

Identifying and addressing sustainability hotspots in fruit and vegetable value chains: A participatory assessment from the Niayes area in Senegal

Aicha Mechri^{1*}, Andre A. Diatta², Katja Kehlenbeck¹, Silke Stöber¹

¹Humboldt Universität zu Berlin, Centre for Rural Development, Germany

²Université Gaston-Berger de Saint-Louis, Dépt. des Productions Végétales et Agronomie, Senegal

BACKGROUND

Senegal is pioneering an agroecological transition through movements led by scientists and civil society actors. These movements are calling for agroecology to be placed at the centre of policy-making for agri-food systems to steer them towards sustainability. However, agri-food value chains in the Niayes area, one of Senegal's fruit and vegetable belts, are facing challenges. These include depleting groundwater reserves, increasing soil and water salinity, dominance of monoculture cropping systems, and overuse of synthetic chemical fertilisers and pesticides, which pose threats to human health, environment and biodiversity.

Objective: To detect most pressing challenges along the value chains and identify potential solutions for tailoring interventions.

CONCLUSION

- ❖ Hotspot analysis method useful for identifying areas for value chain interventions.
- ❖ Value chain actors encouraged for dialogue on sustainability perspectives and collaboration for developing solutions.
- ❖ Hotspot analysis method could still be improved and needs to be adapted to local contexts.



METHODS

- Three farmer groups of the AfriNutriForest project in NW Senegal.
- Three value chains selected in a participatory approach: onion, mango, tomato.
- Selection criteria: relevance for production challenges, income generation, and already existing production knowledge.
- Used method: 'participatory hotspot analysis' (Fig. 1): identify most pressing economic, social and environmental sustainability issues (based on agroecological principles/elements^{1, 2}).
- Data collection through focus group discussions with farmers (Fig. 2) and key informant interviews of other value chain actors, e.g. retailers (Fig. 3).
- Identifying, ranking and scoring challenges to identifying specific hotspots for each of the selected value chains (Fig. 4, 5).
- Final step: Workshop with stakeholders (incl. government, NGOs, local communities) for result validation (Fig. 6).

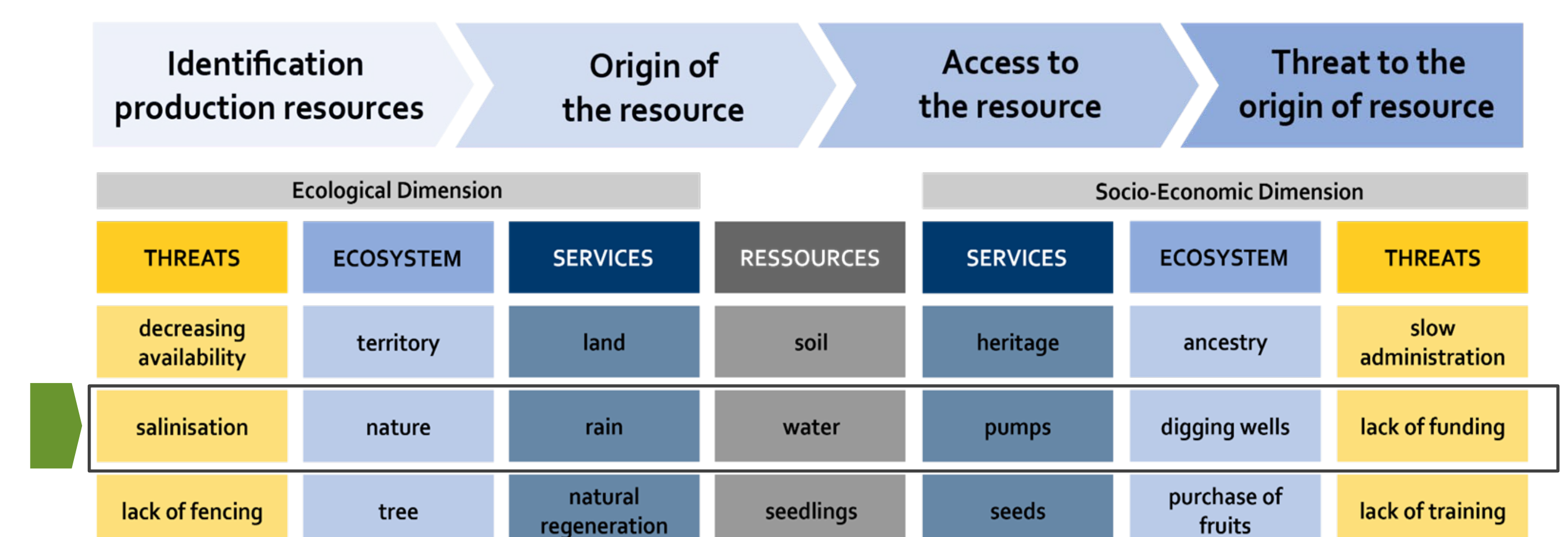


Figure 1: Steps for identifying hotspots within the 3 dimensions of sustainability.



Figure 2: Focus group discussion with farmers.



Figure 3: Interview of a processor.

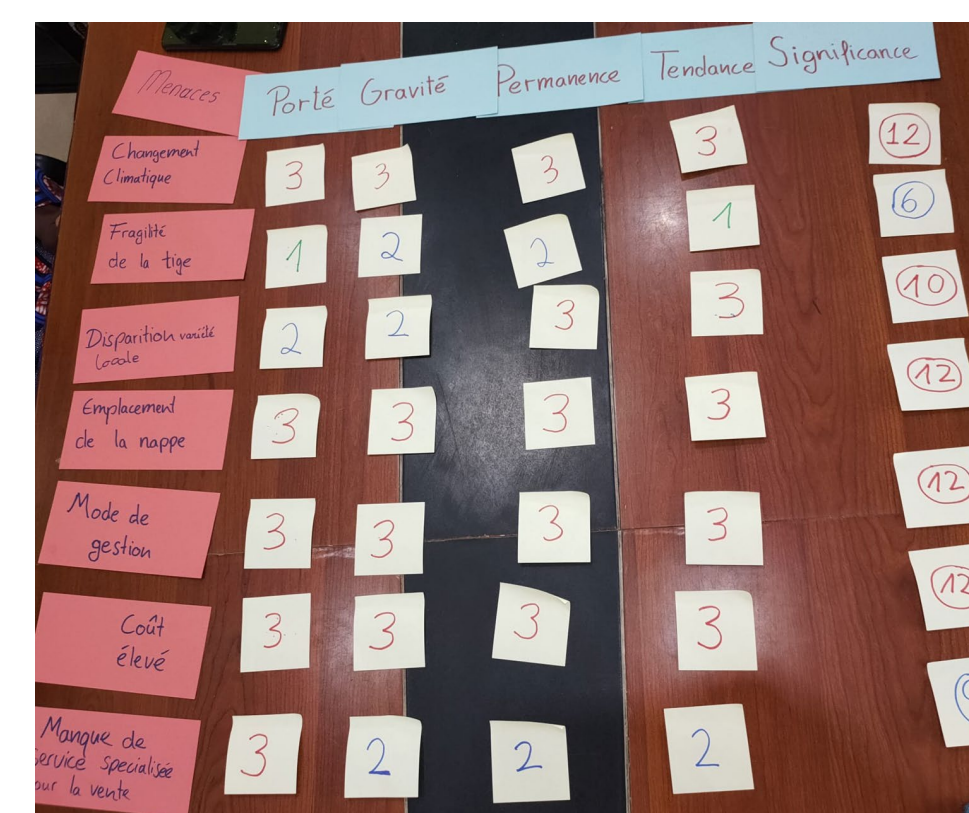


Figure 4: Ranking exercise.



Figure 5: Validation of scoring.



Figure 6: Final stakeholder workshop.

RESULTS

- Total of hotspots: 33 for mango (mostly environmental issues) and tomato (mostly economic issues), 26 for onion (Fig. 7).
- Some hotspots are common to all three value chains and some others are specific for certain value chains or stages (Fig. 8).
- Several solutions to most relevant hotspots identified and feasibility discussed (Table 1).

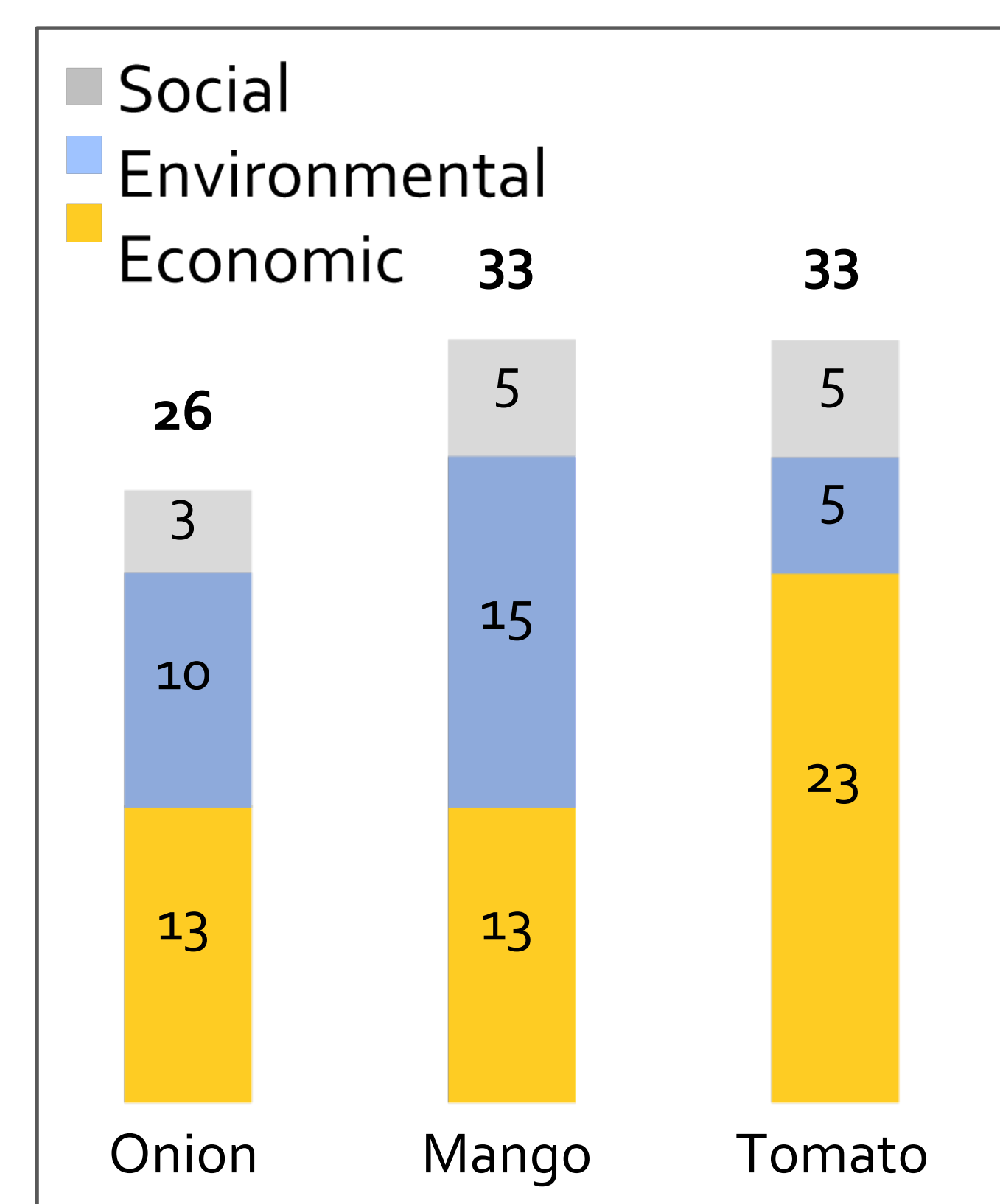


Figure 7: Total of sustainability hotspots per value chain and number of hotspots per sustainability dimension.

Figure 8: Selected hotspots along the tomato, onion and mango value chains according to farmers and other value chain actors.



Figure 9: Frequent hotspot of the mango value chain: fruit fly infestation.

	Selected Hotspots	Proposed Solutions by Interviewees
Input	1. Unavailability of seeds 2. Poor seed quality	2. Seed certification Trustful seller-client relations
Production	1. Lack of funds 2. Poor soil quality 3. Dependency on husband 4. Trespassing livestock 5. Fruit flies	1. Farmer organizations, savings, authority support 2. Organic fertiliser, fallow land, legume trees, capacity building 3. Independent income 4. Fences, fines 5. Natural traps
Processing	1. Lack and cost of packaging material 2. Poor fruit quality	1. Producer-transformer partnerships, authorization for own packaging, training, direct negotiation with packaging companies, local packaging factory
Transport	1. Lack of infrastructure 2. Competition	1. Road improvements 2. Fixed prices
Commercialisation	1. Lack of storage facilities, high purchase prices 2. Lack of transport packaging 3. Credit period	3. Target-group specific credit conditions
Export	1. Competition from multinational companies 2. Certification	1. Access to credit for smallscale farmers 2. Decentralisation of the certification offices

References:
1. FAO (2018). The 10 elements of agroecology: guiding the transition to sustainable food and agricultural systems.
2. HLPE (2019). Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition.
3. Droppelmann & Müller (2023). Making sustainability analysis more participatory – field experiences from Zambia.

Table 1: Potential solutions for selected hotspots of the three studied value chains with symbols for their feasibility (✓ possible; △ challenging).

	Onion	Mango	Tomato
Seeds/Varieties	Regulation	✓ Resistant varieties	△ Local seed conservation
Water/Irrigation	△ Desalination	△ Wells, pumps	✓ Drip/laser irrigation
Fertiliser/Soil	△ Manure	✓ Organic, agroforestry	△ Local fertiliser
Storage/Processing	△ Cold storage	△ Cold chain	✓ On-farm drying
Market/Finance	△ Credit, regulation	△ Export, standards	△ Investment, coordination