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Feeding the world better by preserving a healthy livestock

The world's human population is constantly growing, principally in developing and emerging countries and is expected to expand by more than one billion by 2050. Hundreds of millions of poor households in emerging countries are joining the middle classes. As a consequence, the world demand for animal protein - notably milk, eggs, and meat - is expected to rise by more than 50% before 2050.

To meet this enormous worldwide demand for animal protein, livestock production is intensifying. This is leading to increased sanitary and environmental risks, which need to be controlled effectively throughout the world. Infectious animal diseases are estimated to be responsible for at least 20% of the world's losses in food production of animal origin.
Providing everyone with access to noble animal protein could be greatly facilitated by reducing the losses caused by animal diseases.

The World Organisation for Animal Health (OIE) is mandated to improve animal health and welfare worldwide. It elaborates health Standards and recommendations for disease prevention and control methods and for safety of international trade in animals and animal products. These Standards are science-based and adopted by consensus by the 178 OIE Member Countries. They result from discussions, gathering high level scientists, Veterinary Services of OIE Member Countries, international NGOs, and of course, farmers and other actors in the meat sector.

To favor the effective implementation of these animal health and welfare Standards, keys for health, welfare and food safety, worldwide, it is necessary that farmers work hand in hand with veterinarians. Convinced of this necessity, the World Organisation for Animal Health (OIE) and the World Farmers' Organisation (WFO) have established a cooperation agreement in 2011. This agreement will better facilitate the consultation with farmers during the Standard-setting procedures.

Animal health is a key component of animal welfare, which is a complex issue involving scientific, ethical, economic, cultural, social, religious and political dimensions. It has become a growing concern over the last ten years, increasingly being taken into account by farmers. It also raises more and more interest among consumers, resulting in significant economic fallouts on the world market for animals and animal products.

Farmers are the ones on the field; consequently, they are first in line to preserve the health and welfare of livestock. They play an essential role in the early detection, prevention and control of animal diseases, including zoonosis, which may impact the production and trade of animals and animal products and affect livestock producers: Farmers are key sentinels for early detection of potential biological disasters.

Moreover, the general public seeks to become more and more informed of what it consumes. Certain contentious topics, such as the prudent and responsible use of antimicrobial agents, are to date, raising a high awareness because of the potential selection of resistant pathogens in animals and humans. Preserving the efficacy of antimicrobial agents must be a global concern for everyone. This is one of the key links between animal and public health which has led to the definition of the "One health" concept, which the international health and food safety organisations, FAO, WHO and OIE are closely working together to promote.
Veterinarians and farmers need to work hand in hand to ensure that they continue to work for the sake of animal and public health; their role is crucial to the "One health" concept.

Farmers and the OIE need to work together to achieve progress worldwide. The OIE will keep developing Standards and recommendations in new areas of importance, notably regarding animal welfare, and farmers will continue to play a key role in the implementation of these Standards.

We share one common goal: protecting animals to preserve our future.

LIVESTOCK MAKES IMPORTANT CONTRIBUTIONS TO SUSTAINABLY FEEDING THE WORLD

Hsin Huang,
Secretary General, International Meat Secretariat (IMS), Paris

Feeding 2 billion more people with higher incomes by 2050 is going to put a lot more stress on natural resources, which are already feeling the pinch in many countries.
At the same time, the world needs to adjust to climate change and reduce its greenhouse gas emissions. This is a tall order.

The livestock sector is a significant player in this regard, accounting directly or indirectly for a substantial share of land and water resources.
But it is also major source of nutrition, is an integral part of the value chain providing employment and income in both rural and urban areas, contributes to carbon storage in pastures, preserves biodiversity and shapes cultural landscapes.

What Does Sustainability Mean in Practice?

The International Meat Secretariat (IMS) has been actively pursuing discussions with key opinion leaders such as the United Nations Food and Agriculture Organisation (FAO), the International Livestock Research Institute (ILRI), and the World Bank on the important contributions made to society by the livestock and meat sectors.

We can be proud that these include:

- economic contributions:
  employment opportunities, higher standard of living, the contribution to long-term food security, etc;
- environmental benefits:
  carbon sequestration in soils, reduced erosion, water quality, and biodiversity;
- dietary contributions:
  red meat provides a high quality protein AND essential micronutrients (iron, zinc, B vitamins).

The IMS believes that livestock and meat industries nationally and collectively at the international level can and need to do more to promote this more balanced discussion in which all three pillars of sustainable production -economy, social, and environment – are addressed.

How Should We Rise to the Challenge?

Globally, the livestock sector represents many viewpoints, many different supply situations for reasons of climate, natural resource endowments, and tradition. The international perspective of the IMS focuses on practical actions and economically viable responses by industry to grow while at the same time being in harmony with the environment.

We are not making comparisons about which production system, species or region is better - this a destructive debate to which there is no right answer. And if we engage in it, we will only fall into the hands of our critics. Our goal is to foster inclusive action in which producers in many different systems, in all regions of the world, can participate. The aim is for a culture of continuous improvement –sustainability is a JOURNEY, not a DESTINATION. Therefore, we can all participate as we are challenging ourselves to do better tomorrow than today.

The challenge seems straightforward – how can the sector produce more while reducing pressure on natural resources and the environment? In broad terms the answer is clear – increase resource productivity so as to get more output from the inputs used, while minimizing environmental impacts. But in practice the answers are not so evident. This is partly because there are poorly functioning markets for natural resources and environmental impacts are not priced, so the signals to producers are not always evident.

And in the real-world, the diversity of situations -as opposed to the theoretical world of modelling or laboratory experiments- means it is not always obvious as to what should be done respectively by private business and public policies, which incentives and disincentives will encourage farmers and processors to use natural resources more efficiently, and what are the information needs to monitor progress.

IMS and FAO Global Agenda for Sustainable Livestock (the Agenda)

Clearly, what is needed is a framework for sustainability that promotes global action but at the same time takes into account local differences. The IMS is working closely with FAO to tackle this important issue. The Global Agenda for Sustainable Livestock (the Agenda) is an initiative bringing together governments, private sector, academia, and NGO's. It aims to improve resource-use efficiency in the livestock sector to support livelihoods, long-term food security and economic growth.

An integral part of the project involves a consultative process to build consensus among key stakeholders in the livestock sector to address operational issues in a subsequent phase of the project. In the private sector cluster, the IMS is working together with its global partners in dairy (IDF), poultry/eggs (IPC/IEG), and feed (IFIF). Being global, the Agenda is tasked with bringing together research, experiences and options for action that cover the diversity of situations across developed, transition and developing economies.

Specifically, the Agenda of Action foresees undertaking the following work:

- Strategic analyses, including of policy and institutional issues, methodologies, and providing investment guidelines in support of sustainable livestock sector development;
- Generation and sharing of local and global knowledge, experiences and practices through R&D activities, engaging in dialogue, dissemination, communication, and outreach;
- Promotion of capacity building, investment, piloting and mainstreaming actions and policies in countries and businesses;
- Support to piloting new approaches within different livestock sector systems and related value chains, and among stakeholders, to test, validate, and transfer practices; and
- Advocacy, including the promotion of sustainable livestock sector development within existing inter-governmental and other processes.

The Agenda argues that growing demand for livestock products combined with dwindling natural resources is likely to increase market volatility and production costs in the long run. Thus the livestock sector has a role to play in addressing these challenges and, at the same time, delivering environmental benefits by improving resource use efficiency.
There are two broad technological approaches to thinking about how to improve resource efficiency. One is to expand the "technological frontier" so that more meat and livestock can be produced from a given amount of inputs used. This is already an important source of efficiency gains in commercial, advanced livestock systems.
The other is to reduce "inefficient practices", using available technologies to produce meat and livestock in better ways. This is likely to be the most promising approach to closing the efficiency gap in natural resource use, in all countries. Narrowing the gap between attainable and actual efficiency rates will likely bring larger environmental, economic and social gains than incremental advances at the technological frontier.

Industry Input is Crucial to Success

A key concern is to avoid governments and international government organisations (IGOs) from taking actions or making recommendations that fail to take a balanced view of the contribution of the industry to the economy, environment and rural areas. Moreover, there is a need to recognise the wide diversity of experiences, practices, systems and levels of development in the industry, and avoid generalised, across-the-board policy approaches that too often do not take into account specific contexts and are based on shaky science and poor data.

Three key observations – and words of caution - are worth highlighting:
First, the Global Agenda for Sustainable Livestock is ambitious, both in terms of what it expects to cover and when it will achieve results. There is still uncertainty about the real world relationships between different actions taken and outcomes delivered. Context is everything – what might work in one situation will not necessarily work elsewhere. Thus a robust analytical framework is needed. Data are patchy to produce indicators of natural resource pressure (which can differ as to whether those resources are renewable or non-renewable) and environmental performance. Difficult trade-offs have to be made between financial viability, natural resource and environmental protection and social acceptability. Possibly most importantly, knowing

what should be done is one thing, but being able to put in place effective "carrots and sticks" that will achieve desired outcomes is another.
Second, it was widely acknowledged that, even apart from the differences across livestock systems, agro-ecological conditions and levels of economic development, there is a lot of uncertainty and risk out there. That includes uncertainty regarding the technological frontiers, availabilities of natural resources and environmental tipping points such as biodiversity, the impacts of climate change, the evolution of livestock input and output prices, and domestic and trade policy developments.

Third, great care needs to be taken in communicating results. There is often a tendency to make sweeping generalizations of actions and policies that appeal to the media and politicians but risk leading to inappropriate actions or policies. For some species, technologies and systems are more broadly similar across much of the world's non-subsistence production – such as is typical in pig and poultry production -although there are important differences and one should not over-generalize. But in ruminant system, that vary from highly intensive, confined operations relying extensively on feed and other inputs obtained off-enterprise, to extensive, pasture based systems that are critical for the local environment and community – generalizations should be avoided and caveats clearly stated. It really is a case that one size does not fit all. The IMS representatives stressed that the project should avoid making "recommendations" on policies and actions and focus instead on defining options and the implications for natural resource efficiency in undertaking those options.

A Final Word

There is no doubt that the Agenda for Sustainable Livestock is a major project that promises – if well handled and fully engaged with stakeholders – to deliver valuable results. The uncomfortable experience for the livestock industry of FAO's Livestock's Long Shadow report in 2006 is still fresh in people's memories. The private sector was not involved in that project and had little influence on the results or, importantly, how they were communicated to the wider public and decision-makers. The lesson is that private sector participation is crucial to ensuring that future work on sustainability is actually balanced and represents a realistic view of the industry.

WANT TO KNOW MORE?

PLEASE JOIN US AT THE WFO/IMS LIVESTOCK WORKSHOP ON 25 MARCH 2014 IN BUENOS AIRES

A NEW APPROACH TO OLD CHALLENGES IS ESSENTIAL FOR AQUATIC AGRICULTURAL SYSTEMS

Stephen Hall,
Director General, World Fish Center, Penang, Malaysia

Like many women in developing countries, Bangladeshi Sufia Begum is busy. Not only she does juggle the multiple demands of a wife and mother, she also grows crops and farms fish.

Sufia is one of the more than 700 million poor people around the world who depend on aquatic agricultural systems for their livelihoods.

Sufia pursues a complex and highly adaptive livelihood strategy like many of the other farmers, fishers, and herders who depend upon aquatic agricultural systems. People living in the floodplains, deltas, and coastal systems of the developing world often combine crop cultivation with raising livestock, farming or catching fish, and harvesting natural resources such as timber, reeds, and wildlife.

For a research organization like WorldFish, this diversity of livelihood strategies brings both challenges and opportunities. The challenge is that our own areas of expertise, fisheries and aquaculture, are only a partial solution for improving people's lives in these areas. The opportunity comes from combining fisheries and aquaculture with other farming activities in synergistic ways.

Take, for example combining vegetable production with fish farming. Training farmers in effective practices for growing vegetables on the banks of ponds and using their nutrient rich sediments as fertilizers has proved a highly effective way to improve both incomes and household nutrition. Developing and providing quality plant and fish seed adds further value. In Sufia's case, these approaches have not only increased her income dramatically, her family also consumes twice the amount of fish and three times the amount of vegetables as they did in previous years.

As one of the 15 member centers of CGIAR, a global agricultural partnership for a food secure world, WorldFish is well-positioned to support these synergistic solutions.. By bringing together the expertise of CGIAR and many other research and development partners, the opportunity to transform aquatic agricultural systems is enormous.

The CGIAR Research Program on Aquatic Agricultural Systems seeks to do just this. Currently operating in Zambia, Bangladesh, Solomon Islands, the Philippines, and Cambodia, the Program is modeling how large

scale development impacts can be achieved.

Development efforts have traditionally failed to benefit people living in aquatic agricultural systems; despite the numerous opportunities for growing and harvesting food and generating income, high levels of poverty and malnutrition persist.

Part of the reason is that traditional "Green Revolution" approaches to helping farmers and fishers simply don't work in these systems. Evidence reveals that developing technologies in research stations and working to get farmers to adopt them has significant weaknesses. Attractive and logical as it seems, this innovation pipeline or technology transfer approach does not always succeed, either because the technologies developed on research stations prove unsuitable for the farmers' fields or because farmers abandon them for other reasons. Likewise with small-scale fisheries, efforts to implement standard technical interventions to improve fish stocks and help fishers, such as restricting gear types or introducing licensing schemes, often fail because of the complex social dynamics.

Yet, with the right kind of development approach, the more than 700 million people living in aquatic agricultural system can see better results. In Sufia's case for example, it was a combination of gender responsive approaches that included technical training, improved seed systems and policy changes. Above all, it was also an approach that placed her views and aspirations at the center of the effort and worked with her to prioritize and craft solutions together. Scaling this effort to 500,000 other farmers in the region led to an $US 120 million increase in the value of fish and vegetables produced during the 2012-13 growing season.

What does it take to achieve such results? First, it requires aid agencies and development practitioners to view farmers and fishers as partners in developing solutions that work for them. The essence of this approach is effective and inclusive dialogue, whether with farmers over the most appropriate options for diversifying and enhancing their livelihood options, or with fishers over the goals for fisheries reform and how best to achieve them. Participatory research methods and tools are consistently evolving to support this effort.

Second, it requires a commitment to both understanding the barriers to development created by existing gender and social norms and behaviors and working to remove them. It is now widely recognized that one of the reasons why technology transfer approaches of the past have failed was the failure to do this. For example, introducing in inappropriate settings crossbred cattle, which require more high-quality feed and drinking water, can dramatically and detrimentally increase labor demands on women . Similarly, introducing aquaculture without considering the context, can leave women with little role in decision-making, but substantially increased workloads.

Next, success requires a commitment to partnership among development institutions and with governments. We must build genuine, active, cross-institutional teams and invest much more to nurture them.

Finally, we need to build leadership capacity and develop skills at all levels within our organizations. It is the quality of the people in our organizations, and the values, skills and behaviors they exhibit in their efforts to support those working in agricultural aquatic systems, that will determine how well we play our part in helping make development happen.

THE DAIRY SECTOR IN UGANDA

Rose Akaki,
Smallholder Livestock Farmer and WFO Women's Committee Member, Kampala

Uganda is one of the East African countries in the sub-Saharan region. It engages in a variety of agricultural activities including livestock farming for dairy and beef and beef products.

The national herd population is estimated at 8.5 million out of which 7.2million are indigenous and the remaining 1.3 million are exotic or improved breed. Those keeping indigenous cattle are mainly subsistence smallholder farmers who keep the cattle for duel purposes for dairy and beef.

Apart from economic purposes, smallholder cattle farmers do so for prestige, dowry and social security.

The dairy sector plays an important role in nutrition, income generation and employment. Out of 111 administrative units (called districts) comprising the country, dairy farming is concentrated in 42 districts in the cattle corridor stretching from the south western region through central to the north eastern region of the country. On average, 60% of the households in the cattle corridor keep cattle; with over 2.5 million households engaging in milk production. Those engaged in milk production are more economically orientated. They treat their cattle;

- as a source of income and serves as an investment bank. As the number of their cattle multiplies, they realise profit by selling the surplus.
- as a source of protein through provision of milk.

Uganda's population growth is averaging 3% for the last ten years; the rapid growth in population size gives a growing demand for dairy products. This implies that government needs to get the dairy sector organised to enable it produce adequate supply of dairy products to feed the growing population.

The Dairy farming system in Uganda is characterised by:

- Rearing of local breeds. The advantage of these over exotic breeds is that they are resistant to diseases and most smallholder farmers who form the majority of those who rear this type do not follow strict animal health practices due to high cost of drugs, ignorance, or sheer negligence.
- The most common system of dairy farming is herding, where animals are grazed on communal grazing grounds and watered from common watering points. Disease control poses real threat as disease is easily passed from the sick animals to the healthy ones. Tick control is also a menace since some farmers rarely or never spray their animals against ticks.
- The grass the animals graze on depends on natural factors such as rain and soil fertility for their growth and availability which poses the risk of insufficient feeds during drought, and the common feature of overgrazing.
- The animals are rarely crossed with improved breeds, let alone use of exotic breed. Consequently, milk productivity is very low.
- However, there is an emergence of improved farming systems such as fencing and zero grazing. Fencing is where grazing land is individualised and the farmer constantly improves on the quality of grass and controls the number of cattle kept on the land. The fenced land will always have a water source where the animals will always drink from. Few smallholder farmers practice fencing and keep improved breeds while a majority of farmers who practice fencing keep exotic breeds

as can be seen in the illustration below. Consequently disease and ticks are controlled and milk productivity is increased compared to that realised from the system of herding and communal grazing.

DAIRY CATTLE GRAZING IN A FENCED PIECE OF LAND

- Just like fencing, zero grazing is where few animals are kept in-house and fed with cut grass/fodder together with dairy feed supplements. While this is doing very well with some farmers, those farmers who practice zero grazing in the rural areas are ill prepared for this kind of farming. They were introduced to this system by some Non Government Organisations such as 'Send a Cow'. It was meant to alleviate poverty by giving households with very limited land holdings of an acre or less. A cow which they could nurture and use the proceeds to improve on their nutrition and financial income was distributed to some smallholder households. Most of these farmers were ill prepared and therefore fare badly. Many actually lost their donations.

This system has registered the following shortcomings:

- It requires planting improved pasture, cutting and taking to the animals as feeds.
- It is laborious. In one of the farms practicing zero grazing, one woman was heard saying: 'Don't mow at me. I've just come from the garden. I'm also hungry. You can wait!'
- Quality control of milk production remained wanting due to lack of training.
- Record keeping was considered alien to production.

Elite farmers keep exotic breeds which produce a lot of milk. However, they find the purchase prices inhibiting and yet have to invest a lot of resources in maintenance. Secondly, the milk produced requires a vibrant milk market to compensate the farmer for all the production costs incurred.

Dairy is one of the sectors that attracted the interest of the Uganda government at one point. A government corporation – Dairy Corporation dominated the buying of milk from farmers and processed the milk into dairy products like UHT milk, pasteurized milk, yoghurt, cheese, ghee and ice cream. However, following the liberalization of the dairy industry in the mid 1990s, this monopoly was broken. This opened up opportunities for private investors in this area. Subsequently, the proportion of the national milk production has increased. According to a research carried out by Economic Research Policy Centre (ERPC) Makerere University, results show milk production has increased from 431,000 liters in the 1990s to 1.6 billion liters in 2013. This has resulted in an increase in the number of milk processors. Already, over fifteen processors are engaged in value addition on the milk got from the farms. This has created a healthy competition in product presentation, better milk prices for the farmers and a reasonably reliable market.

Challenges in Uganda's Dairy Sector

Approximately 90% of the milk marketed goes through the informal sector; leaving only 10% to be processed and packaged before marketing. The formal sector markets pasteurized milk and other dairy products through direct delivery to groceries, supermarkets, hotels, restaurants, schools and hospitals. Some processed milk is exported to the neighboring countries.
However, there are a number of challenges the farmers experience in this sector.

Milk Preservation

The need for milk preservation arises from the evening milking and during the peak seasons. Farmers have had very few options for preventing spoilage of milk at farm level. Cold storage equipment would be necessary for storing milk for long hours before marketing.
Small scale farmers need deep freezers while large scale farms would require coolers. However, milk preservation at farm level is still a problem. About three quarters of the farms are in rural areas where there is no access to electricity to power the freezers.
Most of them rely on boiling the milk as a means of preservation, yet boiled milk does not keep for long. This milk is then mixed with the one got from the morning milking and taken for vending. Boiling milk as a method of preservation is shown in the illustration that follows.

Milk Collection and Transportation to Established Diary Processing Plants

There are two systems of milk collection used: informal milk marketing channel and the formal.
The system used by the informal channel is characterized by lack of established milk collection infrastructure. Farmers are seen delivering milk in either aluminum cans or plastic jerry cans for vending or to a 'pick-up point' established by a trader or an agent.
This pick-up point is usually along the roadside without

chilling equipment.
This can be seen in the illustration that follow.

TRANSPORTING MILK IN JERRY CANS

Quality Control during Milk Reception

This is limited. Simple quality tests like physical appearance and lactometer reading may be carried out before the milk is accepted. However, quality tests are not done and milk which is obviously adulterated with water contains physical contaminants like straws, hair, manure and flies may be accepted.

- Milk is put in cans and transported on an open pick-up or lorry over long distances to retail outlets in town or urban centres as is shown in the following picture.

TRANSPORTING MILK IN JERRY CANS

- Traders usually take milk on credit and farmers are paid weekly. However, due to poor handling and transportation, milk may go bad and all those who supplied that day miss payment. Sometimes the traders are also malicious. Even when the milk has not got spoilt, because they want to cheat, out of the seven days' collection, milk for three days is pronounced spoilt. Thus, the farmers are paid for four days only in a week. As these farmers have no other avenue for channelling their milk, they get exploited in this manner.

The system used by formal marketing channels utilises well established infrastructure for collecting and transportation of milk. This is where farmers take milk to milk collection centres. Standard quality tests are carried out before the milk is accepted. From the collection centre, milk is transported in milk tankers whose capacity is from 10,000-20,000 litres to the Dairy Processing plant shown in the illustration that follows.

A MILK COLLECTION CENTER IN A TOWN

Rural milk collection and transportation

This is not well developed. Milk is basically collected during the dry season when the roads are passable. During the rainy season the roads become so bad and muddy coupled with plenty of potholes. The transporters would not want to risk their vehicles on such roads. Thus, much of the milk is not collected and yet this is the peak season for milk production. The milk which is not collected is either consumed as milk or natural yoghurt by the household or used to make ghee for consumption and sale but in the worst case scenario the milk is sold at a giveaway price or goes to waste.

Pricing of Milk

Following the liberalization of the economy, farm gate prices for milk have fluctuated, especially in areas where milk collection and transportation is not well developed. During the rainy season the unit price of milk is lower than during dry season; this is due to a number of reasons some of which are outlined below.

- Lack of policy guideline to promote processing and enhance flow of milk from the surplus to deficit areas within the country.
- The hygiene and handling practices at farm level are generally poor. The collection and transportation of warm milk coupled with sale of unprocessed milk are still a challenge as far as improving the quality in the dairy chain is concerned.
- Local market is constrained by low purchasing power.
- Lack of knowledge in the nutritional value of milk.

Role of Women in Milk Production

Women play a significant role in milk production such as tending the calves to stop them from suckling before milking, pasteurizing, cleaning the utensils, and locally processing ghee and yoghurt.
It is taboo in many communities for women to participate in milking; grounded in the cultural belief that the milk goes sour. Women are also not permitted to sell milk.

The sale is by men who control household income.

Way Forward

1. Since the informal milk supply sector embraces a greater percentage of smallholder farmers, government should have a deliberate effort to provide an enabling policy framework to formalise the informal sector. This can be done by encouraging investment in that line and introducing small milk pasteurising plants within collection centres to encourage farmers to have the milk pasteurised before transportation to urban centres to be sold in loose form. This will cut down the cost of packaging and will keep this relatively cheap milk market outlet functional.

2. Improvement of the transport infrastructure and milk marketing channels so that during the rainy season, milk does not remain uncollected and go to waste.

3. Providing farmers with training in value addition in order to be able to make other dairy products when their milk is not collected.

4. Need to provide veterinary extension services for, as many households enter the dairy business, knowledge gaps are becoming apparent. Farmers need technical assistance on improvement of their breeds i.e. from local to semi intensive/ cross breeds in order to improve on their milk yields.

Other areas of veterinary services can be having smallholder farmers to restock high milk yielding cattle heads, building capacity of the farmers to enhance productivity per cow and enabling the farmers to have access to a veterinary personnel at all times.

5. Public investment in infrastructure such as roads for easy reach and transportation, electricity supply for preserving the milk is necessary to spread market incentives countrywide.

6. Addressing the policy on communal grazing for disease control and improvement of animal quality.

FLEXI BIOGAS: MAKING BIOGAS PORTABLE AND AFFORDABLE

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The Flexi Biogas system is an innovative portable biogas model manufactured in Kenya. Similar to an open-ended pillow case, it consists of a plastic digester bag housed in a greenhouse tunnel.

The tunnel acts like an insulated jacket, trapping heat and keeping the temperature between 25 and 36 degrees Celsius. This combination of the tunnel and the plastic digester increases the fermentation process and reduces the retention time (the time it takes for organic material to break down), ensuring a high rate of gas production levels. The system works for farmers with only one or two cows as it requires only 20 kg of manure to produce the same amount of biogas as conventional fixed dome systems. The simplicity of the installation, the affordable cost and the opportunity to produce renewable energy with resource-poor farmers, convinced the International

Fund for Agricultural Development (IFAD) to allocate a small grant to pilot the technology as part of the Innovation Mainstreaming Initiative funded by the UK Department for International Development.

Between May and September 2012, ten Flexi Biogas systems were installed at smallholder dairy farms in Nakuru (Kenya) within the IFAD investment project "Smallholder Dairy Commercialization Project (SDCP)". Based on the initial positive results on the ground, an additional ten Flexi Biogas systems were piloted at smallholder dairy farms in Kirehe (Rwanda) within another IFAD investment project "Kirehe Community-based Watershed Management Programme (KWAMP)". The results were once again very positive and there is now a plan to install a further 100 Flexi Biogas digesters as part of the scaling up phase in Rwanda. The request for field testing has grown steadily since: the technology has also been successfully tested in India (Orissa State), Sao Tome and Principe and soon in Bangladesh, Mali, Nepal, Pakistan, Swaziland and Vietnam.

Why is this technology well received by smallholder farmers? During the field testing, the Flexi Biogas system affected farmers positively in countless ways and many benefits were recorded. Most importantly, the biogas has had an impact on the lives of women and children. In Rwanda, Marie Goreti Twagirumukisa is one of the farmers who chose a Flexi Biogas kit to produce energy for her kitchen and house. She owns two cows, the first one was given to her by the government to thank her for having saved and raised a lost baby during the 1994 genocide. With the manure from her cows, she can produce enough energy to cook for about three hours per day. A double-hob gas cooker was provided as part of the biogas kit. "I am very happy with the biogas, it's very easy to use and saves me time as I don't need to collect wood anymore," she said. "I went to see a conventional system and thought it was too complicated to use for me so I chose this one." Biogas also has health benefits for small farmers as they no longer have to breathe in all the smoke produced by burning wood in their house.

The biogas has largely replaced other sources of energy (mainly firewood, charcoal and sawdust) for all ten farmers in Nakuru. Firewood collection is a time-consuming activity for women and children which can take several hours per week. The utilization of biogas also makes cooking faster and easier. John Kariuki is one of the farmers with a Flexi Biogas system and is responsible for collecting firewood because his wife is physically handicapped. He said that his life has completely changed and will never be the same again thanks to the introduction of biogas in his household. With biogas, he adds, his wife is now able to make light meals and warm food without any assistance since there is no need to bend down to cook using the traditional "three-stone fireplace".

The pilot study shows that in Kenya farmers who have adopted Flexi Biogas systems manage to produce enough biogas daily to cook dishes such as rice, Ugali, Githeri (a local dish of boiled maize and kidney beans) and many others. Lucy Kimani, one of the beneficiary farmers, had this to say about how she used the time saved in collecting firewood. ''Since I started using biogas in my house I manage to spend more time on the farm both in the morning and evening." She added that with the introduction of biogas "I attend all the women's group activities without any worry because the tiring exercise of looking for firewood is no longer part of my life.''

By producing biogas with cow dung, another benefit from the biogas digester is the bio-slurry obtained produces an effluent that has been proven to have higher nutrient concentrations than chemical fertilizers and organic compost. This effluent has the potential to replace current fertilizers and improve soil fertility and crop productivity, thereby increasing income levels. Smallholder farmers have realized the benefits of this organic fertilizer and awareness programmes are crucial to enhance the uptake of bio-slurry.

In conclusion, with just one or two cows, the adoption of biogas in an integrated farming system can provide 60 to 100 kg of high quality fertilizer, 2.8m3 of biogas daily for cooking and lighting and 12 liters of milk. IFAD's pilot project has opened up new channels and potential partnerships for globally testing the 'One Cow model'. In Rwanda, the KWAMP project is promoting this model, which comprises two cows, a biogas system and a solar component including a 50watt panel, 60AH automotive battery, charge controller, five lamps and a socket for a phone charger or inverter. The model not only creates employment in rural areas but addresses two of the major problems in sub-Saharan Africa, nutrition and availability of clean fuel.

JUST WELL ORGANISED AND WORKED TOGETHER, THE LIVING STANDARD OF RURAL FAMILIES GETS IMPROVED!

Sok Sotha,
Managing Director, Cambodian Farmers Association Federation of Agricultural Producers (CFAP), Svay Rieng Town, Cambodia

Bun Heam, age 43 lives in Ompel Teun village, Sambo Meas commune, Muk Campol district, Kandal Province. She is a member of Ponleu Kaksekor Thmey (PKT), meanings new farmers' light. She has three children (1 boy and 2 girls). The oldest daughter, age 19 while the youngest one age, 12. Because of the poor, her oldest daughter decided to find job in the city as a garment factory in Kandal Province by giving up her study in grade 12.

Mrs. Heam has 10,000 m2 of paddy field, and she can only grow in dry season because her area if a floodplain (tideland), normally she got 2850Kg/crop/year. Additionally to paddy rice growing in dry season, the family also raises chicken as her part of household income to support the family. I used to raise chicken in a traditional manner and my chicken died a lot in dry season (high temperature), but after I become a member of PKT in 2005, I got technical training on poultries production provided by CFAP, CFAP is the led-organisation of small farmers' organisations in Cambodia. After completion of practical training (on-site training), I started from only 7 chickens which 4 chicken provided by CFAP and 3 others were her own (6 hens and 1 cock), now I have more 100 chicken, and there is no more diseases as before, said Mrs. Heam.

Before she could earn only 560,000KHR to 600,000KHR (US$140 to US$150) from poultries rearing per year, now the production has increased of about 3times difference between old practice and new practice. According to Mrs. Heam, the chicken production is sold once every three month since she has applied new practice and she did four times per year. The sale volume for 4 times is about154Kg per year, the local chicken cost about12,500KHR to13,500KHR per Kg, it is however fluctuated between low season and high season in market demands. Her family could earn around 480,000 KHR to 520,000KHR (US$120 to US$130) for one time (each three month). She sold her chicken for four times per year if there is no serious disease problem.

She said, she appreciated very much with the new application of technical protocols on chicken rearing. The production increasing, not only use for household consumption, but also for sale as income for the rural farmer's family. Her family got loan in credit of 500,000KHR (US$125) from her own organisation (PKT) to improve her to chicken rearing and also small business (groceries).

YOUTH INNOVATION IN LIVESTOCK PRODUCTION: CHALLENGES AND WAY-OUT IN NIGERIA

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Livestock production as a business is seen by most young people as being only for the already rich and wealthy Nigerian, due to the huge start-up capital requirement.

Nigerian youth population between the age of 15 and 35 is accounted to stand at 64 million (Nigerian Bureau of Statistics report; 2012). Among these, an estimated 54% are unemployed with the unemployed females taking up 51.9%.

Agriculture has been identified as a viable means of creating gainful employment for youths and women in Nigeria. Despite the promise of better livelihood through agricultural production; youth manpower is yet to be harnessed for agricultural production particularly in livestock enterprise.

Among the 'excuses' given by young people for this include: access to land and capital, diseases and lack of expertise in livestock production. Haven been into poultry production myself; I have realized that these limiting factors usually thought to be surmountable only through government intervention may not totally depend on government. In the face of these challenges some youths have ventured into livestock production and are creating more employment for other young people with no assistance whatsoever from the government. An opinion poll of a section of these youths in Ilorin and Lagos, Nigeria to ascertain how they overcame the challenges highlighted above revealed that the challenges are really limiting however they have found innovative ways around them.

Land is available in Nigeria, but access to it for agricultural activities is difficult especially for youths. This is due on the one hand to the lack of funds to acquire it and access to information on other means of accessing it. For instance, in Oyo area of Nigeria, the rural community leases out land for livestock or crop production at a rate of N2000/acre. But not many youths are aware of this and those that are; do not see the opportunity it offers. Poultry and fishery production is predominant among youth interviewed with the size of the farm ranging from 100-500 birds.

Land for production is got from:
- using their parents' or family land;
- leasing land with existing poultry production facilities on it,
- at their backyard with some pen structure constructed,
- using space available at the house of family friends
- adaptation of cage system to maximize the use of space above the ground and ease waste collection.

Most of these young people started their production after 2-5years of being unemployed or working. Source of start-up capital include personal savings from the 1 year National Youth Service or from salaries at previous job, with support from parents, relatives and friends; and pooling of resources with colleagues to make a joint ownership of the business. In the last instance, the management of the farm is left in the care of those with some experience in agriculture/ livestock production either from their university education or previous job. However, they still maintain a network of senior colleagues and professionals with more experience in the business and are able to make consultation with them in the case of disease outbreak, or any challenge in the day to day running of the farm for free.

Access to market for broiler chickens is also a challenge for this group. My experience in Ilorin brought to my attention the importance of networking in business. My birds were sold through information from friends on those who needed dressed chicken for their events, supply to fast food centers and restaurants. The trending these days is for 'processors' who buy live birds from the farmers directly, dress and resell to restaurants, hotels and food joints. Most of these processors are young women, some of whom were into backyard poultry production at their parents' house (as described above) but had to relocate when they got married.

There is always market for agricultural products especially with the explosion in population. Livestock production (particularly poultry) provides a cheaper source of meeting the protein requirement of the populace and job creation; as most livestock are not seasonal and are available and affordable all year round. However, there is a gap between the farmers and where the demand for their products is; hence the need for the 'processors'.

Another major challenge identified by the respondents was waste management. Regular cleaning of the pen is done to reduce odor in the neighborhood for those in urban areas while the usual practice is for the waste to be dumped in surrounding land or general dumpsite. This still constitutes nuisance to the immediate environment of the farm causing disapproval from neighbors. Few among the youths are aware of the use of the Gabintech nanotechnology system to eliminate odor from livestock waste and only one was using it on her farm. Beyond the handling the odor, she also has a standing contract with vegetable producers who buy the waste from her farm to use as manure at N100/bag. On her part, she ensures the manure is dry and friable. Very few farmers even among the very established ones exploit the potential revenue from the sale of livestock waste. There is an increasing awakening in Nigeria towards the potentials of poultry waste as a replacement for fertilizer. It is not unusual to find lorry loads of poultry manure being transported to Northern Nigeria from the South West. 75% of the manure dealers are women and the price/bag ranges from N100 to as high as N600 says Mr Ariyo, a farmer and consultant in Lagos.

Since bank loans are not readily available, acquiring land not so easy, nevertheless there is always a way out. The advice to youths is to start small, pool resources together and network. There are so many advantages open to us in this 21st century. We are in connection with the world through our android phones, there are information available to us at the click of few buttons. Our local networks are also important. It is easier to get support from government, funding bodies, relatives and friends when we have put in some effort. In these present times one may not readily find someone to nudge or push you in the right direction; however, looking closely, we find a lot of opportunities around us. Innovation is key to success. Timely access to information is also important.

A changed mindset will go a long way towards reducing the unemployment scourge among youths. It is pertinent to mention that most of us still see farming as being a last resort. The craze for white collar jobs is still rampart, forgetting that the existence of any white collared office job is related to the existence of a production activity somewhere. And there will be no white collared jobs if production stops. I am a testimony to the viability of agriculture as a source of livelihood. I and my siblings owe our education to the income generated from my mum's poultry enterprise and my dad's cassava/maize farm; and as an agricultural science teacher. After my First degree, sustenance through my Master's course was from revenue generated from my broiler sale which was set up as a joint business with a colleague in the backyard of a family relative. The story of the youths identified above buttresses the saying that 'when you think its impossible someone else is already doing it".

MIRRORING LIVESTOCK KNOWHOW IN NEPAL

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A beautiful country in the lap of Himalayas having rich land of diversity, Nepalese agriculture is a way of life and subsistence mixed farming of livestock and crop dominates.
Mountain agriculture is solely dependent on livestock for draft, manure food and fiber. Multi species livestock husbandry is the special feature of subsistence farming in Nepal. However, with changing socio-economic dynamism, farming is majorly practiced by women, children and elder citizens since there is increasing trend of youth migration in foreign countries.
With the migration of male counterparts to the foreign labor market, a house wife is being engaged in each and every stuffs which earlier she didn't use to. According to 6th National Agricultural Census 2012/13, the involvement of women in Agriculture has increased from 8 to 19 percent in the past decade

Definitely the increased trend of out migration will threaten the agriculture production of the country. But, there are many instances where the youth after returning back to Nepal are working in fields with improved technology. Poultry farms, Improved cattle farm, Goat farm and many small agro-industries are the areas where youths are being engaged in. An example to cite is; Rohit Rai, who returned from South Korea where he had worked in a mobile company, started a cow farm providing employment to others. He has planted the nutritious fodder grass like Napier, Berseem and uses chaffer machine to make them palatable feed. At first it was a Herculean task for him to convince that there are opportunities in Agri-entrepreneurship but now he has become a source of inspiration to other youth.
But a women is just a follower of the decision made by her male counterparts. She does have less chances in decision making. There are rare instances of initiative taken by women in livestock enterprises.

Livestock as National Economy

The numbers of domestic animals are increasing and so is the status of domestic animals and fowl production. Cow and buffalo milk has increased by 3.6 percent, meat 2.6 percent and egg 4.69 percent comparing to fiscal year 2011/12 (Economic Survey 2013). It is encouraging that poultry alone shares 11.5 percent to the Livestock GDP and 4 percent to the national GDP (Krishna Kaphle, 2014). Lot of young people are engaged in the production, processing and marketing of poultry products. Several findings depicted that there are number of animals and animal production are in increasing trend but still far below the national requirement.

Government Programs in Livestock Sector

Government Programs in Livestock Sector Aiming to attract the active rural youth, GoN is creating opportunities of employment, Rural Youth Self Employment Livestock Development (2008), Dairy Animal Production Program (2013), Animal Health Program (2013), which also focuses on study and research regarding the animal health. Commercial Forage Seed Production and Marketing Program (2014) has been launched while making consideration on nutritious feed to make good health of animal. Karnali zone special Agriculture Project has been launched in the most rural part of the country, since 2004.

Agriculture sector is full of risks. Similarly Crop and Livestock Premium Subsidy Program to attract the farmers, private and cooperative sector to invest in commercialization of animal production.
This program aims to increase the investment reducing the potential risks. The risks are insured by the Government providing 50 percent of the subsidy. Small Farmer Development Bank Limited is providing credits to rural farmers run agro-based enterprises.
Also, Government of Nepal has introduced **Group approach** of agricultural extension system in 1988/99 to transfer the technologies to the farmers encouraging women's participation which is ongoing.

Despite, dreary formalities and tiresome processes for obtaining the incentives, lack of access to information, insufficient incentives, unavailability of sufficient inputs , vague land use policy are making agriculture sector and livestock subsector less charming and provoking youth to migrate abroad for employment. Also, Government launch limited programs, so they could not strike the grass root impact level. Besides, inefficient marketing and distribution system, slow development of transport and communication infrastructures,

uncertain outbreaks of epidemic diseases like bird flue and lack of skilled technicians to cater these issues, lack of processing industries for value addition, unavailability of improved breeds and nutritious feedstuffs are discouraging youth to initiate livestock enterprises. Increasing trend of commercial crop production with heavy pesticides application is a burning constraint of beekeeping. Agriculture Development Strategies should address these issues and also create policies to attract youth in agri-entrepreneurship.

Agriculture sector is providing employment opportunities along with food security to the huge number of population. The present less output can be accelerated by proper nutritious feeding, organized breeding, scientific management and use of advanced technologies for disease control programs and for these to achieve, production of skillful livestock graduates is imperative as they are those who work in the future. Youths who are returning as “brain gain” are key to contribute to steam the engine to drive self sufficiency in food production of Nepal.

UNDERSTANDING LIVESTOCK-BASED LIVELIHOOD VULNERABILITY TO CLIMATE CHANGE IN BENIN THROUGH YOUTH

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Livestock in the African Sub-Saharan countries is practiced through a variety of systems: nomadic pastoralism, sedentary system and various intermediate systems.
The development of these systems is related to the level of input use, land constraints and market integration. The diversity of livestock systems is due to both the variety of agro-ecological environments, animal species but also to socio-economic and political contexts. The development issues relating to these systems are food security of rural and urban populations, the global fight against poverty and the exploitation of natural resources.
But these farming systems are facing several problems including climate change which has direct and indirect significant effects on animal production. Indeed, climate change is now evident and is negatively affecting the poor people and their economic activities. According to IPCC (2007), the African Sub-Saharan is one of the most vulnerable areas to the effects of climate change because the survival of rural communities depends primarily on the exploitation of natural resources, especially through agriculture, livestock and fisheries.

Benin is experiencing the same problem and according to the national report of Livestock Office (2002), livestock is the second agricultural activity in Benin after crops production and much remains to be done to ensure food self-sufficiency especially in animal products. This activity represents then an important component of Beninese economy that requires the attention of policy and decision makers through policy briefs, lobbying, etc. based on sound scientific conclusions. It is therefore important to study the impacts of climate change on livestock systems in order to reach scientific conclusions that guide policy and decision makers in their decisions of development actions relating to livestock.
On the other hand, in order to achieve these outcomes, many researches have to be done on the field for designing future relevant actions. But, youths are the future actors that will implement and make decisions about these above actions. It is therefore relevant to involve young people especially young researchers in research targeting livestock issues because livestock sector is lacking researches especially in studying livestock-based livelihoods vulnerability to climate change. Moreover, youths are now the major part of Africa populations that have to be associated to policies. Indeed, they represent the new force of progress in improving African agriculture and different African policies developed in this direction including the Comprehensive Program for the Development of African Agriculture (CAADP) promote the need to strongly involve young people in agriculture.

That is the reason why the nonprofit organization ACED is supporting a young professional in agriculture for researching in climate change issues and livestock in Benin. This research will enhance knowledge in this sector and enable policies design. Thus, due to fact that many developing countries are facing the same problem (lack of knowledge in livestock sector and need to involve more young professionals in agriculture issues), it is therefore relevant to replicate this Benin experience.

NOAH'S ARK TO SAVE THE ITALIAN FARMS

In the framework of the 111th International Agricultural Tech-nologies Show in Verona, the most rare and precious breeds of cows, hogs, horses, donkeys, sheeps, rabbits, ducks and chickens protected from the extinction's risk by Italian breeders were displayed.
The initiative, sponsored by the Italian farmers' organization Coldiretti in cooperation with Italian National Breeders' Association (AIA) offered the opportunity to see these unusual breeds saved from extictions thatnks to the hard work and dedication of Italian breeders.

IAI EXPO 2014

The 8th Edition of the IAI Expo will take place from 20 to 22 February 2014 at Pragati Maidan, Hall n. 4 and 5, in New Delhi.

The Expo will bring together government authorities, policy makers, breeders and private industries to facilitate a discussion on public private partnerships and to facilitate industry to debate critical issues of the industry.

http://www.iaiexpo.com/

8th in series

IAI EXPO 2014

Leading exhibition on Dairy, Poultry & Livestock Industry

TECHNOLOGY AND SUSTAINABILITY RARE BREED GET A WAKE UP CALL

A South Dakota dairy farm illustrates how technology is used to keep the operation sustainable. Water is reused, reclaimed and recycled on MoDak Dairy Inc. near Kranzburg, South Dakota.

The use of technology is extremely important to achieve sustainable development in agriculture.

http://www.agweek.com/event/article/id/21335/group/Livestock/

WARMER SEAS "ARE MAKING FISH SMALLER"

Scientists found that some species of fish in the North Sea decreased in length by up to 29% over nearly four decades as water temperatures rose. The decline in the size could be due to a rise in water temperatures, according to research, but other factor could be the availability of food and an increase in fishing.

The reduction did not apply to all species, with the length of cod remaining steady and sole decreasing by only 1% over the study period.

http://www.theguardian.com/environment/2014/jan/28/warmer-seas-are-making-fish-smaller-water-temperatures

WORLD MEAT CONGRESS 2014

The World Meat Congress is a biannual event host by the International Meat Secretariat (IMS).

This year the Congress will be held on 15 and 16 June, 2014 in Beijing. It is a global platform for the delegates of livestock and meat sectors to discuss the hot topics concerning meat industry development, such as meat production, quality, distribution and trade, sustainable economic growth and employment, disease control, animal welfare, food and nutrition.

http://www.worldmeatcongress2014.com/en/index.php


WORLD FARMERS ' ORGANISATION