces several ecological challenges, particularly saline upwelling.

- Agricultural economy and production systems.

In terms of agriculture, the department of Fatick is characterized by a predominance of rain-fed farming and agro-pastoralism, with 100% of households owning livestock. Principal crops include groundnuts and cereals, with some diversification into cash crops. Farms are generally small, varying between 1 and 2 hectares, and crop residues are widely used for animal feed and soil fertility improvement. Animal traction relies mainly on donkeys, horses and, in some cases, cattle. Soil fertilization is ensured by a varied use of fertilizers (chemical and organic), although some households use none at all.

- Environmental issues

The department faces several environmental challenges, including the impact of soil salinization on arable land, the disappearance of traditional fallows, centralized land management, and a predominance of agroecological practices adopted out of necessity, often linked to a lack of household-level financial resources.

- Demographics and education

The département's population is growing fast, with a high density of 105 inhabitants per km². The agricultural workforce is characterized by a high proportion of young people, representing 80% of the agricultural workforce. However, education levels remain low among farm households, with 90% of heads having an elementary education level or less.

2.1.2. Introducing Senegal's ALL (Fatick DytaEL)

In Senegal, the establishment of the ALL was based on an existing dynamic, the Dynamique pour une transition agroécologique locale (DytAEL) in Fatick, which was created in June 2022. DytaEL is aligned with the national Dynamique pour une transition agroécologique au Sénégal (DyTAES). DyTAES is a national network of producers' organizations, NGOs (Enda Pronat, AgriSud International), research institutions (Isra, Cira), elected representatives and businesses involved in raising awareness, supporting transitional territories and political dialogue with decision-makers.

As part of the territorialization of agroecology (AE), DytAEL has undertaken to integrate AE into communal development plans. A prospective study initiated this process as part of the Fair Sahel project, defining several scenarios. Based on the major issues facing the Fatick region - water salinity, declining soil fertility, organic input management and food sovereignty - a vision was defined for 2035: "Making the Fatick department a resilient territory in the face of agricultural challenges through the adoption of agroecological strategies".

The DytAEL's mission is to "co-construct with stakeholders a territory committed to agroecology by 2035". Its governance is based on an organized structure comprising a steering committee (Copil), a technical committee, a secretariat and a board of directors. A Charter of Commitment and Membership has been drawn up, with 25 member organizations signed up to date.

To raise awareness of the agroecological transition, DytAEL organizes community forums to inform and mobilize stakeholders. DytAEL interacts with DytAES on experience sharing, capacity-building support, communication support, etc.

Several recommendations are currently being implemented by the DytAEL, namely scaling up composting, building storage warehouses for agricultural produce in each commune, building the capacity of members, and promoting local produce.

There are also numerous challenges to be met. These include involving consumers, formalizing DytAEL, involving women and young people, and finding financing.

After this presentation, rich discussions took place based on questions of understanding and sharing experiences between the different ALLs.

2.1.3. Presentation of Tunisia's ALL

The Tunisian approach to setting up the program differed from those adopted in Senegal and Burkina Faso, which built on existing dynamics. It emerged from a process of strategic visioning on a territorial scale within the framework of the Agroecology Initiative.

This ALL brings together a wide range of actors under the impetus of the International Center for Agricultural Research in the Dry Areas (ICARDA) and Tunisia's Institution for Agricultural Research and Higher Education (IRESA). It mobilizes research partners such as INRAT, INRGREF and IO, extension services (AVFA, OEP) and NGOs such as LACTE and ATAE. These players work closely with national and regional public policies and producer organizations, making up the first circle of stakeholders.

Several innovations have been introduced for ALL in Tunisia:

- Introduction of the "sulla" plant, a melliferous plant for forage and honey production
- Use of Margines (olive by-product) for soil fertilization
- Forage crop association: legumes and grasses
- Intercropping of forages between olive trees
- New Vetch variety
- Biochar and compost as organic fertilizer in olive production systems
- Use of rhizobia for legumes
- Carob tree nursery for agroforestry systems
- Small scale machinery like mobile seed cleaners, choppers, feed pelletizers and grass mowers

After this presentation, rich discussions took place based on questions of understanding and sharing experiences between the different ALLs.

2.1.4. Presentation of Burkina Faso's ALL

In the case of Burkina Faso, the ALL relied on the Dairy Innovation Platform (DIP) in Bobo-Dioulasso, set up in 2020. The AE Initiative worked to broaden the DIP's partners to include consumers (Consumer League of Burkina Faso), microfinance structures, local politicians (Town hall, regional delegation, etc.), as well as other research structures, the private sector, private agricultural training and consultancy firms, and so on.

Within the framework of AEI, several agroecological innovations have been co-designed and implemented with ALL stakeholders. These include:

- Fodder Demo-plot : their objective is to test on-farm, i.e. in real conditions (soil, labor constraints, weeds pressure, etc.) the potential of fodder crops to increase biomass production and thus improve feeding self-sufficiency to feed the dairy herd throughout the year especially in the dry season. A framework based on mother-baby trials allowed the demonstration of agronomic performances of these fodder crops and the dissemination of seeds to other farmers, releasing a key constraint in the region (seed access).
- Managing biomass at farm scale: The CoProdScope tool was used in an interview with farmers to assess their biomass self-sufficiency. Indeed, the tool allows the calculation balance on crop residues produced by the cropping systems and the crop residue needed to feed the cattle. Also, the tool allows the calculation of manure needed to increase soil fertility, and if manure produced by the herd is enough, the herd produces enough manure.
- Co-design dairy cattle ration with Jabnde : the tool Jabnde, a simplified cattle ration simulator with locally relevant data (fodder, livestock characteristics, etc.) was used to simulate the milk production, and economic viability from distinct cattle feed strategies.
- Co-designing manure pit: a monthly survey has been implemented to evaluate farmers use of the manure pits (biomass added, collected), along with chemical analysis of the compost in the manure pit to analyze its content in MO, C, N, P, K, etc.

2.2. Visits and sharing experiences

2.2.1. Center for the Advancement and Modernization of Goat Breeding (CIMEL) in Niakhar (19/11/2024)

A brief history of goat breeding in Fatick

In 2008, the Fatick Regional Council identified the goat industry as a strategic local development lever through the Program of Improvement of the Caprine Sector (PAFC). This program considers goat breeding an essential pillar of the regional economy. This initiative has been reinforced by Fatick's Integrated Development Program (PDIF), which, in its approach to supporting the sector, has joined this vision by promoting synergy between local players and relying on the Regional Council to guarantee a solid institutional base.

Since its inception, the program has aimed to transform goat farming, historically perceived as a social activity, into a genuine economic sector. This involves transitioning from traditional goat farming to an integrated semi-stable model, promoting the valorization of milk and attributing a commercial function to goat farming. Primary objectives include: i) Improving food security through the self-consumption of goat products. Ii) Increase the income of farmers, mostly women, through the sale of surpluses, iii) Promote the integration of agriculture and goat farming to strengthen local production systems.

The program evolved from a departmental approach, with collective goat farms and processing units, to a village scale. However, these approaches encountered difficulties with organizational and collective participation. In response, a new model was developed in 2018, focusing on improved individual goat houses (equipped with feeders, separate spaces according to the age of the animals, and milking parlors) and planting fodder trees on cultivated plots. This model is currently being tested on two pilot farms.

At the same time, the program supports the valorization of goat products through training in the processing of milk into cheese, yoghurt and soap, technical missions, and organizational support for processing units. Awareness campaigns and animation activities are organized in villages to promote the Fatick Regional Association of Goat Breeders. In addition, training and management support are provided to some breeders to structure the sector long-term.

The Niakhar Center for the Advancement and Modernization of Goat Breeding (CIMEL) has been set up to reinforce the dynamic already in place in the region. Currently, the pilot phase focuses on cross-breeding and stabilization of goats from crosses between the local breed and exotic dairy breeds to improve the milk production of the region's goats. The Center's mission is to develop and disseminate modern goat breeding techniques while supporting the empowerment of women who are particularly active in chicken and goat breeding. This project aims to enhance their role and strengthen their economic and social capacities.

Alongside the Center, participants visited a unit that processes goat's milk into dairy products such as yogurt, curd, cheese and soap.

After these two visits, a discussion break was organized to give participants a better understanding of how the Center works regarding goat milk production and processing. The goats milked at the Center produce an average of 0.5 liters of milk daily, thanks to a diet of natural herbs from the Center's 5 hectares and food supplements.

The processing unit collects milk from surrounding farms and transforms it into various dairy products, such as curds, yogurt, cheese and soap.

This exchange session was enriched by the sharing of experiences by participants in Burkina Faso's multi-stakeholder dairy platform, offering new and complementary perspectives.

2.2.2. Visit to an agro-pastoral farm in the village of Podom 19/11/2024

After a break for exchanges, the visit continued to the village of Podom, some 7 km from Niahkar, to discover an integrated agro-pastoral farm belonging to Mr. Aliou Diouf. The farm combines market garden and cereal crops, fertilized with organic manure, and benefits from a large-diameter well for off-season irrigation. Mr Diouf raises exotic dairy cows for milk production.

An exchange session was organized on-site to understand better the activities carried out and share experiences with other countries. For example, enriching discussions took place on artificial insemination, with contributions from delegations in Burkina Faso and Tunisia, which have advanced expertise in this field. Discussions also covered the production and use of organic manure to fertilize crops, and the integration of trees into farming systems. This farm is a perfect example of the promotion of integrated agroecological practices.

2.2.3. Visit to the agroforestry farm (assisted natural regeneration) and market gardening perimeter in the village of Ndiob (20/11/2024)

The commune of Ndiob is a pioneering village for agroecological practices in Senegal. It is one of the Fair Sahel project sites that has benefited from the introduction of agroecological techniques.

In the village of Ndiob, the commune's mayor warmly welcomed the delegation. After protocol greetings, the participants visited Mr. Mbaye Diop's agroforestry farm. This site is a remarkable example of where assisted natural regeneration (ANR) has been implemented for many years.

Mr. Mbaye Diop was introduced to the importance of protecting *Acacia albida* by his father at an early age, and he has made managing his farm a priority. He systematically takes care to preserve the young plants, while maintaining adequate spacing and managing density to maximize agricultural productivity in this agroforestry system. Even as a child, he observed that crops grown close to *Acacia albida* trees were far more productive than those grown outside.

This tree species has a unique characteristic: it loses its leaves during the rainy season, allowing light to reach the crops below, and turns green again in the dry season. This makes it a valuable agricultural resource. In the dry season, its leaves provide fodder for livestock, while in the growing season, they fall and decompose on the ground, increasing the fertility of the soil under cultivation.

The approach adopted by Mr Mbaye Diop successfully demonstrates how integrating *Acacia albida* into agroforestry systems can combine agricultural productivity and ecological preservation while strengthening the resilience of rural farms in the face of climate change.

Mr Mbaye Diop's farm includes fish farming, market gardening and livestock breeding, with a plot of Maralfafa (*Penisetum purpureum*) for cattle feed.

The delegation stopped at the Ndiob market garden, a pilot project focused on household food security. The project features demonstrations of market garden production while working to preserve and multiply the region's endangered tree and shrub species.

Following these visits, a discussion session was held at the Ndiob town hall to take stock of field observations and continue sharing experiences between the three ALLs.

After these rich exchanges of experience, the delegation enjoyed a recreational pirogue ride across Foundiougne's Léopold Sédar Senghor bridge, exploring the Sine Saloum arm of the river and the bolongs (mangrove mudflats).

2.2.4. Visit to the Niakhar artisan bakery (21/11/2024)

The morning of November 21 was devoted to a visit to the Niakhar artisan bakery. This bakery offers breads made from local cereals (corn, millet, sorghum), with variations on Moringa breads.

2.2.5. Participation in the round table

To celebrate the 40th anniversary of CIRAD, the 50th anniversary of ISRA and the 80th anniversary of IRD, a themed round table was held on Thursday, November 21, 2024 in the Agora space at the monument of the African renaissance in Dakar. This Livings labs round table saw the participation of representatives from the Livings landscapes of Senegal, Tunisia and Burkina Faso on the theme: "Agroecological Living Labs: a cross-case study of Burkina Faso, Tunisia and Senegal", organized by Initiative agroécologie One CGIAR. This round table, open to the public, was moderated by Claire Cedran from CIRAD.

Participants were invited to share their experiences on the modalities, challenges and recommendations for setting up Living Labs. In turn, participants shared their experiences of these multi-stakeholder arrangements, enabling a diverse set of actors (e.g., producers, traders, processors, consumers and institutions) - who are part of food systems and territorial landscapes - to exchange views and knowledge and co-develop and adapt various types of agroecological innovations.

2.2.6. Meeting with the representative of DYTAES at ISRA (22/11/2024)

The Dynamique pour une Transition AgroEcologique au Sénégal (DyTAES) aims to "promote agroecological transition in Senegal through research, advocacy, awareness-raising, experience-sharing and support for territories in transition" (www.dytaes.sn). To achieve this goal, it promotes awareness-raising among the masses, collaborative research with stakeholders, and political dialogue with the Senegalese government for public development policies, particularly agricultural ones, that are more sensitive to agroecology. Today, DyTAES comprises 80 organizations divided into 7 categories: national platforms, farmers' organizations and social movements, national and international NGOs, private sector players, local authorities, public players, and research and training institutions.

In Senegal, the IAE is developed in the department of Fatick, in a local dynamic called DYTAEL Dynamique pour une Transition AgroEcologique locale. These local dynamics, initiated in 2021, result from a process of territorialization of DYTAES, created in May 2019 by various organizations and platforms committed to promoting agroecology in Senegal.

There are currently 11 DyTAELs (Tambacounda, Podor, Bignona, Fatick, Thiès, Kaolack, Mboro, Foundiougne, Mbour, Vélingara and Linguère), spread across the different agro-ecological zones of Senegal, and at very different stages of development and structuring: some are very well structured, and have been in place since 2021, while others are just emerging. DyTAEL was created on the initiative of local stakeholders. The current objective is to work towards the autonomy of the various DyTAELs, while maintaining a constructive relationship with the DyTAES.

DYTAES is the result of a whole trajectory that began in the eighties and was consolidated in 2015 by the FAO's recognition of Senegal as an agroecology pilot country, and then in 2019 by a study into the benefits of creating a multi-stakeholder dynamic, capable of federating the then dispersed dynamics and shouting out a synergy between them, a collation being more audible to public authorities. The year 2019 also offered a window of opportunity, with Macky Sall's government, opening a dialogue on agroecology. DYTAES is orchestrated by the NGO ENDA Pronat.

The discussion then turned to several points:

- the importance of the caravans, where the DyTAES set out to meet rural people in all of Senegal's eco-geographical zones to collect problems and policy recommendations, which can then be used to guide contribution documents.

- the institutionalization of agroecology within the state, particularly the need to pass a law to avoid dependence on political changes, hence the current reflection on developing a national strategy.

- the necessity or not to build a legal structure for these multi-stakeholder schemes.

Afterward, the 2 other countries then presented the progress made in structuring networks around agroecology at the national level: construction of a recent network of 8 NGOs in Tunisia to promote the agroecological transition, and an agroecology day in Burkina Faso, where the population is beginning to understand the benefits of this approach.

3. Conclusion and evaluation

According to the participants, the INALL exchange visit to Senegal has generally met their expectations. The participants from the three ALLs (Tunisia, Burkina Faso, and Senegal) were particularly impressed by the organization of the visit in terms of hospitality, mobilization of various partners, and especially the exchanges and sharing of knowledge and experiences on agroecology among the three countries. Over five days, these intensive exchanges enabled participants to share enriching experiences, discuss best practices and common challenges, and collectively reflect on innovative solutions for local development. These meetings between the ALLs of the three countries certainly mark the start of a lasting collaboration between the various actors, strengthening established links, encouraging the pooling of skills and fostering a reciprocal learning dynamic.

During the exchange visit, specific technological innovations that might be interesting to consider in Tunisia and Burkina Faso were presented and discussed, such as Assisted Natural Regeneration (ANR), Zai, and Moringa flour for baking bread, the management of *Acacia Albida* in agroforestry systems, and soap production with goat milk.

Besides, some organizational innovations have equal potential to be promoted in these countries, like subsidizing organic fertilizer and contract farming for schools and public institutions (Mairie). Dytael's governance dynamics and its multiscalar articulation with Dytaes also attracted attention. The structure and governance of DyTAES and DyTAEL are also inspiring in terms of organization for Tunisian and Burkina Faso participants. All the reflections on transition processes were much appreciated.

A WhatsApp group has been created to maintain these synergies and ensure ongoing communication. This channel will enable members to stay connected, regularly share their experiences, disseminate information on their achievements, and co-construct projects for the future.

4. Recommendations

- ✓ Organize an exchange visit in Tunisia and Burkina Faso to deepen exchanges and sharing experiences.

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