

Workshop to discuss Livestock and Global Climate Change

This workshop took place at the conclusion of a conference held in Hammamet, Tunisia, 17-20 May, 2008. The conference organisers felt there was an urgent need to bring together interested parties to

1. review the latest scientific findings on predictions of climate change and how these will affect livestock production
2. examine the contribution that livestock production makes to these changes and how it can help to mitigate them
3. consider how livestock production systems can adapt to climate change
4. consider future scientific priorities to help in these areas

The conference had over 70 papers presented (invited talks, offered oral and poster presentations) and attracted 130 delegates from 36 countries and from 6 continents around the world, confirming the timeliness and global importance of the subject. For further information on the meeting and the presentations please see www.bsas.org.uk.

These notes highlight the outcomes of workshop discussions to help identify scientific priorities in this area. Three workshop areas were identified, namely;

1. Identifying stakeholder priorities (mitigation/adaptation),
2. Identifying research priorities,
3. Getting information and results into practice.

The discussions within these groups, with an appointed facilitator, based their discussions around 4 questions. These discussions aimed to distil the main messages from the conference and to help formulate future activities in this area.

1. What are the current gaps in knowledge?
2. What areas and/or stakeholders were missing from the meeting?
3. What options are available to mitigate?
4. What options are available to adapt?

The main take home messages from each of the groups are presented, with more detailed notes of workshop discussions presented in Annex 1. For clarification and the purposes of this document, Northern and industrialised farming nations are referred to as developed and southern pastoral based countries are referred to as developing. It is recognised that this may not be a strictly accurate segregation but serves the purpose in this context.

Take home messages from each group

Workshop 1: Identifying stakeholder priorities (mitigation/adaptation)

There is a lack of baseline information to provide a point of reference from a local to a global level. Good access to data on climate change and systems is required from around the world including the larger developing countries (e.g., China, Brazil, India)

Methods for standardising impacts, adaptation and mitigation measures are required. Better information flow between disciplines, groups and regions will help to achieve this and help build a more holistic and global model.

- Modelling the potential impact of different options

- Modelling global “interaction”

It is important to interact not only with different scientific disciplines but also with governmental and industry representatives as activities and policies should be informed by relevant science and science should be informed by external socio-economic factors (e.g., international emissions agreements, payments for environmental services).

Workshop 2: Identifying research priorities

Solutions to mitigation and adaptation are likely to be fundamentally different for “developed” and “developing” countries. A twin-track and internationally agreed approach is required.

Baseline figures are required

- This will enable fair comparisons between species (plant and animal), systems, regions and countries.
- Data: What needs to be collected? Measurement/estimates from soils plant and animals are required.
- Equipment/systems to gather and collate data: tools to enable comparable emissions estimates from systems, including common models and methodologies.
- Common “currency”: to value all aspects of a system (should include economic, biological, environmental and social aspects).

Integrated system research

- For example, breeding animals that can exploit particular plant and breeding plants that fit soil and animal types.
- Whole systems modelling, including valuing trade-offs.
- Consideration of localized issues (e.g., functions that animals perform)

Workshop 3: Getting information and results into practice.

This group focussed on the issue of translation of information and uptake of new practices. The group felt that the problem of Climate Change was a global one but the solutions are sub-regional and the application local. As such knowledge and information should have a local relevance, be evidence based and accept past experience.

There is a need to demystify the actions of climate change and simplify the benefits. This may require investment or capacity building in professional dissemination services and training of many more staff in the exchange of information and in encouraging innovation.

There needs to be interaction with a wider range of groups above and beyond extension or governmental agencies.

- There is a need to engage with the concerns of big producers and suppliers as well as smaller producers and providers of goods and services, emphasising potential solutions.
- There needs to be more networking with CSOs (including farmer and consumer associations) and more response to farmer and consumer needs.

Annex 1: Full notes of from each workshop
Workshop 1: Identifying stakeholder priorities (mitigation/adaptation)
Facilitator: John Williams

Question 1: Gaps in knowledge and information

- Good access to data on climate change
- Early warning systems (e.g., droughts)
- Modelling the potential impact of different options
- Modelling global “interaction”
- Emission factors and efficiencies to inform payments for environmental services
- Better information flow between disciplines/groups (natural, economic and social science)
- Better flow of information and connections between policies, institutes and frameworks, particularly when informing research requirements.

Question 2: Topics not covered and missing stakeholders

- No representatives from two major emerging economies (China, India). It would have been interesting to hear from Brazilian scientists who are developing new ways to cope with climate change.
- Industry was absent e.g. feed companies (such as InVivo); food companies and the large scale distribution sector; drug companies; the media
- Other key stakeholders that were not present were, extension workers, specialists on dissemination, farmers’ associations, bodies that represent livelihoods (e.g. food ‘councils’ that advise governments), CSOs and consumers
- Soil science was underrepresented, so was range ecology
- There are different solutions to climate change and they may differ from system to system or region to region (e.g. installing methane digesters, developing short-chain distribution patterns).
- The effect of climate change on resources such as water quality and plant quality.

Question 3: Options for mitigation

- Carbon sequestration in grassland/grazing management (N.B. this is common to mitigation and adaptation)
- Better manure management (to limit methane emissions)
- Improved crop production to diminish nitrous oxide emissions
- Changes in land use are needed. Animal feed depends on crops and thus fuels the demand for de-forestation (in Brazil, for example)
- Optimization of whole production systems is an appropriate approach
- Ruminant fermentation needs to be optimized
- Can social habits be changed?
- Heat and drought resistant animals such as the camel, barbary sheep and kangaroos are good models for studying and understanding adaptation to warm, dry climates. New knowledge derived from this area could lead to increased efficiency of domestic animal farming.

Question 4: Options for adaptation

- The world population continues to increase – should it be better controlled?
- Grazing management. For example, improve groundcover management to stop evaporation and erosion. This implies better control of grazing.
- Improved control of animal diseases (genetic improvement; pest control)
- Genetic improvement, breed choices
- The development of mixed farming
- Increase returns from optimal systems (payment for environmental services)

General remarks

- Animal agriculture is a singularly good integrator – thinking from this standpoint, you feed back through the entire agricultural production system: feed, crops, land use, soil quality, rural activity.
- Developing countries need funds for adaptation and look to developed countries to progress with mitigation.
- There is a need to establish a counterbalancing force to the highly industrialized agro industry lobby whose aims are too narrow.
- Getting the science to users and listening to stakeholders (push-pull) is an important issue
- The need to develop new and acceptable biotechnologies was underlined
- Are the methods of measurement of climate change well standardized? Should multiple criteria be recorded as a matter of course? Make reference to the Convention for Biodiversity and check its recommendations for methods and mechanisms.

Workshop 2: Identifying research priorities.

Facilitator: Mike Coffey

Question 1: Gaps in knowledge

- Strategic document on livestock and climate change and what research is needed (for EU, govt., CSOs, etc.) (Note: Starting with this document)
- Common policies and strategies worldwide with common targets by all actors (govts, producers, donors, markets, industry).
- Soil-plant-animal interaction (adaptation potential and resilience).
- Common definition and agreement of costs considering economic, environmental biological, and social costs.
- Cost effectiveness different strategies.
- Valuation of pollution/mitigation indicators by identifying common denominators and agreement on the weight for each value.
- Engaging with policy makers in a common debate.
- Real data is required, moving from the level of animal censuses, to system parameters to real measurements when possible.
- Providing qualitative data now (and quantitative when available) to policy makers.
- Downscaling predictions of climate change to local levels to help with planning and adaptations.
- Information on how to deal with variability of climate rather than solely dealing with mean changes.
- Identify missing infrastructure needed to adapt/mitigate/research climate change impacts (e.g., performance recording to allow improvement of indigenous breeds and systems).
- Available technologies and its potential adoption, some producers may choose to adopt technologies such as silage processing, feed additives, fertilizers, GM crops. Can we afford manufactured products vis-à-vis polluting effects?
- Tools for evaluating trade-offs and systems, considering not just climate change but other internalities (e.g., productivity, value of livestock) and externalities (e.g., genetic resources, food security)
- How to determine the commonality and differences in baseline and indicators of efficiencies between “North” and “South” (e.g., what are the optimal breeds, crossbreeds for systems in “developing” countries?).
- Which adaptation (and mitigation) techniques do not perpetuate the problems (short-term versus long term practices).
- Impact of climate change on fire risks and their impact on livestock based livelihoods.
- Better need for localized scenarios, including indigenous knowledge.

- Technologies to help define baseline, including recording technologies (e.g., livestock censuses and associated technologies, recording equipment and their implementation, emissions measuring equipment).

Question 2: What topics were not covered?

- Soils: The role of soils in carbon sequestration, how much of the soil will be lost with climate change (and associated changes in management), what do soils and plants need to be healthy,
- Integrated and systems research
 - There needs to be a systems approach.
 - Livestock and crop sciences need to be integrated
 - Integration of crop breeding and livestock breeding
 - Optimisation of components to maximise outputs
 - Efficiency of current systems – what is the best investment? Efficiency needs to be defined considering how to balance the costs of inefficiencies of components of the system versus the efficiency of the system as a whole.
 - Whole farm modelling which includes pollution.
 - Consider the other global changes that interact with climate change (food availability, animal health, movements, management differences in the views/values of animals (and breeds) in different parts of the world.
- Process to establish what baseline information is needed. Key features include availability of appropriate and integrated models, historic and cultural practices etc.

Question 3: Options for mitigation (other than reducing total output, eating less etc)

- Policies to reduce animal numbers while increasing productivity
- Due to the difference in the value of animals in different parts of the world it is important to provide support mechanisms to replace the function of animals in different parts of the world (e.g., extreme events insurance)
- Post-farm waste policies, including the processing sector and the comprehension of these wastes (i.e., why does the UK waste 30% of its food basket?)
- The balance between ruminants and non-ruminants to provide livestock production and the differences among the systems that produce them around the world. What is the net value (economic, environmental, social) of a production system?
- How can the “North” buy mitigation from the “South” in a win-win way.
- Thorough livestock systems analysis including trade-offs, impacts biological variations, costs and externalities. (Aside: Tax externalities at point of source rather than within the farming system)
- Consider the farmers perspective at the local level, consider education, community consciences to bring about change.

Question 4: Options for adaptation (from the level of the animal, to producer to society)

- Ways to provide clear benefits to change
- The burden of the responsibility is on the “polluter”
- Should we worry about researching adaptation or not? Will farmers not adapt themselves? Will policy emerge to deal with adaptation? However, the rate at which climate change is impacting may mean that adaptation may be difficult, particularly for some producers.
- What extreme events have occurred or may occur to cause adaptation?
- When should adaptation take place?
- Tools for aid adaptation such as early warning systems and mitigation strategies.
- User information – Useful information needs to be available and translated to all users of livestock (links to providing accurate baseline information).

Workshop 3: Getting information and results into practice.

Facilitator: Wyn Richards

Question 1: Gaps in knowledge and effective dissemination.

- Public sector
 - Need to demystify the actions of climate change and simplify the benefits.
 - Knowledge and information should have a local relevance, be evidence based and accept past experience.
 - Need to invest in professional dissemination services and train many more staff in the exchange of information and in encouraging innovation.
 - Significant resources need to be provided to ensure effective marketing of research results to discreet stakeholder audiences
- Private sector
 - It is imperative to engage much more with the private sector, emphasising potential solutions
 - Also need to engage with the concerns of big producers and suppliers as well as the smaller producers and providers of goods and services.
 - The media are important and good communication with them is essential to ensure policy makers and politicians and the general public become more aware. Need to ensure information provided is evidence-based.
- CSOs (incl. farmer and consumer associations)
 - There needs to be more networking with such groups and more response to farmer and consumer needs.

Question 2: Topics not covered and missing stakeholders

- The group felt that the problem of Climate Change was a global one but the solutions are sub-regional and the application local
- Climate change placed in context with other stresses on the farming system; other drivers must be considered such as access to and cost of food.
- The impact of climate change resources such as water quality and plant quality.
- The integration of social issues of climate change versus economic issues.
- Getting the science to users and listening to stakeholders (push-pull)
- Capacity strengthening, particularly in the “developing” world and front line personnel.
- Research on communication and learning and how to transform/transfer research into practice.
- It would have been good to have had specialist journalists at the meeting
- Other key stakeholders that were not present were, extensionists, specialists on dissemination, farmer associations, bodies that represent livelihoods, CSOs, consumer associations and the media.