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Transitions



Development of forage production through agroforestry and effects on farming systems in Northwest Vietnam

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Session 7 : Agroecology and Sustainable Food System Sub-session 4 : Environment, Climate change and Adaptation

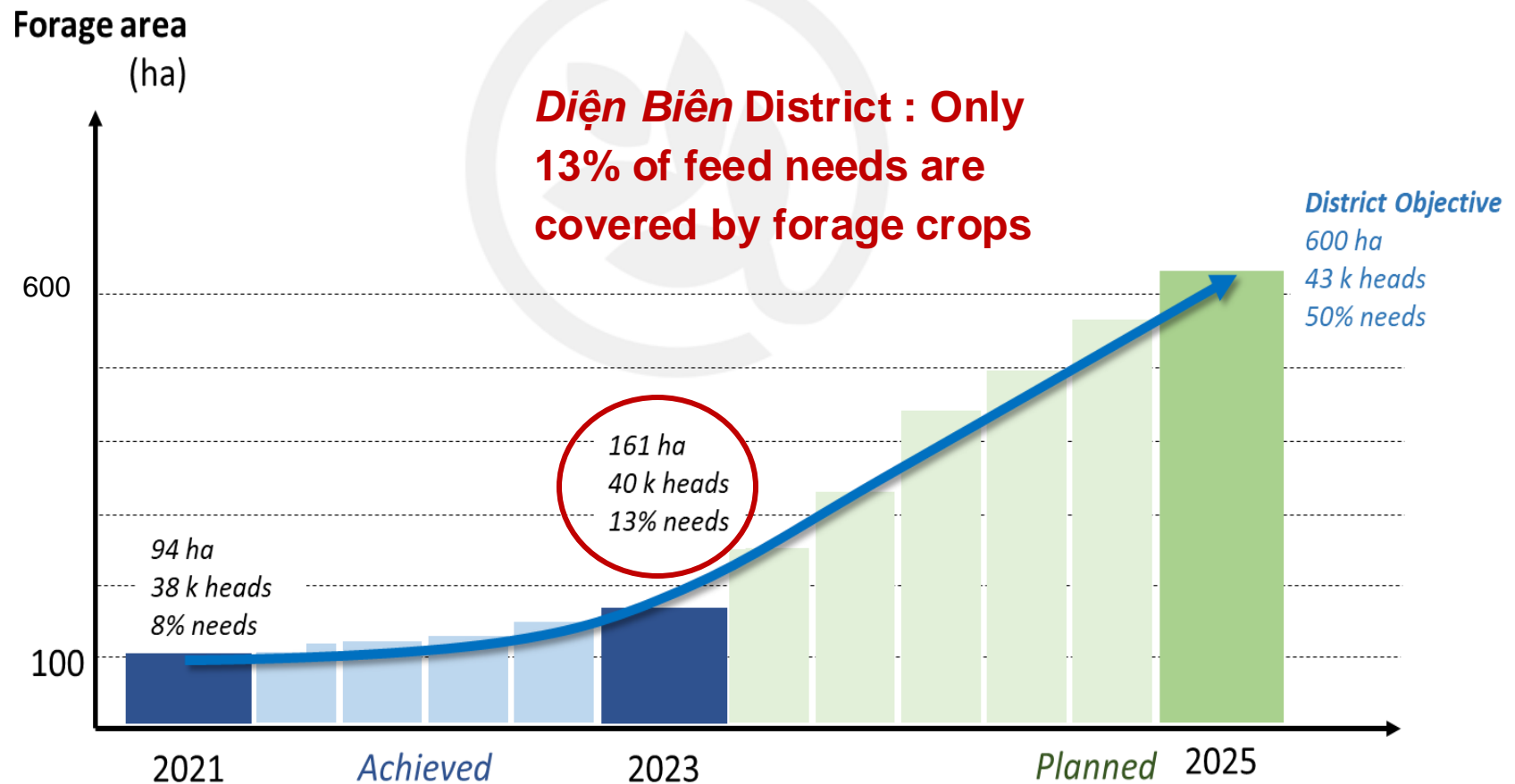
Context

Global changes in the Vietnamese agricultural production systems

Northwest Vietnam

Local
strategies

- ✓ Livestock farming development
- ✓ Slope crops → high value-added crops
- ✓ Forest protection

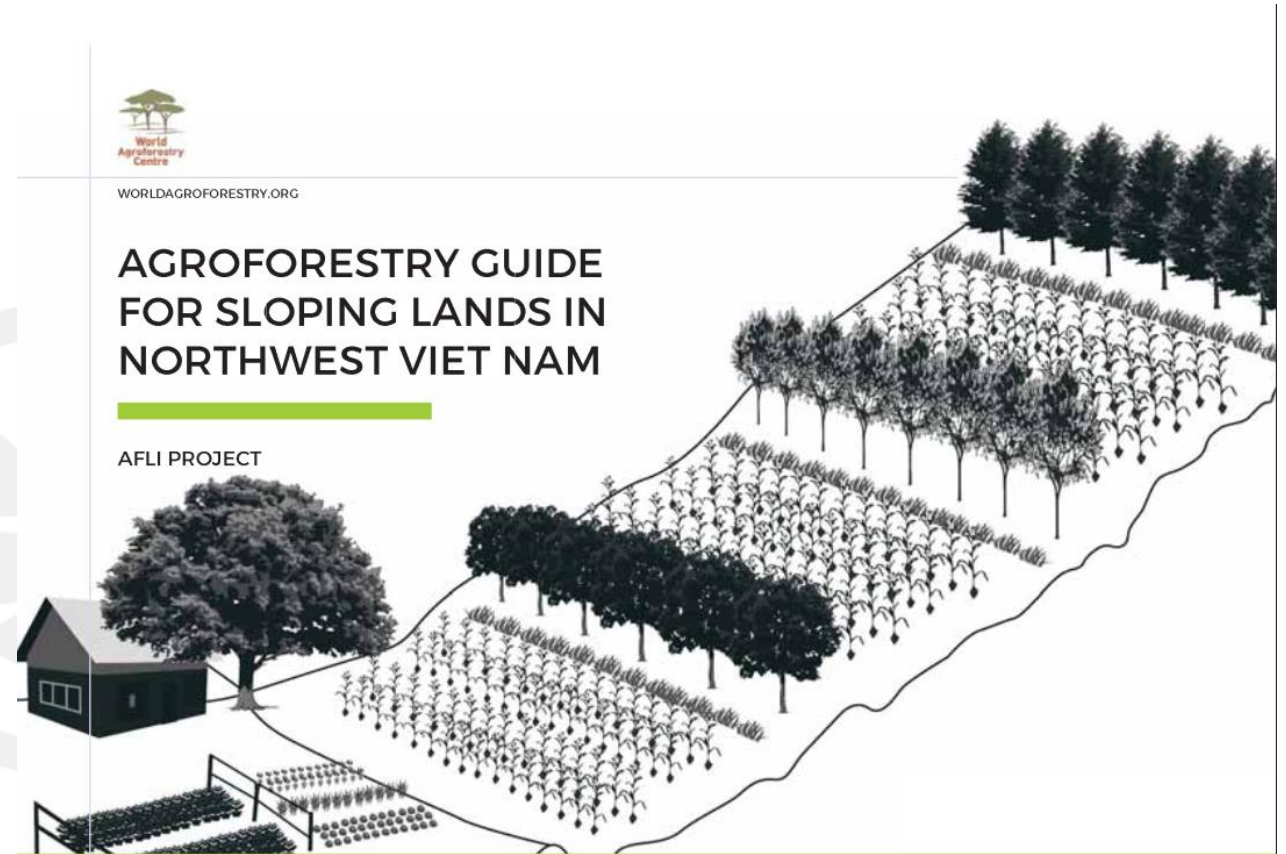


Trends in forage production and coverage of animal needs in *Diện Biên* District, current situation and future prospects (Blanchard, 2024)

Context

What is agroforestry ?

Agricultural practices that combine trees with agricultural crops and/or livestock on the same plot of land.



La et al., 2016. Agroforestry guide for sloping land in Northwest Viet Nam.

→ Prevent soil erosion, benefit soil health, diversify production

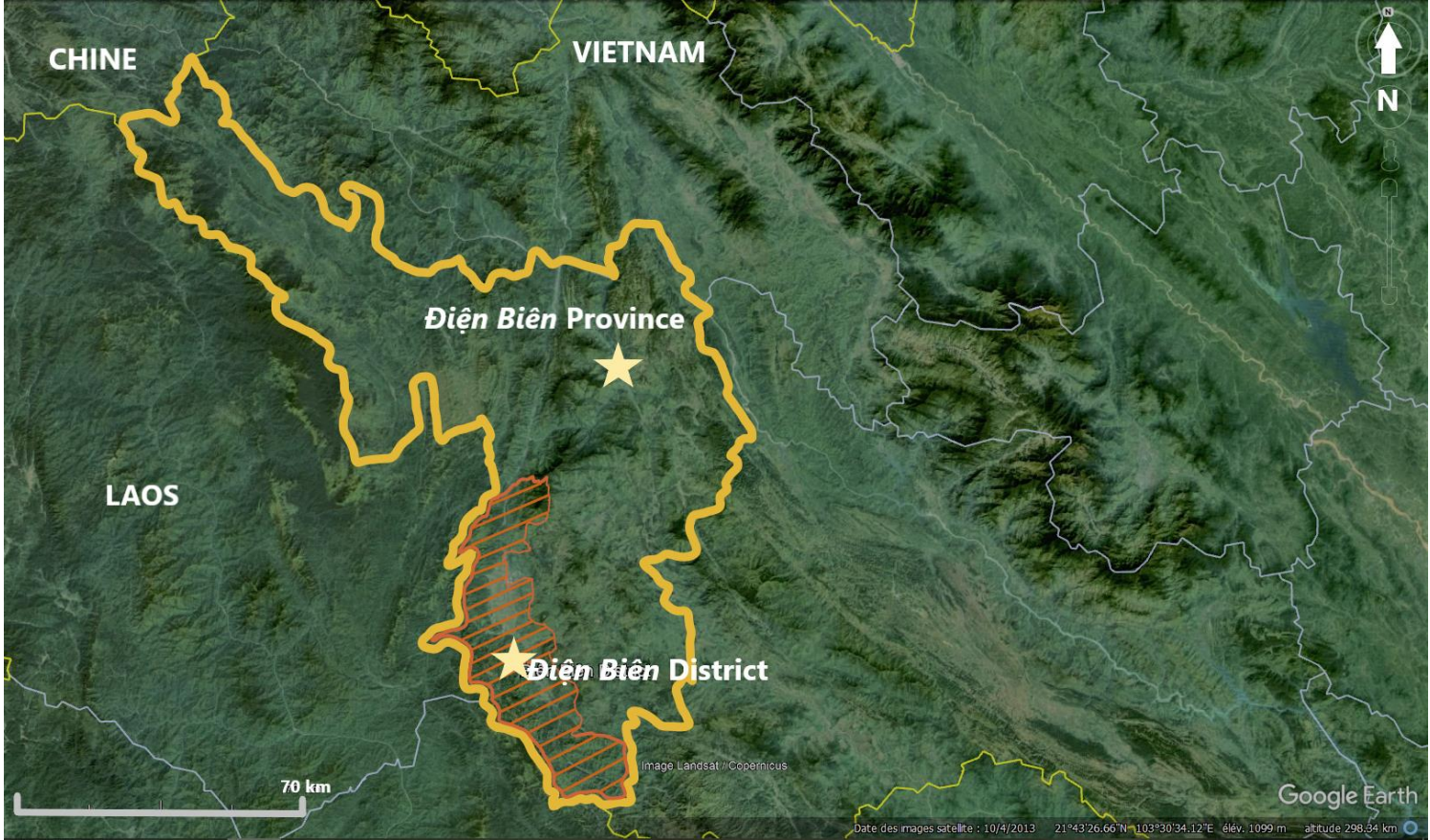
Research Question

What are the effects on farming systems of a livestock development scenario with an agroforestry system compared with a scenario that follows current trends?

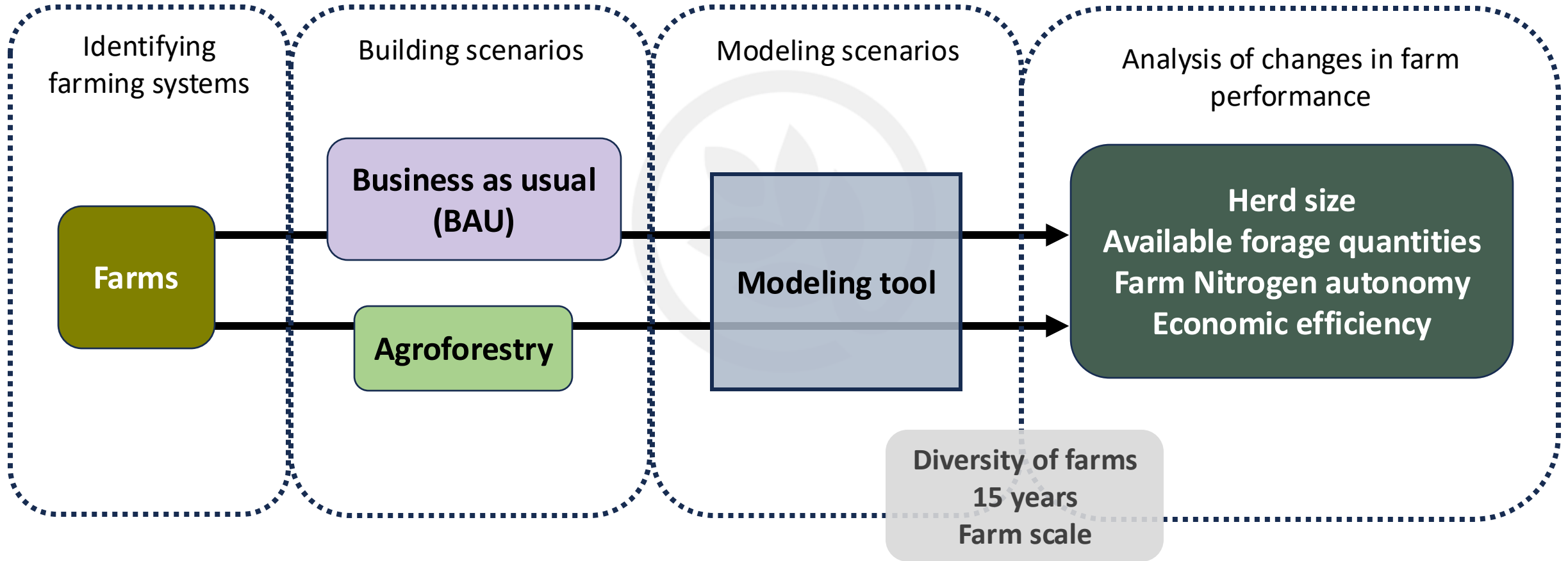
Method : Điện Biên district

~ 1 400 km²

~ 100 000 habitants



Method overview

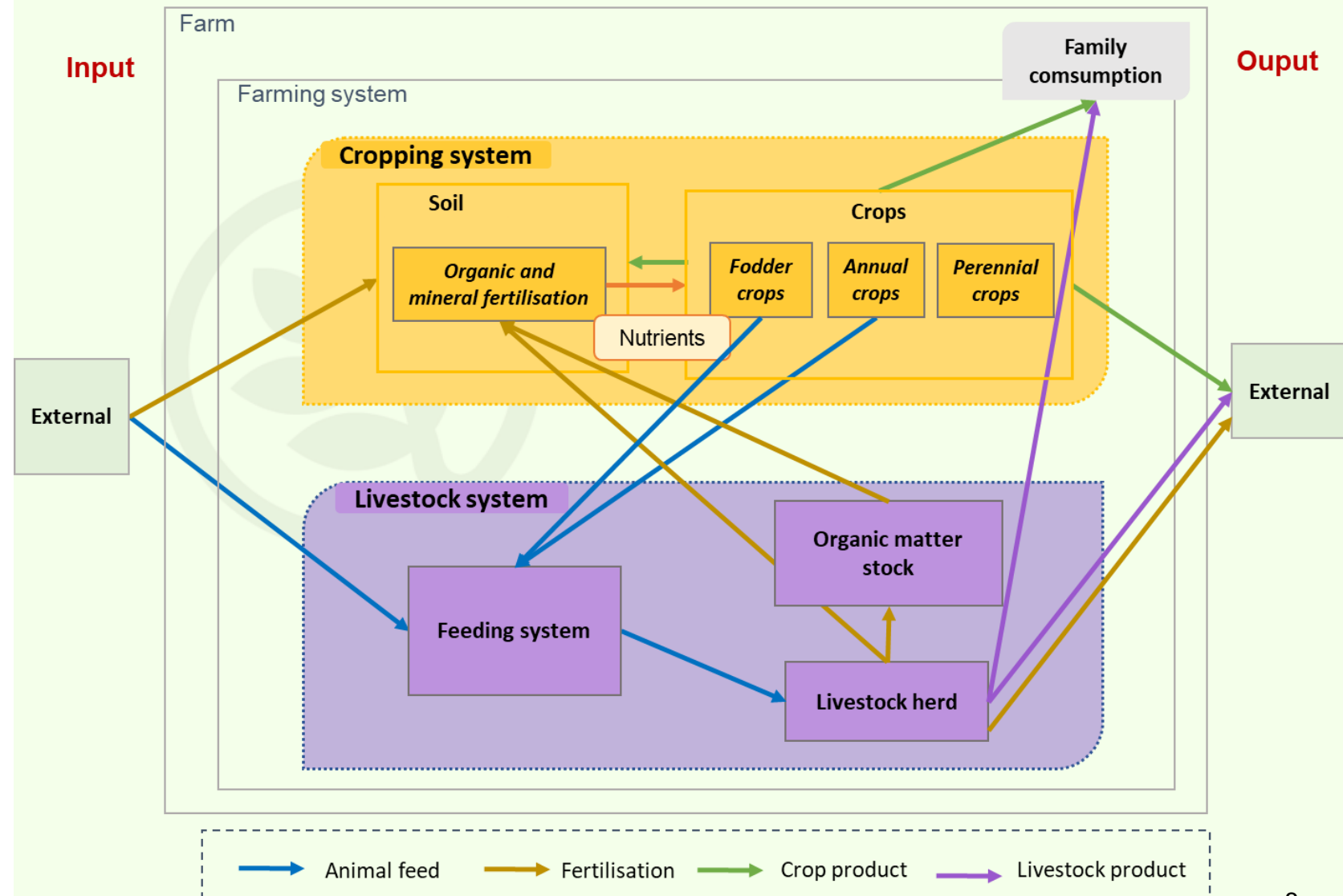


Method : Modeling scenarios impacts

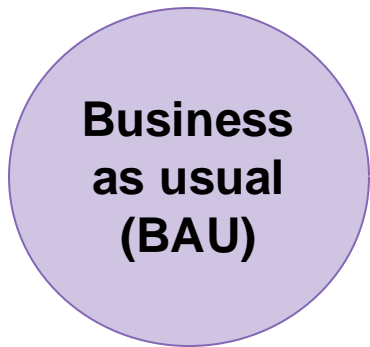


Scenarios implementation

- ✓ Biomass flows (especially N)
- ✓ Indicators : productivity, economic, environmental and social performances of farms



Method : Business as usual vs. Agroforestry scenarios



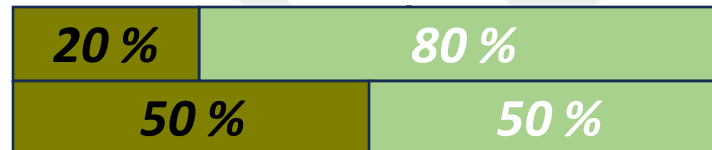
2037



According to current trend in agricultural and livestock development vietnamese policies.

Development of high added-value product through agroforestry and forage production to support livestock production.

Forage needs covered by on-farm production
Needs covered by external resources



Forage autonomy objective : 20%

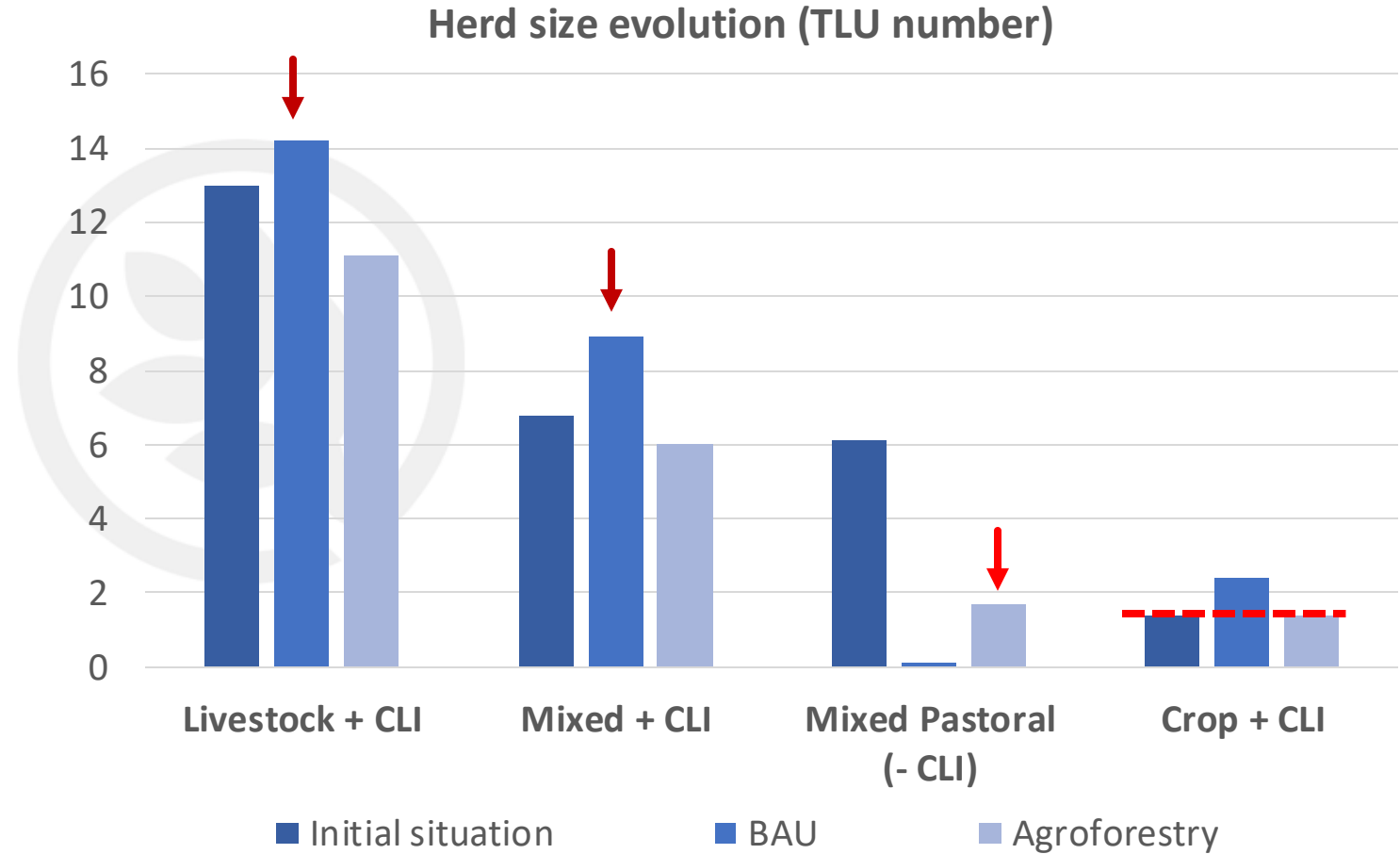
Forage autonomy objective : 50%

- Forage : + 0,035%/year
- Fruit trees : + 0,15%/year
- Annual crops: stable or decrease

- Forage : + 67% of fruit trees area/year
- Fruit trees : + 0,15%/year
- Annual crops: + 0,01%/year (cassava) stable or decrease (maize)

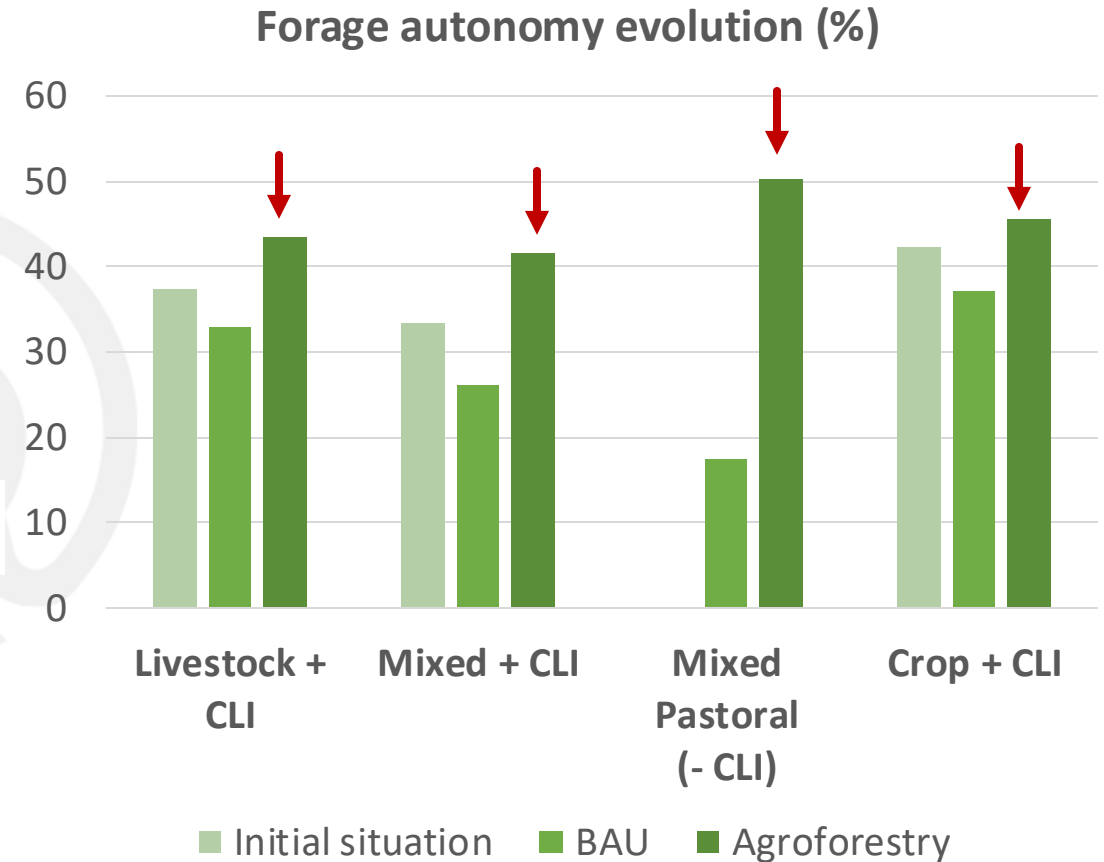
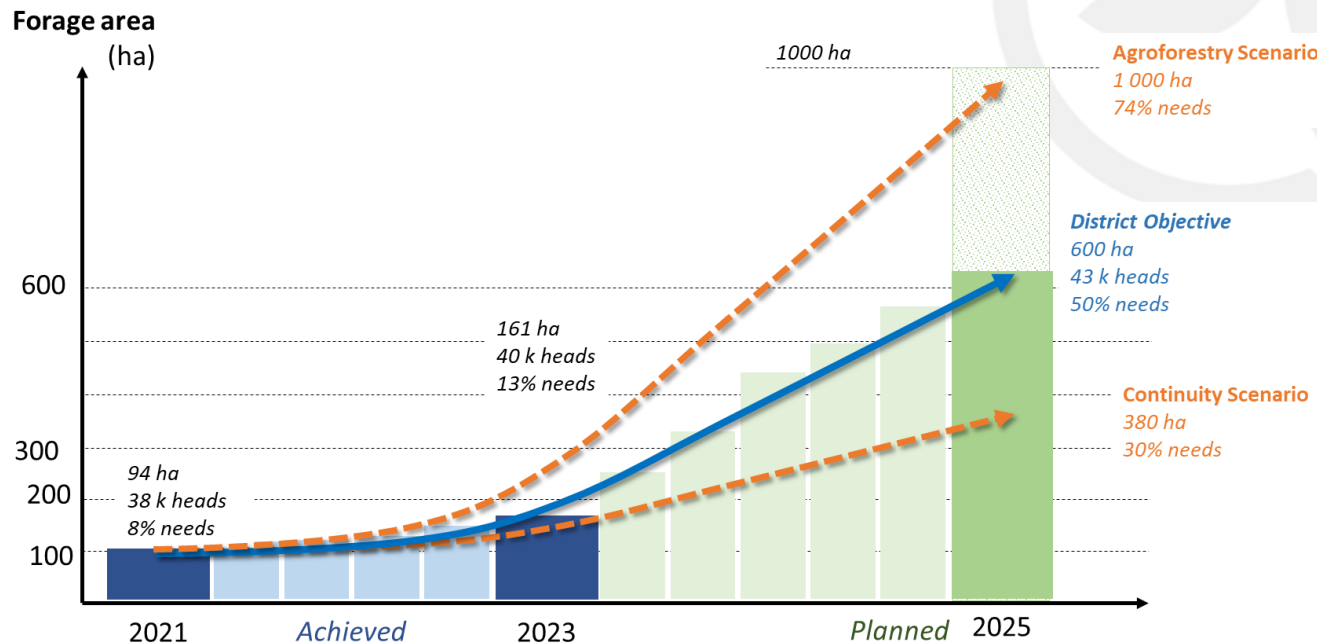
Results : Herd size evolution

- ✓ Few constraints on forage autonomy (BAU) → **increased number of cattle** on the most integrated farms.
- ✓ Crop specialized farms **herd stay stable** with agroforestry system.
- ✓ **Pastoral livestock farm are less impacted** by the agroforestry scenario.



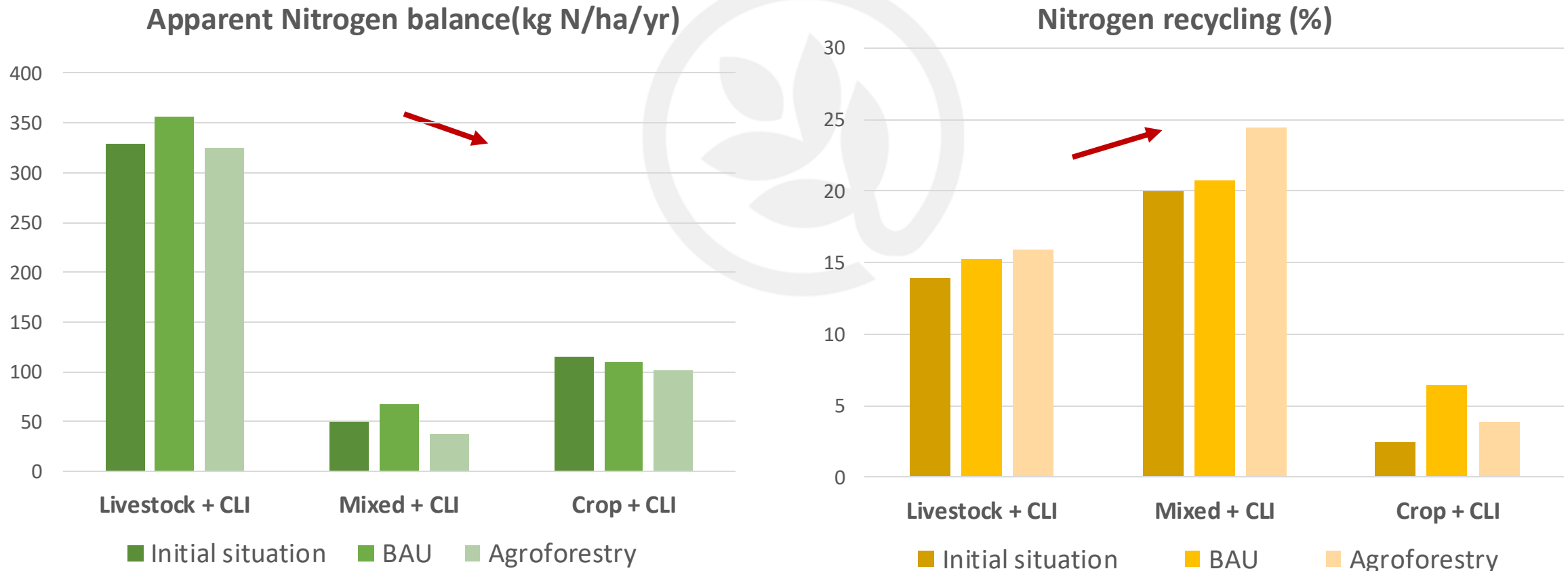
Results : Increase in available forage

- ✓ **Forage production** for livestock development
- ✓ Especially for **crop specialized farm** : available forage to **develop livestock activities** or **forage sales**



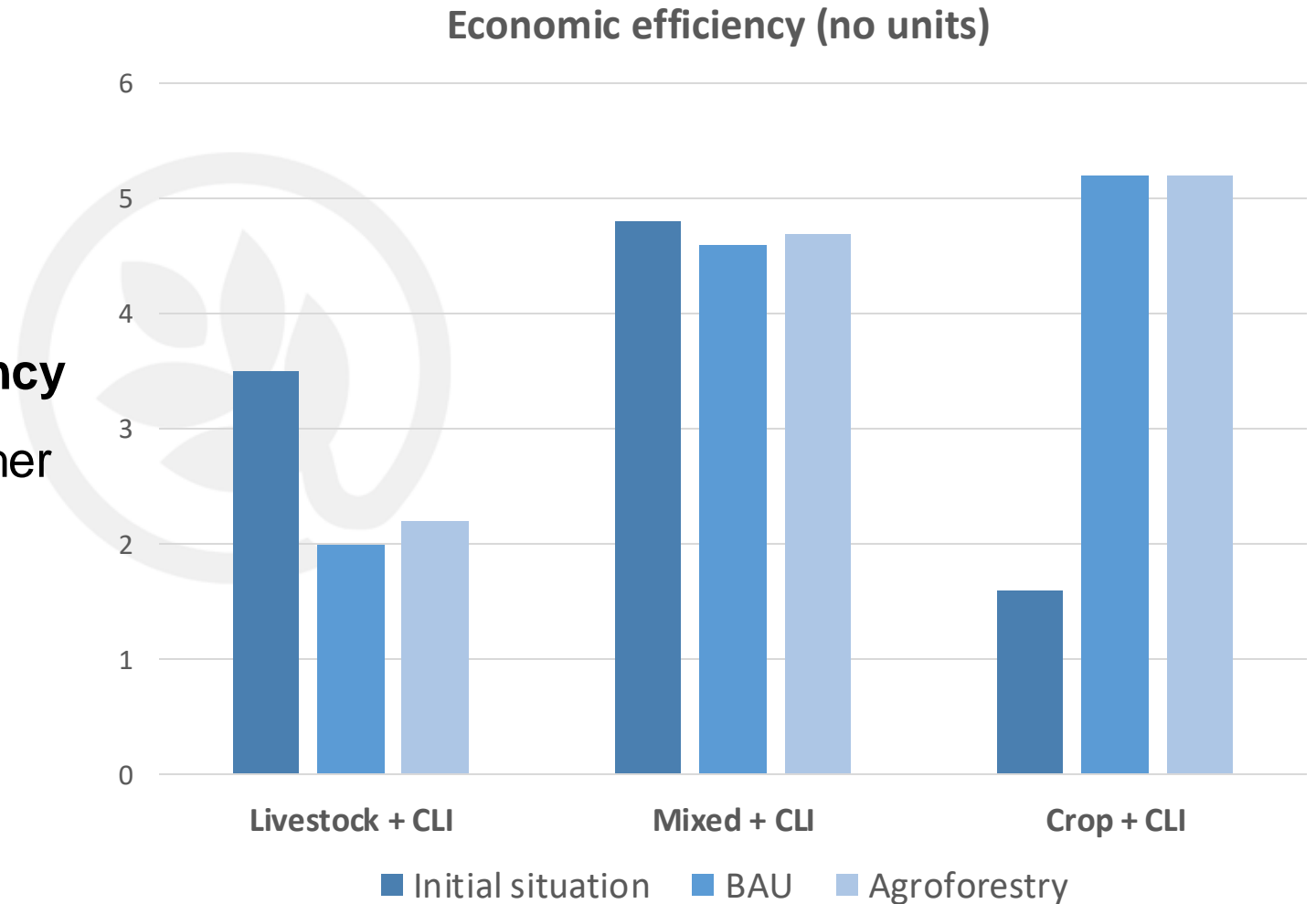
Results : Improvement of environmental performances

- ✓ On-farm feed production can **improve environmental performance** of more integrated farms.
- ✓ **Agroforestry scenario > BAU scenario** for livestock specialized and mixed farms.



Results Economic potential of agroforestry

- ✓ Changes in the economic efficiency show a **improved economic efficiency for crop specialized farms** with higher CLI.



Conclusion and recommendation

- ✓ **Increased herd size** in all type of farms with greater CLI if **little constraint on forage autonomy** (continuity scenario) and a **greater forage production** (agroforestry).
- ✓ **Risk for livestock activities** of mixed farms heavily **dependent on pastoral resources** with little farmland nor financial resources (~60 % District farms) → **Agroforestry could be part of the solution.**
- ✓ Agroforestry gives **crop specialised farms** opportunities to develop a diversity of crops, including forage → **Forage suppliers for specialised in livestock and mixed farms.**
- ✓ **Environmental and economic benefits : higher value-added crops, slope protection**
- ✓ Agroforestry systems : **innovative models** adapted to the production of **larger quantities of quality forage** and should be developed further (*ASSET tree-crop-livestock experimental design*).
- ✓ **Attention must be paid to the management of tree health** (use of pesticides) and **fertilization** (covering organic matter needs).



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Agroecology and Safe Food System Transitions in Southeast Asia (ASSET)

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