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Ates S., Louhaichi M.

in

Acar Z. (ed.), López-Francos A. (ed.), Porqueddu C. (ed.).
New approaches for grassland research in a context of climate and socio-economic changes

Zaragoza : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 102

2012
pages 511-516

Reflexions on agro-pastoralists in the WANA region: Challenges and future priorities

S. Ates and M. Louhaichi

International Center for Agricultural Research in the Dry Areas (ICARDA), PO Box 5466, Aleppo (Syria)

Abstract. Rangeland resources are among the most important – and almost certainly the most neglected – agro ecosystem component in dry areas. They are the largest land-use category, home to the poorest segment of the population, and crucial for millions of small-scale livestock producers. The availability of grazing resources for livestock in the world's drylands is low and erratic due to the recurrent droughts in which animals can often fall victim. The insufficient feed supply has been in decline with widespread degradation of rangelands arising from overgrazing, loss of biodiversity, and human induced global warming. Moreover, the feed gap today is more pronounced as the livestock population has increased substantially as a result of growing demand for animal products in West Asia and North Africa (WANA) region. An important option to compensate the shortage of feed from rangelands is to grow more forage without compromising food security. It is evident that the livestock keepers in the drylands of WANA region can only attain the goal of desirable animal production if the rangelands are adequately managed. However, protection and rehabilitation of degraded rangelands depend upon complicated factors such as land tenure, control of grazing, intensified forage production, and recurrent droughts.

Keywords. Agro-pastoralists – Food security – Diversification – Production system – Resilience.

Réflexions sur les agro-éleveurs de la Région WANA : Défis et priorités pour l'avenir

Résumé. *Malgré être largement négligés, les ressources pastorales sont parmi les plus importantes composantes de l'écosystème agricole dans les zones arides. Les pastures sont la catégorie d'occupation des terres la plus répandue, constituent le foyer de la catégorie la plus pauvre de la population et sont considérées déterminants pour des millions de petits éleveurs. La disponibilité des ressources pastorales pour le bétail dans les zones arides du monde est faible et irrégulière en raison des récurrentes sécheresses dans lesquelles les animaux peuvent souvent être les plus affectés. Cependant, l'approvisionnement insuffisant en alimentation animale a été approfondi avec une ample dégradation des terres de parcours résultant du surpâturage, de la perte de biodiversité et du réchauffement de la planète induit par l'être humain. Dans la région d'Asie occidentale et de l'Afrique du Nord (WANA), cette insuffisance en ressources alimentaires pour le bétail est plus prononcé aujourd'hui qu'auparavant aussi par l'augmentation considérable du cheptel en raison à une demande croissante de produits animaux Ainsi, une option pour compenser la pénurie d'aliments dans les parcours est de accroître la production des fourrages sans compromettre la sécurité alimentaire. Il est évident que les éleveurs dans les zones arides de la région WANA ne peuvent pas atteindre l'objectif d'une production animale souhaitable que si, et seulement si, les parcours sont gérés d'une façon adéquate. Toutefois, la protection et la réhabilitation des parcours dégradés dépendent de certains facteurs complexes tels que la propriété foncière, le contrôle du pâturage, la production intensifiée des fourrages et la persistance de la sécheresse.*

Mots-clés. *Agro éleveurs – Sécurité alimentaire – Diversification – Systèmes de production – Résilience.*

I – Introduction

Agro-pastoralists in the West Asia and North Africa (WANA) region depend upon crop-livestock production for their livelihoods. Livestock is an important element of the dryland ecosystem and play a major role in alleviating rural poverty. It is the primary form of savings, as living assets for the poor, and livestock products are an important source of income for rural women, who rank among the poorest livestock keepers. Livestock help to reduce vulnerability to external shocks, increase smallholder resilience and improve livelihoods.

Over the last three decades, there have been significant increases in both the small ruminant population and production in the WANA region, all associated with the growing demand for animal products that has risen from increases in per capita real income, urbanization and population growth (Aw Hassan *et al*., 2010). This in turn has caused unrelenting pressure on natural resources, primarily on rangelands that are gradually giving way to the desertification. At present, it is generally considered that the WANA region does not contain any terrestrial ecosystems that are unaltered by human activity (Aronson *et al*., 1993). Together with the negative impacts of increasing temperatures and hydrological cycle disruptions arising from lower and more erratic rainfall, the degraded condition of rangelands will likely get worse (ICCP, 2007). With the gloomy predictions of high population growth in these developing countries, it is likely that constraints on both the land and food supply will become increasingly evident in both the mixed crop/livestock and grazing systems (World Bank, 2008). On the other hand, projected increases in the demand for livestock products in these countries (Delgado *et al.* 1999; Aw Hassan *et al*., 2010), presents significant opportunities for poor livestock keepers to increase incomes and build assets to improve their livelihoods. However, meeting the developing world's increasing demand for animal production from the limited, but degraded resources is a major challenge. Nevertheless, the animal feed deficits in the WANA region is already widespread and prevents resource poor livestock keepers from taking advantage of the growing market for animal products that would improve their livelihood. This is primarily linked to limited access to land, water, improved fodder production and livestock feeding technologies, input and output markets, pro-poor policies, effective institutions, and various forms of environmental degradations. Thus, reversing the negative trends of resource degradation requires better management and enforcement of appropriate pro-poor institutional and policy measures. The purpose of this paper is to offer an analytical review of the main constraints and opportunities faced by the agro-pastoralists in WANA region.

II – Challenges

Mediterranean grasslands face a range of global challenges that constitute serious concerns for food security, rural poverty and environmental degradation. In most cases, the vicious circle of poverty and degradation of the natural resource base are often compounded by mismanagement, weak institutions, lack of capacity, and unsustainable economic and political systems. Usually these factors lead to overgrazing which results from rangeland area loss (cultivation and ploughing impact) and the increasing number of animals (Louhaichi *et al*., 2012). Conversion of natural ecosystems to cropland and, exploitation through selective harvesting, fuel wood removal, charcoal production and overgrazing are the major causes of degradation, habitat change and biodiversity loss (Reyers, 2004). In addition the widespread shortage of fodder exacerbates the pressure on rangelands. Disturbances arising from these activities influence ecosystem dynamics, structure and composition at the local and regional scales and are important in structuring plant communities (Sumina, 1994). Hence fodder availability becomes limiting for herbivores, resulting in a regular loss of herds during droughts and rendering livestock a driven rather than driving variable in the system. This situation, the so-called non-equilibrium conditions, also known as "New Rangeland Ecology", is expected to occur under dry climates (Sullivan and Rohde, 2002; Vetter, 2005; Gillson and Hoffman, 2007). These trends are expected to be further exacerbated by current and projected climate change scenarios.

Disruption of traditional grazing system. The traditional pastoral system of "nomadism", which evolved over hundreds of years, contained strategies for coping with various climatic, physical, and biological environments. The free movement of livestock was severely restricted through the creation of international boundaries, which cut across pastoral routes. Furthermore, the administrative boundaries set by governments during the post colonization period did not match tribal boundaries (Abu-Zanat, 2005). This mismatch accentuated the sedentarisation of

herders, overgrazing, and destruction of woody plant species through burning for fuel and contributed to land degradation.

Encroachment of agricultural practices into traditional rangeland. The change from nomadism (pastoral) to agro-pastoral systems has lead to the conversion of the best rangeland (deeper soils with higher nutrient status) to cropland (Dixon *et al*., 2001). Cultivation of rangelands using unsound practices such as ploughing down slopes and the use of heavy farm machinery have accelerated the rate of soil erosion and lowered land productivity (Abou-Sharar, 2008). Many of these more productive rangeland sites were genetic reservoirs of beneficial range plants during times of prolonged drought. Because of conversion to cropland these safe sites or "refugia" for native plants no longer exist (Louhaichi and Johnson, 2008).

Individualism. Unfortunately, this shift from the pastoral to the agro-pastoral way of life was accompanied by a different attitude of the farmer/pastoralists towards the land, with an erosion of traditional values and a lack of respect towards nature (competition for forage and land resources). Thus, early grazing and overgrazing has become a common problem (Kisamba-Mugerwa, 1995).

Dilemma of governmental policies. Both colonial and post-colonial governments have invested funds in rangeland development with particular emphasis on rational pastoralism, but in many cases these efforts have failed to achieve sustainable results due to high livestock density. For instance, the policy to protect livestock during harsh times pushed governments to intervene with various forms of assistance to farmers and herders, including distribution of subsidized animal feed, rescheduling of loans, investments in water development, and expansion of animal health programs. Although they helped limit production losses caused by drought, the drought management programs have also had negative impacts. These include the following:

(i) Accelerated rangeland degradation over the long term by undermining the traditional process of adjusting flock size to inter-annual climatic variations. Herd sizes have increased sharply in recent years, and grazing practices have changed such that many of the animals no longer leave the rangeland areas during the bad years (low rainfall) but have their feed and water trucked in. This practice leads to overgrazing, reduces the natural seeding of annual pasture species, disturbs the soil, and contributes to wind erosion, particularly in areas near water and feed supply points;

(ii) Inappropriate signals to the agro-pastoral communities have encouraged continued dependence on support programs, leading to "subsidy hunters", unsustainable farming practices, and environmental degradation (Louhaichi, 2005).

Lack of trust between the authority and the rural community. Social organizations and relationships are also disturbed by some administrative considerations. In many cases, the delineation of the rural communes (administrative entities) does not always correspond to tribal land boundaries. In this regard, whatever the proposed institutional option, the execution of the project, the effective participation, and the sustainability, can be guaranteed only if beneficiaries are given security in terms of duration of grazing, and protection from intruders and other users of the rangeland resources (Louhaichi, 2005).

Lack of grazing policies and law enforcement. The main issues in these pastoral and agropastoral systems that need to be addressed, such as grazing rights and access to water, are often policy or institutional ones (FAO, 2009). Pastoral communities, however, are often socially and politically marginalized. Their livelihoods are undermined by inappropriate policies and laws. Although, several countries have already established pastoral codes that help manage these natural resources, unfortunately, in many cases these regulations are not widely enforced.

III – Future priorities (opportunities)

Recent advances in dryland research for development (R4D) show that strategies that integrate agro-ecosystem approaches can deliver international public goods (IPG) that can be applied and up-scaled globally to improve the livelihoods of the 2.5 billion people living in the dry areas, while safeguarding biodiversity and protecting the environment. Several mechanisms and tools are available to alleviate natural resources degradation and enhance agro-pastoralist livelihoods through productive and sustainable production systems that conserve the natural resource base.

Resilience: (harsh environment) well adapted to climate variability. In the dryland areas, pastoral communities have a close relationship with the natural environment. Pastoralists and agro-pastoralists have been adapting to extremes of climatic variability for centuries. Often conditions are harsh and natural resources are scarce. Therefore, communities must use the resources carefully and manage them wisely to ensure their continued sustainability. Pastoral communities living within rangelands have adopted a combination of livelihood options to ensure their survival. Drought in the pastoral areas is not an unexpected event but is instead a common characteristic of these ecosystems. In the past, pastoralists were able to withstand the effects of drought and other environmental stresses by applying coping strategies that have evolved over time. These coping strategies have lead to the development of customary early warning systems, resource tracking strategies, and so on.

Ecosystem services. Historically, the primary use of rangeland was to provide forage for livestock and wildlife. However, this vision of considering rangelands as solely grazing lands is narrow. Today, rangelands are recognized for their importance and value in providing a much wider variety of services and ecosystem functions. In fact, these lands also provide society with valuable products and services that support the standard of living and quality of life. These products include ecosystem services such as mitigating climate change via carbon sequestration, purifying water via bioremediation, and storing genetic diversity within the flora and fauna of these environments. Rangelands also provide natural beauty, a diversity of wildlife, recreational opportunities such as hunting, hiking, and camping, as well as economic values such as ranching and mining. Rangeland watersheds are important for clean and abundant water production. Rangeland soils, vegetation, and water are important for sustaining ecological and economic health of the world. Therefore, rangelands should be managed under principles of multiple-use, where these resources are simultaneously cared for to prevent overuse or destruction of natural resources. Proper management of rangelands is imperative to the social, economic, and political development of not only pastoral communities but the whole humanity.

Livestock mobility. Pastoralists traditionally relied on herd mobility to cope with unpredictability and risk on arid and semi-arid lands. With increased temperature and more variable rainfall in response to a changing climate, whose occurrence and variability is predicted to increase, mobility is a key strategy for mitigating the negative impacts of climate change. Seasonal movements are vital for pastoralists to make use of the scattered rangeland resources on a large scale while enabling rangeland auto-regeneration during certain times of the year (Dutilly-Diane, 2008).

Intensification of forage production. A possible strategy to overcome the widespread feed shortages and to reduce the pressure on rangelands is the intensified forage production through more integrated crop/livestock farming practices. Intensification of forage production may help farmers grow greater amounts of fodder for the livestock and help meet the feed gap. However, the unrelenting pressure on land and water due to increasing human and animal populations, and intensifying forage production without compromising food security, pose a significant challenge. Historically, in the WANA region, the effort to increase food and cash crops, arising from food security concerns, has caused conversion of large areas of rangelands to crop lands (Dixon *et al*., 2001; Nefzaoui, 2004).Crops for grain and forage for animals compete for land and water use. Thus it is not an easy task to increase the area dedicated to cultivated fodder

production and to allocate water for the irrigation of these forages. However, as well as the provision of food for humans, adequate supply of feed for livestock today is more pronounced than before as the animal population has increased in the WANA region (Le Houerou, 2000). It is evident that an implementation of trade-offs among the production systems that utilize forages, more often as supplementary and complementary to the rangelands in WANA region, is crucial to improving animal production without degrading the natural resource base.

Diversification of production systems. Diversification of agricultural production systems as a means of reducing the risk of failure may have a significant agro-socio-economic impact for smallholders in the WANA region, in the face of climate change. Diversification of production with the use of water use efficient crops, moving from cereal-based systems to cereal-legume rotations may increase the efficiency and the resilience of crop/livestock productions. At ICARDA long-term cereal based rotation trials have demonstrated the importance of forage legumes as a means of a diversification strategy in improved farming systems of the WANA region (Al Moneim and Ryan, 2004). However one of the major constraints to diversifying and improving forage production is the lack of improved high yielding varieties and poor access to locally adapted germplasm (Pecetti *et al*., 2011). Thus, the development of locally adapted and higher drought and salinity tolerant germplasm is of paramount importance for the diversification purposes of fodder production.

Market trends. There is an increasing trend in consumption of animal products that results from increases in per capita real income, urbanization and population growth in the WANA region. The projected consumption growth rate for the livestock products is 2.4% for the period of 2000-2020 (Aw Hassan *et al*., 2010). This growing demand for livestock products present livestock producers with a significant opportunity to increase benefits from their livestock and to raise income through participating in livestock-related markets (Delgado *et al*., 1999). However, the small producers in the WANA countries who are often the poorest in the region may not be able to exploit the potential benefits of this growing market. Livestock producers and traders in these WANA countries face a challenge in maintaining their share of export markets due to structural and technical limitations that hinder their competitiveness (Aw Hassan *et al*., 2010). The inability of small-scale farmers to feed their livestock adequately remains among the most widespread global technical constraints and removing it would enable smallholder livestock producers to improve their livelihoods by taking advantage of market opportunities and building assets.

Institutional and policy support. It is evident that technological progress and technical solutions are of paramount importance for a more efficient livestock production system in the WANA region. Improved animal health and nutrition, provision of locally adapted forage and range species, better integrated crop/livestock production systems, genetic enhancement and better post-harvest handling are essential for achieving higher livestock productivity. However without proper backstopping and improved efficiency in animal production, producers in WANA may not be able to compete with the more efficient foreign producers in either the domestic or export markets. Policies both at regional and national levels to promote the adoption of productivity-enhancing measures that will help improve the management of natural resources are needed (Aw Hassan *et al*., 2010; Louhaichi, 2011).

IV – Conclusions

Reversing the trend of degrading natural resources, and increased forage production in a sustainable manner require better management. If management and rehabilitation are to be sustainable in the long-term they must also be conducted in a participatory manner; involving the agro-pastoralists in the restoration and management of the resources they depend upon. In the past the focus was geared toward the technical aspects, however, the results clearly demonstrate that institutional and policy support is urgently needed for the sustainability of the natural resource base.

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