

Sustainability Performance in Dairy Farms of Baltic States

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Strategies for the agri-food sector and rural areas - dilemmas of development.

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Outline

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Introduction

- Sustainable agriculture, an integrated system of plant and animal production that will last over the long time, satisfy human food needs, enhance natural resources, use non-renewable resources efficiently, sustain economic viability of farms and enhance the quality of life for farmers and society as a whole.
- EU vision on sustainable agriculture should increase the productivity without affecting the quality of soil and water, preserve the ecosystems, safeguard animal welfare, generate income for farms and improve quality of life in rural areas, support territorial development and contribute to economy [Sustainable Agriculture, 2012]



The aim

The aim is to provide an analysis of the sustainability performance of dairy farms in the Baltic States.

This study examines dairy farms' environmental, social and economic dimensions of sustainability, and compares the agricultural sustainability performance of the Baltic States.



Sustainable Value approach to measure sustainability performance

Sustainable Value approach is value-based assessment approach of sustainable performance. [Figge, 2001; Figge and Hahn, 2004].

Sustainable Value approach assumes that a return, such as a profit, is not only created by a single resource, e.g. economic capital, but rather a bundle of resources all of which are scarce [Manzhynsky *et al.* 2015].

Sustainable value can be measured by the formula (*Liesen et al., 2009*):

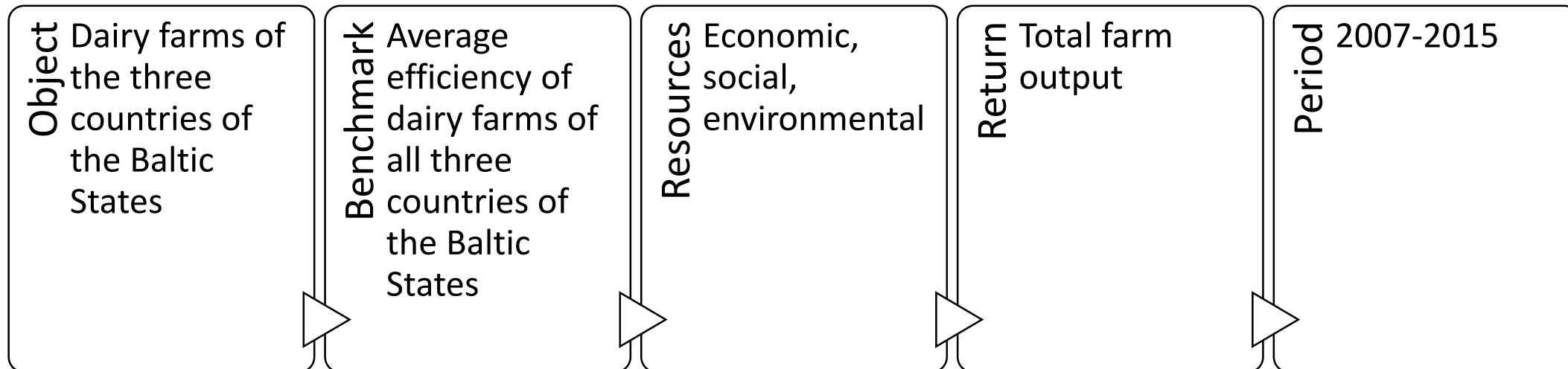
$$SV_j^t = \frac{1}{n} \sum_{i=1}^n \left(\left(\frac{TO_j^t}{u_{ij}^t} - \frac{TO_b^t}{u_{ib}^t} \right) \right) u_{ij}^t$$

TO_b^t – the return of the benchmark;

u_{ib}^t – the resource i use of the benchmark in year t .



Sustainability performance assessment according to the Sustainable Value approach



Sources: Manzhynsky et al. 2015, O'Donoghue et al. 2016



Data and method

- The raw data was obtained from the FADN network and Eurostat databases.
- The data consists economic, social and environmental indicators of Estonian, Latvian, and Lithuanian dairy farms and cattle breeding, including the period of 2007-2015. Comparative analysis is used to analyze the data.



Indicators of sustainability of dairy farms

Indicator	Unit	Type of indicator	Benchmark
Labour productivity	€/h	Economic	maximisation
Land productivity	€/ha	Economic	maximisation
Profitability	€/ha	Economic	maximisation
Income per kg of milk	€/kg	Economic	maximisation
Capital productivity	%	Economic	maximisation
Unpaid labour input per week	h/week	Social	minimisation
Average hourly wages	€/hour	Social	maximisation
Paid labour input per week	h/week	Social	maximisation
Income per unpaid labour input	€/kg	Social	minimisation
CH4 emission from enteric fermentation	t/ha	Environmental	minimization
Nitrogen balance per used agricultural land hectare	kgN/ha	Environmental	minimization
Phosphorus balance per used agricultural land hectare	kgP/ha	Environmental	minimization

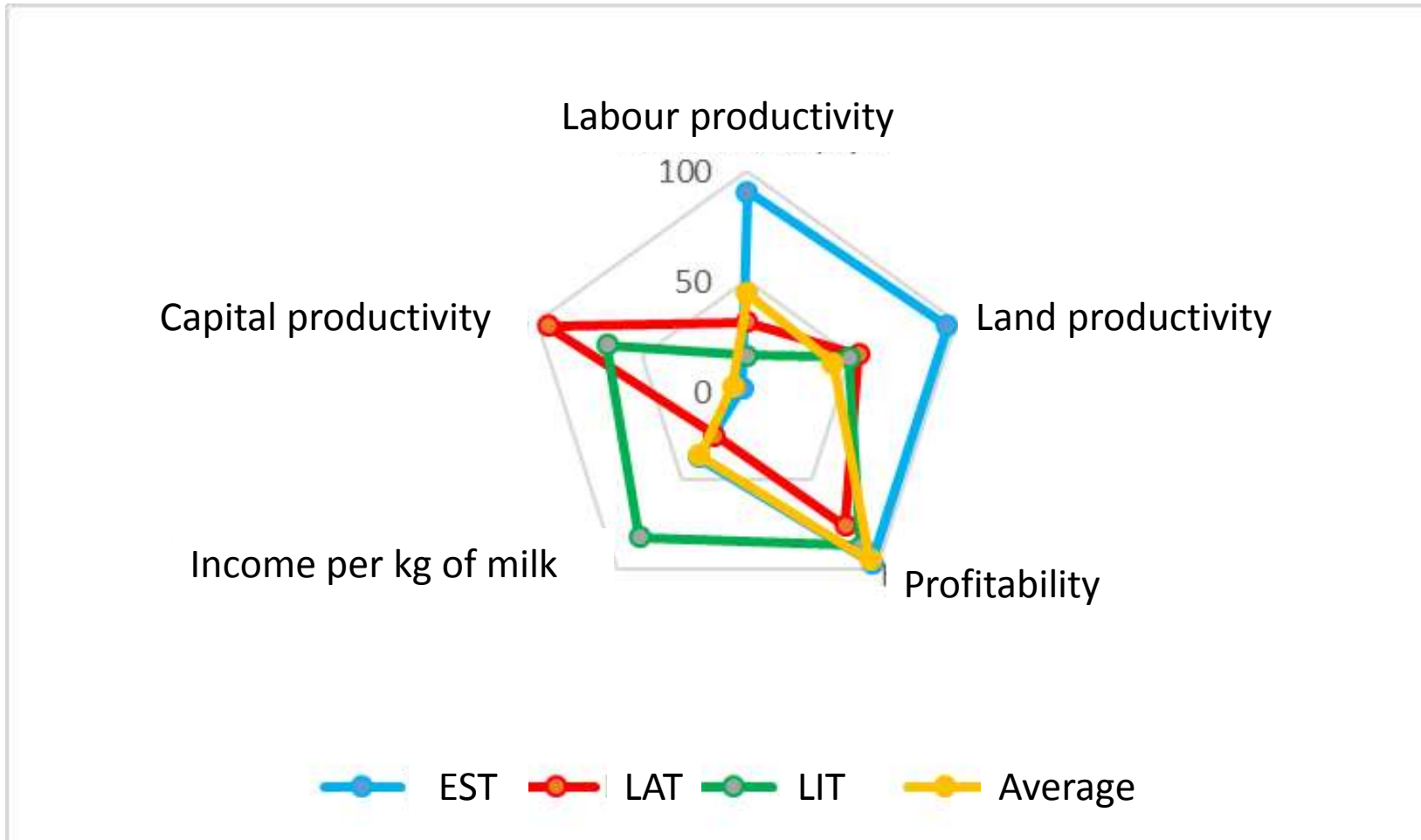


Economic sustainability of dairy farms

- Estonian dairy farms had high labour and land productivity, low capital productivity.
- Latvian dairy farms had high capital productivity, and low profitability.
- Lithuanian dairy farms had low land and labour productivity, but the highest income per kilogram of milk.



Estonian, Latvian, and Lithuanian dairy farms' economic sustainability 2015(FADN)



development.

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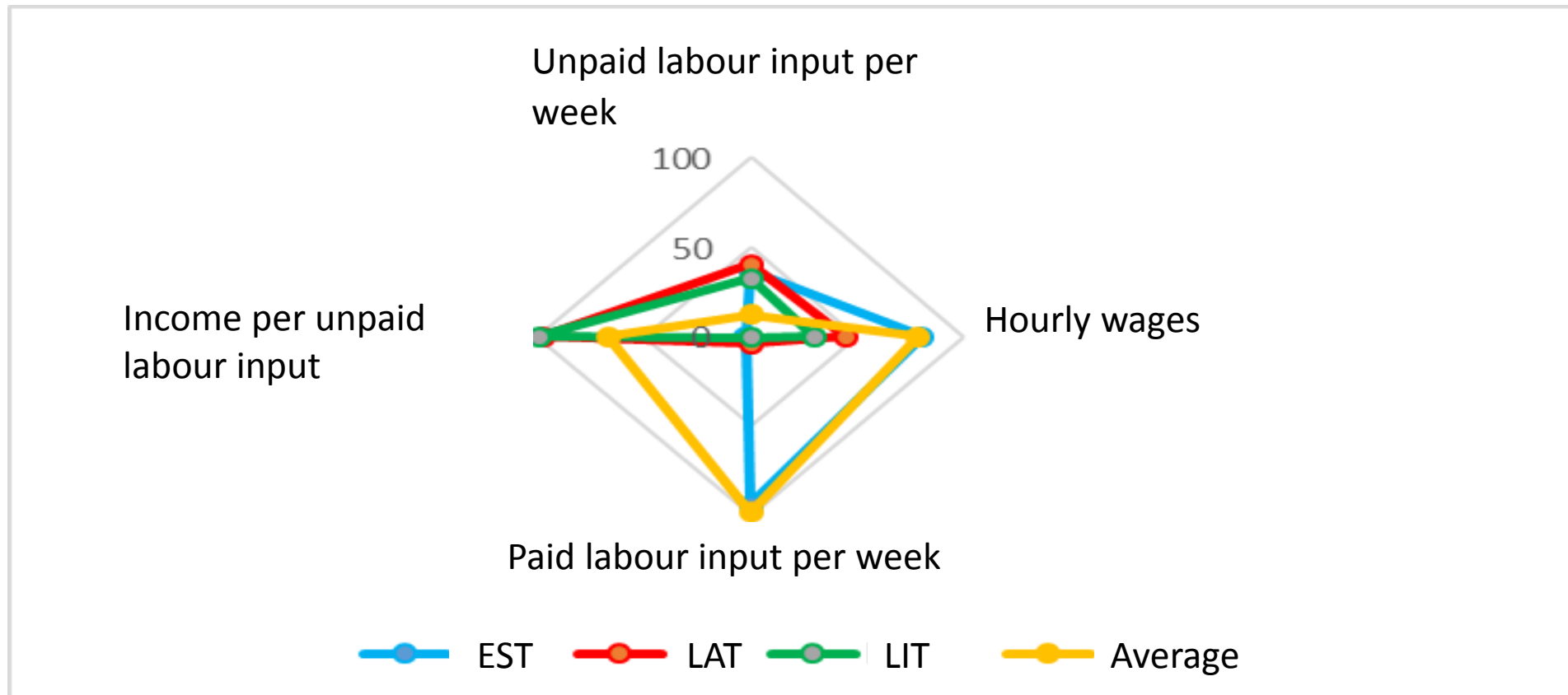
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Social sustainability of dairy farms

- Estonian dairy farms had high hourly wages, low unpaid labour input per week.
- Latvian dairy farms had high unpaid labour input per week.
- Lithuanian dairy farms had low paid labour input per week, and low hourly wages.



Estonian, Latvian, and Lithuanian dairy farms' social sustainability 2015(FADN)



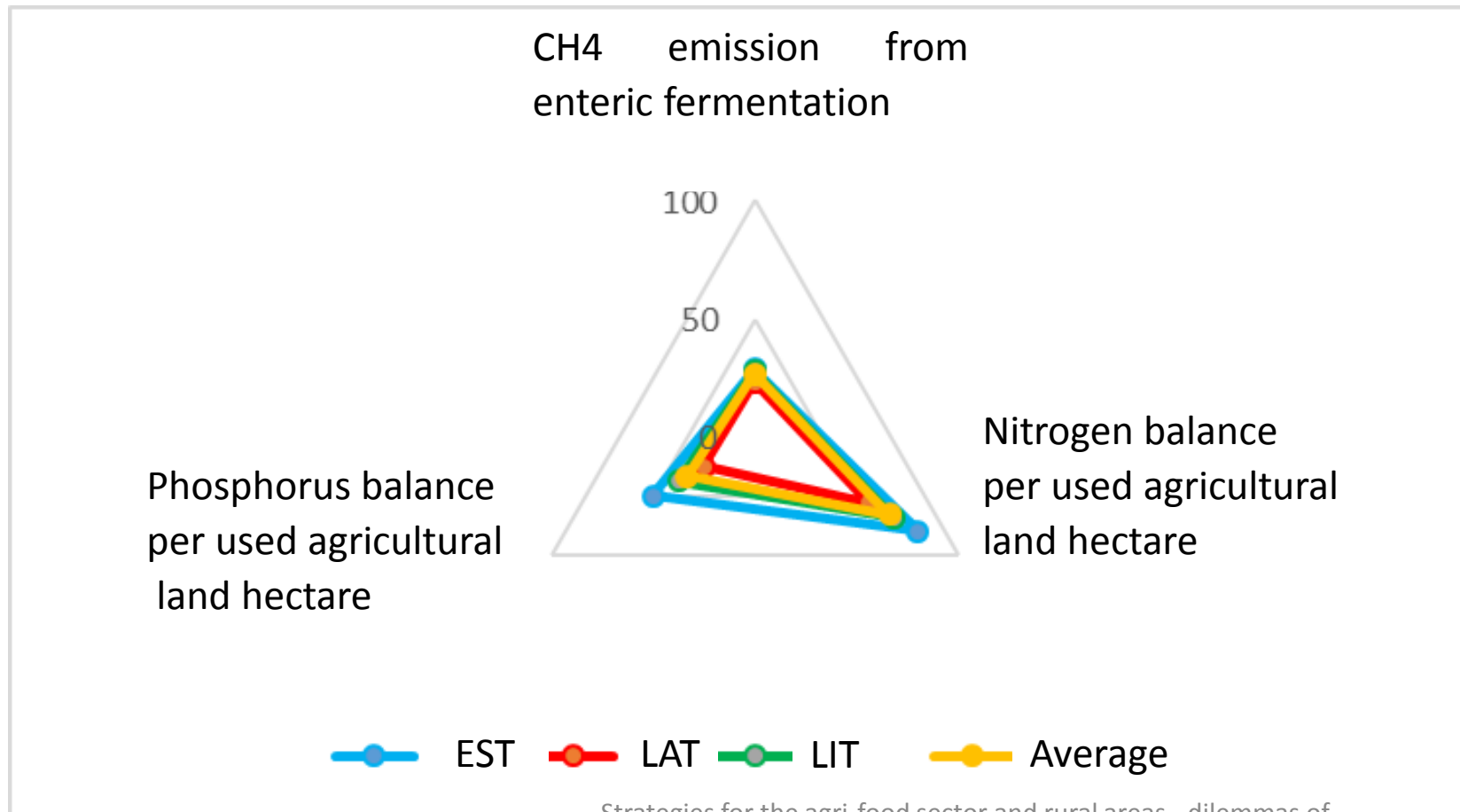
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Environmental sustainability of dairy farms

- The Estonian cattle breeding sector had high nitrogen and phosphorus balance per used agricultural land hectare.
- The Latvian cattle breeding sector had low CH₄ emission from enteric fermentation per used agricultural land hectare, and both nitrogen and phosphorus balances per used agricultural land hectare.
- The Lithuanian cattle breeding sector had high CH₄ emission from enteric fermentation per used agricultural land hectare.



Estonian, Latvian, and Lithuanian dairy farms' environmental sustainability 2015(FADN)



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Conclusions

- The use of one-dimensional approaches for measuring and evaluating sustainability performance is limited.
- Although the Baltic States are sometimes considered agro-environmentally homogenous, and dairy farming is one of the main agricultural sectors in Estonia, Latvia, and Lithuania, the sustainability performance from the point of view of economic, social and environmental dimensions of sustainability is diverse.
- The study concludes that according to the sustainability indicators dairy farms of Baltic States on average do not perform on higher levels concerning sustainability performance benchmarks.



References

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