CASE STUDIES ABOUT THE ROLE OF LOCAL AUTHORITIES IN DESIGNING AND IMPLEMENTING CLIMATE CHANGE MITIGATION POLICIES

By

Giancarlo Canzanelli

Francesca Acerra

September 2023

General Approach

Due to the specific and wide-ranging nature of climate change impacts on a given territory, adaptation measures need to be taken at all levels, from local to regional and national.

A proper adaptation strategy should aim at minimizing the risks connected to climate change protecting public health, life quality and prop erties as well as preserving the nature by improving the adaptation capability of natural ecosystems and the social and economic systems.

Nevertheless, adaptation action can bring new market opportunities and jobs, in such sectors as agricultural technologies, ecosystem management, construction, water management and insurance. Businesses, including SME, can be early first movers in developing climate-resilient products and services and grasp business opportunities worldwide. In line with the Europe 2020 Strategy, adaptation strategies aim at moving towards a low-carbon and climate-resilient economy, promoting sustainable growth, stimulating climate-resilient investment and creating new jobs.

Therefore, adaptation and mitigation should not be considered alternative or conflicting approaches. Rather, they both represent complementary aspects of a comprehensive and more successful policy to tackle all the impacts of climate change. While mitigation operates on a longer time scale (up to 50-70 years) and requires a world-wide coordinated approach to reduce gradually and eventually totally curb greenhouse gases emissions at planetary level, adaptation acts main lay at local level (from national downwards) and can be modulated according to the different local situations (i.e. local impacts, vulnerabilities and resilience ca pacities). As the Stern Report highlights, if adaptation measures are not properly taken, the costs of mitigation will be higher and more serious will be the consequences of the climate change, before it can be stabilized by the long-run effects of mitigation policies.

According to the European Commission (EC White Paper 2009), strategy of tackling climate change ought to be developed in two different directions:

- a reduction of the greenhouse gas emissions with the target of slowing down global warming in the long-run (mitigation actions);
- an increase in the resilience of human activities and ecosystems to prevent or minimize the unavoidable impacts in the short-run (adaptation actions)

In this framework, through reviewing the international literature, seven study case were selected

1) The European Alp territory - Climate Change Adaptation at the local level in the Alps
2) Sidney (Australia) - Adapting to climate change through local municipal planning: barriers and challenges
3) Mongolia - Climate adaptation, local institutions, and rural livelihoods
4) Kyrgyzstan - Improving the Sustainability of Pasture Use

5) Ifad cases: Climate change and pasture restoration from Sudan, Morocco, Lesotho, Nigeria, Yemen, and Kyrgyzstan

6) United Kingdom: A net zero framework for local government

7) FAO: “Tackling Climate Change through Livestock: A global assessment of emissions and mitigation opportunities

These study cases were analysed through four special lens:

1) Context
2) Governance
3) Strategies, Planning
4) Cross cutting issues

Case 1: The European Alp territory - Climate Change Adaptation at the local level in the Alps

1.1 The context

The Alps – as other mountain regions of the world – are visibly affected by climate change. During the last 150 years, the Alpine region has experienced a total annual mean temperature increase of nearly twice as much as the average in the northern hemisphere. Temperature increase and change in the weather patterns will impact the whole spectrum of life in mountainous regions. By on-going trends, 95 % of the Alpine glacier mass is likely to have disappeared at the end of this century.

Therefore since 2006 the Alpine Convention has been committed to dealing with the issue of climate change, with a specific Ministerial Declaration subsequently taken up by the Action Plan for Climate Change in the Alps approved in 2009 and now at an advanced stage of implementation.

In this framework a special guideline document was delivered for addressing assessment and strategic actions.

1.2 The governance

At local level

Local and regional levels play a critical role in adaptation that is often a national policy managed under the responsibility of centralised authorities. Nevertheless, different governance systems may command the "in-between" level of regions to play a specific role in order to achieve effective adaptation measures within a specific country.

For a successful implementation of a sub-national adaptation strategy, the selected measures have to be concrete, feasible, inserted into the adaptation framework and coherent with the sectoral strategies at higher levels.

In order to enable local institutions to act toward an adaptation strategy the following factors have to be considered:

- provision of incentives, funding and authorisation to enable local action;
- strategic direction through a more comprehensive multi-municipality strategies or action plans, in order to save costs and increase effectiveness
- Interaction of the regional (or higher administrative level) with local/municipal needs, and measures for coordinating activities.

- Improve perception and awareness on environmental topic, and climate adaptation, that is sometimes still con fused with climate mitigation.
- Fill knowledge gaps and uncertainties, regarding vulnerabilities and concerns on even contradictory visions for adaptation to climate change.
- Identify and coordinate different interests and potential conflicts, and strongly fragmented competencies in policy and administration assigned to different sectors and territorial levels.
- Strengthen participation, through appropriate forms (e.g. work tables, seminars, workshops or presentations, joint committees, etc.), so to use the principal resources, knowledge and expertise of the different stakeholders for responding to climate change impacts, and negotiate adaptive strategies

Multi-level governance

- Coordinate at least on three levels: cross-sectoral, inter-regional, and vertical integration of decisions in order to convey a mutual understanding of different approaches on the adaptation problem.
- Build climate-resilience by means of cost-effective adaptation measures requiring the prepared ness and capacity to respond to the impacts of climate change at various levels.
- Consider adaptation to climate change a multi-sectoral issue since it affects most economic sectors, but it is also cross-sectoral, due to the interconnectedness of the affected sectors. For example, a shift from ski tourism (including artificial snow-making) to all-year tourism may impact not only the regional tourism economy, but may show an effect also on other sectors (e.g. energy, water, biodiversity conservation).
- Embrace a “horizontal” integration of adaptation policies across sectors within and beyond the environmental domain, as well as mechanisms easing the dialogue between state, business and civil society in the affected sectors.

1.3 Strategy and planning

In order to address adaptation issues, spatial planning instruments should firstly consider climate change scenarios in their projections of protection objectives, then some expected climate change effects should be integrated into spatial planning instruments. It is then useful to create synergies between spatial planning and sectoral planning.

Climate change (with particular reference to temperature increase, coupled to an increase in atmospheric CO2) will cause changes in current distribution of crops, extending the potential distribution area of some crops and reducing it, increase the spatial distribution and intensity of existing pests, diseases and weeds, the vegetative period.

At this aim some enhancement options have been suggested:

- Rethinking the political and legal framework
- Focusing spatial planning policies and instruments
- Improving the knowledge base
- Cooperation, participation and engagement
- Providing financial and human resources
- Raising awareness and sensitizing stakeholders.

As far as the **livestock production** and reproductive fitness, climate affects animals both directly and indirectly.

Indirect effects include climate influence on grassland and crops, and on water availability. Additionally, climate may also affect survival of pathogens and/or their vectors, which may cause risks for health in animal and human populations.

The following measure are recommended:

- Promote management of low-cost techniques to enhance water retention and minimize water evaporation during extreme events such as minimum tillage or mulching.
- Support interventions measure in favour of farmers and shepherds, through:
- providing “ad hoc” insurance mechanisms to cope with extreme events hazard to farm management and technical equipment facilities.
- providing facilities such as maintaining local abattoirs, creating meat-cutting rooms and sales outlets to support the development of farm processing activities, promoting short distribution channels, or providing equipment on Alpine pastures.
- Facilitate the support to farmers to adapt to the new climate conditions through Access to technology, education, information, resources,

1.4 Cross cutting issues

- Adaptation requires higher soil resilience against both excess (intense rain falls) and lack (extended droughts) of water. In this sense adaptation objectives should be targeted to incentive good soil management practices to maintain its main functions
- Future increase in forest fire risk, drought events, and more intense precipitations will probably intensify hydrological erosion in the next decades, whereas increase in temperatures accelerate the process of mineralization of the soil organic matter decreasing soil organic carbon pools

- Mountain farming might be a source of attractiveness for mountain tourism. To cope with the lower productivity of organic farming, particularly during the transition process from intensive agriculture, local authorities should financially support it (e.g. incentives, collective facilities).
- Ensure stakeholders involvement, and disseminate climate change impacts and "know-how" information. These social tools are crucial to ensure an adequate perception of the identified risks and a satisfactory degree of acceptance of the adopted adaptation measures implemented.

Case 2: Sidney (Australia) - Adapting to climate change through local municipal planning: barriers and challenges

2.1 The context

At the local scale local governments represent a core institutional unit that are increasingly recognized as having a critical role to play in climate adaptation initiatives and policy in Australia. Since approximately 2005, Australia's federal government has pursued a range of initiatives regarding climate change impacts and adaptation options for local government, that have led to the proliferation of climate change risk assessment and adaptation planning by Australia's local governments.

The federal government has invested in the formation of adaptation research institutes such as the CSIRO Climate Adaptation Flagship and the National Climate Change Adaptation Research Facility, and in scientific and technical assessment at the local level.

Local government is charged with a range of roles and responsibilities that influence spatial planning, business activity and commerce, and also for providing a diverse array of non-regulatory services including storm water management, community education, public health fire prevention, recreation, taxation, and enforcing statutory regulations on behalf of higher governments.

In the context of climate change, this diversity of responsibilities creates a number of challenges for both identifying potential natural hazards, including those associated with climatic events, and for ensuring that consideration of such hazards is incorporated into statutory and non-statutory local government decision-making.

Three main barriers were recognised in the adaptation process, such as lack of information, lack of resources and institutional limitations, but the main one is the recognition that climate adaptation is not only an environmental issue, but as a cross-sectoral one.

The main factors leading to an efficient/effective management of climate change adaptation processes in the case of the Sidney metropolitan area are illustrated as it follows.

2.1 The Governance

Local Government shall:

- Assume the role of leadership for supporting climate change adaptation through local planning, and favor partnership with all the other community leaders and actors
- Lobby with higher level state administrations in response to the limited provision to adapt to climate change through existing planning processes.

2.2 The Planning process

Local Government shall:

- Consider climate change as guiding issue within the overall local development strategies, focusing either on mitigation, and to adaptation, since they have a legislated responsibility for incorporating hazard management into planning, for hazards such as flooding and bushfires.
- Make the strategy at work, for example specifying greenhouse reduction targets.
- Provide useful, credible and relevant information about the nature of the climate risk, since it is a key barrier for planning for climate change.
- Improve the information base for key climate adaptation issues, mainly regarding the increased intensity in storm events and the potential for sea-level rise and storm surge, through including in planning a model to calculate storm surge levels by incorporating a margin to allow for predictions of sea-level rise and more intense storm events

2.3 Cross-Cutting issues

Local government shall:

- Consider climate adaptation not only an environmental issue, but as a cross-sectoral one, overlapping with other planning component.
- Include Climate adaptation within non-regulatory services, such as water management, community education, public health fire prevention, recreation, taxation

Case 3: Mongolia - Climate adaptation, local institutions, and rural livelihoods

3.1 The context

The way that pastures were used (not only numbers of humans and livestock) resulted the most important indicator of pasture degradation. The highest levels of pasture degradation were found in the field sites with the lowest levels of livestock mobility.

Overall, mobility was the dominant category of livelihood adaptation strategies used by herders in Mongolia. Herders changed the beginning, end, and duration of their migrations to adapt to climate variability and change. Surveyed households chose to ‘‘migrate more frequently’’ more often than ‘‘migrate less frequently.’’ Some of the herders changed the distance, direction, and locations of their migrations to adapt to climate variability.

Climate variability and pasture degradation have increased livelihood vulnerability of herders on the Mongolian plateau.

This adaptation strategy was mainly shaped by governmental institutions. Most pastures in Inner Mongolia have been allocated to individual households and fenced. The ‘‘Grain to Green’’ policy (i.e., including grazing ban in Inner Mongolia) further constrained grazing mobility

3.2 Governance

Local governmental institutions are the instruments for the implementation of national environmental policies (e.g., the ‘‘Grain to Green’’ policy). Only a few of the storage-related adaptation strategies in Inner Mongolia were facilitated by civic/communal institutions.

- Communal pooling in Mongolia was mostly subsistence-oriented activities in the form of pooling pastures together for migratory grazing. Pooling pastures for communal use was a kind of self-organized cooperation for pooling climate risks across space and improving the efficiency of pasture-use. This kind of community-based natural resource management was mainly facilitated by communal institutions, such as flexible property boundaries and reciprocal use of pastures. 90% of the agricultural cooperatives mentioned by the respondents in Inner Mongolia were organized by local governmental officials.

  The most spread initiatives were:

  - Dig wells together with other people
  - Start communal water harvesting
  - Pool pastures together for communal use
  - Join agricultural cooperatives

3.3 Strategies

Livestock management strategies in the study case were mainly facilitated and shaped by local institutions.

- **Mobility**

  Priority strategy

  - Stop migration

- Other strategy

- Alter the beginning of migration
- Alter the period/duration of migration
- Alter the end dates of migration
- Alter distance of migration
- Migrate more frequently
- Migrate less frequently
- Move all the time
- Migrate to different locations
- Temporary migration to urban areas or abroad
- Temporary migration to other rural areas
- Permanent migration to urban areas

- **Storage**

All of the storage-related adaptation strategies in Mongolia were facilitated by communal institutions.

Prioritised strategies:

- Reduce expenses by consuming less
- Reduce livestock, surpluses or savings
- Build permanent houses
- Build a new or improve winter shelters
- Stall-feed more livestock

Other strategies

- Improve the storage of forage
- Start hay cutting earlier or later Stop hay cutting
- Use manure of family herd on the field
- Use irrigation
- Build Mini dams
- Use pump or manual irrigation
- Improve management of water points
- Begin new veterinary practices

➚ **Livelihood Diversification**

Market incentives also stimulated herders to ‘‘adopt new animal species’’ for increasing livestock productivity. Pasture rental markets, which were represented by the ‘‘sublease land’’ strategy, have been emerging and are under development. Herders can sublease their contracted pastures to other herders. This can increase pasture-use efficiency and decrease climate-related vulnerability to herders. Livelihood diversification was mainly facilitated by governmental and market institutions. Many herders took loans from banks or their governments. Governmental subsidies were important income sources for them.

Moreover, herders in Inner Mongolia are encouraged by the local government to feed ‘‘introduced’’ high-productivity livestock species.

Only ‘‘take loans from banks/ government,’’ ‘‘start harvesting wild plants,’’ ‘‘eat different foods’’ were commonly cited by herders in Mongolia.

Priority strategies

- Eat different foods
- Start harvesting wild plants
- Take loans from banks/governments
- Introduce new high-productivity animal species

Other possible strategies:

- Increase the time of off-farm working

- Apply different feed to animals
- Start home-garden agriculture
- Change kind of crops being cultivated
- Change use of plots for grazing or agriculture
- Sell handicrafts
- Start tree nursery
- Sublease land
- Start a business
- Collect traditional herb medicine
- Plant fruit trees

Case 4: Kyrgyzstan - Improving the Sustainability of Pasture Use

4.1 The context

Agropastoralism is a key agricultural activity in Kyrgyzstan (41u009N; 75u009E). An average altitude of 2750 m and about 9.1 million ha of natural pastures make transhumance the most important livestock production system in the country.

In 2009, a new law introduced a system of community-based natural resource management, under which pasture access is to be managed by local user groups. This reform followed a new ‘‘policy consensus’’ (Mosse 1997; see also Agrawal 2001; Pincus 2001; Blakie 2006), which builds on commonpool resource theory influenced by the works of Wade (1988) and Ostrom (1990). This theory acknowledges the possibility of sustainable self-governance of commonpool resources by user groups if specific success factors that prevent free riding and allow for community participation are met

On 26 January 2009, the government of Kyrgyzstan issued the Law on Pasture (N 30), which shifted responsibility for managing pastures to new community-based user organizations and abandoned the earlier fragmented system of state authority. According to the new law, all pasture users have to form pasture user unions (PUU, which elects its own executive body, called a pasture user committee [PUC]). These bodies are authorized to govern the use of pastures independently from state administrative control. The PUUs hold a bundle of rights. Under article 6, section 5 of the new law, the PUCs have the right to:

(1) develop and implement a community pasture management plan and an annual pasture use plan,

(2) issue pasture use right certificates (pasture tickets) and collect payments for pasture use,

(3) resolve disputes among pasture users, and

(4) carry out investments in pasture infrastructure and maintenance.

Unfortunately, according to the study made by Crewett Wibke (Improving the Sustainability of Pasture Use in Kyrgyzstan, the localization of pasture administration in municipal-level PUCs and the envisaged simplification of access procedures might not be sufficient to increase livestock mobility. Results of this study suggest that administrative hurdles, including the need to travel to administrative offices outside of the municipality, were not among the key reasons for the contraction of seasonal livestock movements. It also showed that herders adhered neither to what can be considered traditional seasonal migration rules nor to pleas by the municipal administration

4.2 Governance

The study suggests to:

- Realise effective mechanisms for strengthening seasonal migration and establishing sanctions, that could improve the control function of PUCs.
- Enforce migration rules and particularly to withstand pressure from local groups or individuals who might have an interest in avoiding migration (eg influential herders who prefer to use already secured pastures near settlements).
- Improve and apply monitoring the implementation of the Pasture Law for avoiding a large discretionary power by the municipality administrations to use their own version of appropriate procedures for resource user information and pasture committee establishment.
- Establish an effective independent enforcement bodies, such as an umbrella organization of PUUs at the district or regional level, located outside the municipal level, that could serve as a control body, independent of municipality-level pressure group influence, and could effectively control seasonal migration rules

4.3 Strategy/Planning

The study suggests to:

- Increase investment in infrastructure.
- Improve the livestock service system, and make easy the access for herders, for facilitating their traveling to remote pastures, through the umbrella organization on PUUs.

Case 5: Ifad cases: Climate change and pasture restoration from Sudan, Morocco, Lesotho, Nigeria, Yemen, and Kyrgyzstan.

5.1 The context

Pasture restoration refers to the rehabilitation of degraded grasslands used to feed domestic livestock such as cattle, goats, and camel.

Grasslands are generally resilient ecosystems that depend on a cycle of plant death and renewal; however, they are vulnerable to anthropogenic and climate change. Given its resilience to environmental stressors, grassland degradation is often a result of combined human induced pressures and climate change impacts.

Unsustainable grazing practices and cutting of tree and shrub vegetation interact with drought and flooding, resulting in degradation, erosion and, depending on location in desertification.

Grassland degradation directly threatens the livelihoods of pastoralists, who rely on the resource for livestock grazing. While unused grasslands tend to be very resilient, droughts coupled with overgrazing decrease resilience and can permanently alter the quantity and quality of vegetation.

Degradation levels vary locally, but are generally highest around water sources, infrastructure and settlements, due to their use by pastoralists.

With higher temperatures and more frequent and intensive droughts projected for many grassland regions of the world, grassland degradation due to human interreference is expected to be amplified.

Flooding can cause further degradation of damaged grasslands, when bare soil is washed out, while invasive weeds can intensify the degradation of grasslands.

Secondary impacts from climate change impacts on pastures include; permanent degradation and desertification, increased pressure on remaining pastures, conflict between pastoralist groups and with farmers due to competition over remaining pastures, loss of pastoralists' source of livelihood and traditional way of live, decrease in regional livestock trade and availability of meat and dairy products.

Pastoralists will be most affected by the impacts of climate change on grasslands, with poor households, women, children and youth being especially vulnerable.

Patriarchal structures often limit women in taking part in communal decision-making processes and inheritance of animals, negatively affecting their ability to adapt.

As a group, pastoralists suffer marginalisation, including lower acce to services such as health and education.

Generally, pastoralists' adaptive capacity to climate change impacts on pastures is low.

Apart from climate change impacts on pastures, challenges placed on pastoralists in some regions that affect their ability to rear livestock include, land tenure insecurity, transformation of pasture into cropland, political and demographic changes blocking migration routes to pastures, and competition over pastures and water resulting in conflict between pastoralist groups.

Unsustainable cutting of native trees and shrubs for fuelwood and charcoal production causes erosion due to the loss of soil organic matter, leading to a loss of soil moisture and stability. It also diminishes an additional feed source for grazing animals.

On a global scale, the role of grasslands for climate change mitigation is not fully understood but localized scientific evidence shows that grasslands have large carbon storage and sequestration capacities. Grasslands store carbon mainly underground in roots and organic matter of the soil.

Sequestration occurs over decades to centuries, with varying ability to store carbon depending on soil type and moisture as well as management practices. Carbon is mainly released from the soil through increasing soil temperature, decrease in soil moisture, degradation, and conversion to agricultural land (ploughing and tilling).

These changes can also affect the soil's ability to store carbon, turning a carbon sink into a source. In summary, climate change impacts on grasslands interact with other pressures, leading to (further) degradation of pastures for livestock grazing. It directly threatens the livelihood and food security of pastoralist.

Pasture degradation has a negative effect on the soil's ability to sequester and store carbon.

5.2 Governance

Local authorities shall:

- Include pastoralist groups to ensure that interventions are socially accepted and do not impede pastoralists' livelihoods.
- Integrate a gender perspective in adaptation and empowering women in order to have positive outcomes in terms of capacity to adapt to climate change. have
- Address the challenges faced by women, indigenous and marginalised groups, and poor people in order to mitigate the inequitable impacts of climate change, especially when increasing temperatures can accelerate microbial break down of soil organic matter, a process which releases carbon into the air (For instance. in Somalia the absence of this specific focus resulted in a destructive charcoal production)

5.3 Strategies/Plan

Local authorities shall include in their plans:

- increasing the resilience of pastures to climate change impacts, and reducing other stressors including grazing management and land restoration.
- measures to maintain grasslands healthiness in order to cope with drought and flood and hold and sequester larger amounts of carbon.
- Coordinate the adaptation of livestock rearing and pastoralism, to make use of synergies and to avoid redundancy and maladaptation, for example, changing grazing patterns and making alternative fodder sources for livestock available to pastoralists.
- Favour of support restoring, regenerating, and rehabilitating degraded grasslands, through realising synergies between enhancing natural resource productivity and environmental protection and restoration such as
- Enhancing agroforestry techniques, such as natural run-off and erosion control, and water retention of the soil.
- Facilitating Pasture sowing and native shrub and tree planting that can improve pastures' productivity.
- Building capacities for managing overgrazing through adapted grazing patterns, making use of underutilized pastures, and using non-climate sensitive sources of fodder that can greatly reduce the stress on grasslands, increasing their resilience to climate change impacts.
- Applying a landscape scale approach in pasture restoration, that can address cost-effectiveness, landscape connectivity
- Preventing damage from fire, invasive species and counteracting further degradation of pastures
- Seeking to gain a better understanding of climate change impacts on grasslands and measures to increase the resilience of pastures through research.
- Enhancing ecosystem services.
- expanding pastures into less vulnerable locations and making use of nutrient
- providing pasture flooding in plains, that can provide relief for climate-stressed and overgrazed pastures.

5.4 Cross cutting issues

- Integrate climate change intervention into national and regional policy processes and plans.
- Raising awareness of climate impacts and other stressors on grasslands among staff of regional institutions and pastoralist groups,

Case 6: United Kingdom: A net zero framework for local government

6.1 The context

According to U.K. national government[1], local government has a critical role in reaching net zero. According to the CCC, local authorities are a "cornerstone of climate change partnerships".

UK will struggle to reach net zero by 2050 unless central and local government work together to deliver solutions tailored to meet local circumstances.

Climate change mitigation will need to be made have a strong local dimension, such as decarbonising buildings, transport, waste, agriculture, and industry because of their powers and responsibilities in these sectors, or, in general, powers or influence over roughly a third of emissions in their local areas.

Most councils have already set climate change targets at least as ambitious as central government's. Nonetheless[2] the NAO reported that local government representatives had warned of "a lack of clarity from central government on the role local authorities should play in achieving net zero".32 In its more recent report, Local government and net zero in England, it further found that central government had "yet to determine, in consultation with the sector, local authorities' overall responsibilities and priorities in achieving the national net zero target" and that consequently there was a risk local authority climate action would not be "as coordinated, targeted, or widespread as it might need to be".33 Echoing these concerns, the CCC said the Government "should engage with local authorities to ensure that a net zero delivery framework is included in its Net Zero Strategy" and that this framework should "align and clarify national, subnational, regional and local delivery roles and areas for collaboration".34 Without some central government co-ordination, it said the UK risked pursuing a "fragmented strategy towards net zero", with councils duplicating both effort and expense.

6.2 Governance

The following recommendations were provided by the U.K. House of Commons in 2021

- The national Net Zero Strategy shall clarify the relationship between central and local government in the delivery of net zero and to improving co-ordination between different layers of government, through consulting local government on the contents of a draft net zero delivery framework setting out the relative roles and responsibilities of local and central government, clarifying the critical role local government must play in delivering a just transition that benefits

[1] National Audit Office, Achieving net zero, HC 1035; National Audit Office, Local government and net zero in England, HC 304; Climate Change Committee, Local Authorities and the Sixth Carbon Budget, (December 2020); UK100, Power Shift: Research into Local Authority powers relating to climate action, (April 2021); Blueprint Coalition, A blueprint for accelerating climate action and a green recovery at the local level, (January 2021); Institution of Civil Engineers, The role of sub-national leadership in achieving net-zero, (September 2021)

[2] Local government and the path to net zero - Fifth Report of Session 2021–22

all communities, and consulting local government on what additional powers it might need to meet its climate targets.

- Give local government the means to do it, particularly additional powers and funding, for upskilling within local authorities as well the delivery of individual measures.
- Provide dedicated grant funding but overcoming the current competitive bidding, that risk to increase fragmentation
- Commit long term and more co-ordinated funding streams to enhance innovation and investment, reduce bureaucracy, and encourage more efficient and integrated decision making"
- Simplify and consolidate funds which target net zero initiatives at the local level where this provides the best approach to tackling climate change.
- Promote the net zero agenda among local businesses and the public, as already evidenced in many cases of councils supporting local businesses to reduce their emissions: Essex Council secured an extra £1.3 million of funding for a further phase of the LoCASE programme, funded by the European Regional Development Fund (ERDF), and designed to help small and medium-sized enterprises reduce their carbon emissions through investment in energy efficiency measures and renewable energy, through grants to businesses of up to £10,000 and is a collaboration between local government and universities; Cherwell District Council implemented a £3.2 million project aimed at "boosting lowcarbon economic development in Oxfordshire", also funded by the ERDF and run collaboratively by the Low Carbon Hub, Oxford City Council, the University of Oxford, Oxford Brookes University, Cherwell District Council and Bioregional, The latter two are also developing a county-wide networking organisation to support knowledge transfer from Oxfordshire Green Lab and local businesses

Case 7: FAO: "Tackling Climate Change through Livestock: A global assessment of emissions and mitigation opportunities

7.1 The context

7.2 The governance

Local authorities may:

On the local scenario

- Facilitate designing and implementing of cost-effective and equitable mitigation strategies and polices through concerted action by all stakeholder groups (including producers, industry associations, academia, the public sector and intergovernmental organizations).
- Assign mitigation targets for farmers/sectors, as well as more prescriptive approaches such as mandating the use of specific mitigation technologies and practices.
- Align private and public economic objectives, and to facilitate further uptake of all mitigation strategies
- Introduce instruments that seek to increase the flow of information about the emissions associated with different livestock commodities (e.g. labelling schemes). This can help consumers and producers to better align their consumption and production preferences with the emission profiles of these commodities.
- Realise awareness about livestock's role in tackling climate change to influence and promote mitigation policy development for the sector (e.g. through intergovernmental representation of this issue in the UNFCCC negotiation process)
- Introduce o apply policy safeguards to avoid unintended environmental, disease and socio-economic risks

On the national scenario

- Make livestock mitigation policies to be consistent with the overall development goals of the country

On the international scenario

Favor strong internationally binding emission targets that are inclusive of agriculture and the world's

Participate to global initiatives that are focused on livestock specific issues, and that can effectively integrate and mainstream the mitigation and development objectives pursued by sector stakeholders. An example is LEAP, which gathers partners from the private sector, governments, civil society

organizations, research and international organizations that have agreed to develop common metrics to define and measure environmental performance of livestock supply chains

Another example is the Global Agenda of Action in support of Sustainable Livestock Sector Development is a closely related initiative by a similar group of stakeholders from all parts of the livestock sector, which tackles the issue at the level of implementation, by focusing on practice change and continuous improvement. It draws on the differing strengths of each stakeholder group to build the trust and cohesion that are essential for concerted international action along the sector's entire supply chain.

7.3 Strategies/Plan

Local authorities may:

1) Enhance livestock support services through:

- Facilitating access to improved practices/ technologies, knowledge and capacity for their application, and information about emerging market
- Promoting demonstration farms
- Facilitating networks and linkages among service providers
- Improving the veterinary and sanitary services for caring the animal health
- Supporting effective and efficient waste management services
- Boosting alternative energy plants

2) Favor knowledge building and transfer through:

- Establishing livestock field schools
- Facilitating farmer networks to promote peer-to-peer knowledge transfer,
- Establishing livestock roundtables
- Facilitating the brokering of linkages among livestock participants
- Boosting research and development to build the evidence base for mitigation technologies/practices.
- Applying affordable methods for measuring emissions, to guide practice change for measuring the recovery and use of CH4 from stored manure as a clean energy source, such as livestock biogas
- Encouraging technological innovation and building institutional capacity to support and make use of these innovations

3) Design financial incentives, through

- Designing financial instruments that allow the public sector to underwrite the risks of mitigation projects, which the private sector is unwilling to take on board, for attracting private sector co-investment
- Applying beneficiary pays' mechanisms (abatement subsidies) or 'polluter pays' mechanisms (emissions tax, tradable permits) for incentivizing the adoption of mitigation technologies/practices

7.4 Cross-cutting issues

- Trade-offs between mitigation and other environmental and socio-economic objectives must also be considered and managed. While efficiency-based climate change mitigation strategies can improve efficiency in the use of other natural resources, policy safeguards are still needed to avoid unintended environmental, disease and socio-economic risks

8. Learned lessons about the Role of local authorities for designing and implementing climate change mitigation policies in the case of livestock value chain

According to the seven studied cases, this chapter resumes the main learned lessons, as usual, categorized by the three components, such as Governance, Strategies, and cross-cutting issues.

The synoptic table included in annex 1 guided to resume the lessons, that follow.

8.1 Governance

The main learned lessons coming from the comparative study and regarding the role of local authorities refer to:

At local level

1) **Favor and strengthen multi-actors participation**, through appropriate forms for responding to climate change impacts, and negotiate adaptive strategies (ALPES, KYRGYZSTAN, SIDNEY), for
    - Strengthening the role of local authorities, and leadership for supporting climate change adaptation through local planning (SIDNEY), and implementing cost-effective and equitable mitigation strategies and polices through concerted action by all stakeholder groups (FAO)
    - Establishing effective mechanisms for strengthening seasonal migration and establishing sanctions (KYRGYZSTAN)

- assigning mitigation targets for herders and farmers, as well as more prescriptive approaches (FAO)
- identifying and coordinating different interests and potential conflicts, and strongly fragmented competencies (FAO)
- lobbying with higher level state administrations in response to the limited provision to adapt to climate change through existing planning processes (SIDNEY)
- addressing the challenges faced by women, indigenous and marginalised groups, and poor people in order to mitigate the inequitable impacts of climate change, and integrate a gender perspective in adaptation and empowering women, so ensuring that interventions are socially accepted (IFAD)
- favoring the flow of information about the emissions associated with different livestock commodities, such as labelling schemes (FAO)

2) **Building knowledge**, for filling knowledge gaps and uncertainties, regarding
   - facing vulnerabilities and concerns on even contradictory visions for adaptation to climate change (ALPES),
   - improving perception and awareness on environmental topic, and climate adaptation (ALPES), with particular reference to the livestock's role in tackling climate change to influence and promote mitigation policy development for the sector to avoid unintended environmental, disease and socio-economic risks (FAO)
   - upskilling local authorities staff and providing the means, powers and funding to perform better the main role of promoting and implementing climate change adaption policies
3) **Providing financial support**, through provision of incentives, funding and authorisation to enable local action (ALPES), dedicated grant funding (overcoming competitive bidding, that risk to increase fragmentation), and committing long term and more co-ordinated funding streams to enhance innovation and investment (UNITED KINGDOM).

At national and international level

1) **Coordinating cross-sectoral, inter-regional, and vertical integration** of decisions (ALPES), clarifying the relationship between central and local government, and boosting consultations with local government (UNITED KINGDOM) for overcoming the limited resources of local administrations (SIDNEY), and reducing bureaucracy (UNITED KINGDOM), with the final aim of committing long term and more coordinated funds to enhance innovation and investment, and to adopt appropriate climate-resilience measures (ALPES)

2) **Aligning livestock mitigation policies** with the overall development goals of the country (FAO, UNITED KINGDOM), and monitoring the implementation of the national regulations for avoiding a large discretionary power by the municipality administrations (KYRGYZSTAN)

3) **Participate to global initiatives** that may favor strong internationally binding emission targets that are inclusive of agriculture and the world's, and are focused on livestock specific issues, and that can effectively integrate and mainstream the mitigation and development objectives pursued by sector stakeholders, as the LEAP, or the Global Agenda of Action in support of Sustainable Livestock Sector Development (FAO)

8.2 Strategies

The main learned lessons coming from the comparative study and regarding the role of local authorities refer to:

1) **Make the strategy at work** considering climate change as guiding issue within the overall local development strategies, rethinking the political and legal framework (ALPES), through
   - engaging all the local stakeholders (ALPES), and focusing either on mitigation, and to adaptation (SIDNEY),
   - providing instruments allowing the public sector to underwrite the risks of mitigation projects, which the private sector is unwilling to take on board, for attracting private sector co-investment (FAO)
   - focusing spatial planning policies and instruments (ALPES), with particular reference to greenhouse reduction targets (SIDNEY),

2) **Improve the resilience of pastures,** through
   - Increasing the resilience to climate change impacts, and reducing other stressors including grazing management and land restoration (IFAD),
   - coordinating the adaptation of livestock rearing and pastoralism and maintain grasslands healthiness (IFAD),
   - facilitating pasture sowing and native shrub and tree planting (IFAD), enhancing agroforestry techniques, such as natural run-off and erosion control, and water retention of the soil (IFAD), reduce expenses by consuming less, and livestock surpluses or savings it (MONGOLIA), improving the storage of forage, using manure of family herd on the field, using irrigation, improving management of water (MONGOLIA), harvesting wild plants, introducing new high-productivity animal species (MONGOLIA)
   - stopping or altering the period/duration of migration; and/or the distance of migration, and/or the migration frequency (MONGOLIA),
   - diversifying activities (Collect traditional herb medicine, Plant fruit trees) (MONGOLIA), Boosting alternative energy plants (ALPES).

3) **Improve services** and/or access, such as
   - credible and relevant **information** about the nature of the climate risk, mainly regarding the increased intensity in storm events and the potential for sea-level rise and storm surge (ALPES),
   - access to improved practices/ technologies, knowledge (FAO, ALPES), veterinary and sanitary and waste management services (FAO), boosting research and development of mitigation technologies (FAO),
   - facilitating networks and linkages among service providers (FAO, KYRGYZSTAN), and establishing specific support entities, such as the PUU (KYRGYZSTAN),
   - enhancing ecosystem services (IFAD)

4) **Provide finance**, through
   - designing financial incentives (FAO, ALPES, MONGOLIA),
   - applying beneficiary pays' mechanisms (abatement subsidies) or 'polluter pays' mechanisms (emissions tax, tradable permits) for incentivizing the adoption of mitigation technologies/practices (FAO),
   - facilitating farmer networks to promote peer-to-peer knowledge transfer (FAO), provide "ad hoc"
   - promoting insurance mechanisms to cope with extreme events hazard (ALPES)

5) **Improve capacities**, through facilitating access to capacity building, and information (FAO, ALPES), with specific regard to
   - management of overgrazing patterns, use of underutilized pastures, and of non-climate sensitive sources of fodder that can greatly reduce the stress on grasslands (IFAD),
   - expanding pastures into less vulnerable locations or pasture flooding in plains and making use of nutrient (IFAD),
   - enhancing agroforestry techniques, such as natural run-off and erosion control, and water retention of the soil (IFAD),
   - management of low-cost techniques to enhance water retention and minimize water evaporation (ALPES), preventing damage from fire, invasive species and counteracting further degradation of pastures (IFAD),
   - applying affordable methods for measuring emission (ALPES),
   - promoting demonstration farms (FAO), and
   - establishing livestock field schools (FAO), establishing livestock roundtables (FAO), and raising awareness and sensitizing stakeholders (ALPES)

6) **Provide facilities,** through increasing investment in infrastructure (KYRGYZSTAN) and in particular for maintaining local abattoirs, creating meat-cutting rooms and sales outlets to support the development of farm processing activities, promoting short distribution channels, or providing equipment on pastures (ALPES), building permanent houses, new or improved winter shelters, and increasing stall-feed livestock (MONGOLIA)

8.3 Cross Cutting Issues

The main learned lessons coming from the comparative study and regarding the role of local authorities refer to:

1) **The integration** of the climate change intervention into national and regional policy processes and plans., as clearly stated in the IFAD cases

2) **Cross cutting t**he climate change mitigation issue with other environmental and socio-economic objectives (FAO), for
   - ensuring an adequate perception of the identified risks and a satisfactory degree of acceptance of the adopted adaptation measures implemented (ALPES), and avoiding unintended environmental, disease and socio-economic risks (FAO).
   - promoting eco-tourism (ALPES),
   - enhancing strategies against future increase in forest fire risk, drought events, and more intense precipitations, that will probably intensify hydrological erosion in the next decades (ALPES)

3) **Include climate adaptation** within the non-regulatory services (SIDNEY), including awareness of climate impacts and other stressors on grasslands among staff of regional institutions and pastoralist groups (IFAD), and financial support or increasing access to finance (ALPES)

SINOPTIC TABLE ON CASE STUDIES ABOUT THE ROLE OF LOCAL AUTHORITIES IN DESIGNING AND IMPLEMENTING CIILATE CHANGE MITIGATION POLICIES

	GOVERNANCE	STRATEGIES/PLANS	CROSS CUTTING
ALPES	**LOCAL LEVEL** Provision of incentives, funding and authorisation to enable local action; more comprehensive multi-municipality strategies or action plans Improve perception and awareness on environmental topic, and climate adaptation Fill knowledge gaps and uncertainties, regarding vulnerabilities and concerns on even contradictory visions for adaptation to climate change. Identify and coordinate different interests and potential conflicts, and strongly fragmented competencies Strengthen participation, through appropriate forms for responding to climate change impacts, and negotiate adaptive strategies. **MULTI-LEVEL GOVERNANCE** Coordinate cross-sectoral, inter-regional, and vertical integration of decisions Build climate-resilience by means of cost-effective adaptation measures Consider adaptation to climate change a multi-sectoral issue Embrace a "horizontal" integration of adaptation policies across sectors within and beyond the environmental domain, as well as mechanisms	**GENERAL ISSUES**. Rethinking the political and legal framework Focusing spatial planning policies and instruments Improving the knowledge base Cooperation, participation and engagement Providing financial and human resources Raising awareness and sensitizing stakeholders. **LIVESTOCK ISSUES.** Promote management of low-cost Boos techniques to enhance water retention and minimize water evaporation Provide "ad hoc" insurance mechanisms to cope with extreme events hazard Provide facilities such as maintaining local abattoirs, creating meat-cutting rooms and sales outlets to support the development of farm processing activities, promoting short distribution channels, or providing equipment on Alpine pastures. Facilitate the support to farmers to adapt to the new climate conditions through access to technology, education, information, resources,	Adaptation requires higher soil resilience against both excess (and lack of water. Boost good soil management practices to maintain its main functions Adopt strategies against future increase in forest fire risk, drought events, and more intense precipitations will probably intensify hydrological erosion in the next decades,as weel as increase in temperatures Promote mountain tourism. Financially support (e.g. incentives, collective facilities) to cope with the lower productivity of organic farming, particularly during the transition process from intensive agriculture Ensure stakeholders involvement, and disseminate climate change impacts and "know-how" information. These social tools are crucial to ensure an adequate perception of the identified risks and a satisfactory degree of acceptance of the adopted adaptation measures implemented.
SIDNEY	Assume the role of leadership for supporting climate change adaptation through local planning, and favor partnership with all the other community leaders and actors Lobby with higher level state administrations in response to the limited provision to adapt to climate change through existing planning processes.	Consider climate change as guiding issue within the overall local development strategies, focusing either on mitigation, and to adaptation Make the strategy at work, for example specifying greenhouse reduction targets. Provide useful, credible and relevant information about the nature of the climate risk, mainly regarding the increased intensity in storm events and the potential for sea-level rise and storm surge	Consider climate adaptation not only an environmental issue, but as a cross-sectoral one Include Climate adaptation within non-regulatory services,

FAO	**LOCAL LEVEL**Facilitate designing and implementing of cost-effective and equitable mitigation strategies and polices through concerted action by all stakeholder groups, and Align private and public economic objectivesAssign mitigation targets for farmers/sectors, as well as more prescriptive approachesIntroduce instruments that seek to increase the flow of information about the emissions associated with different livestock commodities (e.g. labelling schemes)Realise awareness about livestock's role in tackling climate change to influence and promote mitigation policy development for the sectorIntroduce o apply policy safeguards to avoid unintended environmental, disease and socio-economic risks**NATIONAL LEVEL**Make livestock mitigation policies to be consistent with the overall development goals of the country**INTERNATIONAL LEVEL**Favor strong internationally binding emission targets that are inclusive of agriculture and the world'sParticipate to global initiatives that are focused on livestock specific issues, and that can effectively integrate and mainstream the mitigation and development objectives pursued by sector stakeholders (as the LEAP, or the Global Agenda of Action in support of Sustainable Livestock Sector Development)	**Enhance livestock support services through**Facilitating access to improved practices/ technologies, knowledge, capacity building, and information Promoting demonstration farms Facilitating networks and linkages among service providersImproving the veterinary and sanitary and waste management services Boosting alternative energy plants**Favor knowledge building and transfer through:**Establishing livestock field schools Facilitating farmer networks to promote peer-to-peer knowledge transfer Establishing livestock roundtables Boosting research and development of mitigation technologiesApplying affordable methods for measuring emissions**Design financial incentives, through** Instruments allowing the public sector to underwrite the risks of mitigation projects, which the private sector is unwilling to take on board, for attracting private sector co-investmentApplying beneficiary pays' mechanisms (abatement subsidies) or 'polluter pays' mechanisms (emissions tax, tradable permits) for incentivizing the adoption of mitigation technologies/practices	Trade-offs between mitigation and other environmental and socio-economic objectives for avoiding unintended environmental, disease and socio-economic risks
IFAD	**GOVERNANCE**		**CROSS CUTTING**
	Include pastoralist groups to ensure that interventions are socially accepted Integrate a gender perspective in adaptation and empowering women Address the challenges faced by women, indigenous and marginalised groups, and poor people in order to mitigate the inequitable impacts of climate change		Integrate climate change intervention into national and regional policy processes and plans. Raising awareness of climate impacts and other stressors on grasslands among staff of regional institutions and pastoralist groups,

	STRATEGIES/PLANS	
	Increasing the resilience of pastures to climate change impacts, and reducing other stressors including grazing management and land restoration.Implement measures to maintain grasslands healthiness in order to cope with drought and floodCoordinate the adaptation of livestock rearing and pastoralism, to make use of synergies and to avoid redundancy and maladaptationFavour of support restoring, regenerating, and rehabilitating degraded grasslandsEnhancing agroforestry techniques, such as natural run-off and erosion control, and water retention of the soil. Facilitating pasture sowing and native shrub and tree planting that can improve pastures' productivity. Building capacities for managing overgrazing through adapted grazing patterns, making use of underutilized pastures, and using non-climate sensitive sources of fodder that can greatly reduce the stress on grasslandsPreventing damage from fire, invasive species and counteracting further degradation of pastures Seeking to gain a better understanding of climate change impacts on grasslands and measures it through research.Enhancing ecosystem services.Expanding pastures into less vulnerable locations and making use of nutrientProviding pasture flooding in plains	
	GOVERNANCE	**STRATEGIES/PLANS**
MONGOLIA	Support Communl Pooling initiatives, as Dig wells together with other people Start communal water harvesting Pool pastures together for communal use Join agricultural cooperatives	**Mobility** (Priority 1: Stop migration; Priority 2: Alter the period/duration of migration; Alter distance of migration, alter the migration frequency) **Storage** (Priority 1: Reduce expenses by consuming less, Reduce livestock, surpluses or savings, Build permanent houses, Build a new or improve winter shelters, Stall-feed more livestock. Priority 2: Improve the storage of forage, Start hay cutting earlier or later, Stop hay cutting, Use manure of family herd on the field, Use irrigation, Build Mini dams, Use pump or manual irrigation, Improve management of water points, Begin new veterinary practices) **Livelihood Diversification** (Priority 1: Eat different foods, Start harvesting wild plants, facilitate loans from banks/governments, Introduce new high-productivity animal species. Priority 2: Increase the time of off-farm working, Apply different feed to animals, Start home-garden agriculture, Change kind of crops being cultivated, Change use of plots for grazing or agriculture, Sell handicrafts, Start tree nursery, Sublease land, Start a new business, Collect traditional herb medicine, Plant fruit trees

Kyrgyzstan	Establish an effective independent enforcement bodies, such as an umbrella organization of PUUs at the district or regional level, located outside the municipal level, that could serve as a control body, independent of municipality-level pressure group influence, and could effectively control seasonal migration rules Realise effective mechanisms for strengthening seasonal migration and establishing sanctions, that could improve the control function of PUCs. Enforce migration rules and particularly to withstand pressure from local groups or individuals who might have an interest in avoiding migration Improve and apply monitoring the implementation of the Pasture Law for avoiding a large discretionary power by the municipality administrations	Increase investment in infrastructure. Improve the livestock service system, and make easy the access for herders, for facilitating their traveling to remote pastures, through the umbrella organization on PUUs.
UNITED KINGDOM	The national Net Zero Strategy shall clarify the relationship between central and local government in the delivery of net zero and to improving co-ordination between different layers of government, through consulting local government on the contents of a draft net zero delivery framework on what additional powers it might need to meet its climate targets.Give local government the means to do it, particularly additional powers and funding, for upskilling within local authorities as well the delivery of individual measures.Provide dedicated grant funding but overcoming the current competitive bidding, that risk to increase fragmentationCommit long term and more co-ordinated funding streams to enhance innovation and investment, reduce bureaucracy, and encourage more efficient and integrated decision making Promote the net zero agenda among local businesses, the academic and the public sector	