Contributions in Week 2 of the crop-livestock e-consultation

From the Moderators

-----Original Message-----
From: Crop-Livestock
Sent: 07 February 2010 22:12
To: Crop-Livestock-L@mailserv.fao.org
Subject: Welcome to Week 2 (February 8-12) of the e-consultation on Integrated Crop-Livestock System for Development

February 8, 2010

Dear Colleagues,

Thank you to all of you who provided input to Week 1 of our e-consultation on Integrated Crop-Livestock Systems for Development - The Way Forward for Sustainable Production Intensification.

It is time now to turn our attention during Week 2 (February 8-12) to supply and value chain dynamics and the actors associated with promising crop-livestock systems.

In our background paper, we identified a focus on Input and output market linkage development for promising integrated crop-livestock systems and associated input and output supply chain processes and public-private service providers for different production systems and diverse markets (including constraints and opportunities in input supply chains covering production inputs of seeds, agro-chemicals, farm power, equipment and machinery, veterinary services, advisory and innovation systems on good farming practices, marketing infrastructure and organization forms etc; constraints and opportunities in output supply chains covering animals for meat, milk and other dairy products, hides and skins from cattle and small ruminants, and meat and eggs from poultry, and meat from pig; and opportunities for processing in integrated production systems etc).

During this week we need to highlight those opportunities and constraints along the input supply and output value chains from the various production inputs (for crop/livestock health and production) through the transport (distance/mode) and processing (infrastructure, food and worker safety, etc.) components en route to a variety of markets (local, national, international). Further, we need to better understand the role or potential role of different private sector, government and civil society actors that interact along the input supply and output value chains.

Needless to say, we are covering a lot of variables this week! That said, we would ask you to please ground your responses in a specific crop-livestock system and scale as you share your insights on the following questions.

- There are integrated crop-livestock systems across a range of types (on-farm or area-wide) and scales in different agroecologies. Are there system-dependent input supply chain constraints (e.g. seeds of certain legumes, equipment and machinery for minimum soil disturbance and direct seeding, herbicides, livestock feed for specialized systems, etc.) that need to be addressed? Which are these and how have they been or might they be overcome?

- Do integrated crop-livestock systems offer an advantage when it comes to incentives/rewards for good practice such as payment for environmental services or access to special markets? If so, what is your experience with these?

- Are there market (local, national, international) dependent value chain constraints (e.g. lack of local processing facilities, food quality/safety regulations, market access, etc.) that need to be addressed? Which are these and how have they been or might they be overcome?

- Who are the input supply chain and output value chain actors and how do they inter-relate? Who drives the chains (farmers, input providers, markets, government, etc)? How equitable are the benefits to different actors along the input supply chain and output value chain? Are there examples of input chain and output value chain actors working together to gain more competitiveness and sustainability or stability?

- Might we see a shift toward greater local/national sustainable markets in light of decreasing availability and increasing costs of transport fuel, climate change, food insecurity, etc.?

Please speak to any other issues or opportunities with which you have experience in terms of input supply and output value chains dynamics associated with integrated crop livestock systems.

Thank you for your attention to these questions. We look forward to learning together through this second week of the e-consultation.

Please do keep in mind the three overall objectives of the consultation (what do we know about integrated crop-livestock systems for development – what works and what does not; define next steps for key stakeholders; and guide and empower FAO to better support member countries to harness the development potential of integrated crop-livestock systems) towards which the discussions must aim at over the next four weeks. Also, each week's topic should be addressed in the context of two cross-cutting issues – the role of stakeholders, and capturing public goods and incentives for action.

For the technical background document and other related information, please visit the website: http://www.fao.org/agriculture/crops/core-themes/theme/spi/iclsd.

Week 1 summary will be posted on the website as well as a folder containing all the contributions during the week. The attachments that came with the contributions during Week 1 will also be available on the website in the documents section.

With that we thank you and welcome your responses.

Warm wishes,
The Moderation Team

Amir Kassam
Constance Neely
Theodor Friedrich
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Contribution 1 from Max Shelton at the University of Queensland, Australia.

-----Original Message-----
From: Horne, Peter [mailto:horne@aciar.gov.au]
Sent: 07 February 2010 22:35
To: Crop-Livestock-L@mailserv.fao.org
Subject: Contribuiton from Max Shelton

1. We (Ross Gutteridge) at UQ were involved in alley cropping trials in the 80s and early 90s and published on the topic. The trials were never really taken onto farmers fields, except in an experimental context where the researcher was completely in charge. The work did not lead to any adoption that I am aware of, and I was not surprised that this work, and all of the work started by BT Kang in the 70s and 80s never led to serious farmer adoption due to a number of factors:
    - The scarcity of labour as mentioned was one issue, but more importantly, I doubt that farmers viewed the technology as a viable way to meet their needs. Using the tree legume mulch to lift soil organic matter and fertility was an indirect benefit not easily appreciated or recognised by farmers.
    - The actual responses of the alley crop to mulching were variable and difficult to easily demonstrate for a variety of reasons.
    - Add to this, the lack of commercial return from alley crops (often food crops), which made the extra work for variable or limited financial benefit hard to justify.
    - We always felt that there needed to be clear financial benefit to farmers (environmental benefit alone was not sufficient to motivate farmers) and that this might come from direct use of the foliage of the tree legumes for feeding animals which had more immediate commercial value. However, in the 70s and 80s the commercial value of livestock, though better than subsistence food crops, was still low and this was a disincentive to take on a labour intensive system.
    - The commercial value of livestock in smallholder systems has greatly increased in the past 10-15 years and this has changed the dynamics e.g. there is greatly increased interest in the use of forages that improve livestock production. Therefore interest in such systems has increased. If this is the case, then tree legume crop/livestock alley farming system may benefit from some reappraisal but there can be no certainty that it will succeed.
    - The crop improvement aspect of alley farming may still be a hard sell but the direct use of tree legumes for livestock is a different matter, especially if you do not prescribe that the tree legumes be planted in an alley cropping format. There are already large numbers of farmers around the world feeding tree legumes directly to livestock, but not always from an alley cropping style system.

- There are examples of alley cropping working in practical farmer situations. In Australia, there has been some alley cropping of leucaena with forage crops rather than grain crops so livestock has been the main focus.

2. Whilst it is important to test new technologies on-farm, with full participation of farmers who need full opportunity and ownership to evaluate variants of the system, and farmer field schools might help, this alone will not lead to adoption if ultimately the concept does not meet a need of the farmer. Improved participatory approaches will not make the technology succeed if does not meet farmer needs.

Assoc. Prof. Max Shelton
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Contribution 2, from Jorge Grijalva Olmedo, INIAP-Ecuador

-----Original Message-----
From: Jorge Grijalva Olmedo [mailto:jgrijalva55@hotmail.com]
Sent: 08 February 2010 02:41
To: Crop-Livestock
Subject: Week 2 contribution from Jorge Grijalva Olmedo, INIAP-Ecuador

saludos, aunque con retrazo involuntario, pongo a consideración un aporte del INIAP-Ecuador a la discusion de la primera semana.

Las pasturas para crianza de ganado, asociadas a sistemas integrados árboles - pasturas y/o pasturas-cultivos, constituyen la principal forma de uso de la tierra en la Amazonía ecuatoriana, cuya expansión en base de la utilización de prácticas no sostenibles, son a menudo consideradas entre los factores más importantes de deforestación y cambios climáticos globales. Desde otra perspectiva, esta actividad pionera ha acompañado al proceso de ocupación y transformación del espacio amazónico, y ha sido un contribuyente en la generación de empleo y evolución de varias cadenas de valor en la región. Sin embargo, varias preguntas aun merecen ser investigadas y contestadas: (i) La intensificación es realmente un camino seguro que puede contribuir a detener o al menos reducir la deforestación en la Amazonía?, De qué modo las sub-cadenas asociadas a cada componente del sistema integrado agricultura-ganadería, pueden contribuir a captar mano de obra?, La inversión en sistemas integrados puede efectivamente contribuir a reducir el impacto ambiental del efecto invernadero?

Trabajos realizados en varias comunidades de los Andes y Amazonia ecuatoriana sobre el valor de los sistemas silvopastoriles, muestran que la recuperación e intensificación de pasturas son las mejores estrategias para aumentar la unidad animal por hectárea, y por lo tanto, podrían contribuir a reducir el impacto ambiental. De hecho, en la región amazónica ecuatoriana sería posible liberar al menos un 25% del área con pasturas degradadas para dedicarlas potencialmente a la producción agroforestal (árboles-cultivos, árboles-pasturas). Por otra parte, tal como se evidencia en sitios o nichos particulares de la Amazonía donde se practica

una agricultura intensiva basada en silvopasturas, el mejoramiento genético de los hatos así como el desarrollo de razas con mayor conversión alimenticia pueden contribuir a ese fin.

Por otra parte, de acuerdo con varios trabajos de investigación del INIAP en torno al establecimiento de pasturas asociadas en sistemas silvopastoriles, muestran algunas variables importantes que pueden afectar las decisiones y la difusión de tecnologías agroforestales, entre ellas se pueden citar a: las condiciones climáticas y las características del suelo, el crecimiento económico de los centros urbanos, la instalación de una agroindustria para dar valor agregado a los productos, la disponibilidad de mano de obra, la Disponibilidad de capital y acumulación previa, el Crédito para fomento agropecuario, la organización de productores, entre otros incentivos.

La intensificación que explica los altos niveles productivos en algunas propiedades del sector empresarial de varias cuencas importantes de la Amazonia, se debe a la introducción de innovaciones para conservar el suelo, otras prácticas de manejo y utilización de pasturas y de animales, la fertilización aún cuando podría potenciar el desarrollo de los pastos y cultivos, no es un elemento tecnológico discriminante sobre todo al sector marginal. Al respecto, cuando se analizan Pobreza, racionalidad económica y conservación, se cuestiona el supuesto del modelo convencionalmente conocido de pobreza-deforestación, al menos al nivel local ecuatoriano, precisamente porque los fragmentos boscosos en predios del sector de subsistencia y marginal, sugieren una *relación entre el nivel de pobreza, baja aptitud del suelo y conservación del bosque*. En este sentido, las familias más vulnerables, a pesar de que tienen mayor área boscosa, no lo aprovechan justamente porque no cuentan con la mano de obra suficiente y el capital para actuar en favor de la deforestación.

Dado el índice de pobreza que caracteriza a la población de la Amazonía, la estrategia de desarrollo debería buscar la conciliación entre los objetivos de desarrollo humano y la conservación de los recursos, explorando estrategias múltiples, que no sólo se orienten a la intensificación y al uso del bosque, sino también a promover la educación y generar empleo. La participación del Estado y la Cooperación Internacional es esencial para enfocarse a la intensificación y recuperación de áreas ganaderas que ya han sufrido un proceso de transformación, y por otro, poner énfasis en la gestión ambiental participativa de los bosques remanentes.

Se requiere intensificar las acciones para el desarrollo de mercados para los servicios ambientales que provienen del bosque. Las acciones estatales deben encaminarse a negociar la inclusión de alternativas “con sombra” (alternativas integradas agrícola-ganaderos) en los *acuerdos internacionales de implementación conjunta* de venta de carbono, solamente así, el pago por este servicio cumpliría un objetivo social.

Las prácticas tradicionales de producción agrícola-ganadero que se aplica en Amazonia, reflejan una racionalidad campesina aparentemente muy consistente con las características biofísicas y las condiciones socioeconómicas de los productores. En adición, la generación de tecnología enfocada al mejoramiento de las economías comerciales puede tener efectos negativos en el sector marginal, al provocar procesos de concentración de la tierra y, por otro lado, al liberar recursos, mano de obra y capital, pueden influir en la ampliación de la frontera. En consecuencia, la evaluación de sistemas alternativos agroforestales y

silvopastoriles conducentes a incrementar la productividad en el largo plazo y retener mayor cantidad de mano de obra y generar ingresos, debe considerarse como una prioridad. En esa perspectiva, los sistemas agroforestales abren el camino correcto para el establecimiento de tecnologías sostenibles o eco-tecnologías, apoyadas en los principios de la agroecología y la agroforestería. Asimismo, deben examinarse *las reformas políticas necesarias para promover la agroforestería dentro de esta estrategia de desarrollo,* dándole atención preferencial al mejoramiento de la estructura institucional para el desarrollo de mercados de productos arbóreos y apoyo a la investigación, extensión y promoción campesina.

cordialmente

Jorge Grijalva Olmedo, Ing. Agr. Ph.D
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Contribution 3, from **from Kwaku Agyemang, FAO Sub-Regional Office for Southern Africa (SFS), Harare**

-----Original Message-----
From: Agyemang, Kwaku (FAOSFS)
Sent: Mon 2/8/2010 10:47 AM
To: Crop-Livestock
Cc: Han, Gaoju (FAOSFS)
Subject: Week 2 contribution from Kwaku Agyemang, FAO Sub-Regional Office for Southern Africa (SFS), Harare

Dear Friends and Colleagues,

I would like to extend my congratulations to the Organizers of this discussion and to all of you who were able to contribute to the Week 1 discussion. Due to back to back Workshops here last week we were not able to contribute on the topics for Week 1. I was encouraged by the last Contribution on Week 1 (Contribution # 48) from Ken Giller who referred to earlier contributions that dealt with resource constraints. Perhaps the competing use of crop-residues at individual farm level and at community level raises the most tension in management. At the community level the tension often escalates into conflicts among users of crop-residues (e.g. for conservation agriculture practitioners and livestock keepers relying on community resources including crop-residues). These conflicts which in West Africa sometimes lead to loss of human and livestock lives was one of the motivation for Research and development groups at ILRI, IITA and NARES in several countries to focus efforts in research in the Inland Valley Systems (Lowlands) in the region. Pastoralists and sedentarized livestock grazers have often claimed these areas as their traditional grazing areas or migratory routes while participants in development projects focusing on horticultural crops (with little or no residues for livestock) frequently claim the right to use these lands. These vast lands estimated to be over 240 million ha in Sub-Saharan Africa hold huge potentials for crop-livestock integration because of the residual moisture in the soils even during the dry season.

I am attaching two publications from this multi-institutional, multi-country study published in 2006 and 2007 because they address most of the questions raised in Week 2 but also give good examples requested in Week 1. Briefly, I supply some answers to some of the questions raised in Week 2, mostly based on the findings from the study referred to.

1. System-dependent input supply chain constraints: With regards to Inland Valley Systems (IVS) crop-livestock enterprises, there are a few constraints. The major reason for the support of the integration on-going in the IVS is the recognition that in West Africa the IVS perhaps provides the highest potential to increase food production using intensification methods because soil moisture is not a constraint. However, the soils tend to be heavy and usually require animal draught power to cultivate the valley system. The ultimate constraint is availability of draught power (oxen, bulls, horses, etc) to IVS farmers in timely manner because they are either too few in the community or are being used on up-land plots. Individual farmers may not have draught power at all or may have only half of a pair and must rely on hiring or teaming up with another resource poor farmer in order to have a full complement of draught power. Thus, the clear supply chain constraint in this case is inadequate animal draught power.

2. Incentives/Rewards for good practices in crop-livestock farming: The use of IVS for crop-livestock farming should logically attract incentives and rewards because the use of the IVS reduce or prevent the rush to use marginal fragile uplands to increase food production. Secondly through the planting of "more acceptable" crops such as dual-purpose or multiple purpose crops (legumes, cereals. etc) in the IVS that leave crop-residues for livestock, the raging conflicts between crop and livestock farmers are known to reduce. The harmonious co-existence of these two groups of farmers should be rewarded by local and central government administrations. In the IVS areas of Nigeria and Southern Mali, these benefits are appreciated by local authorities, although I am not aware that this appreciation has translated into rewards yet.

3. +Input supply and Out value chain actors: Ideally most crop-livestock farmers in the IVS should have their own animal draught power for soil preparation and weeding, it is not so in practice and these farmers rely on a few well to do people who own oxen, bulls, horses, etc. The relationship between these input suppliers and output value chain actors can be simple or complex depending on how many of the oxen/bulls are available at the beginning of the cropping season, how many farmers are cultivating the presumed higher priority up-lands, how large the up-lands areas to be cultivated are, etc. The timely use of oxen/bulls to cover cultivation in the IVS depend on many factors named above and also how smooth negotiations go on the transactions on the hiring and use of them. It is also known that farmers with half pair of oxen do pull their resources together with other farmers with incomplete pair to achieve complete pairs in order to facilitate optimal and timely use of draught power. This working together certainly bring sustainability or stability if not competitiveness.

4. Shift towards more sustainable markets in light of food insecurity: Historically, many of the large cities and towns in West Africa are situated near IVS. It is the demand from such large human populations atht are driving the intensified use of the inland

valleys, for example in the production of high valued crops, milk production and small ruminant fattening. As urbanization increases and more people move into the the large towns and cities near IVS, the pressure to intensify will assume greater importance in attempts to reduce food insecurity among the less privileged but also better meeting the demands of the more sophisticated and rich consumers for products like meat and milk.

The attached papers deal with other aspects of crop-livestock integration in the IVS of West Africa but also give some production figures and trends observed from the studies. Should any of the colleagues be interested in this subject matter area they are welcome to contact me on kwaku.agyemang@fao.org

Thank you.

Kwaku Agyemang
FAO Sub-Regional Office for Southern Africa (SFS)
Harare
Zimbabwe

Contribution 4, from Roberto Díaz, INIA, URUGUAY

-----Original Message-----
From: Roberto Díaz [mailto:rdiaz@inia.org.uy]
Sent: Mon 2/8/2010 2:40 PM
To: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 contribution from Roberto Díaz, INIA, URUGUAY

Dear Moderator,

Please find below some comments on proposed topics. I was out of office and I hope the moderator forgive this rather late contribution.

Attached is a recent paper that discusses a successful experience on adoption of pasture rotation with grain crops in a temperate country (Uruguay) and the new challenges because soybean expansion under continuous cropping.

* Do you believe that integrated crop-livestock systems are an answer for sustainable intensification? Do they have a place in our strategy for feeding 9 billion people in 2050?

There is no other way for sustainable intensification than the diversification and integration through crop-livestock systems. The main challenges will come from feeding the growing urban population. Most of that food will come from medium and large farms which are in continuous grain cropping systems where land degradation continues. The key role of pastures by fixing nitrogen (BNF) and recovering the soil carbon balance will be crucial when nitrogen fertilizers increase their prices because of petrol shortage.

* What have we learned about integrated crop-livestock systems since the 1980's? Please describe innovative crop-livestock systems that you are familiar with (please remember to let your readers know the geographic/agroecological area that you are referencing).

Livestock production has been traditionally dominant in the grassland ecosystem of Uruguay. The soils of the eastern pampas have traits that make them very susceptible to soil erosion; The direct consequence of the high erosion rates was a reduction of the soil productivity after a few years of conventional grain agriculture leading to a process in which land had to be discarded to recover under low productive native pastures. Some years later, those pastures were ploughed again to annual crops in a new cycle of agriculture that was shorter every time, because natural pastures were unable to completely recover soil productivity.

The opportunity to propose and evaluate ley-farming systems took place when technology to increase animal production, based on perennial pastures with temperate legumes started to be evaluated in the early sixties. Then local research was extremely successful to promote this rotation system based on a) the large productive and economic benefits demonstrated by long term experiments and b) the development of low cost technology based on under-sown pastures with winter cereals .

Some farmers began to adopt the rotation of perennial pastures with grain crops at the mid seventies, and by the nineties the entire grain production was based on a rotation of crops with cultivated legume pastures. It took only twenty years to change completely the integration of agriculture and livestock production in the new production systems

Survey reports in mid nineties indicated that almost a 90% of grain crops were planted in soils in which a legume pasture had been plowed in one of the four preceding years.

However some years ago, around to the turn of the century, started a vast intensification of field crop production based on soybean. Large farming companies began the practice of hiring agricultural land and establishing continuous soybean cropping systems. This process caused a disruption in the use of sustainable agriculture and livestock integrated production systems, regardless of raising meat prices. Previous considerations on productivity could be playing a mayor role on the change to intensive agriculture. However, medium and small producers who still manage their own farms stay on ley farming and still take advantage of their high livestock productivity.

> * What are the key benefits that arise from these systems? economically, environmentally, and socially? From a production standpoint, what are the gains in terms of functional biomass, multiple purpose production?

The adoption of integrated crop livestock production under ley farming systems, proved to be a fast process, regardless of its complexity, when economic advantages are evident.

The contribution of organic matter by legume pasture mixtures in rotation with crops was able to maintain or recover SOC in the long term even under conventional tillage.

Biological nitrogen fixation by legumes could potentially satisfy the whole demand of the cropping phase, and this condition takes a higher economic relevance with increasing prices of N. Therefore, improving nitrogen fixation efficiency and use is a major research issue to be developed locally for each specific agroecosystem.

Land degradation by continuous agriculture cannot be overcome only by fertilizer application and other conventional practices. Yield potential is significantly higher when crops are rotated with pastures and the extent of that effect can only be evaluated in the long term.

Intensive livestock production requires much more labor per hectare than mechanized grain agriculture.

* What are the key constraints to implementing integrated crop-livestock systems? What about constraints to scaling up/out?

Small and medium size farms require achieving high livestock productivity in order to economically sustain the integration with crop production. When the incomes from animal production are low, farmers easily take the shortcut to permanent agriculture. Thus, the main challenge for experimental research in order to promote ley farming is to develop technology for high animal productivity under pastoral production.

The integration of crop and livestock production progressively requires two different farmers developing the system. One farmer taking care of animal production and another dedicated to the crop farming. A key issue for this contractual relationship is the long term commitment of both, taking advantage of mutual benefits of the integrated system.

Kind regards

Roberto Diaz
INIA
Uruguay

Contribution 5, from Suresh Tandon, ex-ICAR, India

-----Original Message-----
From: Suresh Tandon [mailto:skt4339@yahoo.com]
Sent: 09 February 2010 13:57
To: Crop-Livestock
Subject: Week 2 - Contribution from Suresh Tandon, ex-ICAR, India.

Dear Colleagues,

In India the farmers have been following integrated livestock farming since ages. Most of the farmers in India have a pair of milch animals to meet need of milk for the family as well as they also sell the milk to get addtional income. It is not something new. Yes, earlier the farmers had draught animals for doing various farm operations. In 1970 animal power contributed about 45 % to the total power availability on the farm but now it has reduced to 5%. Now tractor power contributes 45 % to the total power availaibility on the farm. We still have 64 milion draught animals. In hilly areas and in dryland areas animals are still being used for doing various farm operations.

Many farmers in India have started practcing integrated farming .They have started practicing aquaculture, poultry keeping and also have

milch animlas. So the farmer is not dependent on grain crops only but earns extra income by folowing integrated farming. Under the National Agriucltural Inovation Project under livelihood security component of the Indian Council of Agriculutural Research (ICAR) about more than 35 projectshave been sanctioned on integraed farming in about more than 100 backward districts out of 153 districts identified by GOI.This has enabled the farmers to earn additional income and has resulted in increaed livelihood security. .

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India
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Contribution 6, from Brian Sims, UK

-----Original Message-----
From: BrianGSims@aol.com [mailto:BrianGSims@aol.com]
Sent: 10 February 2010 12:10
To: Crop-Livestock
Cc: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 contribution from Brian Sims, UK

Dear Colleagues:

Some thoughts to contribute to the week 2 debate.

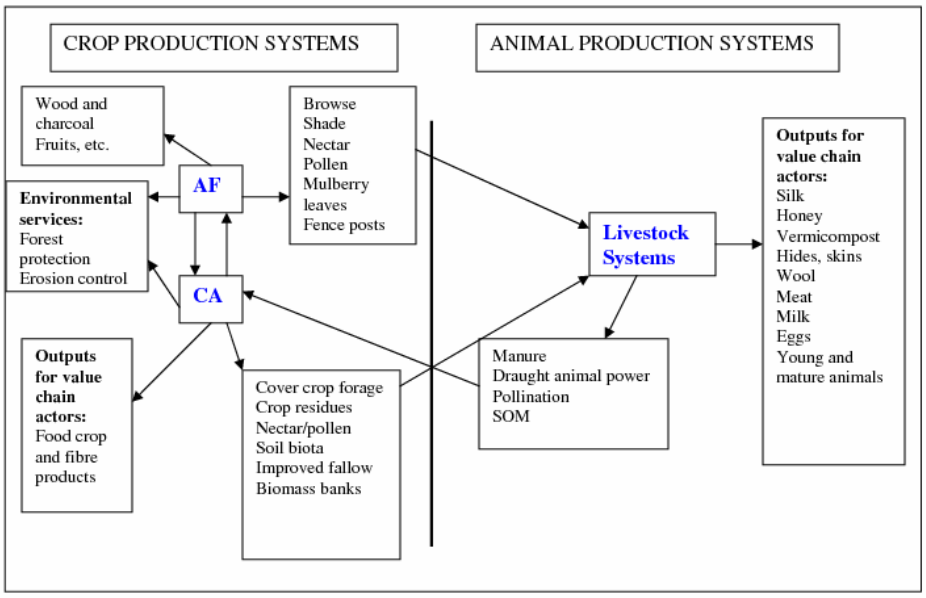
Brian Sims

Crop-Livestock e-conference. Week 2

Brian Sims (9/02/10)

I think that we are all agreed that to increase food production by >70% before 2050 in the face of climate change, desertification, bio-fuel production and population pressure means that we need to change radically our food production systems. That is why I emphasize the crucial potential of conservation agriculture (CA) and agroforestry (AF) integrated crop production systems.

Whilst pondering the supply chain question, I tried to visualize the range of interactions that there are between livestock and CA-AF cropping systems. The following sketch illustrates my first efforts (quite easily improved upon, for sure). And following the diagram I offer some further thoughts for consideration in this debate.



Some thoughts for debate:

- Firstly John Landers (Week 1, contribution 20) offered us a 'Fork for our thoughts' when citing Goodland's advice to convert all pasture to crops.
  Whilst it is true that meat production from grain is hugely inefficient (4kg grain to produce 1kg pork; 7kg grain to produce 1kg beef) livestock keeping is a much greater concept. It can include: bee-keeping; silkworm rearing; vermiculture; poultry production (chickens, ducks, geese, turkeys); guinea pigs; rabbits; etc., etc. Importantly we should also include improved soil biota (especially earthworms) as

Contribution 7, from P. Parthasarathy Rao at ICRISAT, India

-----Original Message-----
From: ParthasarathyRao, P (ICRISAT-IN) [mailto:P.PARTHA@CGIAR.ORG]
Sent: 10 February 2010 17:06
To: Crop-Livestock
Subject: Week 2 contribution from P. Parthasarathy Rao at ICRISAT, India

To the Moderator,

I am not addressing the specific questions given below in that order but cover some of them in my write up below on institutional arrangement to link small farmers to the demand centers.

Like in all developing countries the demand led livestock revolution is taking place in South Asian countries particularly India. Milk and meat production are growing faster than population growth rates leading to increase in per capita consumption levels albeit from low levels compared to global average consumption levels. The demand led livestock revolution will continue in the near future due to income growth, urbanization and change in tastes and preferences. The question often asked is, are the poor livestock keepers benefiting from the faster growth in livestock products given the constraints such as lack of access to inputs, technology, credit, services and product markets? Are the existing institutions/marketing arrangements ensuring the participation of the poor in this growing market?

For the small holders due to small marketed surplus selling in distant urban markets is uneconomical due to high transportation and marketing costs. It is found that marketing and transaction costs taking away 15-percent of the sale price in open markets. One notable example, in India is the milk marketing where small landholders participate in commercial dairying. This is because of the excellent net work of infrastructure developed under the Operation Flood Project under the leadership of NDDB. This implies that small landholders are capable of up scaling livestock activity provided they can overcome some of the production and mainly institutional and marketing constraints.

Institutions like growers' associations, cooperatives and contract farming can reduce marketing and transaction costs, provide assured markets and reduce price risk to the producer. Availability of an assured market also acts as an incentive to producers to use quality inputs, adopt improved technologies and scale up their production systems. In circumstances when farmers face problems in accessing inputs, technology, information and services, firms provide these as a part of contract and hence reduce uncertainty in their availability, quality and prices for the farmers. Studies in India by Birthal et al. (2005) observed contract farmers of milk realizing almost twice the profits compared to the non-contract farmers. In a study of dairy cooperatives, Gupta et al. (2006) found members of dairy cooperatives realizing 29 percent higher profits as compared to those of independent suppliers in the open market. In both the cases,

higher profits were largely due to reduction in marketing and transaction costs.

For riskier ventures as poultry, contract farmers may not realize the same difference in the profits as do the dairy farmers. Nonetheless, contract farming in broilers performs important functions of banking and insurance besides reducing price risk for the small scale producers. In general, contracting firms provide day-old chicks and feed at no cost to the producers, which in a sense is interest-free credit for them. Firms, in turn, lift the entire output and pay producers fixed growing charges that covers their contribution to cost (labour, water, electricity litter and rent for fixed assets). This insures producers against market risks. The coefficient of variation in the net revenue for contract producers was estimated 3.4 percent, as against 69.5 percent for non-contract producers.

Two other institutional aspects that have a direct bearing on the scale and productivity of livestock are credit and insurance. Lack of capital and higher production risks are important barriers to the expansion of smallholder livestock production. At present, credit and insurance support to livestock production is meager. Policy interventions are thus needed to improve credit flow to the livestock sector and strengthen insurance support, especially to poor smallholders.

Thanks

P.Parthasarathy Rao
ICRISAT

Contribution 8, from **Murat Karabayev, CIMMYT-Kazakhstan**

-----Original Message-----

From: Murat Karabayev <m.karabayev@cgiar.org>
Date: Tue, Dec 8, 2009 at 4:16 PM
Subject: Week 2 Contribution from Murat Karabayev, CIMMYT-Kazakhstan

Dear Moderator,

For the period 2004-2008 CIMMYT-Kazakhstan in cooperation with NARS and farmers implemented the component of the World Bank “Dryland Management Project” in Central Kazakhstan. The main objective of this component was "Validation and Demonstration of New Technologies for Restoration of Degraded Lands and Forage Crop Production". Below is a brief conclusion of the project component realization.

The main objective of the Project component implemented by CIMMYT is to show different methods of grassland establishment by sowing perennial and annual crops with low costs resulting in sustainable and profitable production, to convert the abandoned dry lands of Central Kazakhstan into pastures to contribute to carbon sequestration. Specific tasks to implement in 2004-2008 seasons to achieve the objectives were as follows:

- demonstration of different methods of abandoned dry land restoration for sowing perennial forages;

- demonstration of perennial crops and forage mixes;

- sowing forage under cover crops;

- to extend forage provision period.

Based on the results of demonstration experiments the following conclusions can be drawn:

· The best method of abandoned land restoration is chemical fallow followed by direct sowing of perennial forages. This method controlled weeds best.

· Perennial forages and its mixtures which produce the highest yield in dry conditions of Central Kazakhstan were identified. The results of trials have demonstrated that sowing perennial forages directly in the undisturbed stubble in the early spring ensured good germinating rate. Weeds were cut two or three times during summer. This technology was found to be labour saving. The highest hay yield was produced by a crested wheatgrass and sainfoin mixture.

· The wheatgrass is known to be the major forage in the dry steppes of the Central Kazakhstan. However, the data on the possibilities of significant improvement of forage hay yield by sowing wheatgrass with legume grasses are rather new. Replacement of natural hayfields with sown cereal forages has doubled productivity, whereas establishment of legumes and legume and cereal mixtures increased the hay yield four-fold. It is of especial significance that there has been convincing four-years' data obtained which demonstrated high productivity of legume forages such as sainfoin and alfalfa. Their productivity was much better than that of cereal forages which was not observed in previous studies in the region. Sainfoin demonstrated higher yields than alfalfa, but alfalfa can also be recommended. Thus, the yield of legume and cereal mixtures increased largely due to the legume component which is very important for improvement of the nutritional value of a pasture. In the conditions of the dry steppe of Canada, sowing legume and cereal mixtures is the widely adopted technology for pasture establishment. In the Northern Kazakhstan, the attempts to create legume/cereal pastures failed, and basically only cereal forages (Crested wheatgrass and Russian wildrye) remained in the dry steppe of southern chernozem. In Canada, sainfoin is not widely spread; alfalfa is more popular there. It is possible that the data showing that legume and cereal grass mixtures are a good option are related to the climate warming.

· Sowing perennial grasses under the cover of winter grains is not feasible, as in the dry years the grass shoots cannot compete with weeds and are suppressed by the winter grain crops.

· Sowing annual forages instead of fallow allows obtaining additional produce such as green forage, hay and grain. This conclusion is also new; at present the most widely used method to turn abandoned lands to forage production is fallowing.

· A 'green conveyor' concept was developed for the region which envisages production of annual forages as well as perennial ones. This approach greatly prolongs the period of forage availability and enhances the range of forages.

With the best wishes

Sincerely Yours

Professor Murat Karabayev,
Representative in Kazakhstan,
CIMMYT (International Maize and Wheat Improvement Center, Mexico).
http://www.cimmyt.org CIMMYT is a Future Harvest Center of the CGIAR
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-Seeding innovation… Nourishing hope

Contribution 9, from Hassan Mohammed Nur, Sudan

-----Original Message-----
From: hassan nur [mailto:hassanurnur@hotmail.com]
Sent: 11 February 2010 09:25
To: crop-livestock-l@mailserv.fao.org
Subject: Week 2 contribution from Hassan Mohammed Nur, Sudan

Dear All,

In the Sudan three animal raising systems can be identified: migratory, semi-migratory and agro-sedentary herding. Livestock on their movement often trespass on crop fields causing great damage that leads to tension/dispute between farmers and herders. A common maxim is often quoted in these communities 'crops and horns never co-exisits'.

However, the growing domestic and export market for live sheep and sheep meat has encouraged many crop farmers to enter in the business of sheep raising in an integrated manner. Crop residues are often used to feed small ruminants which in turn are sold to finance crop farming. Hence livestock is the biggest financier in a situation where formal credit is not accessible for it needs collaterals that vast majority of small farmers lack.

In places where rainfall variation is the trend, drought is frequent leading to a mounting fragile farming system. Livestock in such a case make a cushion against crop failures and consequently a better food security chances.

Hassan Mohammed Nur
Project Coordinator
Improving Livestock Production and Marketing Project
Federal Ministry of Animal Resources and Fisheries
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Sudan

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Contribution 10, from A K Misra , DRWA, Bhubaneswar, India

-----Original Message-----
From: Arun Mishra [mailto:mishraak17@yahoo.com]
Sent: 11 February 2010 12:14

To: Crop-Livestock
Subject: Subject: Week 2 contribution from A K Misra , DRWA, Bhubaneswar, India

The Moderator,

Please find below some of experiences on institutional arrangements for scaling up/promotion of crop-livestock interventions in India.

A good scope exists for liaison with Panchayti Raj Institutions (PRIs) for harmony and to enable transparent utilization of common resources for the benefit of community. Poor farmers need to be linked with institutions like market, insurance, banks etc. to reduce the vulnerability. Sustainable development in developing countries can only be achieved through optimum utilization of their natural resources. There is tremendous scope for increasing the livestock production and productivity of indigenous breeds by improving nutrient availability from locally available feed and fodder resources. The availability of key inputs and veterinary services needs to be strengthened and improved to equip the farmers for livestock development. A favourable policy environment in terms of access to micro-credit and assured markets will need to be provided and socioeconomic and technical constraints need to be addressed.

At Central Research Institute on Dryland Agriculture (CRIDA), we have implemented a DFID funded project in selected rainfed districts of South India (Anantpur, Mahbubnagar and Tumkur) with an institutional innovation for enhancing the livelihood of poor people through NRM interventions. The project has come up with formation of Salaha Samathi (SS) at cluster level (group of villages), which is an advisory group of villagers, formed by members who are acceptable to the community and willing to work for common cause. It is an informal and inclusive body in which existing Panchayti Raj Institutions (PRIs) and Self Help Groups (SHGs) are represented, besides representatives from women and weaker section of society (SC, ST). The SS has helped in smooth implementation of the project activities with assured people's participation in all the project interventions and in establishing linkages with the line departments (Animal Husbandry, Agriculture, Market, Insurance and Input Supply Agents). We have shown that SS successfully manage the project interventions. After working over two years, this cluster level institution has gained enough confidence for sustaining the project interventions even in the absence of donors funding.

In the same way, we have initiated action researches on crop-livestock-fish integration to assess implications of technologies in women perspective at **Directorate of Research on Women in Agriculture**. Among many resources, water bodies are an important resources base available in the coastal villages of Orissa in India. But unfortunately such resources remained unutilized for years. We federated the women SHGs to take water bodies and common lands from Panchayt on lease and adopt good practices of integrated farming. The required technical support including crucial inputs and trainings was provided by DRWA. As a result integrated crop-livestock – fish system enabled the farmers/women to earn additional income and has resulted in increaed livelihood security.

An action research has clearly demonstrated that available water bodies/village common resources can be productively utilized by wo/men groups for their socio-economic development provided appropriate technologies are blended with viable institutional mechanism. The DRWA model involving research, panchayatiraj institutions and women self help groups is an example worth replicating in similar situations.
Thanks

Dr A K Misra
Principal Scientist
Livestock Production & Management
Directorate of Research on Women in Agriculture
Baramunda P.O., Bhubnaeswar 751 003, Orissa, India

Contribution 11, from Mark Powell, USDA-ARS Madison, Wisconsin

-----Original Message-----
From: Powell, Mark [mailto:Mark.Powell@ARS.USDA.GOV]
Sent: 11 February 2010 13:31
To: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 contribution from Mark Powell, USDA-ARS Madison, Wisconsin

I must apologize in advance for some of these general observations.
It would have been better to cite particular contributions from last week, and add examples from the '80s.

So much was tried and learned during the 80's when funding for tropical crop-livestock research and development was at an all-time high. Although much has change in many tropical and subtropical environments, one can contend that much remains relatively unchanged. I refer to great changes in socio-economic conditions, yet most biophysical conditions and their associated challenges/opportunities remain relatively unchanged. There may well be 'on the shelf', well researched technologies that are still adaptable to specific biophysical conditions, but were not successful during the '80s due to prevailing socio-economic circumstances (e.g., policies, markets, gender roles). These practices may be more amenable to current societal conditions. What we cannot ignore is the great wealth of information gathered (much of it published) during the '80s. I attended an international symposium October 2009 that featured a presentation on research needs for soils of West Africa (where I spent 15 years in the 70's, '80s and early 90.). I came away quite dismayed. These 'ideas' were at the core of much research and development efforts 25 to 30 years ago. There was no recognition of the wealth of information from times past, what has been learned and how best to move forward. Is it a question of making this information more available? It seems as if good literature reviews are needed as first steps to mapping out new directions. What have we learned, are there technologies that should be revisited (what criteria should we use to evaluate and select technologies that should be revisited)?

One major oversight last week was livestock manure. Ruminant livestock convert a general range of only 15-30% of their feed into meat and milk (poultry and swine are

better). In many crop-livestock systems manure is a precious 'by-product' that may actually exceed the value of what we usually perceive as 'products'. I recognize that this occurs mostly in subsistence farming systems, but there livestock play multiple roles including provision of traction, capital storage, food security and poverty alleviation.

As crop-livestock systems intensify towards a goal of enhanced productivity more feed is imported and manure becomes a problem. There are many creative things going on with manure collection, processing and use to mitigate pollution potential, including exchanges between specialized crop and livestock production systems.

Crops and livestock do not have to be operationally integrated (within the same management unit) to have functional integration (e.g., feed-manure). Henning Steinfeld et. al. depicted this 'area-wide integration' eloquently in some of his publications of the late 1990's (I do not have any electronic copies, but one reference is in the attached document: Crop-Livestock Integration in West Africa).

Carrying capacity and input use efficiency need to be considered when promoting expanded crop-livestock systems. For example, if livestock growth is to be promoted in a particular region, what is the capacity of the land base to provide forage and other essential feeds? When production goals are set, we need to know the capacity of the soil, water, air to capture and recycle the imported feed nutrients (often necessary for intensification) that end up in the manure. Feed concentrates, minerals, and other compliments to local feeds will be important inputs towards goals of enhanced livestock production. Assessments need to be made of imported feed impacts not only on livestock production but on manure chemistry and environmental outcomes. In some cases pollution may be a concern, but in nutrient poor environments s improvements in livestock productivity may enhance manure quality and therefore its positive impact on crops and pastures. Such tradeoffs in input use and their outcomes need to be assessed.

Regards,
Mark
****

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http://www.soils.wisc.edu/soils/people/faculty/powell.php

Contribution 12, from Mario Herrero, CGIAR Systemwide Livestock Programme

-----Original Message-----
From: Herrero, Mario (ILRI) [mailto:M.HERRERO@CGIAR.ORG]
Sent: 12 February 2010 06:14
To: Crop-Livestock
Subject: Week 2 contribution from Mario Herrero, CGIAR Systemwide Livestock Programme

Dear Eric et al,

Please post this paper that just came out in Science. It is from a CG-wide effort on the future of crop-livestock systems. It covers some of the material discussed plus some aspects about the role C-L systems are likely to play in sustaining food security in the future

Kind regards

Mario Herrero

ILRI lead/SLP funded study published today in Science Special Issue on Food Security

Bruno Gerard | February 12, 2010 at 5:11 am | Categories: Crop-Livestock, Food security, Global, Intensification, News, climate change | URL: http://wp.me/pIHn6-73

Smart Investments in Sustainable Food Production: Revisiting Mixed Crop-Livestock Systems

M. Herrero P. K. Thornton, A. M. Notenbaert, S. Wood, S. Msangi, H. A. Freeman, D. Bossio, J. Dixon, M. Peters, J. van de Steeg, J. Lynam, P. Parthasarathy Rao, S. Macmillan, B. Gerard, J. McDermott, C. Seré, M. Rosegrant

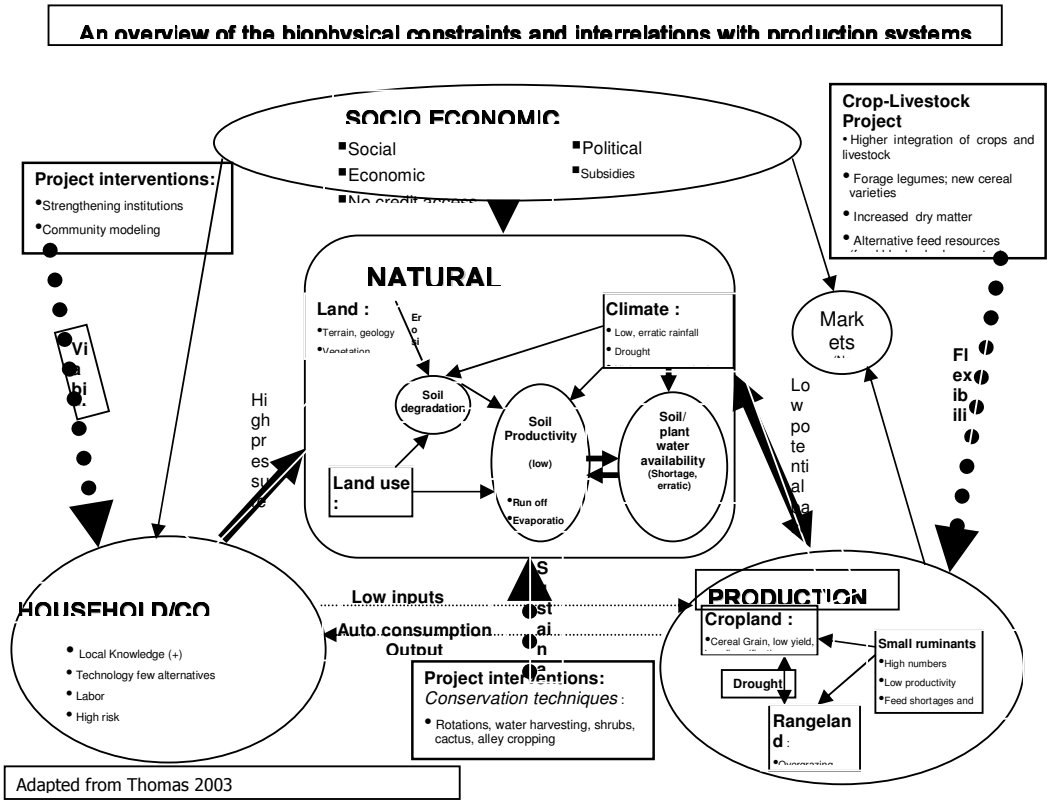
Farmers in mixed crop-livestock systems produce about half of the world's food. In small holdings around the world, livestock are reared mostly on grass, browse, and nonfood biomass from maize, millet, rice, and sorghum crops and in their turn supply manure and traction for future crops. Animals act as insurance against hard times and supply farmers with a source of regular income from sales of milk, eggs, and other products. Thus, faced with population growth and climate change, small-holder farmers should be the first target for policies to intensify production by carefully managed inputs of fertilizer, water, and feed to minimize waste and environmental impact, supported by improved access to markets, new varieties, and technologies.

Contribution 13, from Stephhen Twomlow at UNEP, Nairobi

-----Original Message-----
From: Stephen Twomlow [mailto:Stephen.Twomlow@unep.org]
Sent: 12 February 2010 13:51
To: Crop-Livestock
Cc: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 Contribution from Stephhen Twomlow at UNEP, Nairobi

Dear All,

A possible alternative schematic to Brians - but maybe too complicated



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Contribution 14, from **Bruno Gerard**, CGIAR Systemwide Livestock Programme, ILRI

-----Original Message-----
From: Gerard, Bruno (ILRI) [mailto:B.Gerard@CGIAR.ORG]
Sent: 12 February 2010 15:53
To: Crop-Livestock
Subject: Week 2 Constribution from Bruno Gerard, CGIAR Systemwide Livestock Programme, ILRI

Dear colleagues,

It seems that contributions somehow slowed down this week. Not being an economist I will not develop much but rather point to few publications/pieces I found interesting (not much docs so far for this week).

It is clear that markets play a large role in driving the intensification/specialization of crop-livestock systems and that the actual situation is very diverse across and within regions (see table below). With the increasing overall demand for livestock products and urbanization, niches/hotspots of intensification/specialization at diverse scales are quickly emerging and in those rapidly changing environments productivity, sustainability, equity, conflict resolution over resource uses, sometimes land deals and environmental issues certainly require attention/support.

Have a nice WE,

Bruno

	Intensification gradient		
	Extensive	**Intermediate**	**Intensive**
Crop nutrients	Fallow	Manure	Chemical fertilizer
Livestock feed	Rangeland	Crop residues	Feed crops, concentrates
Power	Manual	Animal traction	Motorized
Finance	Natural assets/stocks	Informal credit/loan	Formal credit/loan
Market orientation	Subsistence, barter exchange	Semi-commercial	Commercial, monetized market
Crop + livestock system evolution	Parallelization	Integration	Specialization
Nominal cost gradients:			
- Capital	High		Low
- Labour	Low		High
- Land	Low		High
Induced innovation	Capital saving		Land and/or labour saving

Table 2.1: Conceptualization of crop-livestock systems along an intensification gradient (Source: Erenstein and Thorpe, 2009)

Livestock Market Dynamics and Local Vulnerabilities in the **Sahel**. Matthew D. Turner, Timothy O. Williams
http://dx.doi.org/10.1016/S0305-750X(01)00133-4

Improving livestock marketing and intra-regional trade **in West Africa**. Williams, Spycher, Okike
http://books.google.be/books/download/Improving_livestock_marketing_and_intra_.pdf?id=7_0jK1Io7ZEC&hl=fr&output=pdf&sig=ACfU3U2wLL6skAsQFUzur9gY-zXHvyXWmQ

Feed marketing in **Ethiopia**. Berhanu Gebremedhin Adane Hirpa and Kahsay Berhe
http://www.vslp.org/cgslp/cms/upload/pdf/Feed%20marketing%20in%20Ethiopia-Working%20paper%2015.pdf

Pro-poor livestock Policy Initiative (ppli) working papers (47) at
http://www.fao.org/AG/AGAINFO/programmes/en/pplpi/workingpapers.html

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Contribution 15, from Sérgio José Alves and Ademir Calegari - IAPAR, Brazil

-----Original Message-----
From: Sergio Jose Alves [mailto:sja@iapar.br]
Sent: Fri 2/12/2010 8:35 PM
To: Crop-Livestock
Subject: Week 2 Contribution, from Sérgio José Alves and Ademir Calegari - IAPAR, Brazil

Please find below some comments .

Integrated animal and grain crop systems have enabled the production of high quality milk and meat at highly competitive costs. A combination of perennial and annual forage species, management tactics, pasture fertilization, and animals with high genetic potential has enabled the production of high quality animal products with high market value. In stocker operations, the system has made it possible for animals to be ready for slaughter with less than 20 months of age, finished on pasture and having high a quality carcass, meeting the requirements of demanding markets. In dairy enterprises, work has been conducted on pasture production with and without supplementation, resulting in milk yields ranging from 15 to 20 liters animal-1 day-1, at low cost of production, demonstrating that high profitability is possible in this system.

In South Brazil, Nort West of Parana State, in a Tropical and subtropical region, three Farm Cooperatives, developped together with Iapar (Research Institute) a R & D Program,and during the last 10 years increased from around 200-300 ha and now achieved more than 350-400 thousand hectares of the Crop (no-till corn and soybean) Livestock Integration System. So, the soil and water protection and profitability of the system has encouraged the farmers to follow this way. Also some forage/cover crops species such as, black oat, ryegras, Pearl Millet, Finger millet, Brachiarias, Panicum sp., Cynodon sp., has been studied and used by farmers in different agroecological zones. Some farmers has increased the profitability from 20-45% their Annual farm Net Income,and diminishing their risks.

Regards,

Dr. Sérgio José Alves
Dr. Ademir Calegari
Crop-Livestock Systems
Soil researcher - IAPAR
IAPAR - Instituto Agronômico do Paraná
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Contribution 16A, from Alan Franzluebbers at USDA - ARS in Georgia

-----Original Message-----
From: Franzluebbers, Alan [mailto:Alan.Franzluebbers@ARS.USDA.GOV]
Sent: Fri 2/12/2010 10:55 PM
To: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 contribution from Alan Franzluebbers at USDA - ARS in Georgia

Dear Colleagues,

Some brief thoughts on system constraints for crop-livestock systems in the southeastern USA:

1. Large volume of information needed for sophisticated production systems (with specialization, farmers have focused on limited aspects of farming compared to more complex systems)

2. Lack of field infrastructure (fencing, water sources) and supply and delivery linkages

3. Lack of information on how chemical usage could affect crop, animal, and human health, as well as food safety

4. Need to balance year-round forage supplies and labor for crop and livestock requirements

5. Need to develop a market for alternative meat production (e.g. consumer preference for grain-fed vs. pasture-fed beef).

Alan

Alan J. Franzluebbers
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Tel: 706-769-5631 ext 223
alan.franzluebbers@ars.usda.gov

Contribution 16B, from Jagadish Timsina, IRRI- Bangladesh Office

-----Original Message-----
From: Jagadish Timsina [mailto:j.timsina@irri.org]
Sent: Sat 2/13/2010 2:42 AM
To: Crop-Livestock

Subject: Week 2 -- Contribution from Jagadish Timsina, IRRI- Bangladesh Office

Dear Colleagues,

I agree with Mark Powell that much has been done on crop-livestock integration (CLI) during 80s and early 90s and that a good literature review should be the starting point before formulating any new research and development activities. This is true in Asia too. At IRRI, we had first Asian cropping system network/program in 70s and then Asian rice farming system network/program in 80s and early 90s. Crop-livestock integration was one of the strong components/activities of ARFSN. The network had established good linkages and partnerships amongst several Asian countries and had done substantial bio-physical and socio-economic studies. Gender issues/analysis and women's role in farming systems (including crop-livestock systems) was one of the important activities of the network. Several donors had supported the ARFSN and CLI activities. I was quite a bit involved in the network. There was one international workshop on CLI organized by IRRI and held in Dhaka in 1990. There are no electronic copies of the papers but hard copies should be available at IRRI, Philippines. Likewise, CIMMYT did a lot of diagnostic surveys in Asia during 80s and 90s and came up with various reports for different sites for various Asian countries much of which contain valuable information on CLI, including markets, institutions, and value chain analysis. Hence, literature reviews and identifying "on-the-shelf" technologies for dissemination/delivery are must.

In addition, in my recent work on exploring the current status and future potential of rice-maize systems (yet unpublished), I summarised following that I would like to share with you as it is related to Week 2 discussion.

"The demand for meat and milk in several Asian countries has resulted in a dramatic increase in livestock population, especially poultry, resulting in 'livestock revolution' (Delgado et al., 1999). Consumption of beef is increasing very rapidly in China whereas in India and the Philippines there is only a small increase in beef consumption. Consumption of pork has increased dramatically in China, Philippines, and Vietnam. Consumption of poultry, however, has increased rapidly in China, Indonesia, and the Philippines but at slower rates in Indonesia and Thailand. The countries where livestock population has remained stable or decreased are importing meat and milk products from neighboring countries or from developed countries such as Australia, European Union, New Zealand, and USA.

FAO and UN data for population projections indicate faster rate of population growth from 2000 to 2030 compared to 2030 to 2050. The food and other needs of the growing population underpin the strong demand for cereals. The demand for wheat, based on production and stock changes, is expected to increase from 621 Mt during 2004-06 to 760 Mt in 2020 (Rosegrant et al., 2001), around 813 Mt in 2030, and greater than 900 Mt in 2050 (FAO, 2006, 2007; Rosegrant et al., 2007). This implies growth rates of 1.6% during 2005-20, 1.2% during 2005-30, and 0.9% over 2005-50. For rice, it is 500 Mt in 2030 and 520 Mt in 2050. Projections suggest that demand for maize will be faster than for wheat, particularly because of its strong demand for livestock and poultry feed, and also because of its increasing demand for food and bio-fuel. Rapid population growth in Asia, persistent poverty in areas where maize is an important staple for the poor (especially parts of South Asia, Indonesia, and the Philippines), and rising prices of main staples such as rice and wheat will continue to exert an upward pressure on food and feed maize demand. The latter is expected to be a main driver toward shift in food consumption pattern, especially in poverty-stricken areas since international and farm-gate prices of maize are comparatively lower than those of rice and wheat. Demand for maize will increase by 50%, or 140 Mt, from 558 Mt in 1995 to 837 Mt in 2020. The increase in maize demand will be acute in Asia - an 87% rise from 162 Mt in 1995 to 303 Mt, or an increase of 141 Mt, in 2020 (IFPRI, 2000). Rising incomes, population

growth, urbanization, and changes in diet preferences will be responsible for much of the shift from rice and wheat to maize. *Most of the extra 141 Mt of maize that will be produced in Asia between 1995 and 2020 will be fed to livestock.* Delgado et al. (1999) report that developing countries of Asia are in the midst of a demand-driven "livestock revolution". *Livestock production and consumption of both meat and milk products are expected to grow about four times faster in developing countries than in developed countries up to 2020. By 2020, developing countries will produce 60% of the world's meat products, and Asia, led by China, will account for 43% (51 Mt) of additional meat demand worldwide between 1997 and 2020 (Delgado et al.,1999).

Thanks,

Jagadish Timsina
IRRI Bangladesh Office

Contribution 17, from Adrian Catrileo, INIA, Chile

----Original Message-----
From: acatrile@inia.cl [mailto:acatrile@inia.cl]
Sent: Sat 2/13/2010 3:23 AM
To: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 contribution from Adrian Catrileo, INIA, Chile

Dear All,

Many of the contributions have pointed out the possibilities of the productive response that may be obtained from the crop-livestock systems. I also sent to the forum a modest contribution for Week 1 looking at the experience we have had in southern Chile in the 80's. I will try to add some other elements which in my opinion may play an important role in the definitive system to implement or its sustainability.

Global economy has strongly influenced the presence of crop-livestock systems. For instance, in Chile, where there are nearly 3.8 million cattle, 50% of them are in hand of Small-farmers (<50 ha). Export to the EU was promoted in the recent years by accomplishing a specific certification. Many farmers, especially those involved in the final step to export finished cattle and Small-farmers, who produce mainly calves, were prepared to export and adapted their crop-livestock systems for this target. However, because of an imposed limited quota, many farmers were out of the contract, so the certification for the EU was rejected by the Small-farmers and in general, cattle business became less interesting. At the end, the whole system was affected.

The situation described above shows that not only innovative systems (breed, traceability, animal welfare, etc., for a specific market) are needed to estimulate livestock production, but also, government and political support must be associated with the innovation of crop-livestock systems in order to be improved.

Another point to be analyzed is that farmer capacitation should be done by motivated and well paid profesionals. In general, people who go to work in rural, marginal areas, where characteristic crop-livestock systems are complex and drove for Small-farmers, are young non-experienced professionals, who are looking to get away from that reality as soon as they find a better salary and good personal development chances. In this sense, capacitation programs should consider special conditions for people who are interested in being involved in the reality of these systems.

By the way, I found very interesting the paper of Herrero et al. (2010) and the systems constraints mentioned by A. Franzluebbers which can be applied worldwide.

Regards,

Adrian Catrileo PhD
Instituto de Investigaciones Agropecuarias (INIA) - The Agricultural
Research Institute - CHILE.

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Contribution 18, from Ridcardo Ralisch at the Universidade Estadual de Londrina, Brazil

-----Original Message-----
From: ricardo ralisch [mailto:ricardoralisch@gmail.com]
Sent: Sun 2/14/2010 2:21 AM
To: Crop-Livestock
Cc: Crop-Livestock-L@mailserv.fao.org
Subject: Week 2 contribution from Ricard Ralisch at the Universidade Estadual de Londrina, Brazil

Dear Colleagues,

What does agricultural intensification mean?

- I believe that we have a lot of possible and reasonable answers for this question, but we also need to consider the term in relation to the effects of the intensification and it's costs.

There are a lot of examples around the world showing wrong way to intensify agriculture. Most of these wrong initiatives were mainly based on the economical approach, with very short term horizon and with high environmental and social losses. The agricultural intensification based on technology introduction and specialization was a very useful way to concentrate the means of production, inputs and also the market. In this, many farmers are working for the big enterprises and corporations. It became a way to concentrate money and perhaps to promote hunger.

- More than 'increase' the productivity, the agriculture intensification should 'protect' the productivity.

It is much better to obtain optimum yields that can prolong the good yields, prolong the good yields, reduce the yield variability, reduce production costs, increase food security, to equate food and energy production etc. For this, we need absolutely to respect the natural capability of the environment to produce.

- To prolong the good yields around the world we also need to respect the cultural differences and protect the different ways of practicing optimum agriculture. It is impossible to ignore and override the agricultural techniques and institutions of a community-based social organization. We have to adapt the successful techniques and practices to the environment and to the habits and social organizations of the population in creating change.

- That means Conservation Agriculture (CA)!

The intensification of CA needs to integrate crop with livestock to preserve and strengthen the diversification!

- Seems difficult? Nobody said it would be easy!

Ricardo Ralisch
Ag Mechanization and Farm system impacts
Universidade Estadual de Londrina
Brazil

Contribution 19, from José Guillermo Velásquez Penagos at Corpoica in Colombia

-----Original Message-----
From: José Guillermo Velásquez Penagos
[mailto:joseguillermovelasquezpenagos@gmail.com]
Sent: Sun 2/14/2010 11:56 AM
To: Crop-Livestock
Subject: Week 2 -- Contribution from José Guillermo Velásquez Penagos at Corpoica in Colombia

Dear Colleagues,

Attached please find a presentation that illustrates some experiences of integrated crop-livestock systems in Colombia

José Guillermo Velásquez Penagos, PhD
Corpoica colombia

Contribution 20, from Kevin Gallagher at FAO in Sierra Leone

-----Original Message-----
From: Gallagher, Kevin (FAOSL)
Sent: Sun 2/14/2010 8:13 PM
To: Crop-Livestock
Subject: Week 2 contribution from Kevin Gallagher at FAO in Sierra Leone

In Sierra Leone, we are looking at various constraints but the primary issues across poultry, goats, sheep, rabbits, grass cutters and cattle are:

1. Lack of knowledge on proper housing, nutrition and health care by most farmers (including lack of access to knowledgeable persons as there are few experts in the country)

2. Lack of vaccines and persons that can vaccinate.

3. Lack of feed either as fodder (especially tree sources of fodder) or as intensive feed (e.g. blended mixes).

We are attempting to handle these issues with Farmer Field School training and training for farmer animal technicians although we still have a lot of work today on all 3 points.

From the international community, there is a need for better packaged information for farmers and extension staff - lots of pictures!

We also are working on honey bees and see them as important kind of livestock. For this we have good support from Ghana's Prof Kwame Aidoo who has practical business experience in addition to his professional knowledge of pollinators. We need to be able to identify more people like him that know the situation here and can assist.

Finally, I would like to remind that in Asia, there is a very good use of ducks integrated into rice cultivation for weeding. The International Association for Rice-Duck Cultivation is active in Japan, Korea, Philippines and Vietnam. It shows clearly how crop-livestock systems can be a clear win-win under sustainable crop intensification.

Kevin Gallagher
FAO Sierra Leone
