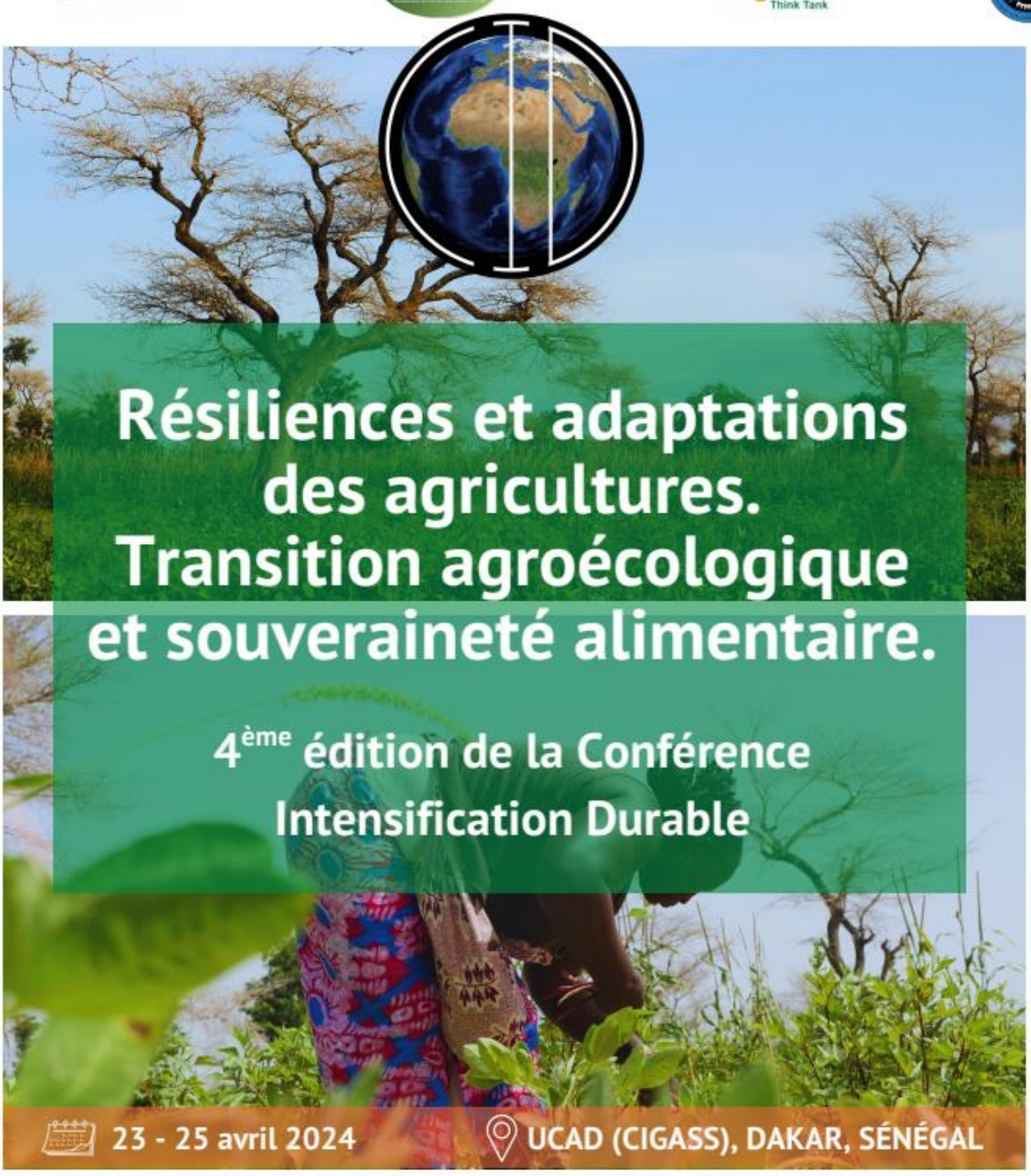

Résiliences et adaptations des agricultures. Transition agroécologique et souveraineté alimentaire.

4ème édition de la Conférence Intensification Durable

23 - 25 avril 2024

UCAD (CIGASS), DAKAR, SÉNÉGAL

S2-16

Poster

Multicriteria assessment accounting for farmers' priorities and soil health: a framework applied to agroecology in the Groundnut basin of Senegal

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In the groundnut basin of Senegal, annual cropping systems have low productivity, partly due to poor soil health and limited opportunities for farmers to improve it. This issue consistently limits farmer's incomes and food security. Soil health is mainly threatened by soil erosion, an increase in exported biomass compare to organic restitutions, phosphorus deficiency, and the simplification of cropping systems to millet/groundnut rotation. Agro-ecological intensification may reconcile productivity and soil health improvement. However, the practice may generate trade-offs between long-term soil health benefits and farmers' short-term income and food security objectives. The objective of the study was to develop a multidimensional framework able of addressing three of the five major methodological challenges of agro-ecological evaluation. This includes adapting to the specificities of local agroecosystems, integrating farmers' priorities, and incorporating more soil characteristics and locally relevant indicators to evaluate trade-offs at the field and farm levels. The framework was incrementally co-designed in 3 steps. A first version (F1) included 21 indicators across four dimensions (social, environmental, economic, and agronomic). These indicators were selected based on a literature review and a vote by 15 experts using 6 criteria: relevance to sustainability issues in the Sahel, scientific relevance, feasibility, usefulness and clarity, sensitivity and interpretability. Secondly, F1 was adapted to the local context by consulting local researchers and using relevant bibliography (F2) and tested in an on-farm experiment with 17 farmers who implemented various agro-ecological practices (e.g., cereal-legume combinations or intercropping with two legume species). Finally, F2 was adapted to better include farmers' preference for indicators using farm surveys and co-assessment workshops (F3). Compared to F2, F3 had 10 additional indicators, 5 modifications of indicators and 2 exclusions of indicators. The added indicators included macrofauna diversity, water infiltration rate, contribution of the cropping systems to fodder self-sufficiency, and farmers' perception of risk in case of price and climate hazards.
The F3 final framework consisted of 28 indicators covering the two levels of analysis: cropping and farm systems. Another result is the readjustment of the experimental design through participatory reflection and literature analysis, with a focus on millet-cowpea intercropping (two modalities of intercropping and three fertilization methods). An application of the framework will provide robust data on on-farm performance of agroecology and the trade-offs, synergies and constraints generated at farm level.

Mots clés : agroecology; assessment; criteria; millet-cowpea