



Innovation for Sustainable  
Sheep and Goat  
Production in Europe

# The iSAGE project: Overview

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# The Consortium

- iSAGE deals with the **less developed** livestock sector in the EU
- iSAGE has all the major players in small ruminant sector

Approximately **16,000** sheep and goat farmers (**5.5** million sheep and goats)



# iSAGE philosophy:



Farms



Farmer



Animal



Processors

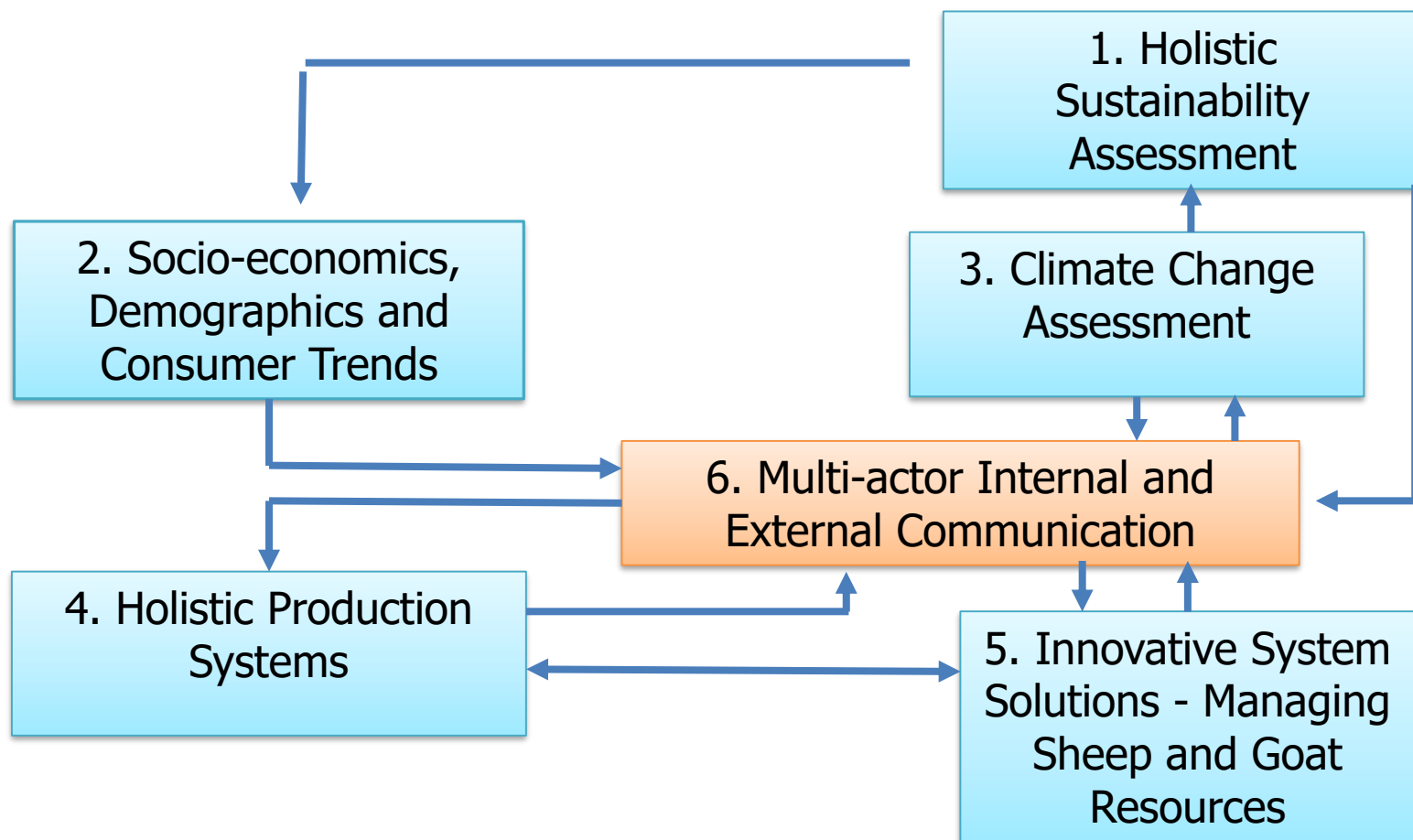


Consumers



Policy makers

# iSAGE working platform



# iSAGE aims

- **Increase/improve** efficiency, profitability, overall sustainability and innovative capacity of the sector
- **Find** new efficiency traits of animals/more adapted to environmental changes
- **Increase/improve** animal welfare, social well-being and rural development
- **Increase/enhance** consumer acceptance, societal acceptance
- **Identify/implement** innovations and **develop policy recommendations**

# What iSAGE did?

## Qualitative techniques

- Case studies
- Semi structured and structured interviews
- Focus groups
- Laddering surveys



# What iSAGE did?

## Quantitative techniques

- Farm level surveys
- **Recording impacts** of new innovations on farms
- **Modelling** expected climate impacts
- **Modelling** how management can improve ecology and farm productivity
- **Assessing** the **genetic potential** of sheep and goat populations for **future breeding programmes**
- New **decision support tools**

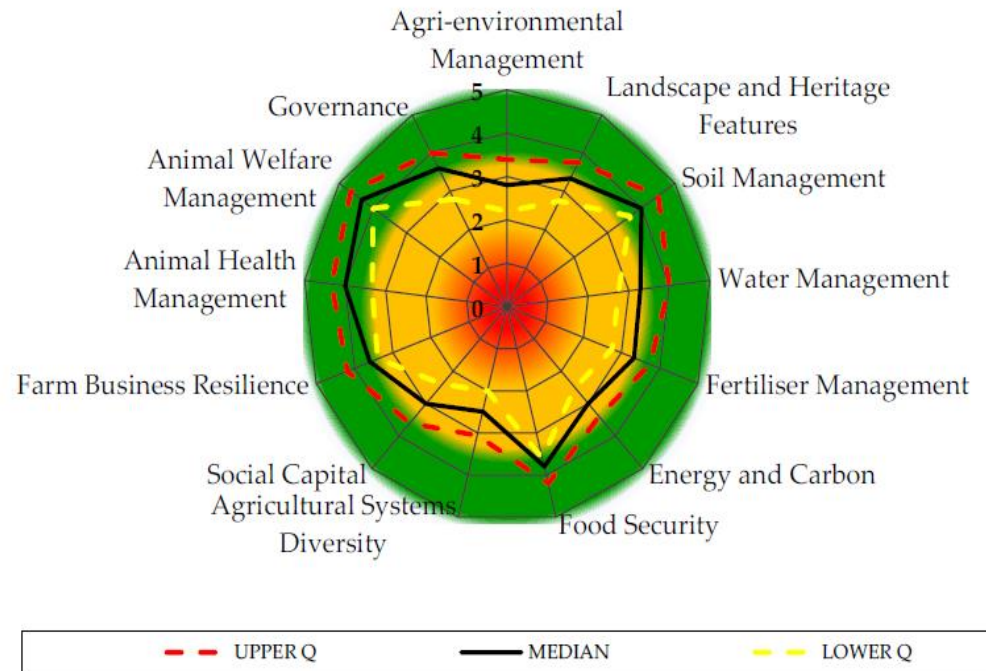
# iSAGE outputs

- Interviews for **retailer surveys**
- **Three case studies** per country on selected supply chains
- **New modelling methods** to promote sustainability and resilience to climate change -**Pasture productivity** statistical model
- Implementation of **innovation case studies** in different countries
- Development of a **toolbox**
- Development and testing of a new **iSAGE farm model**
- Development and testing of **iSAGE-DSS**



# iSAGE Technical and computational innovations for overall sustainability

- The **iSAGE Public Good tool (PG tool)**: sustainability scores in sheep and goat farms.
- A **picture of how the farm performs** with respect to a selection of 13 spurs (areas) that collectively contribute to sustainability.
- The PG tool **can motivate farmers to review their farming activity** considering other perspectives than purely economic ones (e.g. environmental impacts).



**Figure 1.** Upper, median and lower quartile values illustrate the strengths and weakness of the farm

# iSAGE Technical and computational innovations for overall sustainability

- The **iSAGE-DSS**, which is a web-based, model-driven, decision support system for the efficient management of meat and dairy small ruminant farms.
- Farmers can make **annual management planning decisions** by testing future **what-if scenarios**.
- Farm income, variable costs and gross margin are estimated taking into account production estimates
- The **iSAGEDSS** provides comprehensible charts of **income and cost analyses** as well as bar plots of feed costs and variable costs per animal category

**Total number of sheep**

**265**  
ANIMAL

**Estimated weight change of milked ewes during**

**-0,970**  
KG

**Estimated milk production change of milked ewes**

**-2,567**  
KG

Edit scenario

Quick navigation : [Production](#) [Profit](#) [Financial](#) [Projections](#) [Detailed data](#)

## Scenario results

Milked animals	Energy Balance	Protein Balance	Weight Change
Lactation period	-0,16 MJ	50,90 g	-0,97 kg
Dry period	1,87 MJ	39,17 g	2,9 kg
Last month before birth	1,45 MJ	80,41 g	0,65 kg

Estimated milk production change of milked ewes considering energy and protein balance: -2,57 kg

Non milked animals	Energy Balance	Protein Balance	Weight Change
Non milked ewes	2,24 MJ	38,92 g	9 kg
Rams	1,70 MJ	66,85 g	8,3 kg
Lambs	0,6 MJ	14,57 g	0,23 kg

## Gross margin

Gross margin

**28.028,75**€/year

Gross margin per ewe

**136,73**€/year

Gross margin excluding subsidies

**22.968,75**€/year

Gross margin per ewe excluding subsidies

**112,4**€/year

iSAGE-DSS report page with estimated gross margin (**with and without subsidies**) considering production estimates such as milk production change and weight change of lactating animals, based on their energy and protein balance.

## Income

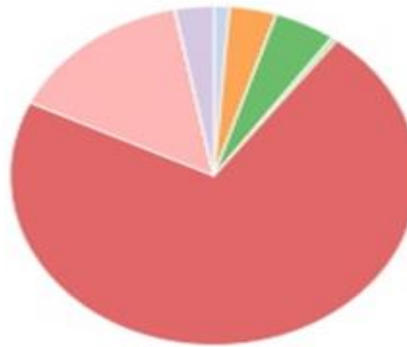
68250.2 €/year



Income from milk	51.158,54 €/year
Income from meat	10.531,66 €/year
Income from animal sales	1.500 €/year
Income from subsidies	5.060 €/year
Income from milk processed products	0 €/year
Income	68.250,20 €/year

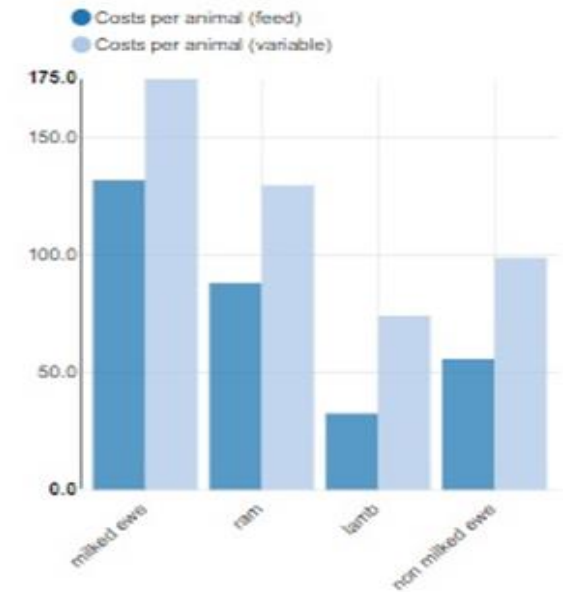
## Costs

40221.45 €/year



Feed costs	28.876,45 €/year
Seasonal labour cost	200 €/year
Total costs of labour	5.960 €/year
Cost of renting	0 €/year
Farm running costs	1.500 €/year
Farm utility costs	1.950 €/year
Milking parlour costs	500 €/year
Processing costs	0 €/year
Veterinary costs	1.235 €/year
Grazing land costs	0 €/year

## Costs per animal



Feed costs per lamb	32,47 €/animal
Feed costs per milked ewe	131,86 €/animal
Feed costs per non milked ewe	55,70 €/animal
Feed costs per ram	88,4 €/animal
Variable costs per lamb	74,12 €/animal
Variable costs per milked ewe	175,1 €/animal
Variable costs per non milked ewe	98,85 €/animal
Variable costs per ram	129,69 €/animal

iSAGE-DSS report page with a graphical representation of farm income & costs and costs per animal category

# iSAGE outputs are used to:

- **Understand barriers** to innovation and sustainability

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- **Understand barriers** to innovation and sustainability
- **Define future opportunities** for a competitive sheep and goat sector
- **Develop farm management tools** and innovative breeding strategies
- **Develop solutions** for social, welfare and consumer issues
- Work with industry to **inform, help** and **innovate**

# Keys issues for discussion:

- **The sheep and goat Industry and researchers** should **continue** to work together to advocate for more sustainable systems. **Research** in technical key issues is necessary for production systems to adapt to changes and be more sustainable.
- **Profit** is the key for sheep and goat farmers. Sustainability needs to take into account 10-year (not 1-year) profitability.
- Farmer's believe that **the sector will not be viable** if the government decides to cut down on **subsidies**
- **Subsidies** using the current regime **did not help** towards increasing productivity or environmental sustainability.
- **Subsidies** should be based on production related figures, welfare indicators and reduction of GHG emissions – money should also be directed to educating farmers and implementing innovations on farms
- The sheep and goat sector need to adapt to regional government changes in **subsidies from direct to environmental support**

# Keys issues for discussion:

- **Age structure is a major problem** in the sheep and goat sector and there is an urgent need for **new entrants** (young farmers).
- There is need for **improvement of the social acceptability/image** of the sheep and goat systems. A **better/more realistic public image** of farmers will probably help to recover the sinking levels of new entrants.
- **Education and knowledge exchange** are essential. iSAGE found that the latter have not been properly covered by institutions and governments. There is a critical need to educate and train farmers and shepherds to professionalise the sector and render it more attractive to young generations; currently is really difficult to find good shepherds.

# Keys issues for discussion:

- The **small size of farms**, the **low education level** of farmers and their **mistrust to changes**, and the **very weak organisation** of the sector are barriers to innovation.
- There is a need for more **collaboration** between farmers for capacity building in participatory and other innovation transfer approaches (eg. Operational groups).
- Farmers are **reluctant to follow suggestions by veterinarians** and **adopt useful innovations to improve flock health**.

# Keys issues for discussion:

- Farmers have always adapted to climate variability, but now we are also **facing huge social and economic challenges** that add complexity and more difficulties to adaptation to climate change.
- **The notion is that research for more resilient phenotypes and genotypes is important.** However, selecting for more resilient animals seem to be negatively correlated with increasing their production
- **Policies and Strategies to improve the environment** (reduce GHG and enhance biodiversity) require active collaboration with farmers to judge feasibility and ensure efficacy
- **iSAGE contributed to a video on CHG emissions** that is an important point to translate to decision makers.
- New calculations on the **reduced impact of Sheep and Goat systems on global warming** need to be taken into account by EU and regional governments.



# Keys issues for discussion:

- iSAGE performed consumer and marketing studies. **Packaging, labeling and education/awareness** were raised as the most important factors that will make sheep and goat sector antifragile.
- There is much variability in **consumer reactions** regarding milk and meat products which needs to be taken into account.
- Sheep and goat products consumption is very seasonal around big religious feasts. **Marketing strategies should be developed and value chains adapted to them.**

# iSAGE concluded that special emphasis should be given to:

- (i) **Supporting supply chains** and increasing consumption of sheep and goat products through novel labelling, packaging and cuts,
- (ii) **Coping with climate change** and greenhouse gas emissions using novel methodologies and technologies, and informing relevant policies,
- (iii) **Breeding** for enhanced animal resilience, efficiency and adaptability, and promoting region-specific use of local breeds,
- (iv) **Increasing the adoption of relevant innovations.** The efficient adoption of innovations is expected to increase the sector's overall resilience and sustainability and decrease reliance on public support.



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# Thank you