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Urban pastoralism as green infrastructure generator that provides important ecosystem services to the city

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Abstract. Pastoralism is a pattern of subsistence, that has survived in its close to original form even today in an increasingly urbanized environment. Marginalized by agriculture intensification, then industrialization and lately by the urbanization processes, this productive practice was restrained to marginal spaces and interstice of urban territory unexploitable by other activities. Its capacity of adaptation to harsh and changing conditions generated its resilience. The interdependency between the exploited environment, the shepherd and the flock along with the independence from urban infrastructure and mechanization permitted its survival despite its criticized low productivity, while transforming marginal land in productive and biodiverse spaces. Historically ignored by policies, a reconsideration of this practice is necessary, especially in the urban environment. In Romania, due to a combination of factors like rapid fragmentation of the rural and agricultural city's periphery by the urban sprawl phenomenon or the abandonment of agricultural exploitation of ancient socialist farm land located in the immediate proximity of the cities, the phenomenon of urban pastoralism developed in the last 2 decades in the urban interstices of nature. In France, the last decade has seen the evolution of eco-pastoralism in the city from experimentation to institutionalization for ecological management of urban green spaces. While traditionally perceived as a rural practice, the pastoralism values the social, cultural, economic, ecological and agricultural dimensions of urban territories; with an appropriate recognition and management it could become an important tool for sustainable urban management. Its important role in supporting green infrastructure and local food systems is yet to be considered and integrated into urban policies

Keywords. Pastoralism – Green Infrastructure – Ecosystem services – Sustainable urban management – Local food system.

Le pastoralisme urbain comme générateur d'infrastructure verte qui fournit d'importants services écosystémiques à la ville

Résumé. Le pastoralisme est un modèle de subsistance qui a survécu sous sa forme originelle jusqu'au présent dans un environnement de plus en plus urbanisé. Marginalisé par l'intensification de l'agriculture, puis par l'industrialisation et par les processus d'urbanisation récents, cette pratique productive était restreinte aux espaces et aux interstices du territoire urbain inexploitable par d'autres activités. Sa capacité d'adaptation aux conditions difficiles et changeantes a généré sa résilience. L'interdépendance entre l'environnement exploité, le berger et le troupeau ainsi que son indépendance par rapport à l'infrastructure urbaine et à la mécanisation ont permis son existence malgré sa faible productivité souvent critiquée, tout en transformant des terres marginales en terres productives et riches en biodiversité. Historiquement ignoré par les politiques, une reconsidération de cette pratique est nécessaire, surtout en milieu urbain. En Roumanie, en raison d'une combinaison de facteurs tels que la fragmentation rapide de la périphérie de la ville rurale et agricole par le phénomène d'étalement urbain, l'abandon de l'exploitation agricole d'anciennes terres des fermes socialistes situées dans la proximité immédiate de la ville, le phénomène du pastoralisme urbain s'est développé au cours des deux dernières décennies dans les interstices urbains de nature. En France, la dernière décennie a été synonyme d'évolution de l'éco-pastoralisme dans la ville, allant d'expérimentation à l'institutionnalisation de la gestion écologique des espaces verts urbains. Bien que traditionnellement perçue comme une pratique rurale, le pastoralisme valorise la dimension sociale, culturelle, économique, écologique et agricole des territoires urbains, et grâce à une reconnaissance et une gestion appropriée, il pourrait devenir un outil important de la gestion urbaine durable. Son rôle important dans le soutien des infrastructures vertes et des systèmes alimentaires locaux doit encore être valorisé et intégré dans les politiques urbaines.

Mots-clés. Pastoralisme – Infrastructure verte – Services écosystémiques – Gestion urbaine durable – Système alimentaire local.

I – Introduction

In an increasing urban context, that marginalized both physically and culturally the agriculture practice, there is a need for a new approach to projects and policies to integrate a steady and productive vision. The agri-food system crisis at a global level encourage us to reflect on more sustainable, resilient and local adapted solutions of managing the territory, and therefore an emphasis on bottom-up initiatives, cultural and productive tradition, empirical transmitted know-how, the specificity of the socio-economic conditions, marginal, informal and spontaneous uses of land are gaining more attention.

The present paper aims to interrogate the city-nature paradigm and, therefore, the relation of man with his life environment from the perspective of ancestral productive practices. The human-animal-territorial relationship, in which the position of the animal (domesticated in this case) is intermediate, is explored through several filters: conceptually and practically.

This article that contains elements of my doctoral research argues that pastoral practice has its place in the urban and especially peri urban territory if the current way of practicing both in Western and Eastern Europe (as identified in interviews) is improved by a careful consideration of its strengths and challenges. Also, the hybridization of the two patterns of functioning could lead to a more resilient pattern of urban pastoralism.

The methodology of the study is based on both qualitative and quantitative data and includes bibliographic synthesis regarding the concept of urban pastoralism and the practice of extensive grazing, statistic data analysis and interviews with shepherds, authorities and other actors involved in this practice in Romania, France and Netherlands.

II – Urban pastoralism an oxymoron?

“Urban pastoralism” evokes a concept and a phenomenon, but also the clash between the two of them, that incorporates the nature-city paradigm.

“Urban pastoralism” represents an expression that designs the search for an ideal living environment (that defines the North American vision of the city) where nature and technology are harmoniously coexisting while approaching challenges related to urbanization, industrialization or ecological crisis and solving classical dichotomies like urban and pastoral (Machor, 1982).

As a pattern of subsistence developed earlier than agricultural practice, pastoralism coexists in its original form in a delicate equilibrium with nature, a fact that justifies the development of the concept of pastoral ideal. Today this practice can restore the biodiversity and productive feature of polluted, degraded and marginalized urban land. Mediating this classical antagonism between urban and pastoral or city /nature with strategy, policies, regulation, participatory methods can reduce the friction and improve the benefits generated by their coexistence.

The urban-rural interface is traditionally considered a space of friction between opposite contexts and functions but can also be a platform for a productive green infrastructure that would generate important ecosystem services like landscapes and biodiversity conservation, local food, preservation of cultural traditions and local identity. Multi-functionality of productive spaces and practices can enhance the quality of urban life (Artmann and Sartison, 2018). For example, ecological corridors recreated and managed by pastoralism can become, in addition to biodiversity reservoirs, also platforms for leisure, cultural and gastronomic activities.

III – The new phenomenon of urban pastoralism

As a phenomenon, urban pastoralism has not yet benefited from a crystallized understanding in scientific research (Bories *et al.*, 2016). The interest of this subject is relatively obvious when the theme of urban agriculture has been explored from several angles over the last decade, except for livestock farming in the city. However, while current research, although schematically addressing all forms of maintenance of green spaces with animals, it focuses on the phenomenon of pastoralism that involves mobility, open spaces, corridors of transhumance, etc (Drăgănescu, 1998).

According to interviews with representatives of the structures involved in this practice in France and the Netherlands, the demand for maintenance of green spaces through the use of ruminants (particularly small ones) is constantly increasing and difficult to satisfy despite the efforts of intermediary organizations to train practitioners and put them in contact with potential clients.

In addition, these structures provide official data on this phenomenon and present the most relevant and complex arguments for understanding its interest.

The French association “Nature & Territory” created in 2009, interviewed in 2019 (<http://intertrain-nature-territory.fr>), which participates in the awareness, professionalization and observation of the eco-pastoral practice has tried to define and categorize different forms of pastoral practice, to serve as a basis for a broader discussion, which this paper does not claim to detail.

Pastoralism is a productive practice that coexists in harmonious conditions with the environment in which it unfolds, this interdependence constituting a fundamental characteristic. The flexibility of this activity is generated by several aspects: the correlation of the size of the herd with the availability of food sources, their accessibility even when they are remote thanks to the mobility of the shepherd and its influence, and its independence from infrastructure or the mechanization and the simplicity of the exploitation of resources generally available in nature. Thanks to this quality, pastoralism has adapted to all kinds of environmental, economic, cultural and socio-political constraints, and it can be described as resilient. This aspect justifies the survival of pastoralism in its original form in spite of having been considered as a retrograde livelihood, criticized and marginalized for its low productivity and has been in perpetual competition with other dominant types of production such as agriculture (particularly the intensive model), industrialization and the rapid and aggressive urbanization, associated with high consumption of space.

The shepherd must be a good observer of the environment, from the small lawn to the vast expanse of the transhumant territory, to find and properly manage the food resources, and the impact of the herd on pastures is beneficial (when grazing is practiced avoiding the land overburdening) in terms of biodiversity and interconnectivity (Meuret, 2010).

The selection of plant species consumed by animals is part of a process that maintains and develops the diversity of local flora. In certain regions of the world, pastoralism is exclusively reserved for this purpose, and when this function has disappeared, it is filled by mechanical means. The presence of animals (in a balanced proportion) in the grasslands improves soil fertility by various methods as animal waste (Bernués *et al.*, 2011).

Transhumance corridors reconnect isolated areas, facilitate the transport of micro-organisms and insects with the help of animals, maintain open and accessible spaces, otherwise threatened by afforestation. So transhumance routes can therefore be described as ecological corridors.

If practiced in a sustainable way, pastoralism encourages flora and diversity of landscapes. Compared to large-scale grazing practices, pastoralism can be much closer to wildlife grazing patterns, mimicking the interactions and functional roles of natural ecosystems (CBD, 2010).

The creation of a multifunctional landscape is one of the most efficient types of green infrastructure in terms of ecosystem services, especially near or in urban areas subject to intense land use (Benedict and McMohan, 2002).

IV – Conclusions

The role of pastoralism in mediating and mitigating nature and city is currently considered and explored. From experimentation to a recognised urban function, the pastoral activity in the urban space expand due to the obvious ecosystem services delivered to the city.

The multifunctionality generated by productive and cultural aspects of pastoralism, along with interconnectivity, created by flock mobility along ecological corridors, and biodiversity enhanced by the pastoral system, are transforming abandoned land in green infrastructure and generating important ecosystem services for the city.

Both approaches encounter difficulties due to frictions with urban functions and an elaborated vision of the coexistence of city and pastoralism must be developed in order to ensure its continuity.

Today a new formulation of harmony between city and nature is needed in order to improve the already existing widespread artificialized space (Niamir-Fuller *et al.*, 2012). Rethinking the complex role (among which productive) of the animal in the urban space could significantly improve the global health of our living environment and therefore the quality of life in general.

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