Learning Area *"Mountains of Thessalia"* (Greece)

INNOVATION EXPERIENCES AND NEEDS

Contribution to deliverable D2.6.1

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Authors: Goussios Dimitris, Anthopoulou Theodossia, Faraslis Ioannis, Gaki Dimitra, Triantou Labrini, Vlahos George

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Introduction and contents

This report looks at innovation that supports HNV farming in **LA Thessalia**, and identifies the types of innovation that are missing and needed in order to secure a sustainable future for HNV farming.

We present examples of innovation existing in this Learning Area (LA) and examples more widely in **Greece** that could usefully be transferred to address challenges in the LA.

Types of innovation that seem to be absent in Greece, and that we would like to explore in other countries of the HNV LINK network, are also summarised.

Contents

The challenges facing HNV farming in LA Thessalia

- Recovery dynamics of upland LA supplied by the lowland communities (diaspora*).
- Management of the significant HNVF potential and renewal of its human resources
- Interest shown by policies and consumers for HNVF of mountainous areas
- Disorganization trends of the inherited communal systems for the management of natural resources
- Acquiring capacity from LA to coordinate :
  - ✓ the participatory planning for the balanced recovery of the LA's area
  - ✓ actions to preserve HNVf and enhance the viability of farm units
  - ✓ highlighting the value of HNVf's products and recognition from quality markets

** Diaspora referring to 3 scales: international, within the county , regional*

Challenges facing HNV livestock farming in La Thessalia

LA has a great tradition in pastoral-permanent and transhumant- livestock as well as in small HNV agricultural holding (polyculture). Despite the rural exodus and its reduction, this potential is still remarkable.

Within this framework the prospects to support HNVf are connected to:

a. the latest reinforcement and renewal of human resources due to the crisis, through the presence and establishment of new farmers from the communities of the diaspora who choose to adopt such systems,
b. communities' capacity due to the presence of the diaspora and its participation in the development of agritouristic activities,
c. the turn of consumers towards quality and identity products.

Therefore, the main challenge for the LA is to acquire the capacity, through new cooperation and coordination forms (governance), to design and implement the balanced recovery of the area as multifunctional and HNV area, utilizing the will of some people to establish there permanently, the return of new farmers and entrepreneurs, new policies, consumers' interest. Utilizing the area's HNV character requires the ability to plan and implement actions that will preserve the HNV character of the production systems (emphasizing the planning of land use and pasture management at the scale of the holding, the community and the LA) combined with the promotion of their products in the markets.

Overview of innovation in LA Thessalia

❖ **General innovation deficit**

- lack of an integrated policy for the mountainous areas
- non specific orientation of the RDP towards HNVF in the LA
- lack of an innovation pole in the Region of Thessaly

❖ **Innovations in the LA:**

- Transition from private to collective innovative initiatives in the areas of:
  - ✓ *cooperation (creation of new social bodies)*
  - ✓ *coordinating multi-stakeholder cooperation (Municipalities networking, Cluster)*
  - ✓ *utilizing the multifunctionality of the space (HNVF and rural tourism)*
  - ✓ *PDO products and new guarantee systems for HNVf products,*
  - ✓ *diagnosis and participatory planning methods and tools*
- These innovations build a favorable environment for more innovations

Is there a lot of innovation, or not much?

A small number of innovative initiatives are being recorded. These concern: a) the form and the way Development Agencies are functioning (ANKA and KENAKAP), b) adopting new flexible cooperation forms (women's cooperatives, social economy) based on the new institutional framework, c) improvements at the level of the holding (milking machines), d) initiatives to increase the value and promote local products and services such as small festivals for agricultural products, PGIs and PDOs (feta, Agrafa cheese, wine) and e) complex coordination initiatives of multi-stakeholder cooperation such as local quality agreement and a cluster in agritourism and the dairy sector,

Is there an overall, integrated project to support HNV farming in the area?

Recently, HNV-Link project launched an initiative to design an integrated HNVF support programme under the auspices of Pindus Network, run by the Municipalities of the LA, responding in this way to the lack of an integrated policy for the mountainous areas and HNVF. The initiative utilizes multi-stakeholding (diaspora, producers and agritourism entrepreneurs), the multifunctionality of LA's space and the dynamics of settling new farmers and developing agritouristic activities in order to coordinate partnerships that aim at the preservation and management of LA's HNVf.

Are there social and institutional innovations, or just individual examples of actions e.g. single farms?

Social and institutional innovation in the area is considered: the creation of Development Agencies, "PINDOS" network created by the Municipalities of the LA, Terra Thessalia Cluster and the new functions undertaken by LEADER groups and individuals within the framework of these collective initiatives.

By utilizing LEADER programmes and RDP, individual innovation actions have been developed in two levels: a) *collective*: Social Cooperative Enterprises (CSEs), local quality agreements, events for HNV products etc. and b) *individual*: in the level of the holding and the business (milking machines, small machinery, sites for the promotion of farm products etc.) through funding aiming at their sustainability (improvement plans, processing, promotion, agritourism etc.).

How do the existing innovations fit under our 4 themes ?

The search for specific elements in order to support competitiveness imposes the need to promote the value of HNVF and biodiversity by leading part of the research and innovation towards this direction.

- In the category “Social and institutional”, the new organization forms for producers and entrepreneurs (SCEs, PLC, cooperatives etc.), favoured by the new institutional framework, contribute to the creation of circumstances and conditions (trust building, improvement of social capital) for the creation of multi-stakeholder cooperation (governance). These partnerships expand the functions of the local social system, they use education and seek the actor's active participation in multi-objective interventions that incorporate HNVF management.

- In the category "Regulatory Framework" innovation deficits are linked to the non-activation of the measures 1, 2, 7, 8, 16 of the RDP concerning conservation and biodiversity improvement, Natura 2000 areas, landscapes etc. Terra Thessalia has submitted suggestions for the change and completion of some regulations (raw milk). The regulatory framework for GI products has been utilized in the case of the following PDO products : feta and Kasseri, Graviera of Agrafa, Meteora wine and Mesenikolas black wine.

- In the category “Products and Markets” innovations (LA and country) cover: a/ GI products, b/ development of short chains aiming at the diaspora and consumers' cooperatives as loyal product markets (alternative markets), c/ research for quality markets-Terra Thessalia is already trying it-utilizing new cooperation forms, new tools, local Leaders etc.

- In the category: “Farm techniques and management” progress/diffusion of innovation is limited due to the frail connection between the scientific and production community. The main innovation is the development and integration of methods and technological tools in the participatory procedures : a) for the management of land use and b) the support of practices and techniques on grazing management of pastoral herds, creating sustainability conditions (economical and environmental) for the managed resources (pastures, waters, forage production…).

Is innovation increasing or stagnated?

There is a slow but steady reinforcement of innovation, with its main characteristic being a turn towards more collective initiatives supported by Development Agencies and university research laboratories through the implementation of large and targeted European programmes (LIFE, ENPI MED, HORIZON etc.) on issues around environmental protection, introduction of organizational innovation and technological tools.

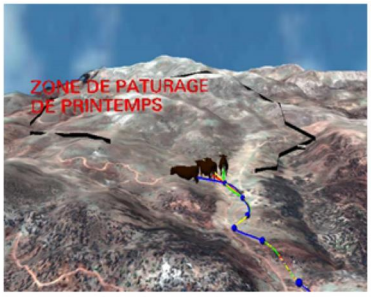
Innovation examples in LA Thessalia: what are their strengths and weaknesses for HNV farming?

- Territorial Cluster "Terra Thessalia": cooperation of small dairy territories aiming at increasing the added value of dairy products focusing on the specificities of pastoral holdings

- Participatory Guarantee System(PGS): control and guarantee tool for the HNV specifications of the HNV holdings

- GPS tracking:
  tracking tool of the grazing system

- Consultation tools: 3D Mapping tools in Public participation procedures



Strengths

- They approach and cover the organization and operation spectrum of HNV holdings (upstream) and their place in the local and regional dairy chain (downstream),
- They contribute with diagnosis methods and tools to the producers' active participation in consultations, planning and implementation of management plans for natural resources
- They facilitate interdisciplinary and corporate cooperation creating groups that include producers, researchers, technicians and representatives of the territory and all the links of the value chain
- They contribute to the densification of focused meetings and regular consultation procedures
- They contribute to the development and continuous enrichment of a territorial marketing for the promotion of products produced by HNVF
- PGS favors and continuously creates new research and evaluation fields associated with HNVF (specific resource components, endemic plants, their nutritional value, grazing systems)
- They make the area a laboratory of interdisciplinary approach for the problems and osmosis of traditional and new research knowledge
- They can be implemented with a low cost in every scale: LA, community and holding
- The innovative initiatives are relatively recent and oriented towards the support of HNVf

Weaknesses

- Their implementation requires specialized support groups (technicians, facilitators, researchers)
- Cluster's development depends on the success of marketing and the sale of products
- Their expansion and coverage of more holdings, particularly the new ones, is affected by the lack of strong professional and multi-stakeholder partnerships
- There is a need to constantly adapt technological tools

What are the main innovation needs in LA Thessaly, and how could they be addressed?

Social and institutional innovation

Social and institutional - innovation needs	Possible approaches
Lack of experience in the operation of multi-holding cooperation and coordination forms (governance) that integrate HNVf	Utilization of LA's multi-holding and institutional framework of decentralization and RDP, transfer of experience from other countries
Lack of a support structure for a long-term HNV "animation" project for the LA	Organization of a Coordination Center (Development Agencies, university and technical institution laboratories etc)
Organization of local groups for the management of land use and natural resources (HNVf, Natura 2000, rural tourism) at the scale of the community and the Municipality	Local assembly of producers, entrepreneurs, the Diaspora, representatives of the community Networking new farmers is a driving force for the support of LA's HNVf
Reinforcement of producers and actors participation in planning and management procedures concerning land use, pastures and biodiversity	Development of interactive spatial tools to support procedures of consultation, decision making, preparation and implementation of management plans

Need for a social and institutional innovation

1. Supporting the involvement of local actors in an innovative governance structure focused on HNVf

The experience related to LA's HNVf is linked to the implementation of various actions under EU programmes. Today, the stabilization of livestock population and the dynamics of the multifunctionality of LA's space require a new integrated intervention. The purpose of this integration will be the coordination of building new forms of land use management at the community, Municipality and LA scales, and also the active participation of local societies (producers, entrepreneurs, diaspora, elected).

2. Ensuring an animation and coordination structure of the HNV actions by utilizing local support bodies and by securing continuous presence, knowledge transfer and support of the producers for their active participation in diagnosis, planning and decision making.

There is a strong need to support the orientation of new farmers towards HNVF and the production of local products that the authorities do not support. Development Agency of Karditsa has developed a support ecosystem but will have to adjust it to the needs of HNVf. Experience is offered by the support structure organized by Terra Thessalia, based on the cooperation of local and regional support bodies.

3. Active participation of local actors (farmers, diaspora, residents, associations etc.) and competent bodies in processing and implementation procedures of land use and natural resources management in the scale of the community

Rural exodus and the reduction of agricultural activities have led to the disorganization of the local landuse management systems, a gap covered by competent services (Forestry, Agriculture etc.). There is the need to organize local society and producers at the scale of the community and the Municipality, claiming their re-participation in landuse and resources management (pastures, forest extension, utilization of parcels that belong to the diaspora, access to abandoned agricultural zones for which there is an interest for agricultural use, management of the relationship production-biodiversity) by activating the planning tools available to the authorities.

4. Ensuring new tools that will support actors' participation in the management of the relationship HNVf-biodiversity. Development of a specialized educational procedure for the learning and use of tools.

The effectiveness of these cooperation forms requires the reinforcement of applied research, the establishment of a multidisciplinary and technical support group for training and implementation.

Regulatory framework innovation

Regulatory framework - innovation needs	Possible approaches
Recognition of the LA as HNV area	A procedure that PINDOS network will promote through the activation of the 7.1 measure of RDP
Utilization of RDP measures to support the HNV agro-pastoral farming systems and biodiversity	Combination of the planning tools offered by the new extended Municipality and the competent Ministries (Spatial Plans, Pasture Management Plans, terroirs, habitats…)
Enhancement of the HNVf dimension of the guarantee systems within the LA	Enrichment of HNVf criteria and indicators and their integration in PGS Compatibility and connection with the national certification systems
Lifting the ban for the production of cheese with raw milk	Scientific documentation and monitoring of the animal control and ripening period of the product with the active participation of producers

Regulatory Framework Innovation Needs

LA's recognition as HNV area will contribute to sustainable development and the increase of the value of products and services. Mobilization and commitment of all the bodies and actors is required in order to secure a) the management of HNVf from local actors themselves and b) the guarantee of the connection between HNV characteristics and local products (action plan, documentation, tools).

Biodiversity measures of RDP are considered to be a secondary priority by Authorities due to the economic crisis, among other things, and thus they remain deactivated. Therefore, the intervention of PINDOS network-initiated by the Municipalities of the LA-for the activation of the 7.6 RDP measure is of strategic importance. It will enhance the organizational and technical capacity of the LA in order to implement an integrated action plan for the utilization of measures and funding from the first pillar and RDP on pastures and biodiversity. The effectiveness of this intervention will depend on the utilization of the national institutional framework related to the preparation and implementation of the required management plans as well as the general support of HNVf through LA's local structures.

There is a need to a) better integrate HNVf aspects in the bottom-up participatory product guarantee systems for the better emergence of its relationship with the products they produce and b) adjust and complement the institutional framework of the existing certification systems operating at national and regional scale in order to combine them with local guarantee systems.

Removing the obstacles for dairy products with raw milk in Greece and the LA is of strategic importance (i.e. increase in the international demand for these products). The obstacles are (1) animal diseases and their transmission through grazing and (2) the opposition of big industries. However, surveys confirm that respecting the traditional ripening period makes the product safe without the need to pasteurize it. The whole procedure requires innovative solutions for the control of the herds and the exclusion of the infected ones during grazing for the acceptance of the change in the relevant regulatory framework.

Products and markets innovation

Products and markets - innovation needs	Possible approaches
Strengthening the ability of the Value Chains to support and promote the product-HNVf relationship and their ties with the LA	Territorial development and territorial resources approach. Strengthening the monitoring role and promotion of the Participatory Guarantee Systems
Creation of an HNV place of origin Label for the goods and services that are offered	Combined exploitation of LA's recognition as HNV and the experience of Terra Thessalia (Participatory Guarantee System)
Development of a territorial Marketing that will incorporate the HNV characteristics of the LA's holdings	Navigation tool for the consumer in the relational route: product-production system- biodiversity
Utilization of local, regional and national markets and also direct sales from farms through territorial marketing	Utilization of Terra Thessalia's experience, the Diaspora, sale points, Delicatessen, alternative solidarity markets, consumer cooperatives etc.)

Products and Markets Innovation Needs

The objective to support HNV holdings through recognition of their products' value by consumers faces the competitiveness of the products coming from the intensive agricultural model of production and a promotion-advertizing which often misleads consumers. There is therefore a need for a different and innovative effort for the promotion of the wealth and HNVF values and the search for a more effective way of meeting and informing consumers. The effort must be assumed by each value chain through "territorial marketing", the development of which is based on the ability of local actors to guarantee with their own means and procedures (PGS) the connection of their products with HNVF.

The basic principle for the development of a new "territorial" marketing for HNV areas and their production systems is to promote not only the product but especially the place and the production method of the products and services they offer to consumers. So the successful promotion of locally produced products to consumers (diaspora) and faithful markets like the No Middlemen market, Consumer Cooperatives) requires: a) the development of GPS in order to demonstrate in a documented way the links of these products and services with the production place and the HNVf (e.g. pastoral sheep and goat breeding, environment and biodiversity protection etc.) and b) the active participation of the directly involved actors.

Farm techniques and management innovation

Farm techniques and management - innovation needs	Possible approaches
Research for the improvement of the HNVf operation and the contribution of biodiversity in its productivity	Transformation of the LA into a research laboratory in cooperation with research groups and osmosis of research with inherited knowledge (grazing practices etc.)
Access to the technology and necessary HNVF diagnosis, management and monitoring devices and their relationship with biodiversity (land use, pastures, ecological corridor etc.)	Adaptation and integration of technological tools into an integrated methodology for the planning/ implementation of management actions at the scale of the holding and the community Creation of learning processes

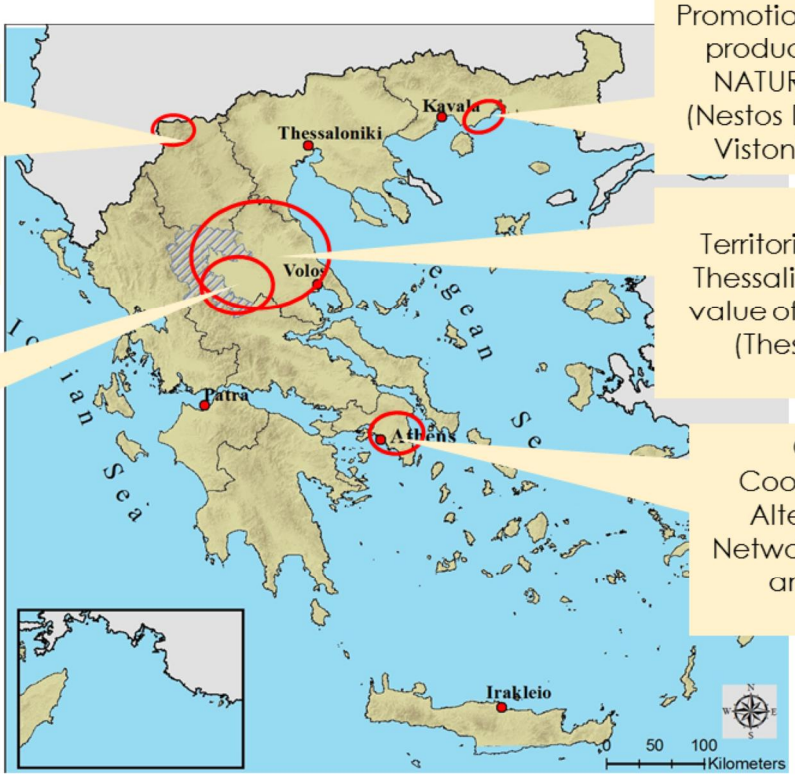
Both the advisory system and research, during the last decades were oriented towards the support of the intensive agricultural model. Nowadays it is necessary that they turn more intensively and coordinated towards HNVF, focusing on the internal organization and operation of farm units and their relationship with the natural environment. In this respect, LA, supported by the cooperation and coordination structures and the HNV holdings as well, can become an interdisciplinary research and implementation laboratory that will attract specialized research laboratories, funded by RDP and other national and European programmes..

This research needs to contribute to the emergence of the biodiversity-HNVF relationship and the assessment of biodiversity's contribution to HNVf productivity. At the same time, for the needs of both research and the implementation of its results, an integrated methodology should be developed - a guide to better organize and monitor the systems and grazing practices, guaranteeing at the same time the pastoral character of sheep and goat breeding and the HNV character of agricultural holding generally.

Innovations from outside the LA that could help address LA needs

Promotion of agricultural products /services in NATURA 2000 areas (West Macedonia Lakes National Park)

Development Agency as a key territorial facilitator for sustainable development.



Promotion of agricultural products /services in NATURA 2000 areas (Nestos Delta and lakes Vistonida-Ismarida)

Territorial cluster Terra Thessalia. Increase the value of dairy products (Thessaly region)

Consumer Cooperatives and Alternative Food Networks within Social and Solidarity Economy

- Development Agency: the case of Development Agency of Karditsa – Thessalia
- Consumer Cooperatives and AFNs (Alternative Food Networks) within Social and Solidarity Economy newly emerged in Greece amidst economic crisis: Metropolitan Area of Athens
- Territorial cluster: Terra Thessalia, to increase the value of dairy products (Thessalia)
- Certification schemes aiming at the promotion of agricultural products produced and services provided in NATURA 2000 areas : two Natura 2000 areas in Northern Greece:
    - Prespa area and Nestos Delta and
    - West Macedonia Lakes

Innovation examples for which LA Thessalia is looking to other Member States

- Structures and support tools
- Institutional and regulatory framework on land use
- Biodiversity conservation plans (grazing)
- Promotion of HNVF products
- Support of HNVF by social actors (communities, consumer cooperatives)

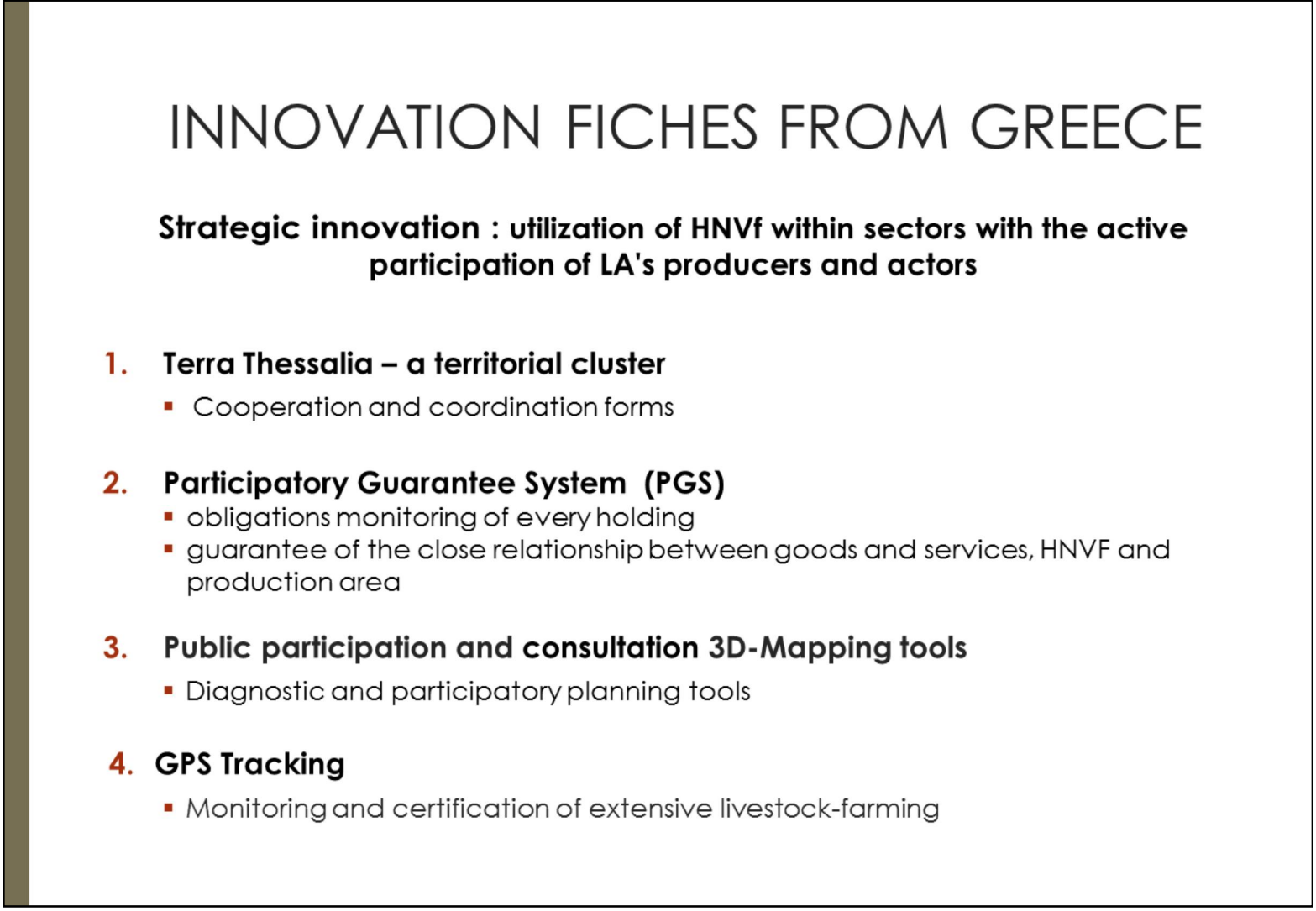
Structures and support tools
- Assistance and technical advice for breeders (Life+ Mil'Ouv)
- Local Management and support Structure
- Montado monitoring system

Institutional and regulatory framework on land use (pastures)
- Creation of governance for the management of the Causses and Cévennes Site
- Dartmoor Commoners Council & Scottish common grazings governance
- Collective approaches which allowed the maintenance of pastoral activities: «Pasture Groups » and «Pasture land associations »
- Inter-municipal pastoral pact
- Facilitation of collaborative land use management (FOCLUM)

Biodiversity conservation plans with grazing practices
- Integrated management plan for the Easter Hills of Cluj (Natura 2000 site)
- Agri-environmental measures & Results-based payments system

Promotion of HNV products
- website Caprites - internet marketing of local-breed products
- Quebrantahuesos & DeYerba internet sales of grassfed products
- Improved marketing strategy and tools for farmers to access markets
- Slow Food Pelješac: fostering HNV products and practices
- Economic association Naturbeteskött (Natural grazing meat)

Support of HNVF by social bodies (communities, consumer cooperatives)
- CSA Community supported agriculture & CSA El Berenjenal CSA group



The presented innovation examples were developed in Thessaly and the LA under the initiative of research laboratories with contributions from local development agencies and bodies, and were funded by EU programmes (Novagrimed, Lactimed, Horizon 2020). This intervention is part of a strategy to promote the sustainable development of HNV mountainous areas and its objective is to strengthen the organizational and operational capacity of local actors and HNVf producers to manage and use their territorial resources.

The 1st concerns the creation of Terra Thessalia "Territorial Cluster", based on the idea that the recognition by consumers of the value of products and services offered by HNV holdings is key to their future. It builds new forms of cooperation and coordination, combining multifunctionality, multi-holding and socio-institutional specificities (role of the diaspora, dynamic coexistence of formal rules and informal standards).

The 2nd concerns the development of a Territorial Participatory Guarantee System that allows local actors to organize their own ways of controlling and transparently guaranteeing HNVf specifications, supplementing the certification systems by third parties and feeding at the same time the content of a territorial marketing that promotes the close relationship between HNVf and produced products.

The 3rd concerns the development of spatial tools (3D-GIS) that contribute to representing and simulating the space in which relations between actors and producers are being recorded (imprint) through HNVf activities. The innovative aspect is the contribution of these tools to training/learning/activating producers' participation in the processes of diagnosis, consultation and decision making around problems related to their space and to planning and implementing HNVf management and promotion actions.

The 4th example is one of the applications that responds to the need for a reliable tool to monitor and guarantee the grazing of the herds and to be accessible to consumers.

Greece – innovation (1): Terra Thessalia a territorial cluster for valorisation of HNVF

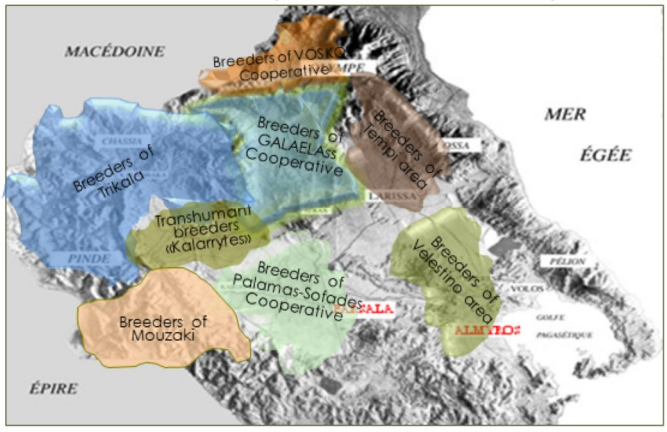
Location: Thessaly, Greece

HNV system: Shepherded sheep and goat farming system. Potentially all HNV farming systems

Scale of operation: 7 small dairy territories (approx 7 km²)

Timespan: The Terra Thessalia cluster as an institutional entity is the output of the strategic MED programme LACTIMED (2013-2015). This is an ongoing project (started in late 2016). Today the actors involved assume the Terra Thessalia initiative to promote their local dairy products.

The 7 small dairy territories in Thessaly



Keys to success: funding from the European programme ENPI MED, value chain approach, cluster with a territorial dimension, development of a participatory guarantee system, recognition by the market of the value of products with pastoral origin, redistribution system

Scale of operation

The cluster includes 7 small dairy territories, approximatively 500 pastoral farms, 7 family artisan dairies, a number of supporting agencies (LAGs, Cooperative Banks, Industry and Commercial Chambers, Public Research Laboratories). A general problem is being addressed (HNVf marginalization and lack of reward of their multi-functional role and the of their products' quality), through a localized example at the optimal geographic scale (organizationally in a regional level and productively at the level of small territories and HNV holdings)

Problems addressed by this example

- Deficit in the horizontal and vertical cooperation of local and public bodies
- Risk of losing heritage resources (landscape, pasture biodiversity, identity dairy products, traditional techniques, etc.) and environmental degradation
- Lack of visibility of the specific quality of GI dairy products on the market through a guarantee system
- Risk of usurpation of cultural resources (e.g. PDO label)
- Lack of professionalization of traditional pastoral activity
- Lack of access of remote farms and artisanal dairies in HNV pastoral areas to market channels
- Need to enhance the spirit of cooperation and networking of territorial actors
- Lack of awareness by local actors regarding close links between HNV-specific product quality-consumers
- Continuous decrease on the value of pastoral products

Story in a nutshell

Creation and adaptation of a territorial dairy cluster integrating, in an innovative way, local productive forces as well as small dairy territories of Thessaly Region. Improvement of the image and promotion of the HNV character of localized pastoral farming systems to support and preserve them through a new organizational structure of the dairy sector, support and consultancy services, and a Territorial Participatory Guarantee System regarding the distinctiveness of origin-placed dairy products.

Keys to success:

- The auspices, the prestige and the funding provided by the European program ENPI CBC MED; the support of the laboratories of 3 Universities; the participation of all directly and indirectly involved actors and in the value chain
- The creation and integration of three bodies within a governance structure that covers and represents: a) the territory, b) support and research bodies and c) producers and processors
- Crisis revealed market distortions and thus the importance of cooperation; consumers are turning to local and Greek food products (value for money)
- Asymmetrical power relations in the governance of the value chain of PDO cheeses, and in particular of the popular Feta cheese being in a growing demand, in favor of large industrial dairies and distribution networks (oligopolistic market structures).
- Active involvement of producers in a process, not of radical changes in the organization of the pastoral system, but of improving, guaranteeing and highlighting attributes and practices already existed in farms of HNV type.
- The innovative role of PGS combines simultaneously the respect for HNV specifications on behalf of livestock breeders and consumers' expectations
- Positive reaction of quality markets.

What does «Terra Thessalia» achieve for HNV farming?

- Key points: Organization of 3 bodies, provision of services, creating a multi-actor platform for dialogue, development and implementation of a Participatory Guarantee System and territorial Marketing, product sale
- 7 small historical dairy territories, 500 holdings and 7 artisanal dairies 100,000 sheep and goats (pilot application in 60 herds- 13,000 animals)

General achievements of the action

- Creation and operation of a flexible governance form based on three bodies that represent the territory (a Territorial Assembly which function and objectives are governed by a Charter), the services (Terra Thessalia, Non-profit Company) and the production/marketing of products (Trade Thessalia Lactis- Private Limited Company)
- The ability of producers and processors to guarantee themselves the relationship between HNVf and the quality of their products was reinforced with the implementation of the Participatory Guarantee System (PGS)
- The new organization and support structures have developed techniques in order to improve grazing practices, ration etc.
- Local actors engaged in Terra Thessalia (breeders, cheese makers) have perceived the importance of pastoral system.
- The first tentative market sales (niche markets) abroad and in the domestic market under the Terra Thessalia label confirm the interest of consumers for place-based quality cheese.
- Implementation of a redistribution system of the surplus.

Does it improve the socio-economic situation of HNV farming? examples

Pilot actions have shown a reduction on the production cost due to the improvement of pastures and secondly due to the configuration of a balanced and adjusted ration in cooperation with the Agricultural University of Athens, local zootechnicians and livestock farmers. The guarantee of extensive production systems through the PGS, increased the value of the products. Particularly for holdings with strong orientation towards HNV systems (transhumance, locale race etc.) the increase in the final price appears much bigger.

A system for the redistribution of a part of the added value allowed by the increase in the value of Terra Thessalia HNVf products has been foreseen and agreed for the benefit of these farms

Does it maintain or improve HNV values? Examples

Nowadays, the local actors engaged in Terra Thessalia (breeders, cheese makers) have perceived the importance of local breeds, grazing and traditional practices to enhance the value of the dairy product and thus the viability of the production unit. There is now a commitment, that is already being realized, to enrich the PGS with criteria and indicators that will promote the relationship between biodiversity and HNVf (grazing management plans, ecological corridors, hedges etc.)

Does it include conservation of nature values as an explicit objective?

There is a strict commitment that the production and promotion of dairy products from TERRA THESSALIA concerns only pastoral herds of local breeds. What is more, TERA THESSALIA's entire marketing policy is based on preserving and promoting the HNV character of the production systems of these collaborating holdings.

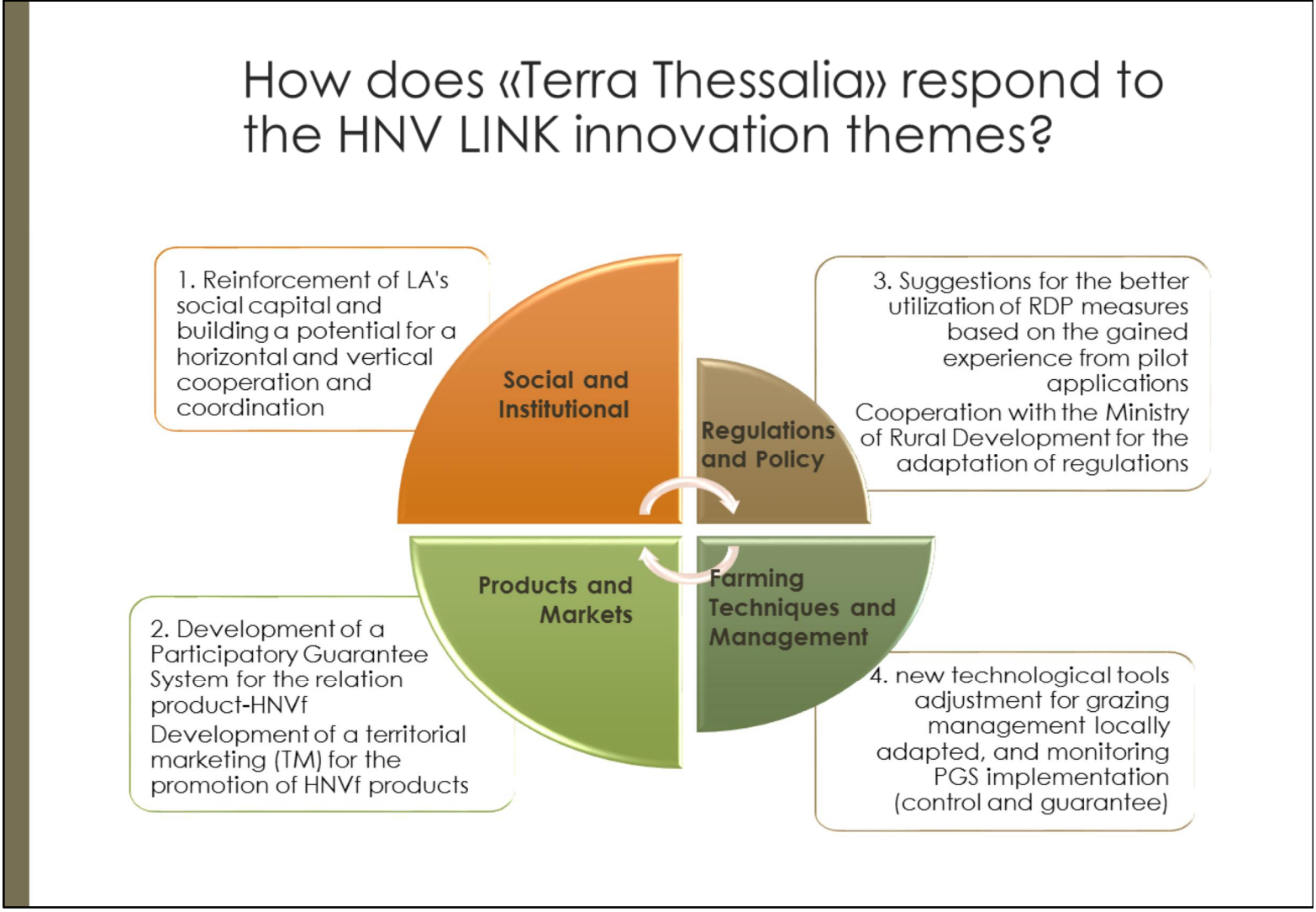
The charter for the small dairy regions and the PGS specifications, explicitly mention the respect of the objective above, alongside the implementation of a redistribution system of profits for the support of the bodies that are involved with specific actions in preserving the HNV character of the production systems. The value of the pastures, for the animal welfare and the product quality, is highlighted.

Also the spring season milk and cheese are promoted as of the highest quality due to the flora and biodiversity associated with the particular agro-ecological context of PINDOS (a specific mixture of Mediterranean biodiversity and flora.

Could the innovation be made more directly beneficial for HNV farming and nature values? If so, how?

The most direct benefit for HNVf depends on:

- the amount of value that Terra Thessalia can redistribute to livestock breeders and hence the success of the promotion of its products through a territorial marketing. The expected increase of economic benefits will have a positive impact on strengthening the role of HNVf and its values and also on the efforts that are made in order to manage.
- The cooperation with collective territorial bodies from HNV areas (e.g. PINDOS network) in order to a) utilize the "Cooperation" measure of RDP, b) extend the application of the PGS in the agro-ecological field and enrich it with more HNVf criteria and indicators c) enrich training with issues like the connection of biodiversity and HNVf and d) broaden the marketing strategy with the incorporation of HNVf services (pastoral tourism).



The main theme *Social and Institutional* gives priority to the organization of the livestock farmers with other actors (creation of a Territorial Cluster). The creation of TPGS, the construction of a common product etc. cover the theme *Products and Markets*, while the services that are offered by the cooperation structure come under the theme *Farm Techniques and Management.*

1. The coexistence of 3 bodies and their functional articulation reflect the balanced institutional representation of all the actors involved (in the value chain but also in marginalized and unrewarded pastoral farming: producers, pasture management or pastoral heritage management bodies). Terra Thessalia contributed to the establishment of regular consultations and the multiplication of thematic meetings between actors and special scientists (zootechnicians, range scientists, NTIC technologies, facilitators etc.) with the support of innovative diagnosis and planning tools.

2. The bottom-up development of the tools PGS and TM contributes (through the use of new spatial representation technologies, multi-media etc.) to the promotion of territorial resources and products connecting to HNVf. They function as a mean through which consumers can enter and navigate in the HNVF world. The function of Terra Thessalia contributes to the development of new products under its label, to create added value through a marketing of products from HNV farming systems and areas.

3. Terra Thessalia, based on its services (grazing, local breeds, ration, etc.), its pilot projects (native pastures improvement, demo. pastoral farm) and policy proposals to the Ministry of Agriculture (entering local legume plants in the Nat. Catalog, producing raw milk cheese), contributes to the effectiveness of RDP regulations and strengthens the position of HNVf and pastoral farming.

4. The use of new technological tools functions here as a means that will amplify the ability and skills of actors, especially breeders, to actively participate a) in diagnosis procedures and development plans concerning grazing management systems and HNV farmland, contributing in this way significantly to the facilitation of cooperation in thematic and multi-stakeholder meetings (researchers, technicians, public services) and b) in PGS implementation as monitoring system.

The process that made it happen and critical factors for success

Definition and implementation of a territorial cluster capable of reinforcing and revealing the values and the qualities of HNV products

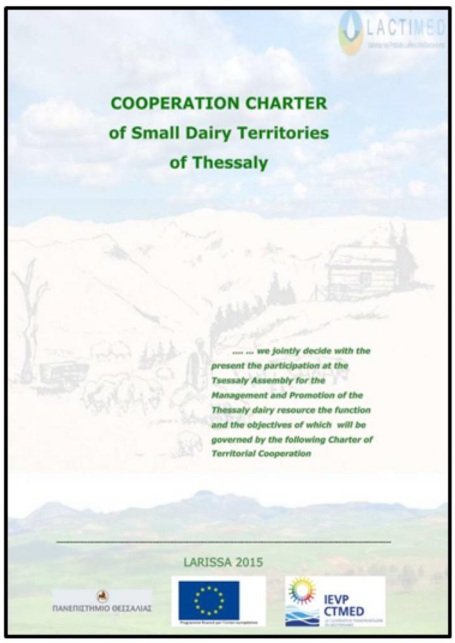
1. Cluster's territorial dimension:
three different (institutional framework, objectives) cooperation forms that organize the relationship of the Value Chain with territories, HNVF and consumers

- Territorial Assembly: governed by a Charter
- Terra Thessalia: provision of services
- Trade Thessalia Lactis: marketing and markets

2. Participatory Guarantee System : bottom-up development and implementation (specification control)

3. territorial marketing : contribution to market recognition of the value that derives from the product-HNVf link

4. Redistribution system of profits in favour of HNVf holdings



Actors and roles: who made it happen, who talked to whom, what roles were played by each key actor?

The driving force was the Laboratory of Rural Space, University of Thessaly and the multidisciplinary team that was formed with the participation of the Agricultural University of Athens (milk sector, pasture management, organization of the livestock farms), Panteion University of Athens (label, certification, PDO, PGI, marketing) and the local Development Agencies. So the first actor, the Laboratory of Rural Space, was the organizer/facilitator of the meetings and the consultations and responsible for the coordination concerning the integration of researchers and technicians from other institutions. The actors involved were a) livestock farmers' cooperatives, b) small cheese makers that retain their artisanal character, c) public services, d) associations of pastoral communities, e) all the representatives of local authorities, f) cooperative banks and g) chambers of Commerce and Industry.

Institutional context that made it possible

The initiative was favored by the institutional framework of decentralization (stronger Municipalities) and the creation of more flexible cooperation forms (professional, multi-stakeholder etc.) and the RDP regulations (quality systems).

Territorial Assembly does not constitute a recognized institutional form. All the representatives of small dairy territories, links of the dairy chain coming from regional and national bodies (Region, Union of Hellenic Chambers, Association of Thessalian Enterprises and Industries, Cooperative Banks of Thessaly, Development Agencies and 3 universities) participate in the assembly. Its function and role are governed by the obligations and objectives set out in the Charter (monitoring the territorial strategy for the dairy chain). Its contribution to the support of the Territorial cluster and its dynamic presence rely on the social moral burden of the bodies within every small territory (Municipalities, Development Agencies, cultural associations etc.).

Terra Thessalia is a non-profit legal entity and organizes the various support services (technical and advisory) throughout the Value Chain (livestock breeders, PGS implementation, marketing). Its members are representatives of the supporting mechanisms (Research Laboratories, Development Agencies, Cooperative banks, Chambers) and Trade Thessalia Lactis, which is the third structure. This is a Private Limited Company charged with marketing and that is why its members are limited to livestock cooperatives and the group of small cheese-makers. In order to avoid conflicts the owner of Terra Thessalia brand name is Terra Thessalia.

Resources: funding, staff etc

The progress of the programme was made without problems due to funding from the ENPI MED. The creation of a multidisciplinary team has played a decisive role.

Processes

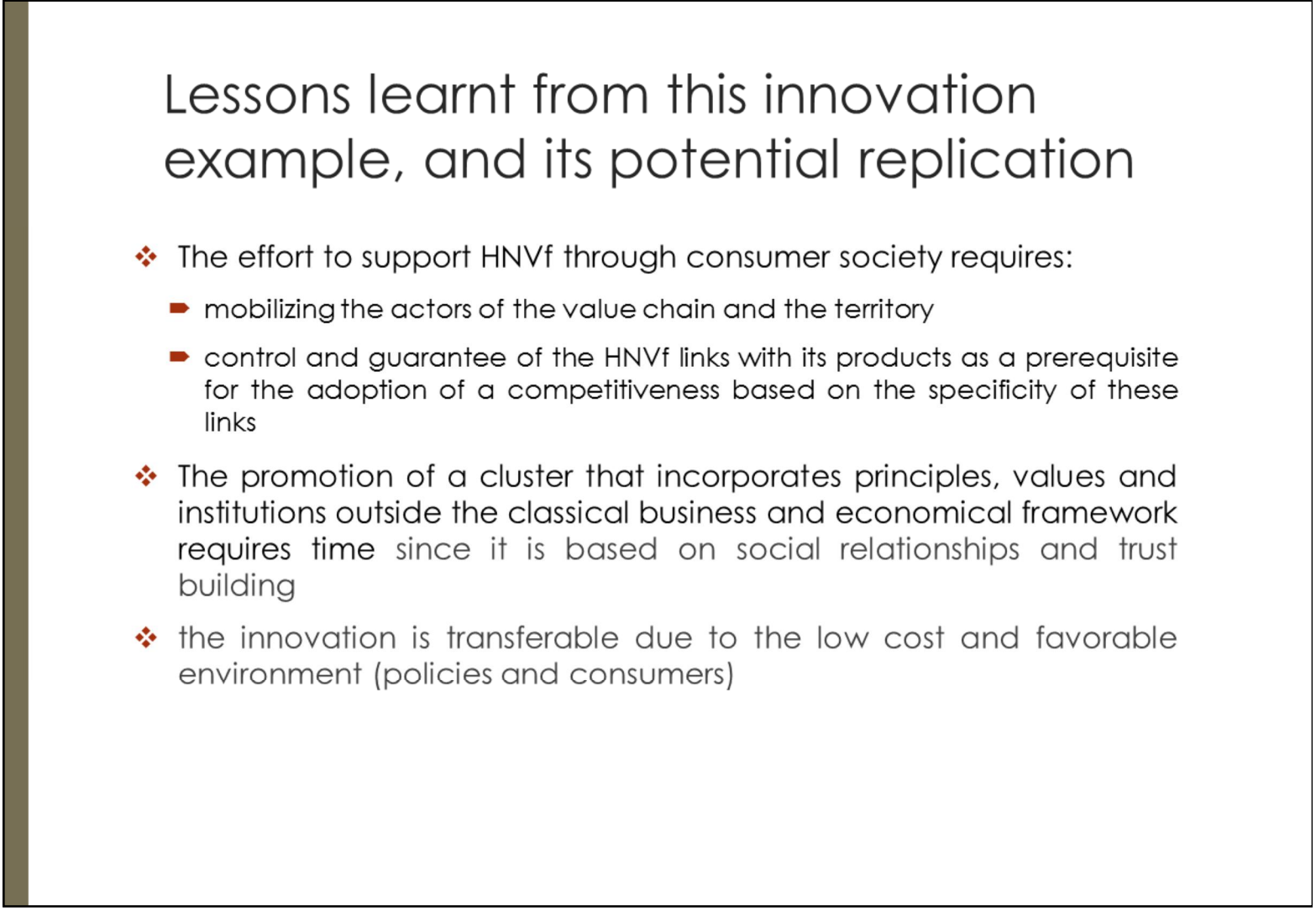
The building process was the following: a) creation of the three bodies, b) networking and pilot actions to support pastoral holdings (pastures improvement, ration, information on local breeds etc.), c) PGS planning and application and d) development of a "territorial" marketing for the promotion of Terra Thessalia and its products. Organization and establishment of numerous consultations that contributed to the familiarization between the various partners and actors and their integration in an institutional learning procedure (organization and operation of the cluster, operation of mulit-stakeholder groups) and transfer of specialized knowledge

Critical factors for success: opportunities, threats, timing, individuals, continuity…?

The redistribution system that was adopted works in favor of all those involved directly in the HNVF management and reflects the coherence of cooperation constituting a powerful tool for the success and continuation of this action. Recognition by the public bodies (Region, Ministry of Rural Development). An important factor regarding the active participation and commitment of livestock breeders was the fact that for them the organization and management of an HNV system is part of the knowledge, the practices and the experiences that they inherited. All actors know that the new expectations by an increasing part of the consumers link the quality and the identity of the product with the HNV systems and areas. New opportunities arise by the forthcoming activation of RDP measures (Cooperation, actions to strengthen biodiversity etc.), by the possibility of funding exports by local cooperative banks and from the better organization of the products' distribution networks. Also, new farmers are playing and will keep playing an important role.

Limiting factors, actual/potential problems, and how could they be overcome?

- The mismatch between timetables for the implementation of support and funding policies. Despite the fact that the cooperation was ready to move to actions since the beginning of 2015, the relevant measures of the 2014-2020 RDP had not yet been activated in mid-2017
- Restrictions due to the crisis, imposed by memorandums (lack of bank borrowing, over-taxation of SMEs, farmers)
- Difficulty of local actors to cooperate and be flexible due to long persistence in individual strategies which is interpreted by the long-term marginalization of pastoral farming by national policies (reservation towards policies, bureaucrats and services) and by geographical isolation (mountainous areas)
- In this context, the interaction within the successive instances of rapprochement between different stakeholders (dairy actors, local development agencies, commercial and industrial chambers, cooperative banks, municipal services, etc.) on a wider regional level might create reciprocity and a spirit of cooperation, and restore the territorial anchorage of collective knowledge and practices. This process also brings local actors closer to the service sector and helps them become familiarized with the institutional environment of the public sector and existing policies



Overall lessons from this example, especially from point of view of HNV farming?
Strengthening the marginalized HNV pastoral holdings that face the competition of the respective intensive holdings in the plain, depends on the ability of the territorial cluster to:

- intervene in the entire range of the dairy value chain
- link the increase of their products' value with the HNV characteristics of the holdings
- orientate part of the profits towards the reproduction of the HNV pastoral systems on which the above increase of value is based
- ensure the link between the farmers' inherited knowledge and practices with the new scientific knowledge through the cooperation of the research and support bodies (e.g. research related to the link of biodiversity and HNVf productivity)

Is the innovation unique to its territory and its characteristics, or is it replicable in other areas?
This particular innovation, being mainly organizational and immaterial, can be transferred to other HNV areas without high cost. Its representatives are determined to maintain HNVf and invest in the management and promotion of its relationship with the agri-foods they produce

Could it be rolled out on a bigger territorial scale?
Yes, as long as we separate the coordination-supporting aspect that can be developed at the scale of the Region (as Operational Partnership) from the productive aspect that should be handled by each territory separately according to the homogeneity of its HNVF heritage

What would be needed to do this successfully?
Cooperation with the regional and central services for an effective combination of motives and regulatory frameworks such as consulting services, training, financial motives, support of the market etc. Commitment of all the directly or indirectly bodies involved in the value chain to cooperate for the management of HNVf and the adoption of a strong tool for the specifications' control. Utilization of RDP funding tools.

Greece – innovation (2): Participatory Guarantee System (PGS)

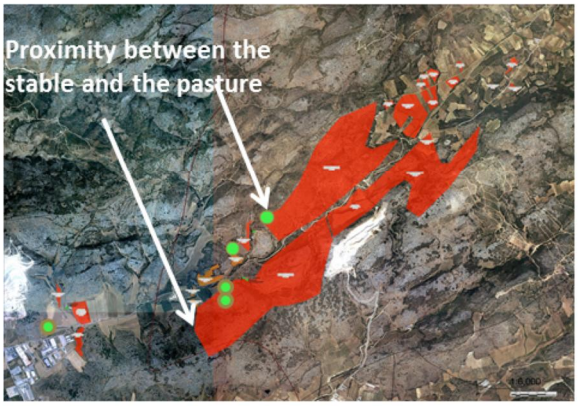
Location: Thessaly, Greece

HNV system: Shepherded sheep and goat farming milk system, Potentially all HNV farming systems

Scale of operation: On the scale of every holding (herd and parcel for forage) integrated in Terra Thessalia

Timespan: Tool developed and implemented as a pilot project by the Laboratory of Rural Space (University of Thessaly) within the framework of the Lactimed programme between 2015 and 2016

Keys to success: a) funding by the European programme ENPI MED, b) integration actors specialised in the services of herd management, livestock feed, diet, etc., c) new technology integration d) strengthening of small territorial chains without assuming an additional legislative certification



Scale of operation

After pilot implementation of the PGS in 15 herds (4,500 animals), its effectiveness was proved and can be now implemented in a larger scale: within a group of livestock breeders or a livestock cooperative but also within the limits of a community

Problems addressed by this example

- Asymmetrical power relations in the governance of the value chain of PDO cheeses (Feta cheese) do not promote the local specificities or guarantee that the characteristics of the dairy product, both inherent and extrinsic, are linked to HNVF holdings, operating thus in favor of large industrial dairies and distribution networks (oligopolistic market structures).
- Inability of the pastoral holdings, despite the high quality of the produced milk, to tackle the continuous decrease on the price of the milk and compete the intensive holdings,
- Lack of a monitoring system (herd management, local livestock feed, diet, etc) for the respect of the specifications that define the holdings' HNV character
- The asymetry of the information relationship (particularly about the HNV character of the holdings and the "artisanal" character of small dairies) that influences the producer-consumer relationship

Story in a nutshell

A key objective for Terra Thessalia was to develop a way to continuously enrich and update quality claims related to place-based attributes. For this purpose, Terra Thessalia has undertaken the implementation of a Participatory Guarantee System (PGS) whose goal is to reveal and guarantee the specific characteristics of the dairy resource as well as to foster it.

This System is defined as a means of utilizing the dairy resource and the HNVf. Its objective is twofold:

a) to observe, support and control the implementation of the obligations that every pastoral holding has and

b) guarantee at the consumers the HNV character of pastoral holdings and its sustainable links with their operating place.

PGS adopts an integrated methodology that combines consultations, a monitoring system using technological tools whose data are displayed in a database and the Terra Thessalia site that is accessible to consumers. All the actors of the dairy chain and a group of scientific and technical support (interdisciplinary and technical working group) participated in its implementation

Keys to success:

- Objectives, layout and timetables of the LACTIMED project (European programme ENPI CBC MED). The role of the working group with the support of specialists from specialized laboratories and local development agencies (organizational, scientific and technical support)
- Specialization of the Laboratory of Rural Space (University of Thessaly) in the development and implementation of technological tools in order to support educational, consultation and monitoring needs (3D spatial representation, GIS, satellite imagery etc.). These tools contributed in the function of the PGS as a support tool for the strengthening of active participation and as a technique for the creation of trust.
- Organization of regular and continuous information meetings, educational cycles and consultations
- Connection of the livestock breeders' participation in the PGS with the redistribution system of the profits deriving from the increase of the products' value
- PGS ability to support the development of a territorial Marketing
- Ability to substitute or/and supplement the certification standards by third parties
- The procedure and guarantee means have a low cost because they are based in soft rather than hard technology and in organizational innovation but also because the tool guarantees practices and actions that producer is already implementing within his HNVf.

What does «PGS» achieve for HNV farming?

Key points :

- Effective monitoring and guarantee of the organization and function of HNV livestock farm units
- Producers' active participation in issues a) farm unit managing and b) documentation of the HNVf character
- Successful pilot application in 15 sheep and goats herds (4.500 animals)

General achievements of the action

a) A guide (methods, tools) for diagnosis, evaluation and guarantee procedures

b) Educational material in order to train farmers and producers to actively participate in the guarantee of the HNVf-product relationship

c) PGS contribution in the development of a territorial marketing for the promotion of HNVF products in niche markets under the Terra Thessalia label

Does it improve the socio-economic situation of HNV farming? examples

It is an information, education and training tool for the producers on issues of HNVf improvement and management. At the same time, it functions interactively as a forum where producers and researchers/technicians can meet and exchange knowledge and experiences, familiarizing at the same time producers with the knowledge and use of new technologies. PGS contributes to the promotion of the value of products produced by HNV holdings and indirectly in the viability of HNVf production unit. Its pilot application has proved its contribution through the expression of interest on behalf of markets and consumers

Does it maintain or improve HNV values? Examples

PGS as a basic guarantee instrument for the connection between the quality of the product and holding's HNV characteristics, a connection that promotes to consumer society, it contributes to the recognition of the value of the HNV dairy product. This is a two-way process so that consumers and producers can actually understand the importance of local breeds, grazing and traditional practices

Does it include conservation of nature values as an explicit objective?

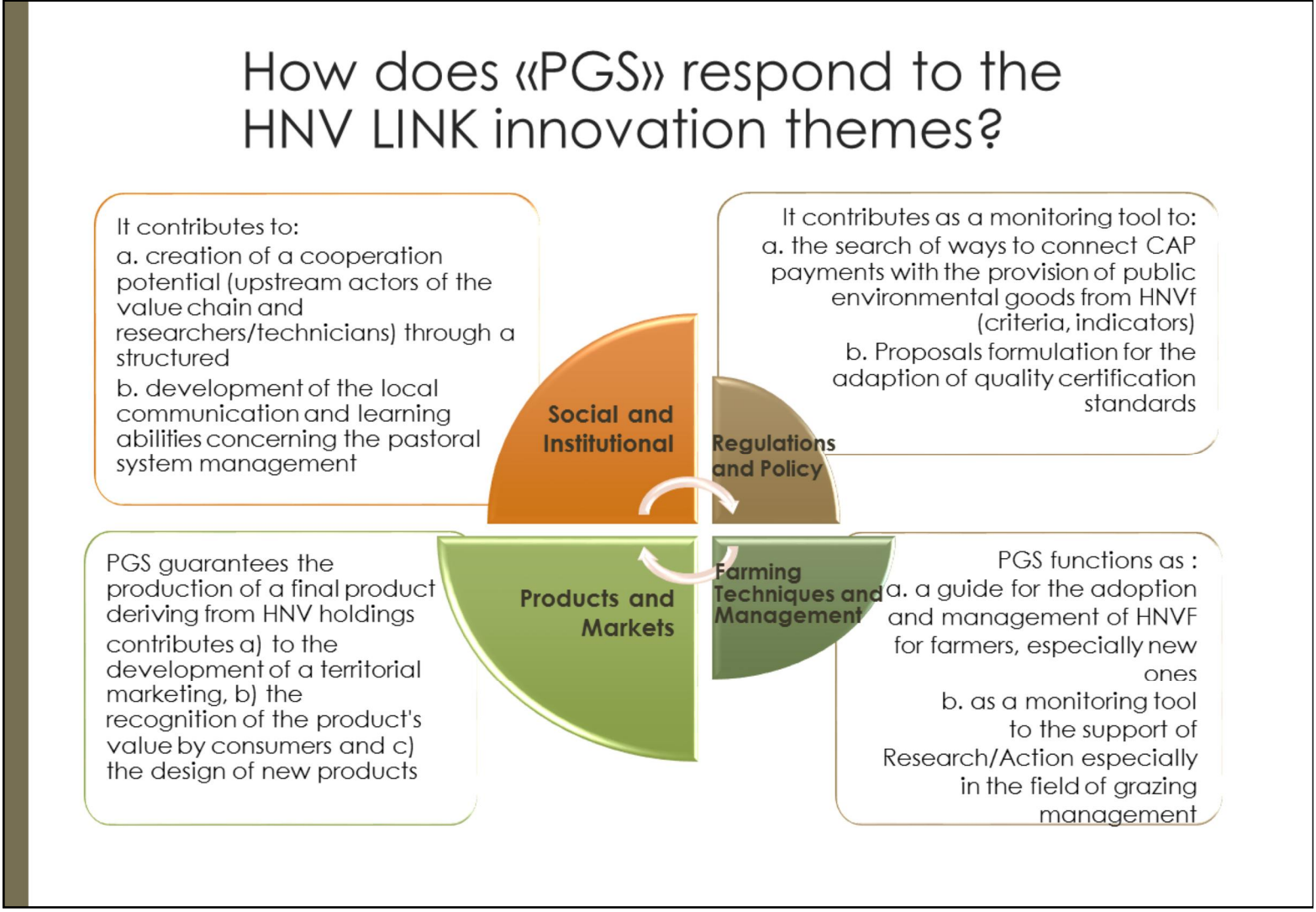
PGS was implemented only in HNVF holdings (only pastoral herds with local breeds) following TERRA THESSALIA's marketing policy which is based on preserving and promoting the HNV character of its collaborating holdings production systems. The charter signed by the small dairy territories, explicitly mentions the respect of the objective above and the adoption of a redistribution system in favor of the bodies that are involved with specific actions in preserving the HNV character of those production systems.

Could the innovation be made more directly beneficial for HNV farming and nature values? If so, how?

HNVF can directly benefit by the implementation of the tool because it also functions as an adoption guide of HNVF by the new entrant farmers. What is more PGS funding will reinforce its capacity to broaden and deepen the guarantee fields and promote more effectively the HNVF image and the multifunctional role of farm units, helping thus to better inform consumers on the value of HNVf and the products it produces.

The cooperation with collective territorial bodies (e.g. PINDOS initiative) that represent HNVf areas can utilize PGS as a policy tool (monitoring, control and reward of services and also support of a wider marketing strategy). Technically, strengthening this role of the PGS is possible without a big cost. It is necessary to strengthen the technical support group, implement a diagnostic study for every area or group of holdings, secure a specialized training (registration of information, use of technological tools etc.). Finally, this tool can also be used for the development of pastoral tourism as an important promotion part of HNVf values.

Already, the collaborating laboratories within the framework of Terra Thessalia aim to enrich PGS with criteria and indicators that will promote on one hand the relationship between biodiversity and HNVf (grazing management plans, ecological corridors, hedges etc.) and on the other hand the research promotion for the relationship biodiversity and farm unit productivity.



- *Social and Institutional*: PGS works as a new cooperation form which ensures that all the actors of the value chain and the research/support group will meet aiming at the bottom-up capture, planning and implementation of ways and means that will guarantee the holdings' HNV character.

- *Farming techniques and management*: PGS functions as a diagnosis and monitoring tool of the holdings' organization. It gets support from technological tools, its multidisciplinary team (zootechnicians, range scientists, computer specialist, etc.), education and regular meetings. The use of new technological tools functions also here as a means of strengthening the capacity of livestock breeders to actively participate in the diagnosis and planning of spatial interventions, a fact that facilitates cooperation with experts and public services.

- *Products and market*: PGS contributes to the promotion of HNV territorial resources and products, based on new spatial representation technologies, multi-media etc. PGS, with the tools it uses, can locate and guarantee elements and practices that can attribute to the product properties and characteristics connected to HNVF (e.g. spring grazing milk, movement, high-quality pastures etc.). These data are then used to shape the label and enrich the promotion message (visual and written).The innovative role of PGS is reinforced since it also functions as a two-way route of exchange, contacts and navigation in the world of HNVF for consumers.

- *Regulations and Policy & Products and market*: PGS contributes to the adaptation of certification standards to small scale specificities based on the experience and active participation of the actors, directly and indirectly involved in the production procedure (raw material & final product). These specification standards can also complement the control generalizations and weaknesses of the standards offered (or imposed) by third parties. Increasing the value of the products promoted by PGS + activation of RDP measures will contribute to a more balanced contribution of PGS in "Regulations and Policy and Farming techniques and management" as a diagnosis and monitoring-control tool of the holdings' HNV characteristics and their relationship with biodiversity with the potential to enrich relevant criteria and indicators in the scale of the holding and the community.

The process that made it happen and critical factors for success

- Project and technical support team
- Identification of elements directly linked to the relationship of the final product and HNVF and which can be guaranteed by the PGS
- Organization of training, consultation and implementation of action cycles for the producers by utilizing new tools
- Implementation of PGS with a monitoring form for the control, guarantee and supply of the territorial marketing

Actors and roles: who made it happen, who talked to whom, what roles were played by each key actor?

The driving force was the Laboratory of Rural Space, University of Thessaly and the multidisciplinary team that was formed with the participation of the Agricultural University of Athens (milk sector, pasture management, organization of the livestock farms etc.), Panteion University of Athens (label, certification, PDO, PGI, marketing) and the local Development Agencies.

The first actor, the Laboratory of Rural Space, contributed with the development of technological tools concerning 3D spatial representations, territorial diagnostic etc.

Next, the implementation team was organized with the participation of researchers and technicians from those institutions and members of livestock cooperatives, small cheese makers that keep their artisanal character.

After that there was a series of regular and continuous information meetings, training cycles.

Institutional context that made it possible

The institutional entity of Terra Thessalia and the institutional recognition status of the operation of some research laboratories as certification centers

Resources: funding, staff etc.

The progress of the programme was made without problems due to funding from the ENPI MED

Processes

The building process that was followed concerns 3 sectors:

1. Organization and implementation of PGS : a) creation of a project team that integrates the services of the actors involved in the fields of research, organizational and technical support etc., b) definition of guarantee sectors and fields that are linked to the HNV characteristics of the area and the holdings and refer to environmental values (print, sustainability, HNVF etc.), c)creation of an integrated diagnosis and guarantee methodology (sources, methods and integration of technological tools developed and adapted by LPS) and d) organization of regular and continuous information meetings, training cycles and consultations.
2. Evaluation-Guarantee : a. implementation of a monitoring system, b. storage and processing of data in a database-portal at the University of Thessaly, c. issuing guarantee certifications for every thematic (grazing, management, local breeds practices, origin of forage, HNV level etc.)
3. Supplying a "territorial" marketing for the promotion of its basic products in the market: a. data on quality and identity characteristics of the final products, b. integration of these elements in the label and packaging shaping and also the promotion message (visual and written)

Critical factors for success: opportunities, threats, timing, individuals, continuity…?

The intensification of competition (expansion of the dairy companies and intensification of livestock holdings), the economic crisis, the failure to organize the feta PDO status in national level so that a higher value can be secured were the main factors that favored the adoption of PGS of the different actors in the value chain.

New opportunities arise by a) the fact that despite the crisis consumers are turning to local and Greek food products (value for money) and b) the forthcoming activation of RDP measures (creation of Label systems, actions to strengthen biodiversity etc.).

Also, new entrant farmers will play an important role in the adoption of PGS due to their orientation towards HNVF and the production of territorial products. The redistribution system adopted in the framework of Terra Thessalia reinforces the role of PGS making it necessary for producers while it secures recognition among consumers. This responds to the new expectations by an increasing part of the consumers that link the quality and the identity of the product with HNV systems and areas.

Limiting factors, actual/potential problems, and how could they be overcome?

The adoption of the tool by an increasing number of producers depends largely on the response of consumers and markets. It is necessary to continuously improve and adapt the technological tools on monitoring and control issues.

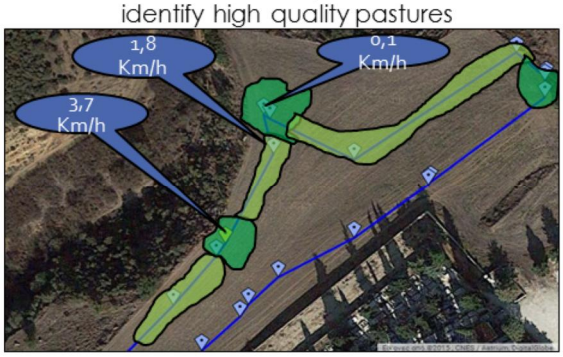
Also the expansion of the tool creates the need to expand the members of the scientific and technical team as a response to the continuous emergence of new research, evaluation (pasture quality, endemic plants, nutritional characteristics of plants etc.) and guarantee fields.

Finally, delays in the activation of national and European funding tools (e.g. RDP) is the main restrictive factor. However, as the value of the promoted products in quality markets increases, at the same time the possibility of at least self-financing the PGS application will also increase.

Lessons learnt from this innovation example, and its potential replication

- The ties between products and HNVF can be substantiated by producers themselves if they are provided with means, training and support
- The functional incorporation of adjusted technologies in PGS transforms them into popular communication and learning tools

Utilization of animal speed in order to identify high quality pastures



- The recognition of the value of HNVf products by the market upgrades the value of HNVf itself in the eyes of consumers, producers and local actors

Overall lessons from this example, especially from point of view of HNV farming?

If we adapt and integrate new technologies (GPS, 3D, Internet, satellites etc.) in a functional and targeted tool they can become a great instrument of a) informing, raising awareness and training producers and processors, b) farmers' active participation in control and guarantee systems of their holdings' HNV characteristics. In this case due to these technologies PGS transforms into an interactive tool that allows also the participation of local consumers (taste control, respect of traditional techniques, ethical aspects linked with the processing phases of the final product) reinforce the effectiveness and legitimacy of PGS.

Local actors' participation in documenting and guaranteeing the specificities of a territorial resource (HNVF), aiming at informing consumers and supporting a competitiveness based on discretion, is more effective than certification systems by third parties.

Is the innovation unique to its territory and its characteristics, or is it replicable in other areas?

Expanding PGS is easy and relatively inexpensive due to the immaterial technology that is used. Its implementation in other areas requires above all the agreement between producers and one or more cheese- makers, then securing a technical coordination and monitoring body for the implementation of the PGS and the utilization of its results. The tool can be applied to all types of agri-food.

Could it be rolled out on a bigger territorial scale?

PGS can be applied at the scale of the holding, a set of cheese-maker's holdings, the community or the LA

What would be needed to do this successfully?

Training the participating producers, creation of a central support group and small thematic structures of technicians and researchers (pastures, ration, local breeds etc.). Utilization of RDP funding.

Greece, innovation (3): Public participation and consultation 3D-Mapping tools

Short name: PP & 3D-Mapping

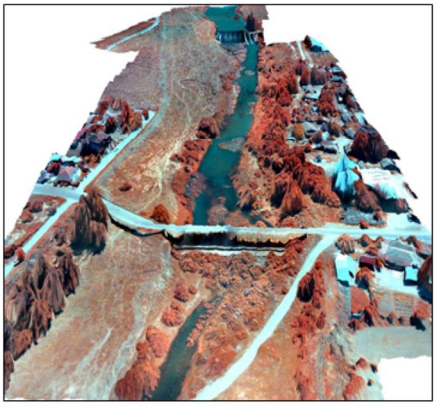
Location: Thessaly

HNV farming system: Improvement of the pasture management. Reinforcement of cooperation between producers and all the other actors

Scale of operation: Ability to change the scale of application (pastures in the entire LA-Thessaly). The most common application scale is the community

Timespan: Over 15-year application and implementation of "PP &3D Mapping" at community level for the settlement of spatial problems (pasture overgrazing -land use conflicts etc.).

3D interactive model-3DGIS



Problems addressed by this example

Addressing the stocking density issue in the grazing zones that are close to the limits of settlements and livestock facilities.

Reduction of conflicts between producers (livestock breeders, farmers, beekeepers) and public services (forestry department, Ministry of Agriculture etc.)

Reduction of disputes between farmers, residents and the municipality, on the movement of the herds.

The story in a nutshell

Within the framework of rural multifunctionality the Laboratory of Rural Space (LRS), Department of Planning and Regional Development of the University of Thessaly, has focused (for the last 15 years) on the development of innovative methodologies to enhance participatory planning and consensus. In this context the LRS has developed and implemented an innovative methodology of three dimensional interactive representations by using GIS & Remote Sensing and 3D computer graphics.

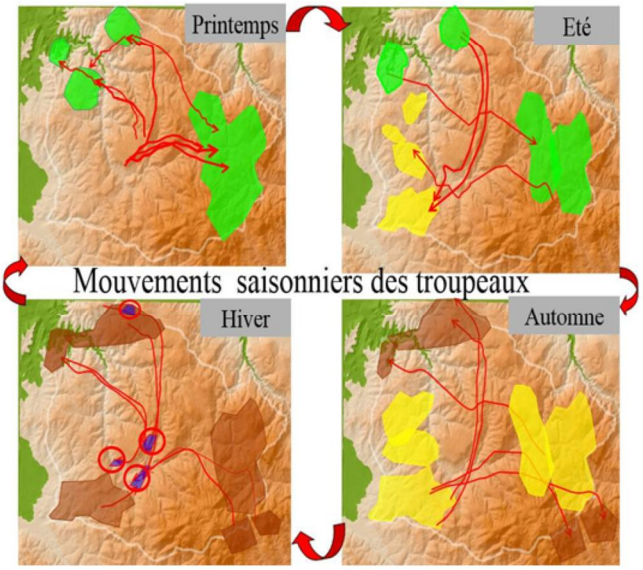
This is essentially the creation of "3D Virtual Worlds" with the ability to change scale, viewing position and virtual tour. The "PP & 3D-Mapping" is a Multi-stage Collaborative 3D Mapping tool for supporting public Participation for landcover/Landuse management. The interactive representations offer a communication language between the various actors. The objective of the innovation is dual:

a) to strengthen the participation-communication of all the bodies (and producers) in the management of pastures and generally the HNV areas and

b) the "bottom-up" collection of information, reliable and updated (creation of gea-database), concerning the area where local society takes action, aiming at an on time and valid addressing of problems

What does «PP & 3D-Mapping» achieve for HNV farming?

- Pasture management: Participation of livestock breeders in the dialogue for the rational use of grazing areas .
- Training the producers in order to understand the mulifunctionality of the space : Reduction of the conflicts between the various production groups but also creation of new cooperation opportunities (livestock breeding & rural tourism)



What's the issue that prompted the innovation?

The innovation was realized due to the need for a strong spatial tool (3D-GIS) that would support education/learning/activation of producers' participation in consultation procedures and decision making, around problems and interventions related to their space (diagnosis, evaluation, HNVf management).

Achievements?

(a) Functional incorporation of Geo-Informatics and 3D visualization into an integrated diagnosis and planning methodology in HNV areas
(b) Enhancement of participation and development of a dialogue between local production teams (livestock breeders, farmers etc.) and public bodies and specialists
(c) Mitigation of contradictions and understanding of the problems on space management between the involved bodies (forestry department, municipality, livestock breeders etc.)
(d) "Building" trust between groups with conflict of interests.

Economics of HNV farming

Indirect economic benefits: Optimization of livestock breeding through the implementation of pasture management plans = minimizing the basic cost that a pastoral holding has, buying forage

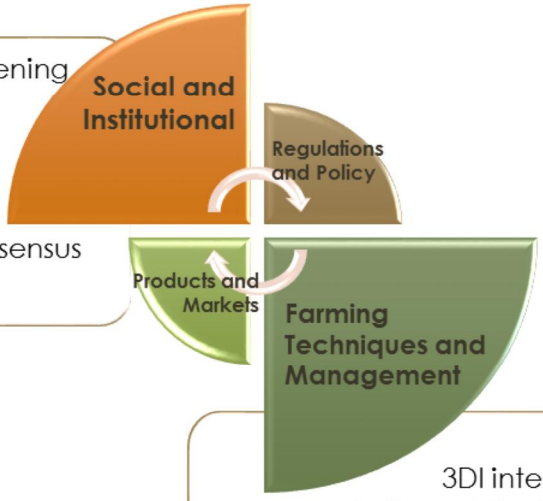
Maintaining or improving HNValues

Implementing the innovation contributes directly to the :

(a) improvement of pastures' biodiversity: rational grazing plans resulted in minimizing stocking density phenomena, avoiding degradation & abandonment of remote pastures
(b) education and creation of sensitive, well informed and with active participation producers, on issues concerning sustainable management of the relationship between the holding and the natural environment.

How does «PP & 3D-Mapping» respond to HNV LINK innovation themes

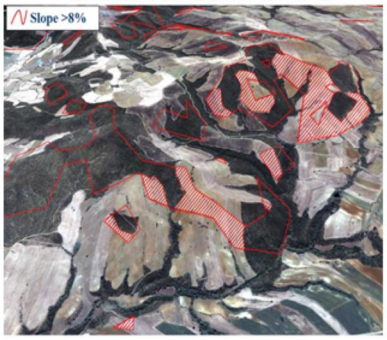
Emphasis on strengthening the dialogue and communication between producers and local authorities in order to reach consensus in decision-making



Use of 3DI interactive representations at the level of community for the rational management of land use and land cover. Continuous monitoring and recording of the changes in the available pasture biomass

Public-Participation in Ellinopirgos village

Localization of disadvantaged areas for cultivations



Calendar with the movement of the livestock holding

Pasture zones	Timetable			
	Spring	Summer	Autumn	Winter
A				
B				
Γ				
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Social and Institutional

"PP & 3D-Mapping" innovation provides local authorities with a communication and information tool for the producers and other actors that are active in the area (NGO's, environmental associations, etc.)

Familiarizing local societies with advanced technological tools like 3D interactive mapping for the diagnosis and management of the space favors:

(a) Improvement of spatial perception and the knowledge that inhabitants have for the place they live

(b) Participation of actors in high scale participatory procedures like: cooperation and transfer of power

Farm techniques and management

"PP & 3D-Mapping" innovation contributes:

(a) to the continuous collection of new information in the database with no particular cost, resulting in the direct knowledge of the problems that occur (drought, floods, erosion phenomena)

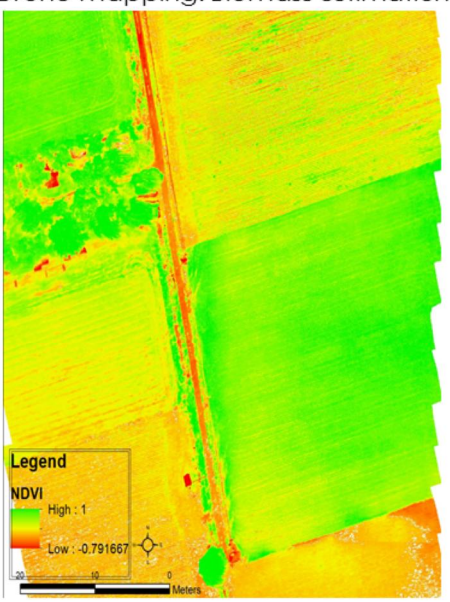
(b) to the estimation of forage biomass for animals in the grazing zones depending on the climate conditions

(c) to the delimitation of exclusion/suitability zones to avoid conflicts between the various production groups

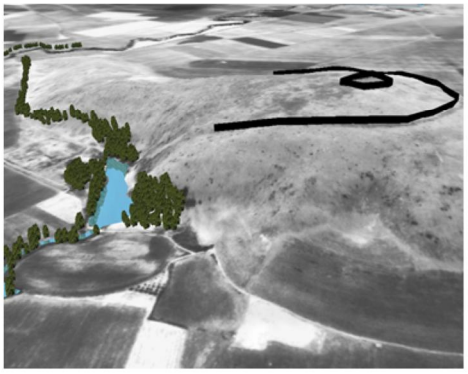
The process that made it happen and critical factors for success

- Participation of a support body in the installation and operation of "PP & 3D-Mapping"
- Engagement of local society in the various stages of the creation of the 3D interactive Virtual World
- Coverage of the fixed and operational costs for the installation, operation and maintenance of "PP & 3D-Mapping"

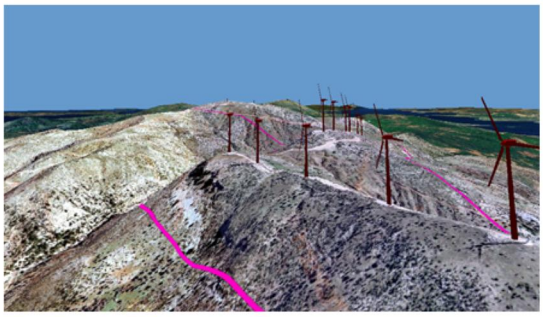
Drone mapping: Biomass estimation



Scenario: Lake Reconstruction



Scenario: Wind farm installation



Technological Issues

-The cost of the supporting software and hardware. Funding is required for the installation and operation of the system at the level of the Municipality
-The cost to get high resolution geospatial data: Aerial Photos /Satellite images /Digital Elevation Models (DEM)
-The relationship between the accuracy of the model and its construction cost

GIS-Remote Sensing technologies are becoming more and more friendly and easy to use. New trends: (a) Open source software that support 3D-GIS public participation procedures and (b) Free disposal of high resolution geospatial data by government bodies.

Technology is evolving fast:

- New, high resolution and low cost digital backgrounds are emerging in the market, creating new spatial visualization possibilities
- New, low cost technologies provide very high spatial resolution data offering at the same time the ability to perform multiple surveys in one day (Drones)

Methodological Issues

For the completion and effectiveness of the tool to be achieved three stages are required:

- Participation of a group of producers in the enrichment of the three-dimensional background with auxiliary information (place names, changes in land use, areas of particular interest etc.)
- Participation of a group of producers for the recording and representation of the spatial and temporal management system concerning land use (routes and grazing-crop areas)
- Training and acceptance, by the area's participants, of the use of three-dimensional visual representations as a tool of: (a) communication and dialogue, (b) collecting accurate data

Lessons learnt from «PP & 3D-Mapping» and its potential replication

- Successful implementation and operation of "PP & 3D-Mapping" depends on its integration into collective coordination and cooperation plans like Terra Thessalia
- 3D representations give the opportunity to extract a huge amount of information from local society. Its coding and utilization is a big challenge.
- The basic advantage of "PP & 3D-Mapping": application ability at both local and regional scale.

Lessons learned

(a) The greater the detail and fidelity in spatial 3D representations, the more active the participation of the livestock breeders/farmers in the diagnosis, consultation, planning and management procedure.

(b) A need for more detailed 3D representations, especially for the creation of location scenarios and decision making. Otherwise there is rejection and failure of the consultation process

(c) Even people with lower spatial perception can understand the space in which they live and participate in consultations and discussions using the 3D interactive representations

(d) Good preparation is required for the real-time recording of the very large amount of information given by the participants during the consultations.

(e) Slow response to the imprinting of information; this slows the dialogue and participants get tired

Replicable in other areas?

The municipalities and other collective organizations (social, professional) can adopt the innovation "PP &3D Mapping" as a tool of spatial management and reinforcement of participatory procedures in their regions. The whole project's success will depend on the possibility to create a technical support team in cooperation with research bodies. In this case it is suggested that the municipalities set up communication and cooperation centers with area's local bodies equipped with a 3D interactive GIS. These centers will be responsible for: a) "educating" and familiarizing the residents and producers of the municipality with 3D representation of the space in which they live enhancing their participation in local meetings and b) encouraging the citizens (especially producers) to participate in the enrichment of the 3D model with information (recording of pollution incidents) helping thus to better manage space.

Greece – innovation (3): GPS-Tracking for monitoring and certification of extensive livestock-farming

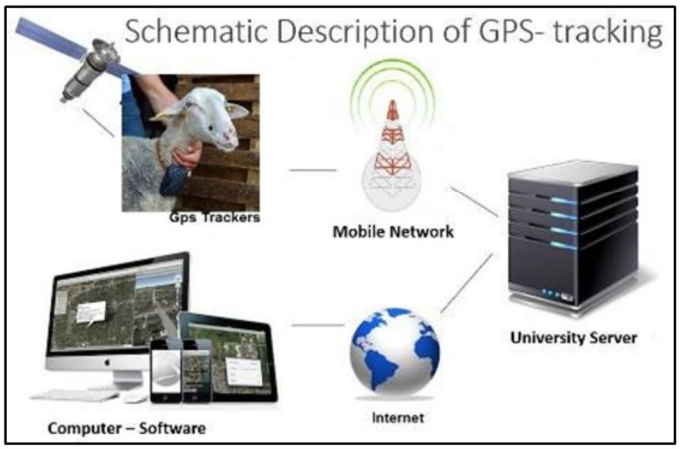
Short name: GPS- tracking of extensive livestock (GPS-tracking)

Location: Thessaly (LA)

HNV farming system: Certification of the holding's pastoral practices in the market. Monitoring the implementation of a grazing plan.

Scale of operation: On the scale of a livestook farming level

Timespan: Tracking the movement of 15 extensive holdings for 2015-2016 under the Lactimed programme. Today, Terra Thessalia has assumed this application



Problems addressed by this example

(a) Certification of the herd's extensivity in order to support the effort to increase the added value of the raw material (milk, meat) and the final dairy products

(b) Tackling conflicts between farmers-livestock breeders, using GPS geofences and other functions

(c) Rapid troubleshooting for free-range cattle

The story in a nutshell

Within the framework of the European programme Lactimed, the Territorial Participatory Guarantee System (TPGS) was developed, part of which is the GPS-tracking system. Initially a monitoring platform (server, softwares, etc.) was created in order to record the geographical position of the moving herds in a daily basis. At the same time, the livestock breeders that participated in the programme, were trained in the use and good operation of the GPS in their animals.

The aim of this innovation is manyfold:

(a) to certify the extensive livestock (sheep farming in mountain and semi-mountain areas) giving the added value to the corresponding dairy products (marketing);

(b) to understand and facilitate livestock movement;

(c) to prevent conflicts between farmers and forestry services using GPS geofences and other functions;

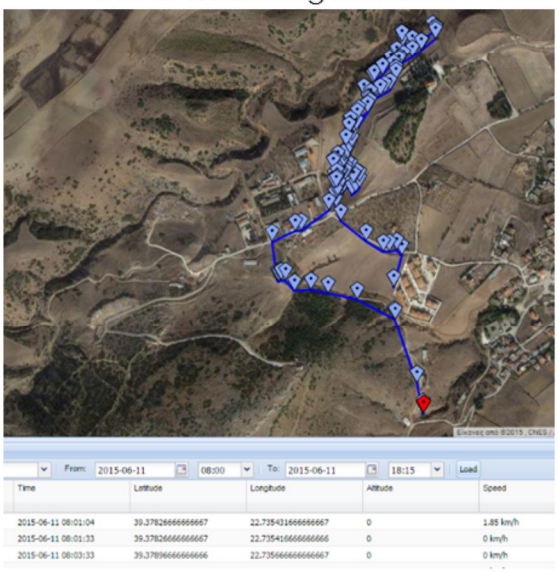
(d) to strengthen the active participation of the producers in the management of HNV areas;

(e) to collect data for the control of the pasture quality (quantity of biomass, biodiversity/plant species) by specialists (range scientists, environmentalists etc.)

What does «GPS-tracking » achieve for HNV farming?

- Market/products: using GPS-tracking undeniably contributes
  - to the guarantee of extensive pastoral practices
  - to the reinforcement of the confidence with consumers
- Management of the holdings:
  - Identification of quality pastures based on animal behaviour
  - Contribution to the design and implementation of spatial and temporal grazing systems
- Creation of an application team with the participation of producers, researchers and technicians

The GPS-tracking interface



What's the issue that prompted the innovation?

The application was implemented due to the need for a reliable tool accessible to consumers that would also guarantee the grazing of the herds.

Achievements?

- Successful implementation of GPS-tracking on all 15 holdings revealed the interest of livestock breeders to promote the practices and values of their pastoral system by adopting advanced technologies, aiming at the same time at a more directly informed consumer.
- Informing livestock breeders about the reasons for installing GPS-tracking on their holding and its contribution to the implementation of the participatory guarantee system helped them shape a more optimistic view for the future of their business and at the same time show interest for the continuation of the monitoring programme.
- Continuous feeding of a geographic database with information concerning the grazing profile of every holding on a daily basis. These data can be used by a range of scientists and specialized zootechnicians to analyze ration.

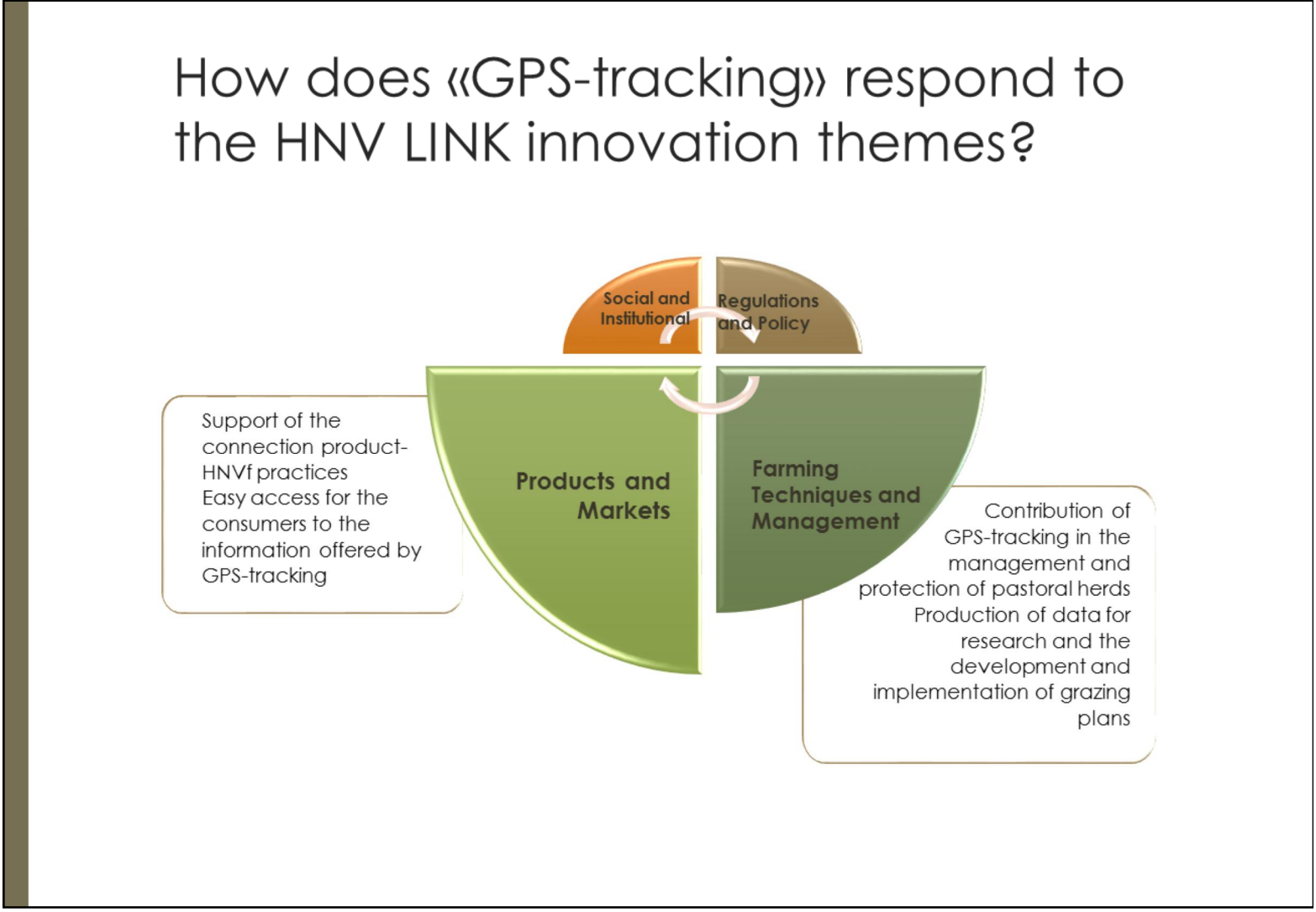
Economics of HNV farming

Direct financial benefits: GPS-tracking, as a certification tool for the grazing of the herds, contributes to the increase of products' added value.

Indirect financial benefits: Especially in cattle holdings, tracking the movement of the animals in the countryside (free range for approximately 6 months) helps to save sick-trapped animals, minimizing the cost from animal losses (sometimes this is equivalent to a few thousand euros).

Maintaining or improving HNV-values

The implementation of GPS-tracking in animal movement contributes directly to the improvement of biodiversity in the pastures. Recording the routes and grazing zones, thus stocking density, would potentially help to better manage pastures and avoid their marginalization and land abandonment.



Products and markets

GPS-tracking innovation offers to the market a reliable certification tool for the products coming from pastoral and free-range holdings.

Potentially this innovation contributes to the reinforcement of the trust between the most demanding consumers, who seek the distinction between HNVf products, and those from holdings with intensive production systems.

Farm techniques and management

GPS-tracking innovation contribution:

(a) Better monitoring of the herd in the difficult and demanding environment of the semi-mountainous and mountainous regions (grazing management, estimation of the forage biomass consumed by animals)

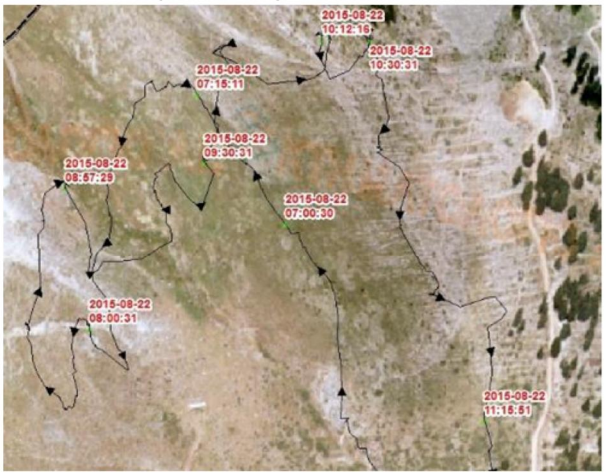
(b) Familiarization of producers with advanced technological tools on diagnosis and space management (using GPS - tablet – smartphones)

The process that made it happen and critical factors for success

- A support body for the installation and operation of the "GPS-tracking" was secured
- Provision of information and breeders' acceptance for the adoption of a GPS-tracking system
- Coverage of fixed and operational costs of the GPS-tracking system

Information activities (working groups)

GPS record: Spatiotemporal movement of a flock



Basic issues that need to be resolved:

- Increasing the battery life before its next charging process, keeping at the same time the system's cost and weight low. Experiments are underway to expand the GPS operation, from 15 days to 3-4 months.
- The cost for special GPS that meet specific protocols and guarantee their good operation in difficult weather conditions (strong sunshine, rainfall etc.)
- It is necessary to train livestock breeders:

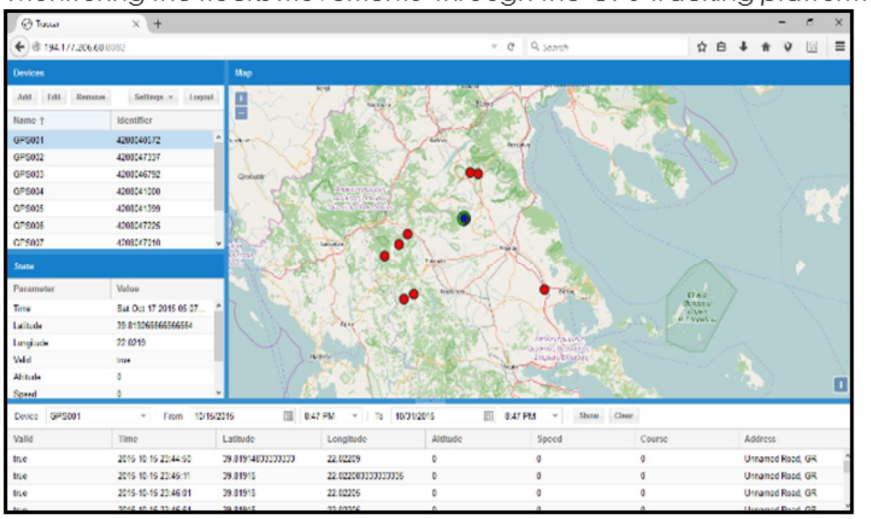
  (a) on the operation and use of the GPS (battery charging) in order to prolong its life expectancy

  (b) on the tracking of the herd (use of tablet - smartphone). However, in many cases new farmers are familiarizing quickly with new technologies minimizing thus the learning curve
- Finding the funds for the installation and operation of the system. Fixed costs: buying a server, GPS devices and their between interconnectivity for the operation of the GPS-tracking system. There are also operational costs linked with the daily monitoring of the GPS function, its maintenance and a monthly mobile telephone subscription.

Lessons learnt from this innovation example, and its potential replication

- The successful implementation of "GPS-Tracking" depends on its integration in a collective cooperation and coordination plan like for instance Terra Thessalia or in an integrated guarantee system.
- "GPS-Tracking" innovation is an educational process for the introduction of a new technology adapted in the management and promotion of the HNVf character .
- GPS-Tracking" system can be implemented in every region

Monitoring the flocks movements through the GPS-tracking platform



The GPS device

Overall lesson

"GPS-Tracking" innovation is for the breeders a collective educational and practical process of learning and using a powerful technological tool in order to highlight themselves the HNV characteristics of their holding and the specificities of their products.

Replicable in other areas?

GPS-tracking can be installed on any extensive livestock holding within the Greek territory provided there is a GSM signal (Global System for Mobile communications).

The movements will be recorded on a server while at the same time every breeder will be able to control, almost in real time, the movement of his herd.

The recording and management of the data could be carried out by a certification body for the extensiveness of the herd.

This body would provide support to the breeders and specialists by supplying the spatial and temporal data from the herd's movement.