

# Productive diversification in livestock farms linking wildlife

## Summary

Historically, Mexican livestock production has experienced several crises, due to several factors; consequently producers have seek for other productive alternatives, one of which is the operation of Management Units for Wildlife Conservation (UMA). This type of units focused as agroecosystems can generate social, environmental and economic benefits. The UMA can complement conventional livestock production systems, as has been demonstrated in both hunting ranches and social land tenure know in Mexico as "ejidos". There are several factors, which favor the success or failure of a UMA, which could be oriented to success by proper planning, implementation, control and evaluation of these agroecosystems that interact with the value chain of the diversified livestock system.

**Keywords:** wildlife unit, livestock diversification, conservation and exploitation, wildlife agribusiness, Mexican wildlife units

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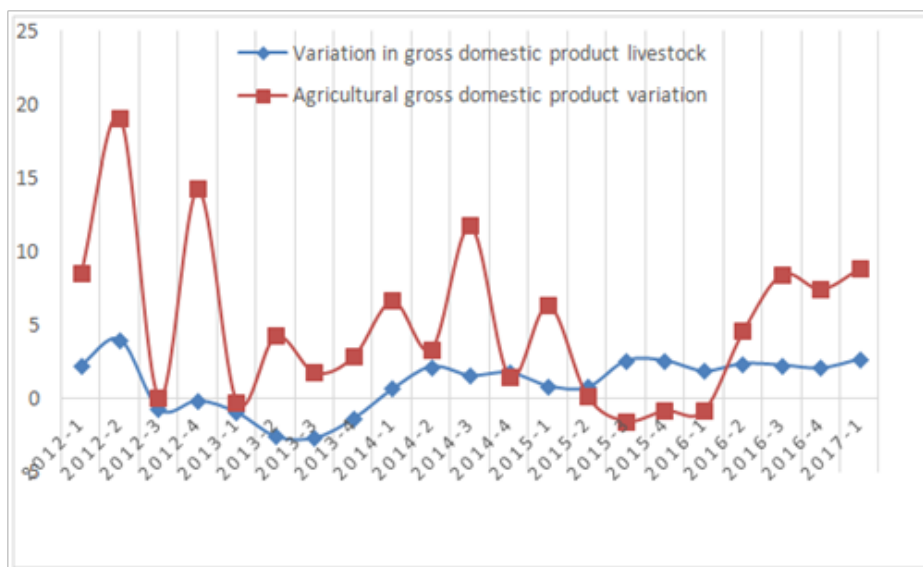
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## Introduction

The objective of this document is to analyze the importance of wildlife populations in the farms where livestock is carried out, with the purpose of linking the use of wild populations with the sustainability of livestock farms. Agricultural activities present stronger variations than the other sectors of the Mexican economy; therefore, livestock production is subject to several shocks that generate strong fluctuations in the stability of the sector. This instability increases the risk in agricultural production. Environmental risks generate uncertainty with potential losses of profits associated with the presence of uncertainty about the possible results, leading to the economic agents to take advantage of this situation or to cover themselves in case of eventual losses. The existence of risks explain

the defensive behavior of some farmers, such as the reluctance to modify the harvested methods or the use of new or innovative diversified systems, which do not seem optimal from the point of view of profitability.<sup>1</sup> Changes in economics growth in the agriculture and livestock subsectors between the years 2012 to 2017<sup>2,3</sup> are shown in Figure 1. However, it is important to focus attention to alternative activities to diversify livestock production, whose aim would be: To reduce the vulnerability of the farm when the environment and the economy are unstable; to optimize the use of natural resources of wild fauna and flora present in livestock farms, through the generation of alternative products or services; to take advantage of opportunities for the use of wildlife, according to public policies that are governed by the binary principle of Conservation and Use.<sup>4</sup>



**Figure 1** Change in economic growth in the agricultural and livestock sectors in Mexico (vertical axis) in quarters of the year 2012 to 2017 (horizontal axis).<sup>2,3</sup>

## Material and methods

A literature search was made from primary and secondary sources, from documents that inform the situation of livestock in Mexico and the link with the conservation and use of wildlife in livestock farms. From the available information, the analysis and discussion of the importance of this link in terms of environmental and economic sustainability was performed.

## Results and discussion

The Management Units for Wildlife Conservation (UMA) or Wildlife Management Properties and Facilities (PIMVS) modality are the instruments to make legal use of products and by-products of wildlife in livestock, agricultural, agroforestry and forestry of private, communal or “ejidal” property.<sup>4</sup> In these livestock, intensive UMA or PIMVS could be rose wild animals, such as deer, peccaries, crocodiles, iguanas, snakes, turkeys, pheasants and others, species that have a demanding market in Mexico and abroad. In addition, There is the modality of extensive management, such as ranches or “ejidos” of hunting sports (hunting camps), and other forms of use of the UMA, such as ecotourism, photographic hunting, etc. These modalities of UMAs (intensive, PIMVS, extensive) can be integrated into a Diversified Livestock Product System.<sup>5</sup> A market study carried out in the Mayan Riviera of Quintana Roo, Mexico,<sup>6</sup> showed the potential of the UMA as agribusiness to generate products for the tourism sector (Table 1). Hunting camps represents a good alternative of agribusinesses in a diversified livestock system, which can generate economic income through hunting trophies. Diversified systems could also contribute to the conservation of large areas of land with native flora and fauna, which could promote environmental benefits, such as forest conservation for capture of carbon dioxide, aquifer recharge, and social benefits, such as new jobs being created, and as additional income for the rural population.<sup>7</sup> The planning, implementation, control and evaluation of the UMA should be viewed from the context of the management of agroecosystems with interaction in the chain of values of the diversified livestock system; because, the holistic vision is important to generate successful projects. Table 2 shows the statistics of income from sport hunting in Sonora, Mexico.

**Table 1** Market study of white-tailed deer meat in the Mayan Riviera, Quintana Roo<sup>6</sup>

Business establishment (BE)	Monthly demand of meat (kg)
BE 1	20
BE 2	40
BE 3	100
BE 4	40
BE 5	56
BE 6	400
BE 7	20
BE 8	60

Source<sup>6</sup>

Some studies indicate that many UMA are not efficient in their functions as they should be, for this reason, they fail in the short term; others lack efficient zootechnical procedures, poor administration, deficient strategic plans and lack of marketing channels.<sup>8</sup> However,

there are several UMA with history of success; especially those that promote sport hunting directed to national and foreign hunting clubs.<sup>7</sup> It has been recommended that the UMA's and PIMVS have multipurpose use. In addition to extractive use, such as hunting, execute the non-extractive use, such as nature photography or ecotourism, may favor the finances of government institutions, such as SEMARNAT or CONAFOR to UMA's in localities of high marginalization and extreme poverty. In addition to establish or strengthen productive chains towards commercialization, training and accompaniment.<sup>9</sup> Therefore, it is important to advise legal managers or UMA owners, the employ of technical managers well trained to carry out the planning, implementation, control and evaluation of the unit as an agroecosystems, linked to the chain of value of the diversified livestock system.

**Table 2** Comparison of incomes from hunting for trophies of different animal species in hunting ranches (extensive UMA) of Sonora, Mexico

Type of Hunting	US dollars	Mexican pesos*	Mexican pesos per calf	Comparisons
Bighorn sheep ( <i>Ovis canadensis</i> )	35000	455000	4080	111 calf per 1 Bighorn sheep
Mule Deer ( <i>Odocoileus hemionus</i> )	6000	78000	4080	19 calf per 1 mule deer
White tailed-deer ( <i>Odocoileus virginianus</i> )	2500	32500	4080	8 calf per 1 white tailed-deer
Collared peccary ( <i>Pecari tajacu</i> )	500	6500	4080	1.6 collared peccary per 1 calf

\*Currency exchange rate: 13 Mexican pesos per 1 US dollar; Calf: 170 kg.<sup>7</sup>

## Conclusion

The productive diversification of livestock farms either “ejidal”, communal or private through the grow of wildlife populations (animal or plant species with a national or foreign market) brings the possibility to carrying out conservation and make sustainable use of potential wild species, through attachment to the legal procedures and with the support and accompaniment of well-trained managers; so technicians can develop the correct plan, implementation, control and evaluation of the UMA, focused as agroecosystems linked to the chain of value of the diversified livestock system, so that the system in a short or medium term could generate environmental, economic and social benefits to society.

## Acknowledgments

None

## Conflicts of interests

The author states that there is no conflict of interests.

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