

# Complex systems, simple solutions?

## Evaluating technologies for sustainable intensification in Northern Ghana

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### Key messages

- ✓ Investigating inter- and intra-household differences provides **new insights** on technology adoption
- ✓ **High investment costs incapacitate** low resource endowed (LRE) households (HHs) to reach more profitable farm configurations
- ✓ Within HHs: **Women were more positive** than men; while there was a **greater match of model results with the male perspective**

### Objectives and approach

Farming systems are diverse and not all technologies are equally suitable for each farm(er). **To better understand the individual suitability** we systematically visited farm HHs in Northern Ghana. We used **typologies, whole-farm modelling** (n=9) and a **weighted scoring technique** to quantify differences in views and benefits among and within local smallholder farms.

### Key results

Farm HHs were classified along a **gradient of resource endowment** (LRE, MRE and HRE). The model assessment projects **LRE HHs to benefit most** (%) from the technology packages, provided that investment costs are procured. MRE HHs were most and HRE HHs least positive about the AR packages. Farmers reported to **adopt techniques rather than technologies**. **Broadly adopted techniques** include **row planting**, techniques and timing for **fertilizer application**, **crop spacing** and the use of **green manures**.

### Significance and scaling potential

A better understanding of **farm and farmer diversity** allows **efficient targeting** and a **nuanced impact assessment** of technologies (technical) and techniques (managerial). The approach is useful for **development projects and businesses** that want to **test or promote new technologies or techniques** among **smallholder farmers**.

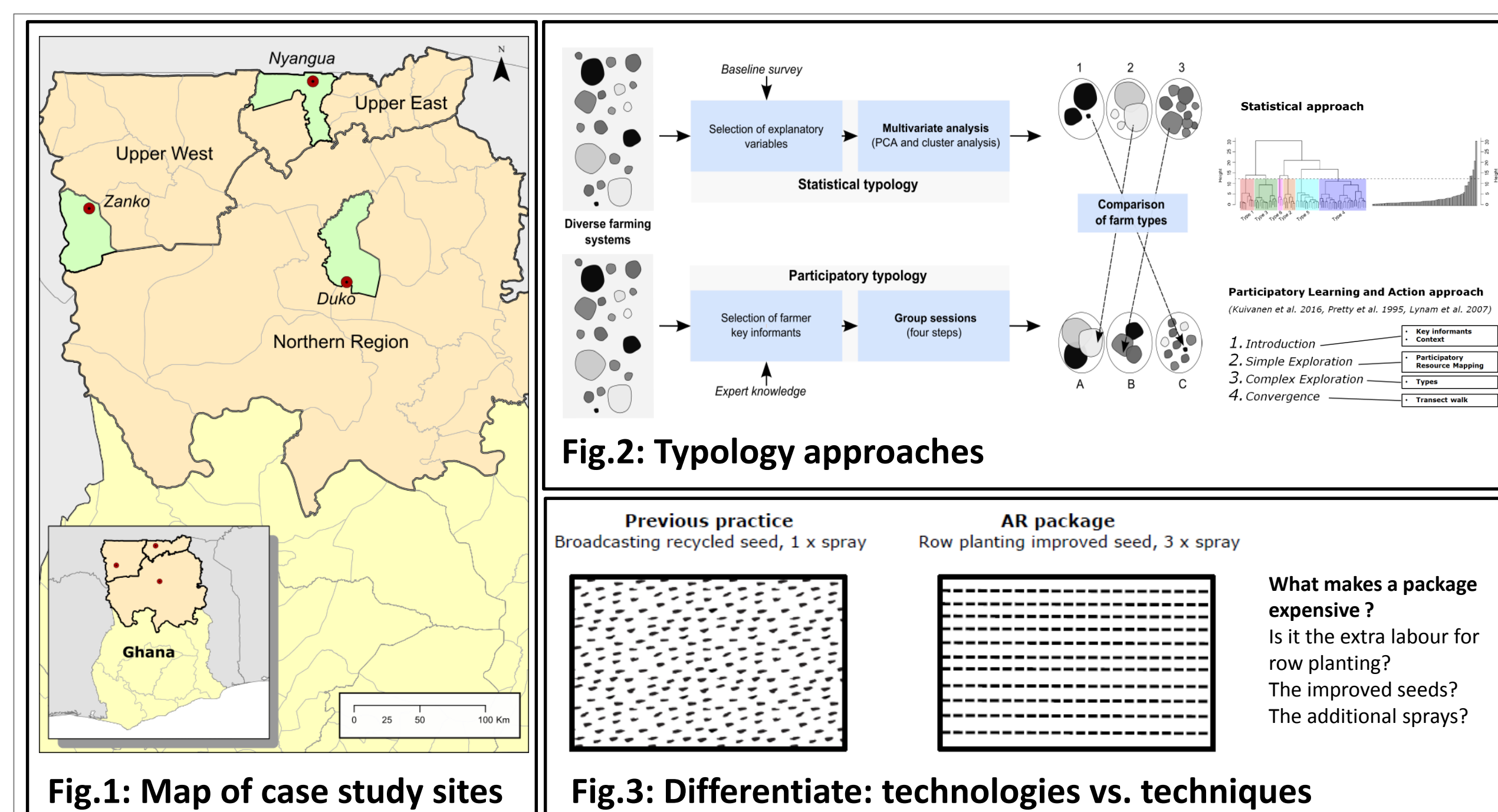


Fig.1: Map of case study sites

Fig.2: Typology approaches

Fig.3: Differentiate: technologies vs. techniques

Table 1: Africa RISING (AR) technology packages (2015/2016)

AR Technologies at Baby Trial Stage	Upscaled AR Technologies
<b>P1: Optimized Fertilizer Application on Maize</b>	<b>P4: Maize-Legume Rotations</b>
<b>P2: Optimized Spraying Regimes on Cowpea</b>	<b>P5: Maize-Legume Strip Cropping</b>
<b>P3: Integrated Soil Fertility Management on Soybeans</b>	

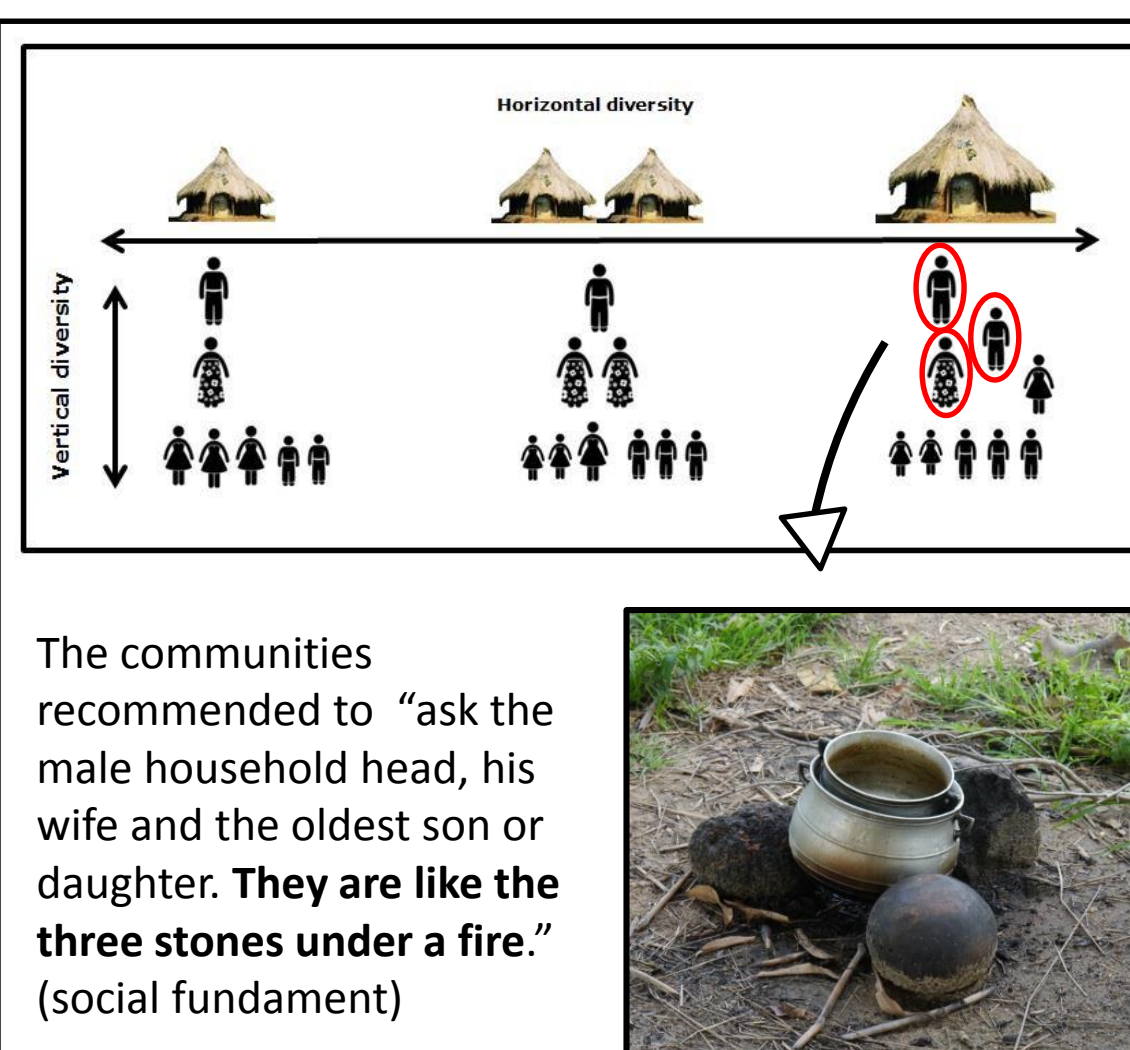


Fig. 4: Inter and intra-household diversity

Table 2: Weighted scoring technique for an evaluation by individual HH members

Africa RISING technology	100 = very good, 0 = slightly negative, 0 = neutral compared to other techs +1 = slightly positive and +10 = excellent
Most important on-farm practices for 2017	
Do not require	
Low importance	
Medium importance	
High importance	
1. Fertilizer use	
2. Crop rotation	
3. Soil fertility	
4. Crop spacing	
5. Maize-legume rotation	
6. Strip cropping	
7. Row planting	
8. Green manure	
9. Crop rotation	
10. Crop spacing	
11. Maize-legume rotation	
12. Strip cropping	
13. Row planting	
14. Green manure	
15. Crop rotation	
16. Crop spacing	
17. Maize-legume rotation	
18. Strip cropping	
19. Row planting	
20. Green manure	

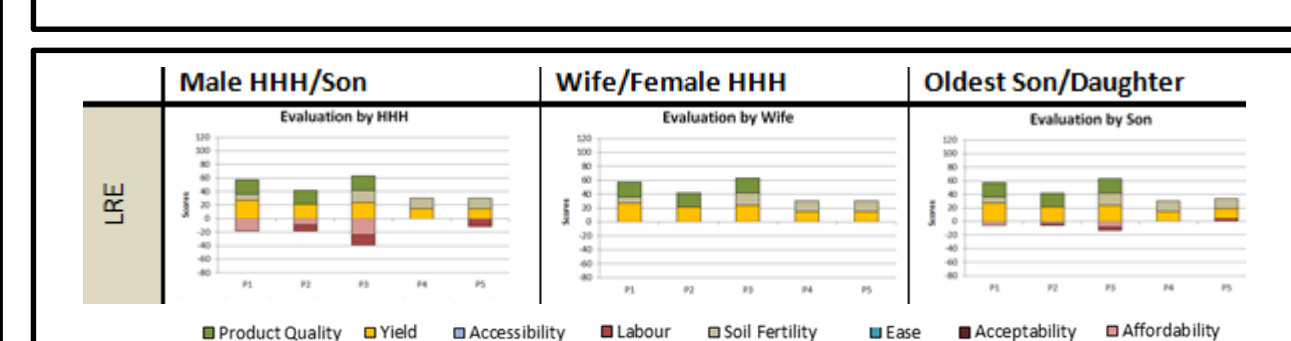


Fig. 5: Results of scoring (LRE, Duko)

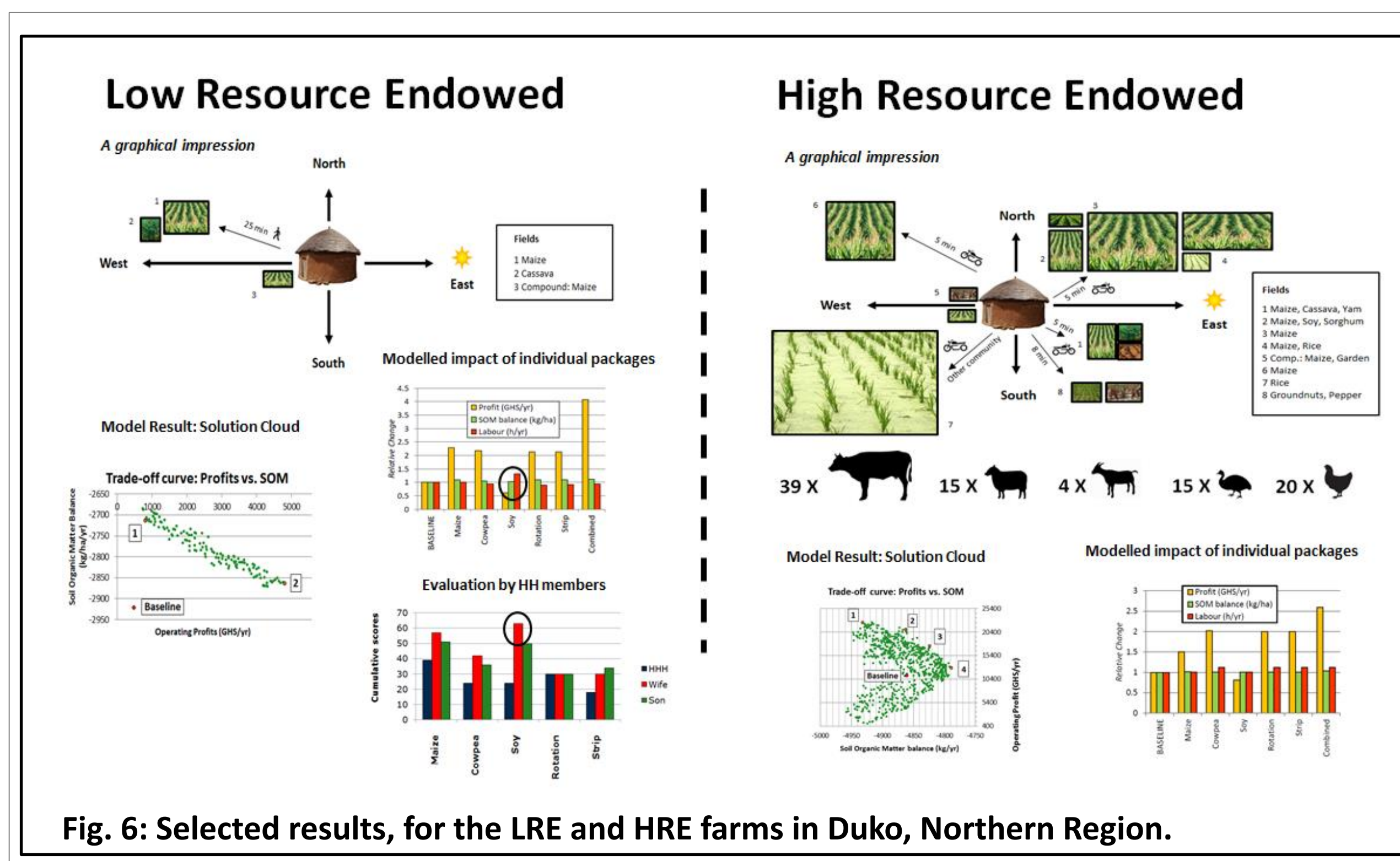


Fig. 6: Selected results, for the LRE and HRE farms in Duko, Northern Region.