“Livestock Sector actions towards more Sustainable Food Systems”

Action Network 2: “Restoring Value to Grassland”

“Assess and recognize Multifunctionality of Grazing Systems for practice change and public action towards sustainable food systems”

Ickowicz A., Hubert B., Blanchard M., Blanfort V., Cesaro J-D., Diaw A., Lasseur J., Thi Thanh Huyen Le, Li Li., Mauricio R.M., Cangussu M., Müller J-P., Quiroga Mendiola M., Quiroga Roger J., Vera T., Ulambayar T., Wedderburn L.

CIRAD, INRAE, France; ISRA-PPZS, Laiterie du Berger, Senegal; NIAS, Vietnam; Univ Xi’an Jiaotong, China; Univ Federal de Sao Joao, Brazil; INTA, Argentina; Zoological Society of London, Mongolia; Agresearch, New Zealand

GASL MSP Meeting, Dublin, 2022, 4th Sept
Why apply Multifunctionality concept to Livestock Grazing Systems?

**Livestock Grazing Systems (LGS)**

- Larger territorial footprint: rangelands + grasslands !!!
- Often characteristic and identical products
- Collective organization for the management of resources (and products)
- Pronounced cultural identities

To move away from mono-disciplinary, mono-indicator and mono-sectoral debates

Emissions of GHG in CO₂ equivalents /liter of milk

Energy use / energy kg product

(Vigne 2014)
Multifunctional analysis: 3 Sust Devpt dimensions + one

Social Dimension

Production Dimension

Territorial development Dimension

Environment Dimension
Development of a conceptual model

Dimension social

Dimension local development

Dimension production

Dimension environment

GASL MSP Meeting, Dublin, 2022, 4th Sept
Economic dimension of production
Local development dimension

Policy and infrastructures

Sectors

Actors

GASL MSP Meeting, Dublin, 2022, 4th Sept
Building a common but open list of indicators

- Bibliography
- Participative and co-construction workshops (field and networking)

**Example: Local development dimension**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>SDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Local development</td>
<td>Services</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>nb and diversity of extension services</td>
<td>17</td>
</tr>
<tr>
<td>2.2</td>
<td>nb local services related to livestock activities</td>
<td>15</td>
</tr>
<tr>
<td>2.3</td>
<td>credit availability to resource users</td>
<td>8</td>
</tr>
<tr>
<td>2.4</td>
<td>number of processing units (dairy, slaughter,...)</td>
<td>8</td>
</tr>
<tr>
<td>Value chain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>distribution of added-value amongst stakeholders</td>
<td>5</td>
</tr>
<tr>
<td>2.6</td>
<td>marketing channels for pastoral products</td>
<td>8.2</td>
</tr>
<tr>
<td>2.7</td>
<td>% production in short channels</td>
<td>8.3</td>
</tr>
<tr>
<td>2.8</td>
<td>added value</td>
<td>8</td>
</tr>
</tbody>
</table>
## Cases studies of the Multifunctionality approach

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>The Puna high altitude, dry pastoralism</td>
</tr>
<tr>
<td>Brazil</td>
<td>Maranhao Silvo-pastoral Systems (ranch)</td>
</tr>
<tr>
<td>Senegal</td>
<td>Sahelian “Ferlo” pastoral drylands</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Bulgan forest steppes</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Dien Bien mountain</td>
</tr>
<tr>
<td>China</td>
<td>Qinghai plateau (Tibet)</td>
</tr>
<tr>
<td>France</td>
<td>PACA agro pastoral systems in mediterranean mountain area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>Sustainability and resilience of pastoralism through a multidisciplinary assessment</td>
</tr>
<tr>
<td>Brazil</td>
<td>Silvopastoralism at farm level as an option for sustainable grazing livestock systems</td>
</tr>
<tr>
<td>Senegal</td>
<td>Sustainable intensification of dairy value chain including traditionnal pastoral systems</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Making conservation of flora and fauna biodiversity coexisting with livestock systems</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Role of extensive grazing systems in Beef value chain development</td>
</tr>
<tr>
<td>China</td>
<td>Conservation of wild biodiversity (birds) with livestock systems</td>
</tr>
<tr>
<td>France</td>
<td>Future of livestock grazing systems in interaction with other land-users</td>
</tr>
</tbody>
</table>
A variety of methods on the field

- Surveys
- Workshops
- Focus groups
- Interview videos + discussions
- Demonstration farm
- Multi-stakeholders / Innovative Platform
- Multidisciplinary research team building
- Participative Modelling

>>> Co-construction of vision and pathways....
A Toymodel to illustrate multifunctionality

Defining the scenarios

Running the simulation

Observing the indicators
A simulation model to illustrate multifunctionality

Social

Local development

Production

Environment

GASL MSP Meeting, Dublin, 2022, 4th Sept
Scenarios of dairy intensification:
• Approvision in nutrients
• Intensification of exploitations

Variation of costs:
• Costs of feed supply and nutrients
• Milk costs

Results of simulation:
• Production (head / herd)
• Collection of milk products, informal market
• Local consumption
• Feeding system by biomass (head)
• Economic and social impact
• Density of livestock numbers...

Accompanying simulation model: Senegal
Indicators and their use to describe and measure functionalities
## Results of the Multifunctionality approach on case studies

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Case Study</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>The Puna high altitude, dry pastoralism sustainability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>Maranhao Silvo-pastoral Farming systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senegal</td>
<td>Ferlo Pastoral dryland dairy development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mongolia</td>
<td>Bulgan forest steppes conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>Dien Bien mountain beef systems development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>Qinghai plateau conservation with livestock systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>PACA agro pastoral systems in multiusers mountain area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Strategies for resilience based on social networks, diversity of livestock species, local and open supply chain

- Strategies for resilience based on social networks, diversity of livestock species, local and open supply chain
- Greater profit achieved compared with monoculture and enhanced soil conservation. Animal welfare enhanced.
- Three scenarios of dairy intensification and identified trade-offs between outputs and inputs and social and environmental consequences
- The positive uptake by herder of conservation related employment and services alleviated poverty and improved environmental outcomes
- Important complementarity that extensive beef production brings to the household, community, and local development
- The landscape mosaic created by yak grazing had a positive impact on bird species richness.
- Identified common objectives, trade-offs and needs to link cultural and productive assets. Levers of public actions to be settled

Greater profit achieved compared with monoculture and enhanced soil conservation. Animal welfare enhanced.

Three scenarios of dairy intensification and identified trade-offs between outputs and inputs and social and environmental consequences

The positive uptake by herder of conservation related employment and services alleviated poverty and improved environmental outcomes

Important complementarity that extensive beef production brings to the household, community, and local development

The landscape mosaic created by yak grazing had a positive impact on bird species richness.

Identified common objectives, trade-offs and needs to link cultural and productive assets. Levers of public actions to be settled
Transversal analysis of Multifunctionality approach impact

- Creating a space and process for multi-stakeholders to hear, respond and decide with common language, making “transparent” different views. Building common list of indicators

- Adaptability to multiple contexts but with diverse methodology and processes. Allow to maintain or restore link with local culture, tradition, socioecological systems.

- Supporting sustainability through different scale from global to farm scale

- Allow to articulate activities in territories: trade-offs and synergies

- Multifunctionality can be identified in very diverse context, but with specific profile in each situation (not all dimensions have the same importance, priority)

- Economic and policy dynamics might endangered some of the functions
Conclusion: what have we learnt?

- Inclusive approach with traditional and small farms facilitate social networking and then resilience and sustainability of agricultural and food systems at territorial level
- Promoting diversity (livestock species, livestock systems, flora and fauna,…) help to find sustainable pathways for food systems but need to deal with more complexity
- Integration of LGS in nature and biodiversity conservation programs helps biodiversity conservation management and increase sustainability of LGS and food systems
- Innovative value chains including traditional and smallholders livestock systems is an option for Sustainable Food Systems
- Sustainable Food Systems may need to build on complementarity of different livestock systems and also on synergies with other activities
- MF assessment help identify shared options for practice and policy change

GRASS AND FORAGE SCIENCE Journal
EGF Special Issue 2022 (In press)

Multifunctionality and diversity of livestock grazing systems for sustainable food systems throughout the world: Are there learning opportunities for Europe? **

Authors: Ickowicz A. 1-2-3*, Hubert B. 1-4, Blanchard M. 1-2-5-8, Blanfort V. 1-2-3, Cesaro J-D. 1-2-6, Diaw A. 1-7, Lasseur J. 1-3, Le Thi Thanh Huyen 1-8, Li Li. 9, Mauricio R.M. 1-10, Cangussu M. 11, Müller J-P. 1-11-12, Quiroga Mendiola M. 1-13, Quiroga Roger J. 1-3, Vera T.A. 13, Ulambayar T. 1-14, Wedderburn L. 1-15

GASL MSP Meeting, Dublin, 2022, 4th Sept
Thank you