DYNAGRO

DYNAMIQUES AGRAIRES EN ZONES SÈCHES

INTERNATIONAL WORKSHOP

DYNAGRO – Agrarian dynamics in dryland regions

Synergies and trade-offs in agro-sylvo-pastoral systems

Institut Agronomique et Vétérinaire Hassan-II
Rabat (Maroc)
1st-3rd December 2026

Organizers

Supporting Communities

CALL FOR PROPOSAL

DIVERSITY AND DYNAMICS OF AGRO-SYLVO-PASTORAL SYSTEMS IN DRYLAND REGIONS

Agrarian systems in dryland regions are characterized by a wide variety of agro-sylvo-pastoral activities and corresponding practices, supporting various environmental (production, biodiversity, biogeochemical cycling, etc.) and social services (mutual aid, training, etc.). Rural households stand at the heart of this system and undertake activities that go beyond agriculture, e.g. craft production, trade or transport. As the land is generally shared among communities of people, it results in rural areas being multi-functional, where various stakeholders harvest the same land and its resources, including water, minerals, soils, and vegetation. Furthermore, urban people also invest in commercial farms – e.g. vegetable farming, animal fattening, milk production or poultry – which often results in resource monopolization or land grabbing, driving deprived rural people to working as farmhand or looking for other activity sectors. People mobility was once mainly driven by climatic seasonality and is now reinforced by multi-activity and trading between rural and urban areas. At the territorial level, stakeholders of the agrarian system – women, men, natives or outlanders – produce, transform and trade goods derived from agro-sylvo-pastoral activities, develop and disseminate new practices, new value chains or share this knowledge through formations, restore degraded land and adapt governance.

In dryland regions, rural flight fueled by population growth since the beginning of the 20th century has contributed to the expansion of urban networks. Accordingly, agro-sylvo-pastoral systems have been deeply reshaped through expansion of cultivated land at the expense of fallow areas and grazing lands, while increasing pressure on land has led to land exhaustion at the household, village and regional levels. Population growth has increased livestock numbers, in particular among sedentary households, while breeding-oriented livestock systems have been especially affected by the contraction and fragmentation of pastoral space. Because most rural households have limited resources, there is no investment or use of inputs that could help agricultural intensification, leading to declining soil fertility and crop yields, rangeland degradation and drop in livestock productivity. Overall, land degradation and increasingly difficult access to resources have aggravated the poverty of many nomadic and sedentary rural households.

On the other hand, alternative pathways are emerging through both individual and collective efforts to transform production practices and modes of action. Low-cost agroecological innovations are gaining ground, such as the use of biofertilizers integrating crop cultivation and livestock farming. Farmers are also placing greater emphasis on multipurpose varieties with food, fodder, and commercial potential. In some areas, communities are establishing local seed conservation and management networks at the village level. Meanwhile, urban expansion is opening up new market opportunities, not only for agricultural, food, and manufactured goods, but also for construction materials, fuelwood, and animal feed. In return, cities provide access to industrial goods, a wide range of jobs in the informal sector, as well as health, education, credit, and insurance services.

Besides, climate change and variations in dryland areas have directly affected the historical trend of agro-sylvo-pastoral production systems. Typically, the extreme drought events that occurred in the Sahel in the 1970s and 1980s cut down crop yields and livestock numbers, forcing rural households to emigrate in urban areas or abroad, and nomadic/transhumant herders to settle down and diversify their activities through farming, crafts, and trade.

Dynamics of the agro-sylvo-pastoral systems also depends on the social and economic context. Public policies play a decisive role in steering both production strategies and farming practices, through state-

regulated subsidies and investment strategies, such as cash crops (cotton, groundnuts, and sesame), mechanized farming, or the use of pesticides and fertilizers. Rural household incomes are likewise strongly influenced by trade policies, and regulation of national markets and international exchange. More broadly, investments in communication, health, and education infrastructure can have far-reaching effects on household economies, as illustrated by the rapid spread of mobile phone use among both urban populations and rural families. Conversely, the rise in civil insecurity observed over the past decade in many dryland countries has had severe repercussions for agro-sylvo-pastoral activities. Beyond the human toll, insecurity disrupts the mobility of people and livestock, hampers transport, and undermines the trust needed for cooperation, exchange, and conflict resolution among stakeholders. It also carries displaced persons and refugees who must be accommodated in territories that are often already under considerable pressure.

OBJECTIVE

The diversity among agro-sylvo-pastoral systems in dryland regions, together with main agrarian trends, is leading to: closer interdependence of crop production and livestock farming; intensification of rural activities on degraded and scarce land; increasing multiple uses of resources such as water, energy and land; growing diversity of stakeholders across rural and urban territories that are becoming more and more interconnected. These processes are driving adaptation, transition or transformation of agro-sylvo-pastoral systems, reshaping biological and ecological interactions as well as material and energy flows within ecosystems, altering agricultural techniques and practices, social and spatial relations, how knowledge is shared, institutions and regulatory frameworks. Such mechanisms can be synergistic or adversarial, generating conflicts among stakeholders while also prompting efforts for meeting technical and social trade-offs.

This workshop on the dynamics of agrarian systems in dryland regions will explore the resilience of agro-sylvo-pastoral systems against multiple social and environmental constraints. In particular it will focus on (1) the synergistic and adversarial mechanisms affecting the trends of these systems, (2) the conflicts these systems may trigger between stakeholders, and (3) trade-offs that are achieved.

The presentations, roundtables, and discussions will examine not only conflicts and failures, but also successful processes of reconfiguration, negotiated arrangements, technological options, and social alliances and partnerships. These issues will be considered in light of both the expectations of the people living in these territories and the wider social challenges to which such territories contribute. Attention will be given to the circumstances and stages through which these processes emerge, to the conditions that underpin their success, and to the extent to which the dynamics under study can be regarded as sustainable. This assessment will be approached through the lenses of equity in access to monetary and natural resources, security—whether in relation to land, food, livelihoods, water, or energy— and health understood in its human, animal, and ecosystem dimensions (*One Health*). Such analysis should provide valuable insight into the capacity of stakeholders in dryland areas to adapt their agro-sylvo-pastoral production systems and livelihoods to social and environmental constraints. It

should also help generate practical lessons and identify remaining knowledge gaps that need to be addressed.

EXPECTED OUTCOMES

The DYNAGRO conference seeks to strengthen the links between research and action, to help capitalization of territorial experiences, and to promote the co-production of knowledge for governance and socio-environmental sustainability of the agro-sylvo-pastoral systems in dryland regions. International in scope, it welcomes researches drylands across the world – including arid, semi-arid, and sub-humid areas – while aiming at a substantial share of proposals from the Sahel. The conference will also host a specific session where contributions addressing humid zones are welcome. Multivoiced presentations – bringing together perspectives from research, development and education, as well as from different economic sectors and cultural backgrounds – will be given priority. In the same way, the conference will focus on interdisciplinary and transdisciplinary approaches along with their operational and implementation in the field. Participatory approaches are particularly welcome. DYNAGRO also invites contributions that emphasize the differentiated status and roles of women, young people, and marginalized groups in relation to access to and management of productive resources—including land, water, credit, equipment, and knowledge—as well as intergenerational knowledge transmission, family- or industry-based production and processing techniques, and social and entrepreneurial innovation. Ultimately, DYNAGRO welcomes approaches that mobilize artificial intelligence (A.I.) for enabling broader and faster knowledge sharing, whether through hybrid models integrating academic knowledge and local knowledge, or through participatory platforms designed to support shared decision-making with communities. It also welcomes contributions that emphasize the role of data sharing, observation systems, and the combined use of models and observations to assess, monitor, and simulate synergies and trade-offs, as well as their effects on territories.

CONFERENCE THEMES

Theme 1. New forms of integration between crop and livestock systems

In dryland regions, and in the Sahel in particular, rural spaces are inherently multifunctional. Historically, climatic seasonality shaped the spatial and temporal distribution of crop cultivation and pastoral livestock production, and structured the management of plant and water resources through alliances among actors and through forms of interdependence operating across scales. Climate variability and climate change are now altering these historically established relations between farming and livestock activities, especially in the wake of extreme climatic events such as the Sahelian droughts of the 1970s and 1980s. Population growth and rising herd numbers have also gradually transformed crop–livestock relations, as cultivated land has been expanding, including into areas traditionally devoted to pastoral use, often at the expense of rangelands, which are shrinking, becoming more fragmented, and increasingly confined to the least productive areas. The reduction of pastoral space and the growing difficulty of access to pastoral resources are affecting transhumant and nomadic breeding systems. This has encouraged the sedentarization of pastoralists in predominantly agricultural areas, where they are increasingly developing diversified livelihoods centered on crop–livestock integration. In farming areas, the growing scarcity and fragmentation of cultivated land have fostered land commodification, which in some places accompanies the expansion of cash crops. At the same time, sedentary livestock production for draught power and fattening has been expanding, further

intensifying pressure on pastoral resources. Taken together, these dynamics tend to heighten competition and conflict among stakeholders, a situation further exacerbated by disruptions in cross-border exchange, shifting public policies, and civil insecurity.

Expected contributions under this theme should document the trajectories of crop–livestock systems and the possible moments of rupture or major reconfiguration. Particular attention will be paid to emerging forms of recomposition, accommodations, and technological options, as well as to new alliances and partnerships among stakeholders involved in crop and livestock activities, including breeding, dairy, and fattening systems, observed at local, regional, or transboundary scales. Contributions may address biophysical mechanisms at the levels of the plant, plot, animal, herd, landscape, or broader territories, while also engaging with institutional processes and social dynamics. They should examine how these arrangements have emerged and assess their social, agronomic, and environmental effects on territories. Finally, expected works should also analyze the role of public policies in enabling the emergence, diffusion, scaling, and long-term maintenance of these new forms of crop–livestock integration, as well as the governance systems that support them, further assessing their contribution to the sustainability of agro-sylvo-pastoral activities.

Theme 2. Multidimensional performance and robustness of agro-sylvo-pastoral production systems

In dryland regions, improving the capacity of production systems to feed populations, supply regional and even international markets, and help rural households move out of poverty, while at the same time preserving the ecosystem functions on which their production depends, has long been both a social and an environmental challenge, and has been aggravated under demographic, climatic, and geopolitical pressures. On the other hand, the concept of robustness refers to the ability of production systems to maintain their performances despite disturbances or changes in social and environmental conditions. It adds a temporal dimension to the issue of system performance and speaks directly to their resilience against uncertainty and shocks. In this context, new forms of recomposition, negotiated arrangements, and technological options, as well as social alliances and partnerships stand for responses developed by producers and territorial stakeholders, including women, young people and men.

Contributions under this theme should examine the different forms these responses take, together with their agronomic, economic, social, and environmental performance and robustness. They should address both failures and successes, and are expected to explain the reasons behind them and to draw lessons from them. They should also specify how these initiatives emerged and under what conditions they have been implemented. Attention should be given to their contribution to social justice and equity, risk sharing, improved nutritional quality of products, and the health of humans, animals, and ecosystems. Analyses of the risks associated with certain production strategies will be especially welcome, for example livestock fattening systems whose viability depends on the availability of low-cost young animals supplied by pastoral breeding systems. Likewise, the use of new inputs—including fertilizers, pesticides, animal feed, and seeds—should be assessed in terms of cost, accessibility, and efficiency.

Theme 3. Complementarities and interdependencies between urban and rural areas

In the Sahel, as well as in arid and semi-arid regions more broadly, population growth and the increasing urbanization of rural areas have been creating major challenges for sustainable land management, territorial balance, and resilience to climate change. At the same time, these trends are opening up new opportunities, e.g. for markets linked to forest, crop, and livestock products. They are also generating flows between urban, peri-urban, and rural territories with varying population

densities, based on reciprocal exchanges of resources, labour, and services. Where urban growth does not undermine rural dynamics, and where urban–rural relations are shaped by complementarity rather than competition, these linkages can become a key lever for the resilience and sustainability of agro-sylvo-pastoral production systems.

Contributions under this theme should adopt a regional perspective structured around urban–rural relations. They should emphasize existing interactions between urban, peri-urban, and rural territories, as well as the interdependencies these relations generate and the factors that may either weaken or strengthen them. They should also pay attention to the ways in which these interactions affect security, equity, and health. In particular, contributions are expected to highlight the technical and social innovations that initiate or reinforce complementarities. Relevant topics may include labour mobility, the recycling and valorization of materials, and the organization of commodity chains and value chains, with attention to their effects on agro-sylvo-pastoral production systems and on other forms of urban–rural exchange and complementarity.

Theme 4. The water-energy- food nexus

In the Sahel in particular, and in dryland regions in general, growing demand for agricultural production and energy relies on limited reserves of freshwater — whether rainwater, surface water, or groundwater — and on plant biomass provided by ecosystems, including both spontaneous and cultivated herbaceous species as well as woody vegetation, above and below ground. Though some activities, such as transport, are becoming more dependent on imported energy resources and therefore less directly tied to local resource constraints, access to water and biomass resources, together with growing societal pressures concerning their quality and diversity, remains a central issue for food and energy security in both rural and urban households. In this context, the sustainable management of agricultural land and water resources must be carefully analyzed. The water-energy-food nexus offers an integrated framework for analyzing issues related to the interdependencies among these three dimensions through examining both resource use and the actors involved. It helps identify synergistic and adversarial mechanisms between the three domains, the tensions or conflicts they may generate among stakeholders, and the trade-offs through which social and environmental impacts are managed in support of more sustainable intersectoral strategies.

Expected contributions under this theme should focus the nexus in dryland regions, and in the Sahel in particular, from the perspective of the resilience of agro-sylvo-pastoral systems and the land, food, water, and energy security of territories. They should examine interactions among resources (water, energy, biomass), uses (food, commercial, domestic, transport, processing), and users. Contributions may also address the diversity of agro-sylvo-pastoral production systems and may come from any of the disciplinary fields concerned with nexus approaches. Finally, particular attention will be given to studies that seek to identify system limits in the context of emerging technologies, such as solar and photovoltaic systems, whether in relation to expanding uses or to new constraints, including observed or projected climate change, as well as to critical perspectives on these quantitative approaches.

Theme 5. Exchanges between dryland and humid regions

The functioning and dynamics of agro-sylvo-pastoral systems do not stop at the boundaries of arid, semi-arid, or dry sub-humid regions. Rivers that crisscross dryland and humid areas generally originate in wetter regions, and their hydrological regimes depend on rainfall patterns in upstream humid

catchments and on those prevailing in downstream dryland areas, and are shaped by hydraulic infrastructure—such as dams and riverbed modifications— and by the ways in which these are managed. These hydrological regimes, in turn, strongly influence crop and livestock systems by determining factors such as temporary or permanent flooding, the availability of green fodder during the dry season, irrigation opportunities, and the deposition of alluvial silt and sand. Reciprocally, pollution generated by agricultural and urban uses affects water quality, whether in surface water or, depending on recharge conditions, in groundwater as well. Together, these mechanisms and connections between dryland and humid riverine zones shape the functioning and trends of agricultural production systems. Agro-sylvo-pastoral systems also maintain commercial ties with nearby humid areas and with wetter regions more broadly, both to market processed or unprocessed agricultural products and to obtain a wide range of goods, and rely, on a temporary or permanent basis, on labour from humid regions. Conversely, rural households in dryland areas often send some of their members to humid zones for seasonal or longer-term work. Livestock herds from dryland regions may also move toward humid areas through transhumance, and the reverse may occur as well. All of these relations between dryland and humid regions may take place either within or across national borders.

Contributions under this theme should examine these connections between dryland and humid areas. They should analyze, in particular, their role in food, health, and energy systems across different scales. They are also expected to describe the degree of interdependence between territories in dryland and humid zones, as well as the synergistic and adversarial mechanisms involved, and the tensions, conflicts, or compromises that may emerge among stakeholders. Analyses of the effects of geopolitical contexts on relations between dryland and humid regions are also welcome.

This theme is also open to contributions addressing any of the other four themes of the conference, provided they focus specifically on humid areas. In such cases, authors are encouraged to bring out similarities and differences with dryland contexts, to promote the exchange of experience, and to help foster future collaboration.

SUBMISSION GUIDELINES

Authors are invited to indicate the main conference theme to which their contribution relates. On the basis of an extended abstract (two pages) submitted by prospective presenters, the scientific committee will contact the authors of selected proposals to offer one of the following formats: a long oral presentation (20 minutes), a short oral presentation (10 minutes), or a poster. Applicants may also choose to submit a poster proposal directly. Both French and English are accepted.
At the end of each thematic session, all participants — whether presenters or non-presenting attendees — will be invited to identify the three contributions they found most compelling. The modalities for anonymous voting will be communicated in due course. These assessments will assist the scientific committee in selecting the contributions whose authors will be invited to prepare a full-length article for submission to a special issue of a peer-reviewed interdisciplinary journal.

Abstracts should be submitted via the scienceconf website: https://dynagro.sciencesconf.org/

Deadline : **July 19, 2026**

Contact : dynagro@sciencesconf.org

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PRELIMINARY PROGRAM

Each session of the conference will be held in a plenary format.

Tuesday, December 1, 2026

Morning:
Official opening ceremony
Scientific introduction by a guest speaker
Presentations on Theme 1
Afternoon:
Presentations on Theme 1
Roundtable discussion on Theme 1
Presentations on Theme 2

Wednesday, December 2, 2026

Morning:
Presentations on Theme 2
Roundtable Discussion on Theme 2
Presentations on Theme 3
Afternoon:
Presentations on Theme 3
Roundtable Discussion on Theme 3
Presentations on Theme 4

Thursday, December 3, 2026

Morning:
Presentations on Theme 4
Roundtable Discussion on Theme 4
Presentations on Theme 5
Afternoon:
Presentations on Theme 5
Roundtable Discussion on Theme 5
Closing