DEVELOPING A GLOBAL AGENDA OF ACTION FOR SUSTAINABLE LIVESTOCK SECTOR DEVELOPMENT

2ND MULTI-STAKEHOLDER PLATFORM MEETING

1-4 DECEMBER 2011 >> PHUKET, THAILAND

ISSUES AND OPTIONS PAPERS

The following document was prepared in response to the request from the Interim Preparatory Committee to the interim Secretariat to develop *Issues* and *Options* papers on three proposed thematic foci and on the oversight arrangements and form of the Global Agenda of Action.

These papers are inputs into the 2nd multi-stakeholder platform meeting in Phuket to stimulate and guide discussion – decisions on actual thematic foci and oversight arrangements will be taken by the meeting.

Global Agenda of Action – Thematic Area 1
Greening livestock sector growth: closing the efficiency gap in natural resource use

Issue. Increasing population and consumption are placing unprecedented demands on agriculture and natural resources. Global demand for meat is projected to increase by 85% from 2005/2007 to 2050 and this demand will have to be met from an increasingly scarce natural resource base. Consequently, the livestock must significantly increase its natural resource use efficiency to meet society's growing food and environmental needs.

Definition. Natural resource use efficiency is a measure of the amount of natural resource inputs used to produce a given quantity of output. This includes the quantity of use (e.g. hectares of land or litres of water) as well as changes in the quality of natural resource stocks (e.g. soil erosion, biodiversity loss, nutrient runoff).

Basic facts/description of the issue. The livestock production function comprises human-made inputs such as labor, capital, infrastructure and feed as well as natural resources such as water, land, air and biodiversity. All of the human-made inputs and some of the natural resource inputs (e.g. land and water) can be further categorized as conventional production inputs. Standard productivity programs and methods have tended to focus on improving and measuring the efficiency with which conventional production inputs are used. Natural resource efficiency can be enhanced by interventions that improve efficiency in the use of:

1. natural resources relative to human-made inputs, and
2. human-made and natural resources combined.

Further, natural resource efficiency can be enhanced by technology that advances the performance of the world's most efficient producers, and/or by development and extension efforts to "close the efficiency gap" between the world's least and most efficient producers in similar agro-ecological conditions.

Historically, agricultural R&D has focused on improving productivity, or the efficiency with which conventional inputs are transformed into marketable outputs. This process, which is motivated at the producer level by profit maximization, has led to significant productivity improvements over the past half a century. Ludena et al. (2007) estimate that total factor productivity (TFP), which measures the efficiency with which all conventional inputs are transformed into outputs, increased at an annual rate of 1.1% for ruminants and 2.7% for non-ruminants, compared to 0.5% for crops between 1981-2000, globally. The study shows that developing countries as a group have been "catching up" to more efficient producers, assisted by the spread of technology, infrastructure development and credit. However, efficiency gaps do not automatically address themselves, especially in areas with poor market development and deficient infrastructure. For example, TFP growth in Sub Saharan Africa has only increased at an annual rate of 0.5% and 0.4% for ruminants and non ruminants, respectively, over the same period.

Natural resource efficiency can, in many cases, be enhanced by conventional productivity improvements. For example, the introduction of advanced genetics, feeding systems, animal health control and other technologies have enabled industrialized countries to reduce their overall land requirements for livestock by 20% while at the same time doubling total meat production, over the past four decades. Productivity gains can also dramatically reduce GHG emission intensities in ruminant based systems (FAO, 2010). Thus there is potential to substantially improve natural resource use efficiency by the transfer of technology and knowledge from the world's most to least efficient production systems. And doing so may allow the sector to reap a "double dividend" by enhancing producer profits and environmental outcomes.

However, improved productivity does not assure improved natural resource efficiency. A recent study on OECD agriculture has shown that while most countries have simultaneously enhanced their TFP and nutrient use efficiency between 1990 and 2003, some countries (Australia, USA, Canada, Portugal) have increased TFP but reduced their nutrient use efficiency over the same period (Coelli et

al. 2009). Consequently, there may be situations where natural resource use efficiency improvements will reduce farm profitability.

To develop a strategy to enhance natural resource efficiency and at the same time increase profitability in the livestock sector, we need to understand the role of efficiency gains in the use of both conventional and natural resources. However, while staying cognizant of these important interactions, perhaps the Agenda can add most value by focusing on natural resources, given that , in the absence of market prices for valuable natural resources, agricultural R&D has focused almost exclusively on improving conventional productivity?

Proposition. Bearing in mind that the opportunities for enhancing natural resource use efficiency will vary significantly among regions and production systems, we hypothesize that environmental gains from bringing a large number of inefficient producers to an acceptable level are much larger than adjusting the performance of efficient producers to ever higher levels.
However, we would like feedback as to whether this is an accurate assumption which can be supported with empirical evidence? If we cannot support this claim is it due to lack of evidence, or because it is incorrect? If it is the former, then what type of information and analyses are required to improve our understanding of the issue?

Scope/boundaries/scale. Consensus is needed to establish practical livestock system boundaries for the framing and measurement of natural resource efficiency. The system boundary can be narrowly defined to only incorporate natural resource impacts that occur within the confines of the farm or, at the other extreme, it can be drawn very broadly using a life cycle approach to cover impacts associated with the entire food chain, including those associated with production of all inputs and with the processing, transport and marketing of all farm outputs.
One possible compromise, to keep the information requirements manageable while including the vast majority of natural resource impacts, is to include feed production and animal production?
In addition to establishing an appropriate system boundary, we also need to reach agreement on the scope of natural resources to assess. While it would be ideal to include the full range of natural resources, we need to keep the assessment manageable and prioritize according which resource issues need to be addressed most urgently, and according to which we are likely to have the most success in addressing. To do this we need to establish a basis for ranking each natural resource. We may also give priority to measurable resource stocks/flows that can serve as proxies for a group of critical natural resources
Further consensus is needed on the scale of assessment. Should we focus on the farm scale or the agro-ecological system scale for each animal species or both? Or is there a more appropriate scale?

Moving towards an objective statement. Our objective statement needs to outline targets for natural resource use efficiency. But we first need to decide on the metrics/methods that should be used for this purpose. Can we rely on existing metrics/methods or do we need to develop new ones? Given the multitude of natural resources that are linked to livestock production, does it make more sense to use several metrics to individually represent each resource, or should we aim for a framework that can assess the use efficiency of several resources collectively? Below is a list of some currently available metrics/methods that could be used:

1. Yield gap assessment – this is typically used in crop science and it describes the difference between the actually attained yield and the potentially attainable yield in a given location. This partial measure of efficiency, which has not yet been applied to livestock, can help us to understand how much more output can be achieved from the current, or reduced, quantity of land.
2. Other partial indicators may include phytomass appropriation efficiency (i.e. estimates of total terrestrial phytomass necessary to produce a unit of food); land use efficiency (which as discussed above could serve as proxy for multiple natural resources); animal biomass efficiency (estimated be comparing the amount of off-take with the standing biomass of a herd – this may also serve as a proxy for multiple resources); nutrient use efficiency (based on the N & P balance of the farm system).

3. A total factor productivity (TFP) framework extended to incorporate a broad range of natural resources and environmental indicators could provide a more comprehensive and robust framework for assessing natural resource use efficiency
4. Life cycle assessment (LCA), can be used to comprehensively assess natural resource impacts along the entire food chain, which can be expressed per unit of output. This approach can be applied to single or multiple natural resource uses.

As mentioned, the metrics selected to set targets in the eventual objective statement will depend on the methods used. For example, if we use an modified TFP framework, extended to incorporate nutrient use efficiency – we could base our target on the work of Coelli and Hoang (2009), who estimate that nutrient use efficiency can be improved by 47.4% by a combination of conventional productivity improvement, and from adjustments to the mix of inputs (based on their N and P contents) used. Are there simpler partial indicators such as land use and water use efficiency for example, that are still robust which could be more easily applied?

Problem statement. The livestock sector presently occupies 3.73 billion hectares globally: 3.38 billion of hectares are used as pastures and grazing land, while an additional 0.35 billion hectares are devoted to feed production. This represents about 30% of the earth's ice free land and around three quarters of total agricultural land. The efficiency of livestock production systems from a physical standpoint, and with regard to both human-made and natural resources, is neither well described nor well known. This has contributed to a deficiency in understanding the long run potential to reduce the sector resource requirements via efficiency improvements.

Most new agricultural lands arise through the clearing of forests, resulting in huge losses of environmental goods and services, including stored carbon, biodiversity, water and air quality regulation. Thus, the intensification of land use, through improving yields and represents one key strategy to minimize further deforestation and its attendant losses in natural resources. The potential for further sustained growth in crop yields is alleged to be gradually diminishing in several major producer countries, mainly because the exploitable gap between average farm yields and genetic potential is closing. An important question is whether this also holds true for livestock?

Projections by Wirsenius et al. (2010) go some way towards answering this question, by showing how an increase in global average feed-to-food conversion efficiency from 5.1% in the reference case to 6.2% in an improved productivity scenario, would correspond to a reduction in land use of 510 million hectares (or 13%) by 2030 compared to the reference case, and a 20% reduction in global feed use – with virtually all of the fall estimated to come from reduced grazing on grasslands and crop residues. The productivity growth needed to support these changes are well below the growth rates estimated to be possible by livestock specialists. This demonstrates the large reductions in land use that could be achieved via plausible productivity improvements, that are based on faster live weight gains, coupled with a faster transition toward higher land-use intensity in low and medium-income regions, with higher pasture productivity and a larger use of cultivated feeds of good nutritive quality.

As discussed, animal and land-based yields only provide a partial measure of natural resource use efficiency. And, in the absence of market prices for valuable natural resources, these resources have been omitted from standard efficiency and productivity analyses. This poses and couple of important problems that need to be resolved. Firstly, while it is widely accepted that the livestock sector is confronting production constraints from the growing scarcity of finite natural resources, there is still a paucity of quantitative data on these constraints. Secondly, there is no universally accepted framework for assessing the natural resource use efficiency, particularly for multiple natural resources. However, we know that to address the sector's dual requirement for increased production and better environmental outcomes (i.e. for green livestock growth) a methodology which can incorporate efficiency in the use of both priced production inputs and unpriced natural resource inputs into the same framework is essential. Because this will enable the profitability and the environmental performance of the sector to be addressed simultaneously – which again, is the key to devising a strategy for green livestock sector growth.

Proposed ACTIVITIES

Analysis/assessments of technical/economic/institutions

Develop capacity to quantitatively evaluate and benchmark the environmental performance of different production systems and supply chains, and assess the potential natural resource use efficiency gains that can deliver both environmental and production benefits.

These assessments need to be complemented with cost benefit analyses for suitable policy interventions. Strategic analyses will also be needed to identify appropriate institutional arrangements to support these interventions.

Information generation and sharing

To be discussed

Outreach/advocacy

Possible links can be made with green growth agenda. Where the approach addresses GHG mitigation, links to UNFCCC intergovernmental processes could be established.

Policy support

To be discussed

Piloting and capacity building

Region-specific training and capacity building investments will be developed to facilitate the adoption and transfer of practices/technologies that enhance natural resource use efficiency, in different settings.

Pilot projects will be established in representative regions and subsectors where there: 1) are acute natural resource use constraints; 2) is a significant natural resource use efficiency gap between the most and least efficient producers and 3) is sufficient institutional capacity and technical expertise to support the interventions. Example include: peri-urban dairy production in Africa and South Asia, Pig production in Latin America and South East Asia.

Mainstreaming/Up-scaling

To be discussed

Global Agenda of Action – Thematic Area 2
Grassland soil carbon restoration: supporting soil carbon, ecosystem health and productivity restoration with climate finance

Issue. Grassland degradation is a source of CO_2 emissions and biodiversity loss. It also reduces long term productivity and economic returns, and reduces the capacity of land holders to adapt to climate change. Grassland restoration and enhancement has the potential to address each of these issues and thus deliver mitigation, adaptation and producer livelihood benefits. Further, given that grassland restoration and enhancement has similar capacity as croplands and forestry to sequester carbon, there is great potential to support these actions with mitigation finance accessed through carbon markets. Presently, this vast potential remains untapped, mainly due to the absence of i) carbon accounting methodology that is affordable but sufficiently accurate to support credit creation and trade in carbon markets, and ii) an international program (e.g. as forestry has in UN REDD) to overcome these and other barriers, coordinate R&D and implementation.

Definition. Grassland soil carbon restoration includes any practices which increase soil carbon uptake or reduce carbon losses.

Basic facts/description of the issue. Grazing lands occupy 3.4 billion hectares (26% of the earth's ice free terrestrial surface) and are estimated to contain 343 billion tonnes of carbon, nearly 50% more than is stored in forests worldwide (FAO, 2010). Moreover, the total global potential to sequester carbon, by improving grassland practices or rehabilitating degraded grasslands is substantial – of the same order as that of cropland and forest carbon sequestration. Practices that sequester carbon in grasslands also tend to enhance resilience to climatic variability, and are thus likely to enhance longer-term adaptation to changing climates.

Institutional realities often lead to management practices that promote overgrazing, consequently a large share of grazing lands are suffering from degradation. Overgrazing reduces vegetation cover, exposing soils to water and wind erosion, which decreases their capacity to retain moisture and thus contributes to declining vegetation yields. This process of degradation oxidizes soil carbon, contributing to atmospheric CO_2 emissions.

Good grassland management can potentially reverse (historical) soil carbon losses and sequester substantial amounts of carbon in soils. The restoration and prevention of further degradation through the management of grazing intensities is the most widely applicable approach to enhancing grassland carbon stocks. In grasslands with sufficient productive potential, pasture intensification measures such as the sowing of improved and deeper rooted pasture species, fertilization and irrigation can also enhance soil carbon stocks. However, the intensification of grasslands is often infeasible and/or uneconomical in the arid and semi-arid rangelands that comprise much of the world's grasslands. Interventions to enhance soil carbon stocks generally improve soil moisture and nutrient retention in soils which can increase primary productivity, net economic returns and resilience to climate change. Practices that sequester carbon in grassland soils tend to maximize vegetative cover, reducing wind and water-induced erosion. Reducing sediment load increases water quality while reducing airborne particulate matter improves air quality. Sequestered carbon can also biodiversity conservation co-benefits.

Conant et al. (2001) estimate that improved grazing management leads to an increase of soil carbon stocks by an average of 1.3 tCO_2-e ha^{-1} yr^{-1}. In the IPCC's Fourth Assessment Report, Smith et al. (2007) report slightly lower estimates of 0.81 and 0.13 tCO_2-e ha^{-1} yr^{-1} for moist and dry grasslands, respectively. Globally, the technical mitigation potential from these measures are estimated to 1.5 $GtCO_2$-eq or 84% of the livestock sectors' total mitigation potential. At a carbon price of 100 \$/tCO_2-eq this quantity falls to 0.81 $GtCO_2$-eq, which is around 30% of what can be achieved in the forestry sector at the same carbon price. The biophysical potential for soil carbon sequestration in grasslands is generally higher in the presence of moderate to heavy grassland degradation and sufficiently moist

climatic conditions. Regions with the greatest total sequestration potentials include East Africa, South America, East and Central Asia.
Investments in soil carbon sequestration can also be partially or completely remunerated through the creation and sale of carbon credits to carbon markets. This can help to diversify, augment and stabilize pastoralist incomes. However developing policies to encourage the adoption of practices that sequester carbon has several significant challenges, such as demonstrating additionality, addressing the potential for losses of sequestered carbon, and engaging smallholders and pastoralists with uncertain land tenure.

Foremost practical methods to measure sequestered carbon, which are affordable, but also sufficiently accurate for carbon markets, need to be developed. Presently, trade in agricultural soil carbon credits is in its infancy, and they are currently only eligible for trade on voluntary carbon markets, which offer much lower carbon prices relative to Kyoto-compliant markets. Until affordable methods that can measure soil carbon with sufficient accuracy for Kyoto-compliant markets, low carbon revenues will limit the uptake of soil carbon enhancing activities. This raises the issue of whether an alternative mechanism is needed for large scale uptake of these activities.
For example, in the forestry sector, which has the potential to supply a larger but still comparable amount of mitigation, the UN-REDD programme for Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries, was launched in 2008 to implement national REDD+ strategies and create value for carbon stored in forests. It is predicted that financial flows (donations by Annex I countries) for mitigation from REDD+ could reach up to US$30 billion a year. Given that grasslands have the potential to sequester almost one third of what can be achieved in forestry, one could argue that there is an urgent need for the development of a similar programme to manage financial support and coordinate the implementation of grassland restoration measures, globally.

Proposition. We expect that a significant share of grasslands' mitigation potential could be realised at current/expected carbon market prices, particularly in high potential grasslands of East Africa, South America, East and Central Asia.
Perhaps the approaches can be used to achieve this goal. First is to facilitate access to growing carbon markets by supporting the development to practical and affordable carbon accounting methodologies that are sufficiently accurate for carbon markets, and the development of institutional capacity for coordination, monitoring, enforcement required to support carbon credit creation and trading. The second approach, while still reliant on practical/affordable accounting methodologies, recognises the limitations of carbon markets and would involve developing an international programme/initiative to promote soil C sequestration in grasslands by overcoming these and other barriers, and by generating alternative financial resources.
Is this a reasonable summary of the approaches needed? Are they achievable and if so on what scale? Are there additional elements that need to be added to these broad approaches, or should would be focussing on a different approach altogether.

Scope/boundaries/scale. Because soil C sequestration potential in grazing lands is largely a function of recovery from overgrazing, we propose to focus primarily on interventions in grasslands with medium to heavy degradation, in regions where is sufficient moisture and large mitigation potentials (e.g. East Africa, South America, East and Central Asia).
While soil C would be the main environmental good that is targeted, a broad range of environmental goods and services that are closely linked with soil C sequestration (e.g. biodiversity, erosion control & sediment/nutrient runoff, water quality etc.) will also be considered.
Socioeconomic and food security impacts will also be investigated. In particular, direct income benefits to landholders and other groups involved in supporting soil C interventions (e.g. contractors, labourers, scientists, technical advisors). Given that many livestock producers consume much of their output, non-cash benefits in the form of own consumption will be also be explored. Further, we will also focus on community mechanisms and other institutional innovation, used in grassland restoration actions, required to strengthen communities' capacities to implement and monitor sustainable development in the long-term.

Moving towards an objective statement. On the basis of additional research to ascertain the economic, environmental and social costs and benefits, of range restoration and improvement, we propose to set global and regional targets. For example, a global target may be: fulfil 25% of grasslands global annual soil C sequestration potential, from restoring degraded grasslands, by 2025. Is this a reasonable target? How much further research is needed to determine appropriate targets and to what extent would targets need to be regionally differentiated?

Problem statement. Grasslands are estimated to contain 343 billion tonnes of carbon, nearly 50% more than is stored in forests worldwide (FAO, 2010), and their global potential to sequester carbon is of the same order as that of croplands and forests. To-date very little has been done or planned to realize this massive potential. As outlined, This largely due to the absence of i) carbon accounting methodology that is affordable but sufficiently accurate to support credit creation and trade in carbon markets, and ii) an international program/initiative to overcome these and other barriers, and to coordinate R&D and implementation

The first of these issues is partly being addressed by the development of grassland carbon accounting methodologies, including the recent methodology submission to the Verified Carbon Standard (VCS) by FAO. Nevertheless, once approved the application of such a methodology to any particular region will involve the collection of substantial biophysical data and the development and implementation of grassland management plans. Moreover, there are significant monitoring and enforcement challenges associated with protecting and ensuring the permanence of soil C stocks. Consequently, interventions to sequester and measure soil C will only be affordable in grasslands with relatively large sequestration potential. Moreover, carbon markets are only likely to be able to fund a limited fraction of this potential; trade in the voluntary carbon market is still very thin, with a total transaction volume of 94 million tCO_2-eq in 2009, for all mitigation sources (of which grassland projects comprise a small fraction), which is tiny compared to grasslands total annual mitigation potential of 1,465 million tCO_2-eq. While carbon markets are expected to grow significantly over time, other avenues for financing including the World Bank Climate Investment Funds, as well as the financial mechanisms that are expected to evolve from the Green Climate Fund (GCF); which is being proposed by Parties to the UNFCCC as a mechanism for mobilizing the proposed $30 billion available immediately as “fast track” funds and the $100 billion by 2020, pledged by higher income countries in Copenhagen and Cancun. One possible way these finances can be accessed may be through the development of Nationally Appropriate Mitigation Actions (NAMAs).

Institutional and policy design issues in collectively managing natural resources are another key challenge, as the tenure systems in much of the worlds grazing lands fall between a continuum of open access and common property. Around 987 million or 70% of the world’s 1.4 billion “extreme poor” depend on livestock. Of these around 301 million are in grazing only systems, many of which comprise pastoralists in poor countries (e.g. in the Horn of Africa and the Sahel) (FAO, 2010). While there is significant soil C sequestration potential in some of these regions (e.g. in the Ethiopian highlands), finding the right blend of policies and institutions to capitalize on this potential is a major challenge.

In the absence of effective collective action, individuals have incentives both to overexploit and to under-invest in pasture resources. While no doubt challenging, a well-designed carbon sequestration payment program can improve incentives to undertake collective action. This requires the development of a community-based management framework in which pastoralists are rewarded for their collective efforts to generate public goods in terms of soil C, increased biodiversity, reduced soil erosion, and increased biomass. These benefits depend on compliance mechanisms that ensure everyone abides by new limits, without incurring prohibitively high enforcement costs. Community-based monitoring mechanisms offer one avenue for minimizing these costs. Moreover, the development of communal tenure institutions to facilitate the transition from open access towards more secure forms of land tenure, including common property regimes, will greatly improve the ease and efficiency with which carbon (and other environmental good and service) revenues can be generated and allocated among herders. Further, grassland restoration projects in traditional pastoralist

regions must also be sensitive to the multi-functionality, from a livelihood perspective, of grazing systems. In these cases environmental goods and services may not only have to be traded off with livestock income, but also with production of fuel, draught power, fertilizer and building materials.

ACTIVITIES

Analysis/assessments of technical/economic/institutions

Develop a Capacity to conduct strategic analyses to:

- quantify the technical soil carbon sequestration potential, and associated environmental co-benefits in grasslands, globally.
- estimate the costs and potential benefits (e.g. carbon credit revenues, productivity gains) of carbon mitigation .
- identify technical, socio-economic, institutional and other barriers to adoption, and develop solutions to build capacity and overcome these barriers.

Information generation and sharing

From the above, region-specific investment strategies will be developed. This will include a proposal for a collaborative international programme to raise and coordinate financing for grassland mitigation actions (similar to the UN REDD programme developed for forestry).

Outreach/advocacy & Policy support

The programme will be promoted in future sessions of the UNFCCC conferences of the parties (COP), particularly sessions within the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), which provides the official avenue for the inclusion of agricultural soil carbon measures in Kyoto-compliant market mechanisms.

Piloting and Capacity building

Along with building capacity of land holders to manage grasslands more sustainably, improving institutional capacity is critical, as the provision of carbon marketing infrastructure requires astute governance, coordination, monitoring, and enforcement. Developing strategies and links to sources of climate change mitigation finance that can be tailored to fit the needs of rangelands producers is also needed, with relatively little experience on the ground so far.

To enhance the evidence base on the mitigation potential and cost effectiveness of sustainable grassland practices, pilot projects will be established in each of the regions estimated to have the greatest potential, including East Africa, South America, East and Central Asia.

Mainstreaming/Up-scaling

An international program/initiative will be developed to promote the uptake of grassland restoration measures through marketing and advocacy, but also by coordinating research efforts to support the identification and implementation of grassland restoration in grassland areas with high and cost effective soil C sequestration potential. The initiative also will draw lessons from piloting activities and analysis, to provide guidance on the validation of project proposals, and it would also support the development of appropriate institutional arrangements which are fundamental for the successful upscaling and mainstreaming of grassland restoration. Some favourable institutional arrangements include effective extension services for the adoption of new practices and technologies; efficient coordination with government land use plans; and the provision of host country measurement monitoring and verification services.

Global Agenda of Action – thematic area 3
Zero discharge: towards full recovery of nutrient and energy from animal manure

Issue. Discharge of animal manure into the environment causes pollution of soils and water resources, as well as the emission of noxious gases. This result in public health risks (e.g. waterborne diseases), biodiversity losses and economic losses (e.g. water treatment costs). The issue is particularly acute where large number of animals are geographically concentrated and not connected to land where manure can be applied.

Definition. Nutrient and energy recovery encompasses any activity that uses the nutrients or energy embedded in animal manure. These include: direct use as fertilizer on crops or fishponds, processing into compost or compound fertilizers, use as a substrate in anaerobic digesters (biogas production), or a combination of these.

Basic facts and description of the issue. Total amounts of nutrients (N, P and K) in livestock excreta are as large or larger than the total amounts of N, P and K in synthetic fertilizers used annually. Improved animal diets and feed conversion ratios can contribute to reducing the share of nutrient available in feed that are excreted by animals (cf. note on Thematic Area 1). The nature of biological process by which animals convert feed into energy and body mass will however always result in the excretion of a significant share of the ingested nutrients. Between 50 to 90 percent of the nutrients contained in feed are not transformed into livestock products but turn up in manure. No more than 40 percent of N ingested by a dairy cow is retained in milk. In a similar way, about 20 to 30 percent of the dietary energy contained in feed is not digested by animals.

Traditional pastoral and mixed systems have since long used nutrient and organic matter in manure, as an input to agriculture or fuel. Recycling livestock manure is however particularly difficult when livestock production is concentrated in certain locations, limiting the opportunities to apply manure to crop land. Such concentration occurs because costs can be reduced by locating close to consumption centers and supplies of feed, or within the operational area of the required support industries. Most countries have experienced such geographic clustering, and struggle to manage the environmental consequences.

Impacts related to manure management are poised to grow, as confined livestock production expands rapidly and continues to concentrate in geographically limited areas. Inadequately handled manure causes nutrient (mainly N and P) runoff and leaching in both surface and ground water systems. Livestock manure also emits greenhouse gas (GHG), especially when stored in uncovered deep (anaerobic) lagoons and applied to land. Pig and dairy production are the main concern as they generate liquid manures or slurry which are difficult to manage. Slurry is often either directly discharged into open waters causing water pollution, spread on agricultural land in addition to chemical fertilizers, causing nutrient overloads, or is stored in permeable deep lagoons causing methane emissions and leaching.

Proposition. Technical options exist to recover nutrients and energy from manure but the economics of their adoption vary greatly with production systems and access to land, from net costs to net benefits. A zero discharge programme would need to be driven by the private sector through voluntary commitments, supported by public policies. To lower adoption costs, policies need to ensure that livestock densities within any particular area are kept within the absorptive capacity of available land. We need to better understand the reasons for industry agglomeration, and the policy tools which can balance geographic distribution. Technical and policy guidelines need to be developed, technologies be transferred and capacities developed.

Does this proposition receive the support of the Platform? Shall it be refocused on end-of the pipe manure management options (e.g. nutrient removal, anaerobic digestion)? What shall the relative roles of private and public sector be?

Scope, boundaries and scale. The primary target of the theme are medium to large intensive production units, where most of the production growth is expected to take place. Large number of small scale production concentrated in a limited geographical area (e.g. specialized livestock production villages found for example in Southeast Asia) can represent a substantial source of pollution but would not initially be the focus of the theme given the high transaction costs associated with addressing numerous producers.

Does this target group allow for optimal cost effectiveness of the GAA? How does it affect social and equity issues? Which species should receive priority attention (e.g. pig and dairy)?

Moving toward an objective statement. GHG emissions and nutrient loads are reduced through the recovery of energy and nutrients from animal manure. Cost-effective practices are adopted to prevent direct manure discharge into the environment or storage in uncovered deep (> 3m) manure lagoons.

Consensus is needed for the further development of such statement and in particular: the possibility to meet the target within the timeframe of the GAA and the need to narrow down the production systems and types of production units targeted in this Thematic Area.

Problem statement. Experience from previous projects and initiatives, including the GEF funded Livestock Waste Management in South East Asia project, show that awareness and technology are not the main constraints to improving animal manure management. In fact, technologies related to nutrient recycling (i.e., manure collection, storage, composting, drying, crop application) and energy recovery (anaerobic digestion) are widely known, although the level of expertise and dissemination vary from country to country.

Under growing pressure from civil society, governments are taking action to mitigate impacts but policy interventions are generally ineffective. Policies are based on a limited assessment of current practices and a poor understanding of the costs farmers have to bear in order to comply with mitigation regulations that are not tailored to farm structure and investment capacity. Furthermore, some countries have derived their policy frameworks for livestock from environmental policies addressing industrial waste, which are of a different composition and generally not adapted to energy and nutrient recovery.

Because enforcement of new policies is sensitive, and because environmental regulations can have a wider effect than the strict environmental issue they intend to tackle, there is a need to analyse their consequences. In particular, environmental policies will affect farmer's income and labor demand, with some consequences on rural development. To be effective, policies must be designed, targeted and phased in such a way that farmers are capable to gradually adopt new farm practices (and technologies) over time without too disruptive shocks in both, the financial and technical management of production units. Determining the consequences of environmental policies across different areas and farm structure is an important part of the policy process which must involve producers and civil society organizations.

Furthermore, there is a need to assess and control leakage: livestock production may move away from countries implementing stringent environmental policies to "pollution havens" where no such regulations are in place. The obvious reluctance to engage in practices that may harm sector and national competitiveness has limited progress.

Proposed activities

1. *Strategic analyses - (including policy and institutional analyses, methodology and investment guidelines)*
   Build a Task Force for analysis and development. A task Force is created, with a central hub and a network of experts and partner institutions in the area of economics, political science, law, land planning, public health and waste management. Focus areas include:

- cost effectiveness of manure management practices;

- land use planning and zoning;
- tradeoffs between environmental, animal health and public health objectives related to manure management;
- constraints to the adoption of zero discharge strategy.

2. *Generation and sharing of local and global knowledge, experiences, and practices through R&D, dialogue, and dissemination*
   As above.

3. *Promotion of capacity building*
   Provide training in the area of policy analysis, policy formulation and consultation processes.
   Technology transfer in the area of manure management, with specific input from private sector and civil society organizations.

4. *Support to the piloting of new approaches within the livestock sector systems, stakeholders, and related value chains to test, validate, and transfer practices: and*
   Support policy development at national level. Provide specific analytical support to the less affluent countries participating in the project.
   Provide grants for the piloting and dissemination of novel manure management options, in the less affluent countries.

5. *Advocacy, including the promotion of sustainable livetock sector development within existing inter-governmental and other processes.*
   Communication on the sector's "zero discharge" objective.

Issues and Options – *A Global Agenda of Action's Business plan*

Like any start-up, the Global Agenda of Action needs a business plan. Whilst the Brasilia meeting developed some key elements already, others remain to be defined. The main elements that any business plan needs to contain are the following: (i) Vision; (ii) Market Analysis, (iii) Strategy; (iv) Key products/services, (v) Operations/ structure/ coordination; (vi) Resources and allocation of resources.

In respect of the first four elements, the Brasilia meeting agreed the following:

(i) ***Vision***: Sustainable livestock sector development which contributes to food and nutritional security - in a context of rapidly growing demand and resource scarcity -, enhances its contribution to broad-based economic growth, livelihoods and wellbeing of actors in the livestock sector, uses natural resources efficiently, recognizes regional diversity, and contributes to the health and welfare of human and animal populations.

(ii) ***Market Analysis***: Despite recent growth in imput costs, growing populations, income gains and urbanization ensure that livestock remains one of the fastest growing sub-sectors of agriculture, and the largest user of agricultural land, directly as pasture and indirectly through the use of feed crops. In many emerging nations, livestock sector growth has been largely unbalanced and skewed toward intensive systems, and has often not been accompanied by necessary adjustments in sector policies, governance and investments. There are large performance gaps among systems and across systems, and while technical solutions are available, incentives for their application are often not well aligned. Moreover, the large potential for the provision of environmental services (carbon sequestration; biodiversity; water), has thus fare been largely ignored. If the necessary policy changes, adjustments in the regulatory frameworks, and supporting investments are made, however, large efficiency gains can be made and livestock sector growth can be more easily accomodated and contribute significantly to society's current and future environmental, social, economic and health objectives.

A Global Agenda of Action responds to the urgency and current lack of coherent action through the development of a stakeholder agreed Global Agenda of Action that targets improved resource use in the livestock sector resulting from changed practices by stakeholders (public, private, civil society, academia, research, international organizations), and from adoption, by the public and private sector, of guidance and recommendations to make livestock food value chains more sustainable.

A Global Agenda of Action covers all major livestock sector systems, stakeholders, and related value chains. It focuses on the improvement of resource-use efficiency in the global livestock sector to support livelihoods, long-term food security and economic growth while safeguarding other environmental and public health outcomes, factoring in regional differences, and linking to other related initiatives as appropriate.

Why Global?
Livestock performs many different functions (e.g. backbone of the rural economy; choice food of emerging middle classes; growth engine for trade; provide livelihoods; economic and entrepreneurship opportunities) and numerous tasks (e.g. waste converter; value addition from marginal lands; environmental services provider and biodiversity conservation; trade commodities; tool of agricultural expansion; food supply) in a wide range of countries and for many different sector actors.

Notwithstanding this diverse range of perceptions and roles, what increasingly unifies different countries and different sector stakeholders is the rising global nature of markets and value chains with the concomitant unification of sector norms, standards, and certification. In addition, growing resource scarcity (land, water, nutrients), climate change, sustainable food security, poverty and livelihoods which are global issues of growing concern, to which the livestock sector is closely linked, and which . can be addressed and solved efficiently only through the concerted action of all global stakeholders.

Why join an Global Agenda of Action?
Participation in a multi-stakeholder process such as a Global Agenda of Action, obviously carries a cost. It is hence important that the value-added of this investment is clear. The table below provides a rough overview of the value added that different stakeholder groups may obtain through a Global Agenda of Action

Stakeholder group	***Potential value-added***
Public sector	Informed policy making; align incentives to environmental outcomes; regulatory framework
Private sector	Image; cost savings; new business opportunities; industry standards
Civil society	Advocacy; Access to policy makers; shape research priorities
Academia/research	Access to policy makers; research relevance; societal embedding
International organizations	Coordinated action; relevance; deliver on mandate

(iii) ***Strategy***: A Global Agenda of Action aims to meet the expressed demand for concerted action through the establishment of a multi-stakeholder process build on broad-based, voluntary and informal stakeholder commitment to act towards the improvement of resource use efficiency in the livestock sector. It will support the capacity for autonomous action by stakeholders through the establishment of routines, networks, partnerships and communities of practice to help design an agreed response to the urgent questions as to how the global livestock sector can play a sustainable role in food security and equitable economic development in an increasingly resource-constrained, urbanising and more affluent world. It is such multi-stakeholder consensus on a Global Agenda of Action thematic priorities and implementation modes will lead to coordinated collective and individual stakeholder action towards sustainable livestock sector development.

(iv) ***Key products/services***: A Global Agenda of Action will deliver the follwoing key products and services (a) Strategic analyses, including policy and institutional analyses, methodology and investment guidelines development in support of sustainable livestock sector development; (b) Generation and sharing of local and global knowledge, experiences, and practices through research and development, dialogue, and dissemination; (c) Promotion of capacity building; (d) Support to the piloting of new approaches within livestock sector systems, stakeholders, and related value chains to test, validate, and transfer practices; and (e) Advocacy, including the promotion of sustainable livestock sector development within existing inter-governmental and other processes.

(v) ***Operations / structure / coordination***: These mechanisms and their respective functions for a Global Agenda of Action need to be further defined as part of the current preparatory phase and need to clearly reflect its multi-stakeholder nature. The following ‘structural’ components were agreed during the Brasilia meeting:

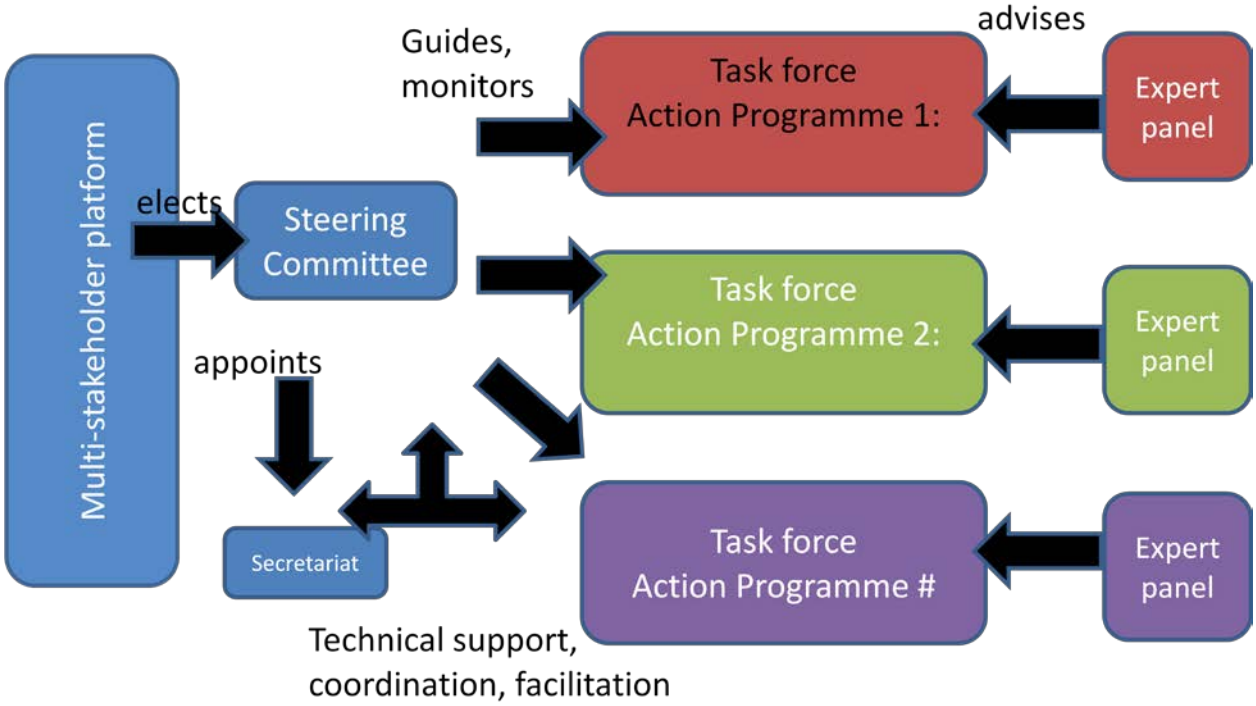
1. Open multi-stakeholder platform and network - All stakeholders including governments, private sector, civil society, academia and international organizations to seek consensus on the challenges the sector faces;
2. Steering committee – Key stakeholder representation selected by and from the Multi-stakeholder platform and network (members possibly by caucus) to provide oversight on a Global Agenda of Action activities. For the preparatory phase of the Global Agenda of Action, an Interim Preparatory Committee (Netherlands, Brazil, New Zealand, (Ethiopia, (India), USA, China, Switzerland. WWF, GRSB, IMS, IFIF, IDF, IPC, AU/IBAR, ILRI supported by WB, FAO) was established to develop a proposal to constitute a Steering Committee at launch, facilitate next steps, and assist in the identification and definition of a funding strategy;
3. Global Agenda of Action Secretariat –Interim secretariat to stay with FAO until the Global Agenda of Action ‘launch’;

The following *Issues and Options* with respect to a Global Agenda of Action's eventual structure and coordination require further discussion and agreement

The need for:
4. Steering/Advisory committee (SC);
5. An independent chair / Ambassador;
6. Think Tanks / Expert panels
7. Action programmes Task Forces;
8. A Global Agenda of Action-Secretariat;
9. Formalization and legal status;

What we are proposing for discussion:

A tentative structure for an Agenda of Action



Ad. 4. SC – Key stakeholder representation selected by and from the Multi-stakeholder platform and network (members possibly by caucus) to guide, approve and monitor a Global Agenda of Action activities. Additional tasks that may be considered for the SC are: (i) review, comment on and approve the Agenda of Action's outputs, including methodologies, databases and communication plans and materials; (ii) approve the agenda, venue and timing of the Multi-stakeholder platform meetings; (iii) take into consideration the comments and suggestions made by multi-stakeholder platform members, e.g. during meetings and take action as appropriate; (iv) provide advice on the technical support and coordination provided by the Secretariat; and (v) assess the result of the action programmes and makes recommendations for further activities.

The SC is proposed to selected by caucus and to be composed of: (i) 5 country representatives (including donors); 2 private sector branch organisation representatives; 2 international civil society /NGO representatives; 2 International academia/research representatives; 2 international organisation representatives; and 1 FAO staff member as an *ex officio* member of the SC. Approval by consensus will be the basis for decision-making. If no consensus is found, decision will be made by a one-member-one-vote, voting process.

The FAO staff member will serve as chairperson of the SC during the first year following the launch of the Global Agenda. After this period, the chair will rotate on a yearly basis among (i) countries; (ii) private sector and (ii) NGOs and CSOs, and be elected by the SC members.

The SC will meet twice a year, with meetings organized back to back with the Multi-stakeholder platform meetings when possible. The SC will be supported by a secretariat that will prepare a report after each of these meetings.

Ad 5. Does and Agenda of Action need an independent chair? If so, what would be the characteristics and tasks of such an Ambassador? A 'senior' statesperson without vested interests to promote the Agenda of Action in diverse fora, meetings and processes? The alternative would be a rotating chair among stakeholder groups

Ad. 6 Think Tanks / Expert panels- Panels of high level specialists, for independent analyses and foresight on the thematic foci identified and agreed during the preparatory phase. At this initial stage such expert panels will further develop the Action Programmes for the selected thematic foci. A strict peer review mechanism could be one feature of oversight for this function. Sub-contracting this function to an independent think tank, such as, for example, a university would be another possibility.

Ad. 7 Action programme Task Forces will consist of the representatives of the multi-stakeholder platform members that are directly involved in the implementation of joint or autonomous activities that are an integral part of the action programmes for the selected thematic foci. At this initial stage the Task Forces will finalize the specific Action Programmes for the selected thematic foci in direct collaboration with the expert panels.

Ad. 8 A Global Agenda of Action-Secretariat for coordination, knowledge management and capacity building. Proposed to be based at FAO, the Secretariat will coordinate and provide technical input to the activities of the Agenda of Action. In particular, the Secretariat will (i) be responsible for the coordination and implementation of work plans; (ii) provide technical advice and collect, collate and disseminate information; (iii) report to the SC on progress; and (iv) provide administrative support to project implementation and organize the different multi-stakeholder platform meetings.

Ad. 9 Formalization and legal status: How will decisions taken at the Phuket meeting be 'formalized'? Do we need formalized agreements? Statements of intent or contract? What would be the best manner to galvanize commitments?

Is this an appropriate structure? Should it be made simpler? What are the other options that could be considered without losing the essential multi-stakeholder emphasis?

Who can and should be members of each of these governance structures? What criteria should be used?

Is this the correct form? What other forms could be considered?

If a secretariat is required, where should it be hosted?

Will it be necessary to give a Global Agenda of Action Agenda 'legitimacy' through some form of legal status?'If so, what would be the best way of achieving this?

(vi) ***Resources and allocation of resources***: Investment into the global promotion of a Global Agenda of Action could be sought from platform members, membership fees, network fees, or through grant applications. A broader network of professionals can help shape the agenda through in-kind contributions.

At the moment the preparatory phase is supported through grants from the Swiss Federal Office of Agriculture, the Ministry of Economic Affairs, Agriculture and Innovation of the Netherlands and through contributions by the World Bank and FAO.

What would be the best funding strategy(ies) to pursue? Do we pursue funding for the Agenda of Action as a whole, or do we try and fund Action programmes separately? How to avoid conflicts of interest?
How will fund allocation be decided? Will this be a steering committee function?

After Phuket
A number of the actions required after the current Phuket meeting have been indicated above already. In summary, some of the key next steps proposed are as follows:

- Formation and consolidation of expert panels (finalized by end of January 2012);
- Expert panels and Task Forces start work on the further development of action programmes – with the assistance and facilitation of the Secretariat (from 1st of February 2012);
- FAO secretariat to organise formal presentation of the Global Agenda of Action in its Rome headquarters to member nations permanent representatives, in collaboration with the Committee on Agriculture's vice-Chair and selected private and civil society multi-stakeholder platform members (before the end of March 2012);
- Draft final action programmes on selected thematic foci ready for SC review (from mid May 2012 onwards);
- Multi-stakeholder platform meeting to discuss and endorse selected action programmes (before end of October2012);
- Targeted fund raising activities and consolidation of Action programme task forces (from 1st of June 2012 onwards);
- Endorsement of action programmes by stakeholder groupings memberships (by 1st of October 2012);
- Launch of Global Agenda's action programmes (before 31st of December 2012).