



Livestock farming system management: models, tools, goals and users...

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8TH INTERNATIONAL SEMINAR OF THE FAO-CIHEAM NETWORK ON SHEEP AND GOATS
SUB-NETWORK ON PRODUCTION SYSTEMS



**Technology creation and transfer in small ruminants:
roles of research, development services and farmer associations**

Tangier, Morocco, 11 to 13 June 2013



Livestock farming system management: models, tools, goals and users...

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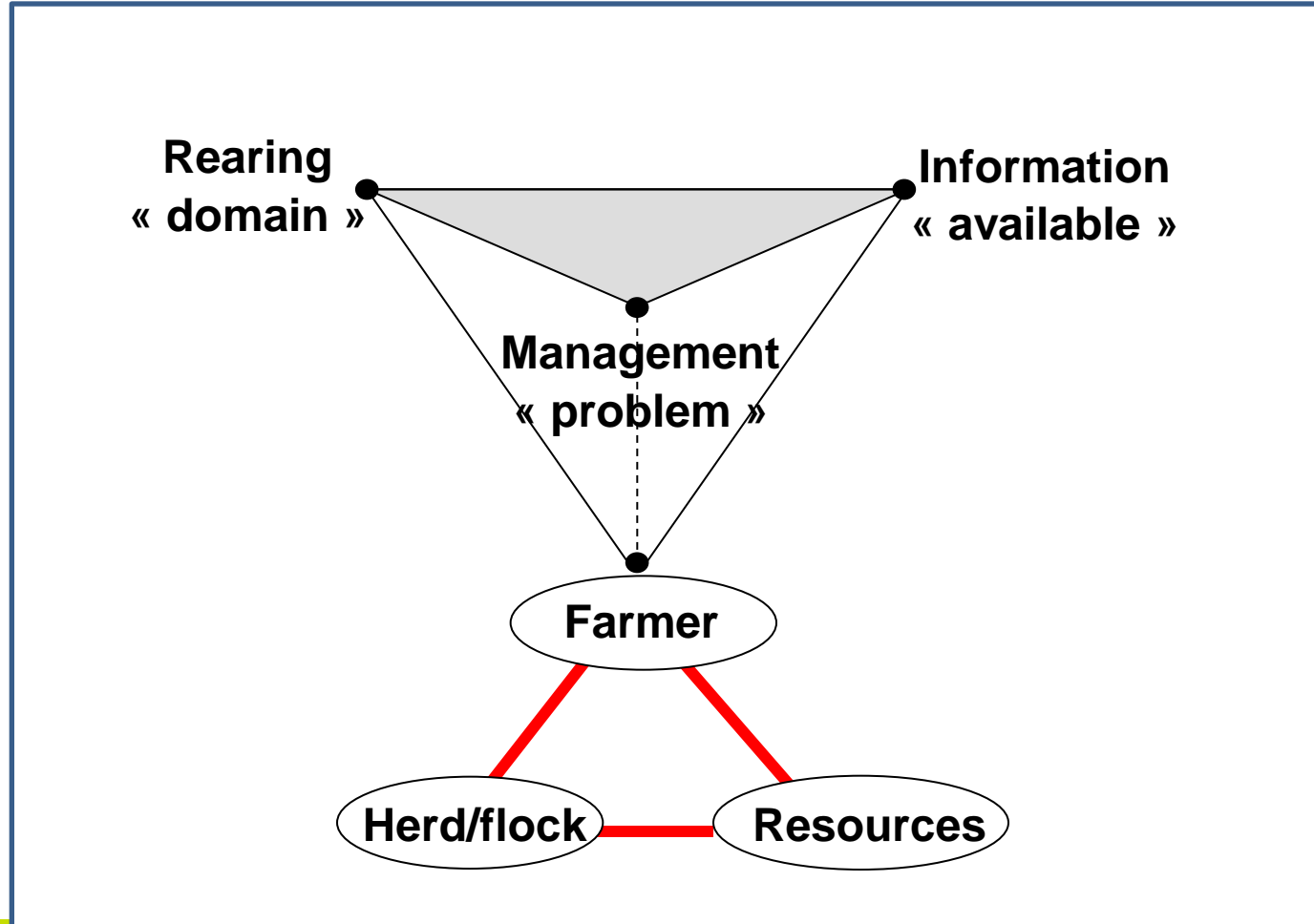




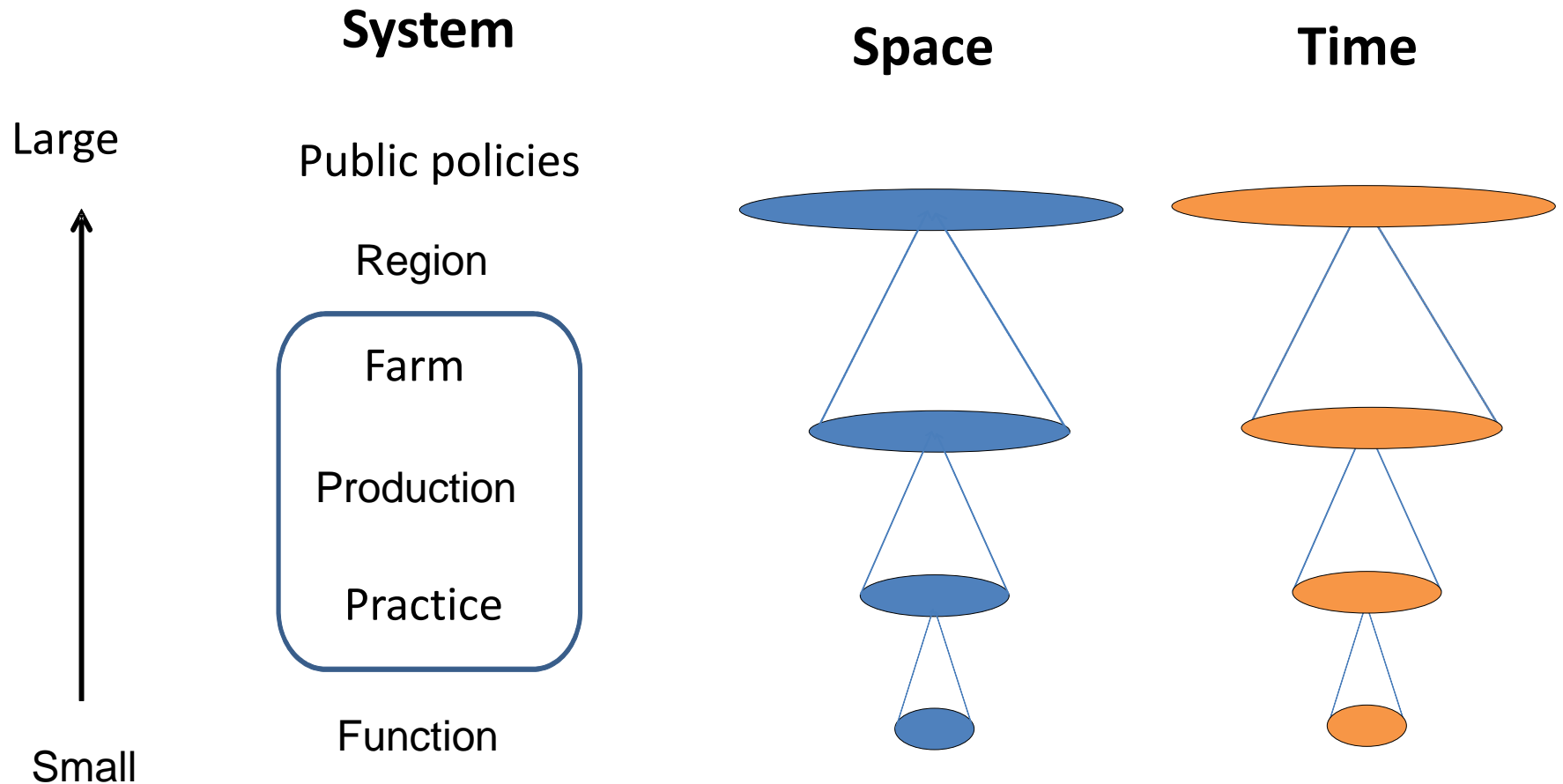
Context

- **LFS in a complex and changing world (uncertainty):**
 - **necessity to:**
 - **adapt (prices, market...)**
 - **think about long-term consequences of short-term decisions**
- **Increasing pressure on farmers about their practices**
- **French organization within the agricultural sector:**
many actors, involved at many levels
- **Increasing part of modelling in research projects,**
assuming an operational impact on the ground

LFS management: a framework to understand what, why, how and when...



Models and tools: a question of scale






A sample of tools: how did we choose?

- From France
- At different scales (time and biotechnical)
- Two main kinds of tools:
 - **Model-based**, usually complex (n=5, 3 presented)
 - **Other tools**, sometimes very simple (n=6, 3 presented)



Model-based tools: Farm types

- ❖ Based on the national device "breeding Networks" hosted by the French Livestock Institute
- ❖ 380 sheep farms in France (all regions) → allow the development of regional typologies of farming systems
- ❖ "farm types" = farms modelled, each illustrating a case of the typology (a farm with its structures, functioning and performance)
- ❖ The modelling process combines observation, analysis of results on many years, "alleviation" of the impact of remarkable years, optimization and coherence of the structure and levels of technical and economic performances
- ❖ The farm types can be used in different situations: technical advice, training, prospective , changes in support of the CAP and prices.



Model-based: The Forage Rummy (“Rami Fourrager”)

- ❖ **A game: players are farmers**
- ❖ **Goal : to build a coherent forage system to feed a herd over a year**
- ❖ **To trigger discussions between farmers and analyse systems built on the basis of their knowledge (participatory process)**
- ❖ **Example: application of a global warming scenario**
 - how they fit in the forage systems accordingly**
- ❖ **Developped by Inra Toulouse**

Model-based: *The Forage Rummy ("Rami Fourrager")*





Model-based: QuaeWork

- ❖ **QUALification and Evaluation of Work in livestock farms**
- ❖ **To assess work productivity: work duration (routine work, seasonal work) and work efficiency (per livestock unit or hectare)**
- ❖ **To assess work flexibility: room for manoeuvre and adjustments face to internal and external events**
- ❖ **To analyse work organization**
- ❖ **To integrate work objectives (productivity, flexibility) into technical and economic goals**



Other tools: **Flock management**

- ❖ → **Software tools possibly coupled to electronic identification of animals.**
- ❖ **To register transfers of animals and interventions: mating, lambing, mortality, veterinary treatments, ...**
- ❖ **To identify production of each animal**
- ❖ **Automatic sorting of animals (electronic identification)**
- ❖ **Genetic monitoring through breeding programs: farm's data are gathered in collective databases**

Other tools: Flock management



Nombre total dans la base :

Brebis : 697

Agneaux : 5129

Troupeau bo (534 brebis et 4289 agneaux au 05/06/13)

Consultation, Recherche et suppression

(avec touche Suppr)

sélection brebis

Modifier brebis

Cause de Sortie

Date

Appliquer brebis

statut brebis

date de naissance
date d'achat
date de sortie
cause de sortie

Calculs sur la carrière de la brebis

agneaux nés
agneaux morts
agneaux vivants

Agnelages

naissance	n°	sexe	départ	code
' '	4128	M	21/05/04	M
10/05/04	4576	F		
' '	4577	F		
23/01/05	5471	F		
20/01/06	6388	M		
17/10/06	7317	M		
' '	7318	M		

agnelages
prolificité
mortalité
intervalle moyen
Productivité numérique

Liste des agneaux

- ☒ Agneaux présents
- ☐ Agneaux absents
- ☐ Liste complète

Mois sexe

Modifier agneau

Cause Sortie Date

Appliquer agneau

Saisie et modifications (se positionner dans le cadre blanc)

commentaires sur la brebis

commentaires sur l'agneau

Liste des derniers agneaux

Rechercher

Nouvel Agneau:

numéro sexe naissance brebis Cause Sortie Date point race

Nouvelle Brebis:

race Ind. marquage numéro naissance achat Cause Sortie Date point

Modification Agnelage:

naissance brebis

Paramétrage

Gestion des agneaux

Quitter

Sauvegarder

Calculs et Editions

Recherche
Affectation



Other tools: ***Lamb selling***

- ❖ **Developed by researchers (Inra) under Excel® software**
- ❖ **Calculation of the difference of gross margin between 2 types of lambs: 17-19 kg carcass vs 24 kg alive (light exported in Spain or Italy)**
- ❖ **It takes into account: the selling price of the lamb, production costs (concentrate, hay, veterinary), daily gain, amount of daily concentrates**
- ❖ **Used for 15 years by the main regional cooperative for sheep production (Auvergne)**

Other tools: Lamb selling

values to be modified	
	Males
Price light lamb €/H	65
Price heavy lamb €/Kg	4.737
weight light lamb	25.00
Carcass weight heavy lamb	17.00
Daily gain	260
Concentrate price	0.31
Veterinary	0.30
lamb mortality %	1.0
Hay price €/kg	0.12
Quantity per day Kg	
concentrates	0.900
hay	0.400

Difference in gross margin for heavy lambs compared to light lambs

	Light lambs (€/head)							
	56	59	62	65	68	71	74	77
Heavy:4.3 €/kg	4	1	-2	-5	-8	-11	-14	-17
4.5 €/kg	7	4	1	-2	-5	-8	-11	-14
4.7 €/kg	11	7	4	1	-2	-5	-8	-11
4.9 €/kg	14	11	8	5	2	-1	-4	-7
5.1 €/kg	17	14	11	8	5	2	-1	-4



Other tools: **Pasture management**

- ❖ **Context: Increasing input prices**
- ❖ **Need to maximize forage self-sufficiency**
- ❖ **Need to plan the use of paddocks to provide quality grass to animals**
- ❖ **→ A tool to measure standing biomass and to calculate “days before grazing”**
- ❖ **Example in France: Herbomètre® tool, easily used by breeders**

Other tools: Pasture management



"To manage grazing, I rely more on the herbomètre
than at the level of milk in the tank! "

Other tools: *Pasture management*

L'HerboMETRE®

Réglette donnant par lecture directe la hauteur d'herbe et les conseils de gestion à la parcelle.



Tube coulissant où se fixe la réglette

Plateau normalisé compressant le couvert végétal

Lecture directe et automatique de la hauteur d'herbe



Possibilité de transférer les données vers un PC

Some tools among others...

Model-based tools

Farm type

Ostral

breeding / environment / economics

Forage Rummy

Quae Work

INRAtion

feeding / diets

Other tools

Flock management

Accounts tools

financial / income

Batching management

graphical scheme / practices

Lamb choice

Pasture management

Crops production

technological devices

Designers (D) and users (U)

Farmers Technicians Researchers Trainers Private

Model based tools

Farm type		UD	UD	U	
Ostral			UD		
Forage Rummy	U	+	UD		
Quae Work		U	UD	U	
INRAtion	U	U	UD	U	U

Other tools

Flock management	U			U	D
Accounts tools	U	U		U	D
Batching management		U	UD	U	
Lamb choice	U	U	D		
Pasture management	U	U	UD	U	
Crops production	U		D		D

Biotechnical scales

	Animal/plant	Batch	Flock/land	System
<u>Model based tools</u>				
Farm type				
Ostral				
Forage Rummy				
Quae Work				
INRAtion				
<u>Other tools</u>				
Flock management				
Accounts tools				
Batching management				
Lamb choice				
Pasture management				
Crops production				

Time scales



	Day	Week	Month	Season	Year
<u>Model based tools</u>					
Farm type					
Ostral					
Forage Rummy					
Quae Work					
INRAtion					
<u>Other tools</u>					
Flock management					
Accounts tools					
Batching management					
Lamb choice					
Pasture management					
Crops production					

Involving users in the design process?

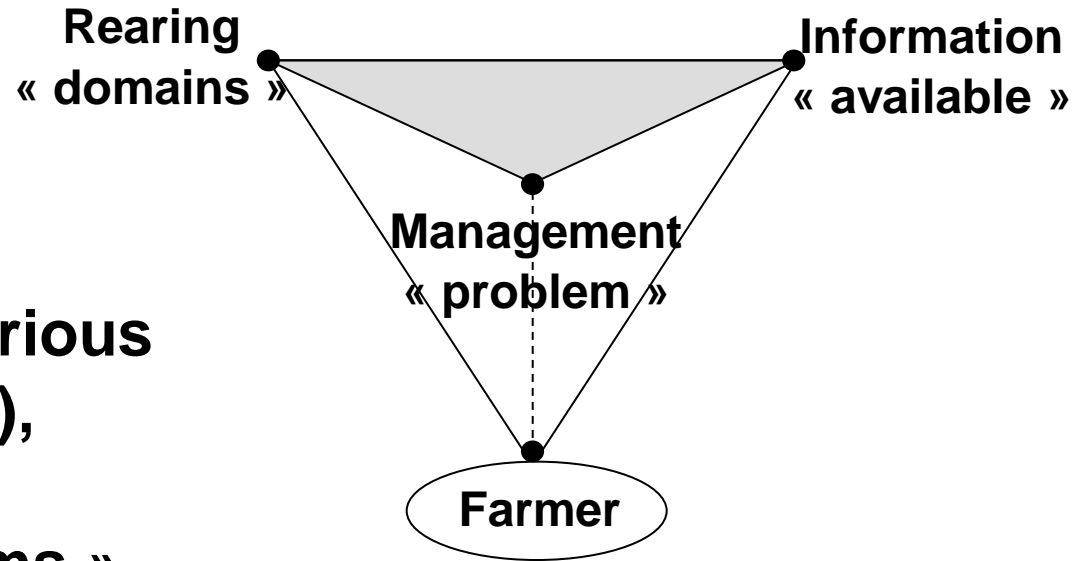
- Short term X technical, economic aspects:
 - Maybe no need
 - But often problem finding vs problem solving
- Long term X global issues:
 - A great advantage to avoid prescription
 - To help decision making by comparing scenarios



→ Models as roadsigns
rather than the destination

To conclude...

- **Very numerous and various kinds of tools (domain), dealing with different « management problems »**
- **Some tools cannot be used by farmers, because of their complexity but also information needed**
- **Different disciplines are needed to manage a farming system; the training of users is then essential (animal science, agronomy, economics, computer)**





CIHEAM



Thank you for your attention!

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