Localized AgriFood Systems dynamics and Geographical Indications as ways to reinforce food systems' sustainability? Case studies in Mongolia and Peru

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Abstract: *Localised AgriFood Systems (LAFS), particularly when they are reinforced by a Geographical Indication (GI) registration system, are seen as a sustainable model of production and trade. This paper interrogates this assertion. Seeking the bases of LAFS and GI sustainability, it examines their appearance and continuation throughout their development trajectory, first theoretically, then thanks to two case studies ("Villa Rica coffee" in Peru and "Uvs Seabuckthorn" in Mongolia).*

Theoretically, LAFS ability to induce a sustainable trajectory for local resources' valorization is established. Different types of proximities, an institutionalization process and territorial solidarity may help overcome collective action blockages and contribute to constructing an innovation system, providing that local actors may interact with the system's external environment. Clear threats appear however during LAFS expansion, as proximities and coordination capacity are necessarily reduced, whereas increase in production may induce a stronger competition. GI could then appear as the solution, being able to delimit production area and to reinforce local organizations within it.

Put to the test, this model appears quite strong during the initial phases of LAFS development, but doesn't capture the interactions between LAFS and the other production and trade models coexisting in the food systems. LAFS and GI, which need a strong producers' involvement, are permanently challenged by other models in which producers can engage themselves individually (private brands, organic production, niche markets…). Permanent tensions exist between collective dynamics having created a reputation that can be seen as a common resource and individual strategies using that resource and potentially weakening it.

Keywords: *Local Agri-Food System – Geographical Indication – sustainability – collective action – coordination- Peru - Mongolia*

Introduction

The sustainability of food systems is a major issue, which may be viewed from different perspectives. From the transition theory point of view, the dominant production and trade model has to evolve towards a more sustainable one, after being challenged by niches. We will here adopt another position, considering food systems made of different production and trade models in a situation of coexistence, and permanently challenging each other. We will focus on one of these models, the Localised AgriFood System, which could be reinforced by a Geographical Indication, and show this model's theoretical sustainability; but we argue that sustainability can only be addressed at food systems' level, as the attempts of sustainable local production systems construction are jeopardized by other potential production and trade strategies. Permanent tensions exist between collective dynamics aiming at creating a sustainable collective resources' management system and individual strategies which may use the resources created and potentially weakening them.

The first part of this paper will establish the bases of a theoretical model on Localised AgriFood System (LAFS) and Geographical Indication, showing the capacity of such a device to federate local economic stakeholders and catalyze sustainable innovation processes. The model will then be put to the test in the second part, through two case studies of LAFS and GI development in Peru and Mongolia. The third part will discuss the results.

1/ Theoretical ability of LAFS and GI to maintain or reinforce food systems' sustainability

The "Localised AgriFood System" model was built in order to provide an analytical framework for the trajectories of local agri-food production systems gathering small and artisanal units (Muchnik and Sautier, 1998; Muchnik et al., 2007). The ideal-type of a LAFS is typified by cooperation-competition (*coopetition*) relations among these local production units, resulting from a strong local institutional device, multiple proximities and a territorial anchorage. These specific interactions, as well as the relations that the LAFS' actors are able to establish with the "outside", allow a collective efficiency and capacity for innovation.

This model of LAFS was inspired by that of the Localized Productive System (LPS), developed by various French authors (see Courlet (2002) for a review of the literature) following the reaffirmation of the importance of the "local" dimension in the works of Italian neo-Marshallian authors on Industrial Districts (ID) (Becattini, 1992). Due to the nature of the productions in question (traditional or semi-industrial agro-food production), LAFS differ in their functioning mode from the more industrial LPS: the territorial anchoring lends the product more specificity, thanks to possible "terroir" effects (at the level of agricultural production and/or agri-food processing) and potential inclusion of this product in a heritage-making process (Fournier and Muchnik, 2012).

A shared vision of LAFS' sustainability stakes

An LAFS embodies a collective strategy of local resources valorization through marketing of specific products. Sustainability is "naturally" sought. A consensus is building that preservation of the local natural or intangible resources, which are the main advantage of the production system, must become a rule. Social interactions within the LAFS aim at ensuring this. There exists a shared understanding that competition through individualistic short term strategies of resource overexploitation, low cost and wages should be avoided.

Thanks to that shared vision, LAFS therefore can have the capacity to orientate themselves towards a sustainable development trajectory. But what make this type of LAFS stakeholders' strategies possible? How competition can let cooperation develop itself?

Source of LAFS‘ coordination and collective action capacities

The nature of the proximity that unites the actors appears as a central point. A geographic proximity between actors exists in all local production systems and allows frequent interactions. These interactions can also be facilitated by a socially built “organized proximity” (Pecqueur and Zimmermann, 2004). Common norms and values, belonging to the same networks, organizations or communities… drive progressively, through local interactions, the construction of this organized proximity.

Because of this double proximity, over time, local actors can build institutions (in the sense of North), which will govern their interactions, through formal and informal organizations. These gradually established "rules of the game" ensure reciprocal engagement in collective action processes (including the establishment of sanction mechanisms) and gradually build the necessary trust (Ostrom, 2010).

Finally, geographical and organized proximity strengthens territorial solidarity. In the long term, the actors living in these spaces can develop a feeling of belonging to a community, reducing in some cases individualistic or opportunistic behaviors. The development of the individual may be perceived as not priming completely or at least being strongly dependent on that of the group. This phenomenon, highlighted by the work of Beccatini (1992), removes many of the barriers that hinder cooperation and collective action and ultimately (collective) innovation processes in certain areas. The individual does not necessarily feel obliged to protect his know-how, inventions, information if the diffusion of these strengthens his community[1]. A long-term vision develops and there is more incentive to collectively build specific assets (Gallaud et al., 2012).

An innovation capacity to improve LAFS’ resilience

A second pillar of LAFS’ sustainability is its capacity to innovate. Indeed, innovations are needed to adapt the production systems and to maintain its sustainability while technical and market environment may change.

This is also the local interaction capacity which facilitates innovation processes within LAFS. The nature of the proximity between local actors (producers, processing units, traders, support organizations…) allows information exchanges concerning market or techniques, subcontracting relationships... Such proximity also promotes innovation by allowing the sharing and combination of tacit knowledge and codified knowledge. Interactions of this sort are added to the simple competitive relationships that naturally link the agri-food producers of a region. These relations of "coopetition" in zones of geographical concentration of activities of a similar nature then induce a reinforcement of the innovation dynamics, a phenomenon that M. Porter illustrates with the notion of clusters (Porter, 1998).

However, these endogenous dynamics cannot fully explain innovation processes, neither within LAFS nor more generally within innovation systems. The strength of a LAFS also comes from its ability to capture ideas, innovations, new practices ... from the outside, and combine them with its own practices to reinforce or renew innovation processes. The relationships of local economic actors with other companies, research centers, support organizations... are often essential in order to stimulate innovation processes.

LAFS's innovation capacity is also strongly influenced by the nature of the interactions between producers (farmers, artisans or SMEs) and consumers. Thanks to the local markets, which allow physical meetings between these different actors and rapid "returns" from consumers to producers, a co-construction of innovations is allowed. It can also frame innovation processes for high symbolic products that are part of a local heritage and that innovations must not distort (Chabrol and Muchnik, 2011). Subsequently, markets for LAFS products can expand, but the local consumer component, diasporas and "connoisseurs"

[1] Marshall was already describing this phenomenon in his work, referring to the "industrial atmosphere" of IDs: within these, "the mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously“ (Marshall, 1920).

communities can continue to play a role in "controlling" innovations. Thus, consumers clearly intervene in innovation processes leading to the construction of local products (Prévost et al., 2014, Casabianca et al., 2011).

LAFS can then be characterized as local systems capable of innovation processes thanks to a strong internal coordination and a capacity to interact with other “external” actors. That allows them to develop sustainable collective projects.

GIs ability to sustain LAFS‘ coordination and innovation capacities

LAFS’ coordination and innovation capacities, which have been empirically noted in many cases, can then be theoretically understood. It is also possible to understand the difficulty of maintaining such dynamics in the middle-term, which is another salient fact that is noticeable when empirically analyzing LAFS trajectories.

Different phases occur in the life cycle of LAFS. As LPS or clusters, LAFS face an important "threat": the success of their innovations can attract a growing number of competing companies. LAFS capacity for expansion is often particularly important: if LPS and clusters are frequently protected from risks of rapid expansion thanks to high barriers to entry (difficulties in acquiring technologies, heavy investment departure ...), this is rarely the case for LAFS due to their artisanal or semi-industrial agrifood production chains. The strong possibilities of expansion then create a life cycle including various phases that can be well characterized:

- The original innovation is produced by a small number of producers, closely linked by geographical and organized proximity, engaged in relationships of trust or even cooperation. This innovation is sufficient to differentiate local production.
- If this local activity generates interesting margins for the producers, LAFS development is often rapid, the majority of barriers to entry consisting only of know-how which is easily acquired locally and a small initial investment. LAFS then extend, and include actors less and less "close", sharing with the producers’ community only their practice of the same activity.
- As long as the activity continues to provide strong margins, the increase in producer numbers and spatial expansion continues. After a certain stage, this development may end up inducing product banalization, lower prices or even a crisis of overproduction. New innovations are needed, but are difficult to achieve at the LAFS scale, due to the large number of actors, their lack of proximity and increasingly fierce competition. Without collective innovation processes, this phase is characterized by a LAFS’s decline; the decrease or even the disappearance of margins leads to a reorientation of the actors towards other activities and / or the concentration of companies.
- The actors at the origin of LAFS must innovate to rebuild specificity for their product or production mode, or wait for the rise of prices that the fall in production may induce (Fournier, 2002).

Due to their expansion capacity and the associated reduction of the organizational device, LAFS may not be able to maintain an innovation capacity. The factors seen previously (proximities, social learning, territorial solidarity) may fade away little by little.

However, in such a situation, LAFS, LPS, clusters… may have a capacity to bounce back. Innovation dynamics may reappear following the reduction or the disappearance of the "first" innovation rent, thanks to the existing proximity between the actors, the established trust, the cooperations built, institutions in place… (Courlet, 2002). Following the original innovation process, the territory has a heritage, "*constituted by the memory of past successful coordination situations, by the trust between the actors which is the result, as well as by cognitive resources specific (which can be combined to solve future productive problems)*" (Colletis and Pecqueur, 2005). This can then lead to a new form of product qualification, or even new products, and / or new know-how.

It has been shown nevertheless that this bounce back capacity, sometimes noted in empirical studies, was frequently allowed by an external support, often brought by State or local governments (Schmitz and Musyck, 1994). Different tools can be used for that purpose, the registration of a Geographical Indication being one of them.

Geographical Indications (GI) appear indeed as tools potentially likely to act positively on the sustainability of the LAFS. By delimiting a production area, they obviously make it possible to limit spatial expansion. Exclusion of "out-of-area" producers can be managed on an objective basis, by identifying scientific criteria that determine the boundaries of the area within which the specificity of the product can be guaranteed.

GIs can also influence the collective action capacity of actors in a territory:

- They can open new markets, limit competition between them and thus foster cooperation.
- They can also, when drafting specifications, strengthen the convergence of individual strategies. The (collective) production of common standards pushes the actors of the territory to define and clarify a collective strategy, which naturally reinforces the possibilities of collaboration.
- Finally, by establishing a GI managing group, they can provide a framework for collective action at a territorial scale or, if it already exists, strengthen it (Fournier, 2008).

Collective management of territorial resources, market power and sustainability within GI-supported LAFS

GIs thus have the capacity to reinforce LAFS innovation dynamics. Moreover, they can also contribute to a stronger cohesion between actors thanks to the perception of their collective interest and interdependence. This can have interesting consequences regarding LAFS sustainability.

Indeed, GIs are able to reinforce local economic actors‘ perception of owning an important common resource, *i.e.* the reputation of local product. Their interdependence is highlighted by the fact that State bestows the right to use the geographical denomination on a whole local producers’ community (Fournier et al., 2018).

It helps avoid the negative consequences the agro-industrial model of production and trade has on supply chains’ sustainability. This agro-industrial model has induced an important horizontal concentration downstream of the supply chains, conferring to these downstream actors (agri-food companies, big retailers…) a strong market power. Faced with this, producers are pushed towards an intensification of their technical itineraries looking for yield increases through the use of chemicals and/or highly productive vegetal varieties and animal breeds. In doing so, they reinforce downstream actors’ market power: the consequence of this intensification is standardization at world scale of agricultural products (which stem from the same species / breeds and technical itineraries). Downstream actors can then easily substitute one supplier for another, not leaving the latter the possibility to efficiently demand higher prices. The only solution for producers is then more intensification -a higher production being able to compensate for lower prices-, with the well-known consequences on environment and biodiversity.

GI products are not confronted with the same issue. GI producers are theoretically monopolists; they offer a unique product that buyers have to pay at a fair price if they want it. Moreover, they can coordinate themselves for a floor price. The incentives for intensification are consequently lower. A virtuous circle is able to develop itself instead of the vicious agro-industrial one: buyers and consumers pay a fair price for a reputed product resulting from agro-ecological practices; this fair price and the producers’ knowledge about consumers’ expectations represent then strong incentives to maintain agro-ecological practices. Intensification with negative environmental impacts is less likely.

The main reasons for which sustainable practices are more likely to maintain themselves or to reappear within GI-supported LAFS are however not purely economic. First, as it has been said before, local producers' interdependence is re-affirmed with GI registration. Different forms of social control may then prevent any depreciation of the GI product (as the presence on the market of low quality product bears consequences for all the local producers). Secondly, the progressive incorporation of the GI product within local patrimony frames producers' technical practices even without any social control. As part of local identity, the GI product has to be as "good" as possible.

Conclusion

The analytical model of LAFS helps us to understand the endogenous development of local innovation dynamics aiming at valorizing local resources in a sustainable way. The local innovation progressively set up for that purpose may encounter growing issues of coordination, possibly leading to the reappearance of individual strategies and a price-competition among local producers, which could jeopardize the production system's sustainability. By delimitating the production area, establishing formal organizations and reinforcing the convergence process of individual strategies, GIs may support LAFS' sustainability. They officialize interdependence around a common resource and the entry of the GI product in the local patrimony. In doing so, they set up strong incentives for the maintaining of qualitative agro-ecological practices. The coordination and collective action capacities of local economic actors guarantee the system's innovation capacity and resilience.

2/ The model put to the test

Case studies realized in 2017 will allow us to put the developed model to the test. These case studies are based on a few dozen semi-structured interviews with supply chain and territory actors (Arvis, 2017; Michaud, 2017).

The "Villa Rica coffee" GI in Peru

Peru is an important coffee producer at world level (8th rank in average over the 2004-2014 period). Production essentially comes from smallholders (85% of the whole production), the average area per producer being 1.9 ha. Organization of the supply chain remains weak, with only 25% of producers belonging to one of the 150 cooperatives (Central Café y Cacao del Peru, 2017). Consequently, the great majority of the coffee is sold to middle-men who benefit from an important market power, facing off with small producers frequently needing immediate cash entries.

Peru has nowadays firmly engaged itself in favor of the development of certified coffees (organic, fair trade…), but only the most important producers and the few organized smallholders benefit from these markets. At national level, 85% of the coffee remains conventional, 13% is certified and 2% is sold as specialty coffee (Sinclair *et al.*, 2014).

This case study focuses on Villa Rica district, which is the place where coffee production began in Peru.

Situation in Villa Rica before GI registration

Created in 1849, Villa Rica district belongs to Oxapampa province, in Peruvian « *Selva centrale* » (Amazonian forest in the centre of the country). Its population is composed of different ethnicities (Municipalidad Distrital de Villa Rica & GRAFCA Villa Rica, 2010):

- the descendants of native Yaneshas (who currently represent only about 2.9% of the population)
- Austro-German settlers arrived in the first half of the 19th century from the north of the region in the cities of Pozuzo and Oxapampa.

- populations originating in the Andes, who arrive at the end of the 1940s with the opening of land-based communication networks.

As climate and altitude are particularly appropriate, coffee production was first developed in the district by the Austro-German settlers in the 1930s. Labor requirements of the coffee farms triggered migration flows of the Andean settlers. From seasonal, the migrations became definitive. The work in coffee plantations allows the Andean populations to improve their economic situation and acquire land. Smaller coffee farms then emerged.

Thanks to their large coffee plantations and the associated investment capacity, educational background, community cohesion, ability to travel to meet resource people… Austro-German settlers have been able to develop local coffee production, some of the innovations introduced having spread all over the country after their implementation in Villa Rica. In the 1950s, after traveling through Central America, these settlers introduced a new variety. After that, in 1980s they were also pioneers for setting up of more productive technical itineraries using chemical inputs, new pruning ways, new processing methods… These innovations not being accessible to all coffee planters, Austro-German settlers reached more important yields and coffee quality.

The cradle of the Peruvian coffee production, the Villa Rica district has remained the most important zone. Most of the technical innovations developed in the supply chain originate from it. It progressively looks like a coffee cluster, with the implantation from the 1970s of technical equipment manufacturers. But it has to be noted that even if Andin settlers have been gradually able to create their own coffee plantations in the area, communication between coffee producers are scarce.

Thanks to these dynamics, Villa Rica coffee obtained with time a quality reputation. This coffee's quality has been recognized through international prices. From the 2000s, important name usurpations by other Peruvian coffee regions bordering on Villa Rica occurred.

GI construction

Faced with this situation, the Villa Rica Mayor decided in 2006 to launch a project of registration of Villa Rica as a GI. This possibility exists in Peru since 1990, when the country built its first juridical framework for GIs[2] registrations. However, only one Peruvian GI (Pisco) has been registered between 1990 and 2004. The national juridical framework has evolved following the ratification by the Peru of the Andine Decision n°486 in 2000, which defines GIs and their registration and protection. This Andine Decision has been then integrated in the national legal framework through a decree in 2004 which specifies the GI recognition national procedure[3] and requirements, as well as those for the GI managing group. It is then only from 2004 that the Peruvian GI registration juridical system is fully operational (even if many changes have been brought since, notably with a new decree in 2008[4]).

In the Villa Rica coffee case, Municipality provided the entire budget required for the constitution of the application, the recognition of the GI, the constitution of the GI managing group and its management. The project is managed with a dozen producers (mainly big planters) and representatives of cooperatives strongly involved in the process.

GI construction is oriented towards a search for quality. A strict code of practices is written, based on the best practices set up in the big coffee plantations (owned by Austro-German settlers). The whole district is included in the GI production area, with a small addition, the adjacent Alto Palomar zone, which received the prize for the "best coffee in the world" in

[2] More precisely, Peruvian system is based on Denominations of Origin (DO). As the distinctions between GI and DO will not interfere with the next developments, we will use the term of "GI" as a generic one.

[3] Peruvian State remains the owner of the GIs, which are managed by the Peruvian Intellectual Property office (INDECOPI). This institution is in charge of GIs protection.

[4] The main changes concern GI definition (which may evolve from a definition closed to the European Protected Denomination of Origin to the WTO definition) and GI managing group (which should be built before GI registration and which producers should join if they want to use the GI).

2005. This allows the Villa Rica GI to base its communication on the affirmation that this zone is the *« tierra del café el más fino del mundo »*. The GI registration is obtained in 2010.

Following that registration, trainings were organized in order to improve the quality of all Villa Rica coffee. The technical practices of the big plantations, on which the GI code of practices was built, were disseminated.

Even if administrative complications, which have denied certification of products during the first years, have prevented the valorization of efforts towards GI registration, an interesting dynamic was created following the registration.

However, in 2015, municipal elections are held as well as a change of board of directors of the GI managing group. The new mayor was also elected president of this GI managing group. Paradoxically, this new situation has been prejudicial for Villa Rica coffee GI. The allocation of municipal budgets changes according to the political priorities of the new municipality and the association is not receiving any more subsidies. The new mayor, although President of the GI managing group, gives less importance to GI development. GI activity diminishes little by little. The current inactivity of the GI managing group is problematic as this organization is the only one able to deliver the “licenses to use” needed for GI coffee marketing. As administrative and technical issues prevented the deliverance of these licenses during the first years, there are no producers officially authorized to use the GI currently. Consequently, no control and traceability system has been set up in 2017, seven years after the GI registration.

GI effects

Despite the absence of regulated use of AO "Coffee Villa Rica", product registration and associated dynamics have impacted the territory.

Parallel to the GI registration and during its early years, many activities of promotion of Villa Rica coffee were developed by the former municipality. The city has become more and more known and a touristic activity has been developed around coffee. Investments have been made in public infrastructures (establishment of the garbage collection service, improvement of roads and accessibility...) and tourism (hotels, restaurants, tourist office, touristic circuit "*La Ruta del Café*", etc.). Some policy measures have also contributed to the strengthening of the quality of coffee (municipal ban on drying coffee on the sidewalks, for example).

During these same years (2006-2015), some producers continued to participate in national and international competitions and to win prizes. Villa Rica is increasingly recognized as a quality coffee producing area. Visits by professionals (coffee growers, cooperative representatives, buyers, etc.) from other areas or countries are becoming more frequent.

The quality turn initiated by the major producers is strengthening and expanding. The training on coffee growing and processing methods carried out within the framework of the GI contribute to this, as well as the opening of a sensory analysis laboratory for coffee associated with a school of tasters in the district in 2011.

The “Villa Rica” origin thus becomes more and more a selling point and a bargaining chip for producers. Positioning Villa Rica coffee on the specialty coffees market is made possible. Some big planters are receiving good prices on it, more and more independent of the stock market prices.

The recognition of the quality of the Villa Rica coffee also led the Nespresso company to set up a supply center in 2015. Since, the company has developed a purchasing program in the area that values the organoleptic quality of the product, independently of the GI (Nespresso doesn’t ask for GI certification). Almost all major producers sell part of their coffee to Nespresso; some medium and small producers (via cooperatives) also have access to this market.

Another form of differentiation developed by some producers is coffee roasting and marketing on local or national short supply chains. This sector is developing relatively quickly, notably with the opening of cafeterias. This leads to a proliferation of brands of roasted and ground coffee (currently about 10% of the region's coffee production, mainly

from medium-sized plantations) and the creation of companies offering roasting services (4 roasters are currently installed in Villa Rica).

Finally, the growing reputation of the area also favors the development of sustainable standards such as organic farming and fair trade. Buyers looking for this kind of certified coffee additionally find in Villa Rica a guarantee of organoleptic quality.

The registration of the GI, even if it was not followed by a real activation of the certification, thus very clearly strengthened a process of differentiation of the coffee of Villa Rica, notably thanks to the voluntarism of the former municipality.

It has allowed all major plantations to position themselves in differentiated markets, as well as almost all medium-sized plantations. Smallholders, on the other hand, have been only partially able to benefit from these dynamics, thanks only to fragile cooperatives, to which they often only sell a small part of their coffee because of their urgent cash needs.

The GI did not allow the establishment of a real collective dynamic. Strong coordination has emerged between the actors involved in its registration; however, it has remained confined to the small initial working group and is now extinct due to the inactivity of the GI managing group. A weak actors' coordination is visible at sector and territory levels. It manifests itself through the poor knowledge the producers have of each other, the fragility of cooperatives (lack of trust and even of identification of their members) and the predominance of the personal interests of the actors. The GI trajectory and its politization -which led to the election of the mayor as president of the ODG and the suspension of the credits- did not allow continuation of earlier actions. It is interesting to note that this case led to a modification of the national legal framework, which now specifies that the members of the GI managing group's board of directors must be private actors.

The GI has not really been appropriated by the planters, who are currently very reluctant to relaunch the dynamic. The central role played by the former municipality in the development of the GI could have put the planters in a passive position, the latter seeming to wait for the intervention of an external actor to redevelop the GI.

The "Uvs Seabuckthorn" GI in Mongolia

Mongolia first established a framework for GI in 2003, but it garnered little interest in the first few years — due in part to a lack of familiarity with the concept from a spectrum of potentially relevant actors involved in food production. Seabuckthorn from Uvs is the first GI from Mongolia to have applied for EU registration, and the example of a product to which the local community is strongly attached.

Uvs, the cradle of seabuckthorn industry in Mongolia prior to GI registration

Seabuckthorn berries grow from a thorny shrub native to Siberia and parts of Mongolia. These have been harvested from wild plants for centuries or more: its bright orange berries served as immune boosters in a meat-based diet, and its silvery leaves as fodder. However, the plant was only introduced in a domesticated form in the Western part of the country by the Soviets, who set up a research center in Ulaangom, capital of Uvs Province. The site was chosen because the relatively low-lying land is in close proximity to a vast salt lake, and the researchers surmised that the saline soil would boost the quality of the berries produced. From 1960's to 1990's, the research center toiled at adapting imported varieties to local conditions through selection, which included some hybridization with wild Mongolian varieties. Simultaneously, local interest in seabuckthorn was heightened: processing techniques for seabuckthorn were studied in the biggest regional food factory, and a few farmers established themselves as seabuckthorn planters, working alongside the scientists.

After the privatizations which accompanied Mongolia's democratic transition in 1993, the research center shut down, but the processing company and planters continued developing their activities with seabuckthorn. With a limited number of planters and processors, the sector was small and seemingly well organized: one company imported and sold certified

seedlings, one major company processed a large volume, a number of small planters produced seabuckthorn for local market. This professional sector was inundated with newcomers in the mid-2000's, as seabuckthorn experienced a surge in popularity nationwide. Agricultural records from this time show that other provinces overtake Uvs in terms of newly-sown seabuckthorn, and in 2017 Uvs Province no longer boasts the highest number of planted hectares.

The pioneers of seabuckthorn planting were therefore faced with competition, but unfortunately their years of experience yielded little advantage. In fact, much of the research on agricultural production was lost during the democratic transition, and the processing techniques employed are commonplace. The progressive emergence of Uvs' Seabuckthorn's reputation therefore would appear to be more strongly linked to natural factors — a particularly variable climate, saline soils — than human know-how. But the superior quality of berries from Uvs, although plausible, has never been formally proven; furthermore, when processed into juices, the end product is indistinguishable from that of other regions. This leads us to a different conclusion: the product's reputation actually stems from the fierce pride the inhabitants of Uvs have for their seabuckthorn and their willingness to defend it as their specialty (in spite of a relatively recent implantation). This embodies the creation of a "common ressource".

Two competing GI registrations

Because other provinces, closer to the Mongolian capital, were now producing seabuckthorn, it became a disputed market. Furthermore, examples of false labelling of products as "from Uvs" were reported. The first to find the means of protecting and maintaining the common resource was the large food processing company, which applied for a GI on Uvs seabuckthorn[5] in its name in 2007. In this first "GI", the delineation was meticulously studied to include zones of similar altitude and soil quality. The processing company had strict standards for the quality of the seabuckthorn it bought for processing, understanding the fundamental importance of quality in order to maintain the reputation of Uvs Seabuckthorn. This registration also gave the company total control over the sector, especially due to its sheer size in comparison with other operators. This resulted in many producers being excluded from the GI process.

This skewed GI situation was a result of the unusual legislative context of GIs in Mongolia, which requires some explanation. A first GI legislation was drawn up in 2003, in compliance with international trade agreements (TRIPS). The definition of GI's did not stipulate that they were a collective resource, however; instead, they were acknowledged as a sort of trademark – albeit one in with a territorial link – meaning that a single private entity could register a GI in its name. Following recommendations from a donor-led project, the law was rectified in 2010 to mostly conform with the Lisbon Agreement definition of GI. Notably, concerning the collective nature of GI : only representative groups could register a GI from that point on.

After the redrafting of Mongolian GI law, a new GI application for "Seabuckthorn from Uvs" was put together in 2015 under the impulsion of the Mongolian IP Office/French Embassy's cooperation program, and accepted. No action was taken to repeal the 2007 GI, so the two would have to co-exist — and still do today. The second GI is held by the GI association of Uvs, a producer's association created for the occasion. Although it was registered with the intention of allowing more producers to access the GI name through a collective scheme, countering the exclusivity of the first registered GI, in its current state the GI is quite ineffective. It lacks a clear code of practice, a plan for inspecting it, and a structured organization capable of defending the interests of its GI name. The area covered by the GI is the whole province[6], a very large area in comparison with the historical domestication zone (the 'Uvs' denomination refers originally to the lake which is the province's namesake). This extension is another complication in terms of the association's capacity to maintain

[5] This registration includes seabuckthorn and derived products.

[6] An area of nearly 70 000 square kilometers

homogenous quality. Furthermore, the concept of GI is not well understood, even by the planters who participate in it. The benefits of the GI are not very clear to the planters : this translates to a lack of implication, each preferring to perfect his own marketing strategy.

Aside from the two GIs, there also exists a Fruits&Berries Association which regroups the older planters in the community. They were initially firmly opposed to a GI, and their main activity is to research new processing techniques, which must be shared with all members. We are therefore left with two “competing” GIs and a local sector marked by strong rifts between groups of actors who are in fact working towards the same goals.

A complex sector undergoing rapid changes, but few mesurable effects of the collective GI

Recent changes in the local seabuckthorn sector can be attributed as an indirect result of the GI registration, which did more to renew interest in seabuckthorn than to actively federate the sector. Local policy choices also played a role in stoking interest. For instance, the provincial government launched a program in 2010 to encourage farmers as well as households to plant seabuckthorn. A large number of inexperienced newcomers started planting and selling seabuckthorn in uncontrolled conditions, in backyards exposed to particles from waste-burning, for example. This led processors to become wary of their providers and mainly manufacture seabuckthorn they have grown themselves. With an abundance of fresh berries available, planters specialized in seabuckthorn began to look towards obtaining or upgrading processing capacities to keep up with the competition. Some turned to marketing to improve the appeal of their products, but the majority looked at improving production processes. One planter developed an alternative technique for separating oil and juice which improves composition of the oil. Another is working on packaging small doses of oil which can be taken daily. Yet another has begun experimenting with cosmetic products. Through these competition-fueled innovations, high quality products should emerge, while lower quality products will be confined to the local markets. The informal nature of distribution circles, however, makes it difficult to read possible impacts on price or demand. Relations remain strained between groups of planters, and so individual strategies are the driving factor behind the growth of the sector.

The creation of a cluster group, led by a German development project, further complexifies the relationships between actors. Its leader is the head of the company owning the 2007 GI, a disputed leadership which led many planters to disengage from the cluster group. Despite some claims that its decisions are biased, the cluster group does help even out the balance of power and generally favors sustainable growth of the sector. Those planters who refuse to take part are once more excluded from a form of collective governance which was denied a first time with the 2007 registration of a “private” GI. The group has thus far focused on importing seedlings to renew older plantations and expand the acreage of planted seabuckthorn. Its second step will aim to build capacity in marketing aspects.

As for the newly created collective GI, it has had little discernible effect on the sector. A recent French-Embassy led workshop whose goal was to draft an updated version of the code of practice did highlight a clear pre-occupation for sustainability from the planters who attended: most insisted on integrating an organic requirement into the code of practice, as well as incorporating a planting layout which includes planting trees to guard against desertification.

Strong interest in creating a sustainable system

To prove that this ornery sector is on the path to a more sustainable system, a number of other strategies are in the works. On one hand, a second government program promoting seabuckthorn growing, but geared towards the professional sector; it could include a public-private partnership to provide storage capacities. On the other hand, a clever initiative between a processor and the local polytechnic college, built on the observation that newcomers to the sector simply had no access to information. The processor will loan students a hectare each during their year of study, which they will tend to, and pay rent by giving the harvest to this processor. After a few years, the students will gain ownership of their parcel.

Although sustainability issues linked to production are gradually being recognized and addressed, an enduring problem will be the economic sustainability of the sector. The expected increasing volume of production will need to reach more customers than the local and even national markets offer. When considering export, collective action will become a requisite, and this calls for balanced and inclusive governance of the common resource, a role which the collective GI could potentially play.

Through this case study, we've seen that the strategies and dynamics which arose from the need to protect a common resource (i.e. the reputation of Uvs seabuckthorn), although they do not fit into a neatly coordinated scheme, are gradually reinforcing the sector's sustainability. The consolidation of a formalized GI, for which the framework is laid, could be a pathway for enhancing economic sustainability by structuring these efforts and lending them a marketable value.

3/ Discussion: what role for LAFS and GI dynamics in the sustainability of these production systems?

The model developed in the first part shows a possibility that territorial dynamics appear within a given space and create a LAFS, which could "naturally" orientate actors' strategies towards a quest for sustainability, as a common resource has been revealed and different proximities have created the institutional and organizational device necessary to guarantee a collective management. The LAFS expansion may however jeopardize this collective strategy of sustainability: whereas production and/or marketing renewals are needed to face production increase, proximities reduction induces a lower coordination capacity. Intensification –associated with dwindling sustainability- may once again appear as the only solution for some producers. Still, theoretically, a GI could be able to reinforce this coordination capacity, by delimitating the area and reinforcing organizational apparatus.

What possible feedbacks on this model based on these case studies?

A LAFS structuration which leads to a sustainable management of the common resources

In the studied Mongolian GI as well as in the Peruvian one, we are dealing well with built LAFS thanks to internal and external coordination. The Uvs seabuckthorn LAFS has been created by Research and then appropriated by local economic actors. Villa Rica coffee production system appeared thanks to the internal cohesion of the Austro-German settlers' community and their capacity to interact with the "outside".

As the model forecasts, this LAFS structuration leads to strategies of sustainability; local actors have quite clearly the perception of the local product as a common resource. It is clearer in Mongolian case, where from 2000's, the new interest for seabuckthorn in the market has been interpreted by economic actors as an incentive to institute sustainable practices, concerning natural resource management as well as actors interrelations (horizontal and vertical cooperation were seen as an important element).

LAFS expansions put their sustainability in jeopardy

A LAFS expansion occurs in both cases.

In Peru, it makes Villa Rica coffee LAFS becomes relatively divisive. The new comers, Andin settlers, weren't able to reproduce the technical and commercial practices developed in the biggest plantations and benefit from their implantation in a well-known coffee production area, but had no other choice than an eco-unfriendly intensification during 80's and 90's.

The spatial expansion around the initial Uvs seabuckthorn LAFS has been particularly significant and, as we saw, it brought an important competition between planters. Without

coordination of the latter, this competition led to unsustainable practices at economic, social and environmental levels.

LAFS (re)coordination, a forgotten objective among the multiple tasks assigned to GIs

LAFS expansions can then well lead to overproduction towards too narrow markets and intensification to compensate for low prices. GI constructions may consequently aim at coordination reinforcement, potentially through a strict delimitation of the production area. But Uvs seabuckthorn and Villa Rica coffee GIs have been built with different objectives. Both aim partly at fighting against name usurpation, but at supply chain development as a priority.

In Uvs seabuckthorn case, it is notable that the first GI, registered by a single firm had this restriction and coordination objective. But the second one, based on a production area expansion and accompanied by support program, goes clearly after a production development.

Concerning Villa Rica coffee, the objective of supply chain development could have been compatible with coordination reinforcement, as the trainings done served both objectives. But the too weak time during which these actions were possible didn't allow establishing a real coordination as it has been seen.

In the two case studies, GI registration has been accompanied by a market expansion. This directly linked with GI registration and the municipality actions in the Villa Rica case; it is a little bit different in Uvs, where seabuckthorn market development had other drivers. It induced then in both cases a situation characterized by a lack of coordination and a potential market development, in which individual strategies can easily develop themselves. The visible outcome is a series of individual attempts to create different niche markets, based on the agricultural product or its processed forms.

Constant tensions between collective and individual strategies… and permanent synergies?

It becomes interesting to analyze the ambiguous relations that exist between these individual strategies and the collective one.

On one hand, we see individual strategies which benefit from the former collective efforts, i.e. the collectively built product's reputation, and which deter producers from investing more in the GI collective construction. Products' valorization through private brands, organic certification, niche markets such as Nespresso or even fair trade circuits appears "easier" than investing in GI construction. These circuits have however been clearly favored by the construction of local product's reputation. These niche markets may appear less sustainable than a GI construction if we analyze them at territorial level. Indeed, new competitions may appear elsewhere and the locally developed sustainable practices may have to adapt themselves, potentially towards less sustainability.

On the other hand, synergies may appear. Even if among the individual (or cooperatives') attempts of market developments done in Villa Rica and Uvs, there are a large range of products, some of these market sectors are quite prestigious and may finally contribute to the GI product's image. The innovation dynamic that we see nowadays in Uvs, even if individual, may contribute in the not so distant future to the whole LAFS.

Conclusion

LAFS and GI's contribution to food systems' sustainability is a complex process. As theoretically analyzed and empirically observed, a "positive" trajectory is possible.

An LAFS can occur and coordinate interactions between stakeholders animated by a willingness to sustainably valorize local resources; this LAFS can structure the innovation

system which enables valorization. At the initial level and on a small scale, an informal institutional device ensures coordination. After LAFS expansion, GI registration can delimitate an appropriate production area and establish a more formal organizational device capable of maintaining social interactions. Sustainability is then guaranteed by the virtuous circle which can take place between consumers expecting specific quality products, producers supplying them thanks to agroecological practices and a State-supported GI device providing the necessary control.

But is it a path fraught with pitfalls. Inclusion is not always the rule within LAFS, not initially and especially not after an expansion phase. A GI's primary objective is not necessarily coordination reinforcement, but may be supply chain development instead. Individual strategies are at any time a more secure plan than investing in collective dynamics for a single producer. All these pitfalls may break collective dynamics by deterring producers from investing in the GI collective construction.

GI-supported LAFS sustainability may be ensured only with massive producer inclusion and participation. Individual strategies could permanently jeopardize it. A complex equilibrium has to be found, as these individual strategies may also enter into synergies with the collective one.

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