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# **Main issues and challenges faced by pastoral goats in arid areas in a fast changing world**

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*Extended abstract*

## **Introduction**

Pastoralism is a type of animal production characterized by the use of spontaneous food resources. To reach these generally scarce resources in harsh dry or mountainous environments, animal holders have developed diversified practices with the selection of adapted rustic local breeds and including transhumance (seasonal migration of livestock between lowlands and highlands) or nomadism (permanent moving of the members of a community with their herds from place to place, following the available food supply). Besides, pastoralism is generally not specialized multipurpose and shepherds have often several species of animals (goats+ sheep+cattle) for both milk, meat and .(skins

Until recently, pastoralism, a millennium activity, has been considered negatively and public powers have tried to eradicate it for several reasons: the productivity per animal is generally low, the human nomadic populations would be hard to control and jump often between the borders, the herds would be responsible of environmental damages due to overgrazing and specially for goats. The diversity .of knowledge related to pastoral practices has been largely ignored

The objective of this communication is to analyze through several cases around the world and focusing on goat pastoralism, at what extent a re design of production systems would be necessary to face the challenges of global changing (climate changes, food safety, globalization of trade, .development of digital technologies...) met by agriculture and animal production

## **Pastoralism and agro – ecology to face the challenges of livestock production**

Since 50 years, the dominant paradigm of development and agriculture has been based on the specialization and intensification of production systems by maximizing the use of production factors. It has led to an important impact on environment (high use of medicine, antibiotics, fertilizers, and pesticides), a huge growth of the livestock (emission of green house gas) with a t and a high dependance of farmers to agro – industry due to important investments to increase the yield of their herds. This paradigm, initially from Western countries has spread all over the world as a solution to solve the important growing population and related food issues. Its negative effects have been the disappearance of a high number of farmers with important environmental and public health issues. To solve them, several authors (Altieri, 1983, 2002; Gliessmann, 1996, 2006, 2016) have proposed to implement the concept of agro – ecology. Agro – ecology is the application of ecological principles to design and manage sustainable agro – systems by considering agricultural practices with an optimum use of their agro – ecological potentialities. Until recently, agro –

ecology has been little developed in animal production (Dumont et al., 2013) and nearly not for pastoralism (Bellon et al., 2016). Ecologically intensive agriculture is an application of agro – ecology well adapted with pastoralism as it based on bio – biodiversity and may connect production .(objectives with the social role of livestock in low favored arid and dry areas (Griffon, 2006

Several studies and researches have shown that re – dynamizing pastoral activities would require a specified methodological approach based on a precise diagnosis of the situation of the studied situation, with an identification of its practices, of its strong weak points and opportunities. This diagnosis would have to be discussed and shared with all the actors including public services, shepherds, technicians, etc...The markets and external factors impacting the development of the sector should be identified. New collective organizations should have to be designed by considering also the traditional existing ones. An important challenge is to define the deadlines and governance .structures, extension services and management structures to implement their development

Several examples show that the application of these points could help to scale up the development :of pastoral goat systems

In South Western Morocco, in the Argane tree area, an endemic protected forest, the traditional - goat systems are based on the complementarity between argane oil collection (now for selling oil to big cosmetic companies and local alimentary oil) and goat grazing for producing kids for meat. Several projects have been implemented to develop the access of goat meat to urban markets by investments in slaughter houses and refrigerated trucks. Based on specialized goat farms and cooperatives, the project has found opposition both by Forest Services arguing that goats are bad for trees and local communities that the project does not include local practices and open the gate to external farmers. The local communities feared also that the project make their households less resilient. Thanks to a consultation between the local communities, the public services and other actors, a new project has been designed enhancing again the traditional “agdal” practices (reservation of periods without grazing to protect the trees) and a strict management of pasture .((Dubeuf and al., 2013

In Argentina, a cooperative of mountain goat farmers has obtained from the National government, - the vote of a special law (“the goat law”) to organize the access to range lands and the local kids .(“have been certified as a Denomination of Origin, (“Chivito de Neuquen

In North Eastern Brasil, the federal and local governments have organized extension services to - develop forage crops to fight drought and supported the markets of goat milk by buying a defined quantity of milk at a fixed price for social milk distribution and fight poverty in the region (Dubeuf .(and al., 2014

In Nepal, thanks to a strong cooperation between an international NGO and the government, the - value chains have been clearly identified by a very thorough study with possible progresses and .(several cooperatives have been created (anonymous, 2013

In Corsica, a French Mediterranean island where goats have always been pastoral and always - considered as so, in spite of an important loss of pastoral practices, pastoralism has been included again in the regional policy with an increasing awareness of the need to apply relevant pastoral .(practices to manage agro – ecological transition (Dubeuf and Linck, 2013

## Outlooks on the future

From these examples, we see that although the dominant models are still prevalent with many “locks in” effects (Cowan and Gunby, 1996) to develop it, pastoralism would be a relevant form of livestock production to apply agro – ecological principles and make the systems more resilient. Developing a basic education and training including references on local resources and observation of animal and plant behaviors and the hybridization between expert and local knowledge would favor these important changes. Besides, the fast development of digital technologies could help to ease the control and management of pastoral herds and the connection between isolated shepherds,

.their access to markets and improve their life conditions

In many mountain and arid areas, pastoralism is often the only economic activity on these lands and generally, livestock is not in competition with agriculture. The re vitalization of pastoralism would favor to keep people in these regions, help to fight poverty, prevent from social problems and rural abandonment of a millennium culture which has to abandon a backward – looking approach and

.adapt its practices to the present world

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