From Lead implementing scientist

In this quarter the programme has achieved a number of things which include enhanced smallholder farmer resilience to shocks in Malawi, intensified 1-2 vaccination campaign in Malawi, goat breeding initiatives in Malawi, development of a disposable multisampling artificial vagina for semen collection in rabbits in Nigeria and conduction of a stakeholder summer camp in hydroponic fodder production in Kenya.

You can also get a copy of the newsletter online and help us circulate it widely. Please take some time to sojourn through our newsletter and website.

LUANAR intensifies I-2 Vaccination Campaign in its surrounding Villages in Malawi

Newcastle disease is one of the key factors reducing the population of Chicken in Malawi. In response to this predicament LUANAR through iLINOVA programme introduced a vaccination campaign to increasing awareness of the community based institutional structure to enhance vaccination of chickens among smallholder farmers. Currently, four clubs have been established through which training on governance issues and other technical areas relating to village poultry will be delivered.

So far members of three clubs (Mkaka, Nkhomani and Mtande) have been trained on how to administer I-2 vaccine and the farmers are now able to vaccinate chickens. The intervention is not only benefiting farmers in clubs, but also none club members, though at a cost. A fee of MWK20.00 (equivalent of $0.04) is levied per bird vaccinated. Most of the households in the area own at least 15 chickens. Thus in a way, the clubs also generate income from this programme. The target for this intervention is to benefit more than 1000 chicken keeping families in the villages around LUANAR.
**iLINOVA enhances smallholder farmer resilience to shocks in Malawi through breeding**

In complementing government of Malawi’s efforts to improve the livelihood of smallholder farmers, Lilongwe University of Agriculture and Natural Resources (LUANAR) through iLINOVA programme is promoting Indigenous Chicken (IC) and Black Australorp (BA) production through distribution of fertilized eggs from its breeding unit.

Through the programme, four breeding clubs namely Mkaka, Khomani, Mtande and Mkwinda had been established in Lilongwe district by June 2015. The total membership in the clubs was 114 of which 82% of the total beneficiaries had already received fertilized eggs. The average hatchability of the eggs was 64% with some beneficiaries attaining hatchability as high as 90%. Only farmers who had broody hens received the fertilized eggs and on hatching, paid back 50% of the chicks to the programme.

LUANAR monitors the performance of the chicks and provides both extension and technical services. It is envisaged that this intervention will result in increased number of IC and BA per household and hence increasing households’ resilience to different shocks such as failure of crops or during emergencies.

**Stakeholder Summer Camp on Hydroponic Fodder Production Technology**

Egerton University hosted the second stakeholder summer camp on 9th to 13th March, 2015 at its Njoro Campus. The purpose of the summer camp was to strengthen capacity on management of indigenous livestock which is in line with the overall mission of ILINIOVA project. Forty participants drawn from all over Kenya attended. The focus of the summer camp was application of technology and innovation in fodder production and livestock feeding with specific reference to hydroponic fodder production. Eleven presentations were made. These included “Livestock feed industry in Kenya” aimed at introducing the participants to the livestock feed industry in Kenya. “Hydroponic fodder production” that entailed two modules namely background on hydroponic fodder and nutritional benefits of hydroponic fodder. “Principles and practice of hydroponic fodder production; establishment and management” that focused on hydroponic site selection, setting up of a simple hydroponic unit, fodder growing techniques and seed selection, supply, treatment and costing. “Challenges in hydroponic fodder production” aimed at familiarizing participants with the challenges that most farmers who have ventured into hydroponic fodder production without professional training face. “Digestive system of ruminants and non-ruminants with regards to fodder utilization”, “Fodder and feeding management”, “Integration of aquaponics into hydroponics”, “Proximate analysis of feeds( laboratory procedures)”, “Livestock genetics and its influence on efficient utilization of fodder” and “Entrepreneurship and hydroponic fodder enterprise”. This summer camp helped to create a synergy that could contribute to further adoption of hydroponic fodder production technology.
Smallholder farmers in Nsanje, Lilongwe and Mzimba pick up community goat breeding initiatives

Farmers in Nsanje (Magoti), Lilongwe (Mkwinda and Mitundu) and Mzimba (Zombwe) have embarked on a community goat breeding program with technical support from LUANAR, Egerton and BOKU Universities; and financial support from USAID and EU. The program is an integration of two projects; the African Goat Improvement Network (AGIN) and ACP S&T Indigenous Livestock Improvement (iLINOV A). Focus group discussion with the farmers showed that farmers practice traditional breeding with communal use of buck, but do not objectively select parent stock in their flock. In fact, marketing forces drive farmers to select large sized animals for sale to fetch more income. Farmers agreed from a joint analysis of the situation that over time the size of the goats have been getting smaller, inbreeding is common due to use of young bucks and no control strategy such as castration was in place. The farmers practices in selecting crop seeds was used as an example to help them understand the need for selection in livestock and the need to develop indigenous goats through selective breeding.

Through the project, farmers were able to describe the characteristics of goats that are of interest and these included, big sizes, high growth rate, twinning rate, good mothering ability and disease resistance. The farmers also expressed interest to be involved in goat selection program. A survey in the study area showed that most farmers in Magoti have flock sizes of 5-30 goats. One farmer however had a flock of about 110 goats. In Zombwe the flock size ranged from 5 to 47 goats. Some farmers also had some Boer bucks, although no appropriate breeding program was in place.

Out of all the farmers sampled in Magoti one farmer had an adult breeding buck. Majority of farmers in Mzimba raised young male goats up to breeding stage. In Lilongwe, one or two bucks grazing with females in their flocks would mate. This suggested that they lacked adequate information on the importance of adult breeding bucks. The farmers were briefed on the need to use adult bucks for breeding and have a community breeding programme with communal breeding bucks. The major contributing factors to the decline in the number of bucks were the festive seasons such as Id Mubarak which comes with very high demand for goats, particularly males. The project reckons that this as a market opportunity for the farmers which needs to be preceded by appropriate breeding programs and realistic targets for sustainability of goat production and contribution to rural livelihoods. Currently, especially in AGIN areas of Nsanje and Mzimba, data recording is taking place to establish selection criteria that will match with farmer based traits and goals, in order to select breeding bucks between 3 and 4 months of age. Farmers agreed to castrate the unselected males and these will grow to slaughter or market weights.

The initiatives are new in Malawi and aim at enhancing productivity of local breeds rather than introducing exotic bucks. Inherently, the innovations are also mitigation to climate change which is a challenge in the pilot regions.
The Teaching and Research Farm of Obafemi Awolowo University (OAU), Ile-Ife, has one of the best stocked rabbit experimental stations in Nigeria. However, evaluating the fertility of the rabbit bucks on the farm has always been a challenge, because of the lack of artificial vagina (AV) for semen collection. This challenge was recently overcome after Dr. Idowu Ola developed an improvised rabbit artificial vagina (nicknamed OLIRAV) from readily sourced laboratory consumables. Dr. Ola is a Reproductive Physiologist in the Department of Animal Sciences of OAU.

OLIRAV was developed from a 20 ml syringe, 5 ml sample collection tube, latex condom and rubber band. Water at 40°C is used to supply warmth for the inner lining of the apparatus. OLIRAV is easy to assemble and in operation, takes less than 30 seconds to collect semen from a properly stimulated buck. OLIRAV was tested over several trials and proven very effective compared to commercial AV brands.

The OAU-iLINNOVA project funded a study that compared the efficiency of OLIRAV to a commercially available AV. The result showed no significant difference between the commercial AV and OLIRAV in the buck's response interval, semen volume and semen concentration. Semen collected with OLIRAV was used to inseminate does and the animals delivered kits that were thrifty with litter sizes ranging from 4 to 8.

OLIRAV has a number of advantages over the commercial brands of rabbit AVs, the most important being its low cost. It costs only about ₦100 Nigerian naira (about $0.5 USD) to build one OLIRAV which is reusable for several semen collections. The apparatus could be disposed off after the day's collections and thus removing the necessity to sterilize for reuse, as is the case with commercial brands. The materials (syringe, collection tube and latex condom) used for building OLIRAV usually come in sterile packaging, which guarantee the cleanliness and safety of OLIRAV for use.

According to Dr. Ola, this latest innovation in the field of animal reproductive technology will make fertility studies with rabbits much easier and cheaper but more importantly, will bring the use of Artificial Insemination technique to the door step of rabbit farmers in the less developed economies.
Chitedze Liquid Feed

Dairy production is faced with deficiencies in energy, protein, vitamins and minerals. As dairy animals depend largely on pasture and crop residues to meet their requirements. Smallholder farmers supplement their dairy animals with maize bran and low quality forages. However the low protein content of maize bran limits its utilization. Due to this reason the Ministry of Agriculture, Research Department in Malawi came up with Chitedze liquid feed where they mix

- 70% cane molasses,
- 10.8% urea
- 1.2% vitamins & minerals
- 18% water

Chitedze Research is evaluating indigenous chicken droppings to replace liquid feed. Chicken manure makes an excellent feed supplement for cattle, goats and sheep. It is high in urea, a source of nitrogen, which improves the environment in the animal’s rumen. In addition to that chickens manure is readily available in Malawi.

Since chicken manure can carry bacteria that cause salmonella and coccidiosis disease. The manure is first dried and the animals are dewormed every three months. This Programme will on the other hand promote rearing of indigenous chickens by dairy farmers.

Liquid feed is fed by mixing it with chopped grass or maize bran. It increases milk production in dairy animals.

Indigenous chicken

Chitedze Liquid Feed

Cows feeding on maize bran mixed with Chitedze Liquid Feed

Dried indigenous chicken droppings
University-civil society linkages and indigenous livestock sector development

As part of the activities of the iLINOVA-OAU project, key stakeholders’ fora were conducted to familiarize diverse groups and stakeholders about the iLINOVA project and to solicit their full cooperation and participation. The first forum which was held on the 17th of May, 2014, represented a gathering of iLINOVA-OAU PAC members, researchers and livestock farmers from Osun and Oyo States, southwestern Nigeria. This forum, in particular, represented a typical scenario of University–Civil Society linkage. Goals OAU partner (ii) Contributions by a representative each of the livestock association on the status of each indigenous livestock with respect to production, processing and local value chains and networks. (iii) Break-out sessions to discuss issues related to the strengths, weaknesses, opportunities and threats associated with each of the indigenous livestock species. Participants agreed that the collaboration will be guided by the following sub-themes: diversity of ecotypes and sub-ecotypes of indigenous livestock, management,

of this gathering included: (a) intimating participants about the iLINOVA project objectives, activities and expected outcomes; (b) seeking their consent and full cooperation and participation under the principle of prior informed consent, and (c) drawing up a common agenda for the implementation of the iLINOVA project.

Members of the participating livestock farmers’ groups included leaders of associations of livestock producers for quails, chicken ecotypes (Yoruba and Fulani), rabbits, grass cutter, goats, sheep and cattle. The academic community was represented by the OAU iLINOVA team (Drs. S.O. Oseni, S.I. Ola, O.A. Makinde, I.O. Dudusola, B.A. Ajayi and Mr. M.A Popoola) as well as staff and post-graduate students of the Department of Animal Sciences.

Highlights of the programme included: (i) Formal briefing of the stakeholders about the project by the iLINOVA-OAU partner (ii) Contributions by a representative each of the livestock association on the status of each indigenous livestock with respect to production, processing and local value chains and networks. (iii) Break-out sessions to discuss issues related to the strengths, weaknesses, opportunities and threats associated with each of the indigenous livestock species. Participants agreed that the collaboration will be guided by the following sub-themes: diversity of ecotypes and sub-ecotypes of indigenous livestock, management,

The forum was an excellent platform for interaction between the University and the civil society and it brought about the following: (a) awareness about the iLINOVA project – objectives, activities, and expected outcomes - ; (b) principle of prior informed consent was accomplished; (c) cooperation of indigenous livestock producers was pledged; (d) agenda for further collaborative activities including summer camps was agreed upon. Essentially, the event laid the foundation for a common agenda on University-civil-society linkage that presents a win-win outcome for the University and owners of indigenous livestock units.

Participants of the stakeholders meeting at OAU
Turkey Rearing  

**Introduction**

Turkey is a large poultry bird indigenous to the North and South America. It is more popular in the USA, UK, Canada, Germany, France, Italy and the Netherlands because of the christian culture of eating turkey during Thanksgiving. The domestic turkey is usually black or white in color and belongs to the genus meleagris and species gallopavo. The male (tom) is much larger and more beautiful than the female (turkey hen) and tend to have a shorter lifespan. Turkey is kept for its meat, eggs, feathers, aesthetic value and occasionally as a pet. Under commercial production, the turkey is mainly kept for meat since it has a rapid growth rate and high dressing percentage of 80-87%.

**Housing**

It is important to house turkey birds in waterproof, spacious and well ventilated room. The width of the house should be around 9 meters and the height may range from 2.6 to 3.3 meters. The floor can be made of wood or concrete and should be well covered with litter. Floor space should be regularly adjusted according to the age of the bird up to maturity.

**Feeding and watering**

Turkey birds have high nutritional requirements than the chicken and require properly balanced rations. Energy, protein, mineral and vitamin requirements vary according to the age and sex of the bird. It is important to raise the male and female birds separately to ensure adequate supply of energy and protein requirements based on the sex of the bird. Clean drinking water should be provided ad libitum especially during the hot season. Given that turkey birds are more prone to leg problems, shell grit may be provided at the rate of 30-40 gm per bird daily. Greens are also important to turkey and can be fed as part of the diet.

**Breeding**

Sexual maturity in turkey birds is typically attained at about 20-24 weeks. Natural mating is frequently practiced and the mating ratio is usually 1:10 tom to turkey hens which can be altered according to the breed/variety size. Some toms tend to have a preference of mating a particular hen and it is therefore important to change the toms after sometime. Generally turkey hens start laying eggs at the age of 24-32 weeks producing 88 to 99 eggs. It takes a period of 28 days to hatch the eggs by way of natural or artificial incubation. Turkey hens can produce about 40-60 poults annually.

**Brooding**

Poults require good environment immediately after hatching. They need to be confined in a special housing commonly known as the brooder for a period of 4 weeks after hatching. The brooder and all the necessary equipments ought to be thoroughly cleaned and disinfected before the poults arrive. The room should be heated at 35 degrees Celsius by means of infrared bulbs during the first one week and can be reduced gradually by 5 degrees thereafter. Adequate spacing and proper ventilation is also essential. Provide enough waters and feeders.

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**Strengthening Capacity for Participatory Management of Indigenous Livestock to Foster Agriculture Innovation in Eastern, Southern and Western Africa (iLINOV A)**

**CALL FOR SMALL GRANT PROPOSALS FOR iLINOVA COLLABORATIVE / COMMUNITY BASED RESEARCH AND DEVELOPMENT PROJECTS**

**Call identification number:** iLINOVA/001/01/2015

**1. BACKGROUND**

The iLINOVA project is co-financed in the ACP-EU Cooperation Programme in Science and Technology II (S&T II); a programme of the ACP Group of States, with the financial assistance of the European Union. The project is led by Egerton University, and implemented in Kenya (by Egerton University), Malawi (by Lilongwe University of Agriculture and Natural Resources), and Nigeria (by Obafemi Awolowo University). The project started in January 2014 and will run for three years to December 2016. The overall goal of the project is to enhance institutional capacity in science, technology and innovation (STI) to foster agricultural innovations through interdisciplinary and participatory approaches to efficiently manage indigenous livestock (IL) for enhanced contribution to poverty reduction, food and nutrition security, and sustainable development in Eastern, Southern and Western Africa. Details of the project can be found at www.ilinova.org including specific objectives and expected results. Among the activities included situation analyses that revealed critical technical, institutional and technical gaps in the use of STI to manage IL by stakeholders. Knowledge building requires research engagement, and this is the purpose of the call for small grants under one of the activities of the project.

**2. THE CALL FOR SMALL GRANT PROPOSALS**

The research is to address the need to develop and apply appropriate technologies and innovations that can foster efficient management and utilisation of IL in the region. It is intended that through research, human capacity of scientists and students will be enhanced in the management of IL, with knowledge generated that will inform policy and technical decisions and guidelines. Sustained and efficient use of IL is also regarded as driver and precursor for climate change mitigation in smallholding communities. We therefore, expect projects that fulfil the following among others:

1. Development of appropriate and adaptation technologies for efficient management and utilisation of indigenous livestock (IL)
2. Integrates IL into existing farming systems and value chains

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**Hunger & starvation in Africa have lasted too long. But Africans are not consigned to a lifetime of food insecurity” - UNDP African Human Development Report 2012**

[www.ilinova.org](http://www.ilinova.org)
3. Engages students as interns and scientists, and communities as custodians of IL.
4. Integrates use of IL for climate change adaptation and mitigation.
5. Utilises and adapts tools developed by FAO and AU-IBAR to evaluate and develop and monitor IL.
6. Develop and test technologies that promote and disseminate IL genetic resources.
7. Improve indigenous based knowledge and technologies for IL development.
8. Informs policy development and decision making.
9. Refine, promote and disseminate knowledge, attitude and practices related to the management of IL.

3. NATURE OF GRANTS
The size of the budget for each grant will be based on the scope and focus of proposals. Scientists are strongly advised to engage students and the communities, and be able to constantly provide feedback to stakeholders. The grant may form top up grant for postgraduate studies, especially at MSc level.

4. DELIVERABLES FROM THE RESEARCH GRANTS SHALL INCLUDE
- The generation of research outputs addressing key questions on ST&I for management and utilization of IL in Kenya, Malawi and Nigeria. Typically this will take the form of publications in high quality peer-reviewed academic publications and usable technology development and deployment.
- The effective dissemination of research findings to stakeholders, key policy and decision makers. This will be indicated by examples of engagement with policy-making processes.
- Strengthening capacity of upcoming researchers to lead and manage research.

5. ELIGIBILITY
The call is open to staff and students. Due to small nature of grants, it is expected that prospective projects will be conducted on campus or in the communities that surround the campuses, though justification to work in other communities will be entertained. Proposals that integrates existing projects for synergy will be preferred.

6. FORMAT FOR DEVELOPING PROPOSALS
The proposal should include:
- Develop a title that should be brief and clear
- Outline the background and describe the research problem, objectives, methodology, expected outputs, location where the work is expected to be carried out, and give an indicative budget;
- Not exceed 10 pages, excluding the attachments - with single spaced paragraphs and font size 12 Times New Roman in Microsoft Word.
- Proposal should be submitted on prescribed form.

It is permissible for potential competitors who have queries concerning the compliance stipulations, other requirements and technical details of this call to contact:
Dr S O Oseni (soseni2@yahoo.com) for Nigeria
Prof. A. K. Kahi (a.kahi@incip.org) for Kenya
Prof. T. Gondwe (timgondwe@yahoo.com) for Malawi

7. SUBMISSION OF THE PROPOSALS
Submission should be in a form of electronic copy. The application form can be downloaded from www.ilinova.org. There is no deadline for submission of proposals but receipt of proposals and funding will be determined by the available budget. When the proposal is duly completed save the document as ‘last name of principle investigator-iLINOVA Call 2015’ (e.g. Name – iLINOVA call 2015). The electronic copy should be in word format. Please send electronic copies of the proposal to
Dr S O Oseni (soseni2@yahoo.com) for Nigeria
Prof. A. K. Kahi (a.kahi@incip.org) for Kenya
Prof. T. Gondwe (timgondwe@yahoo.com) for Malawi

The decisions taken as a result of the review process will be notified to the applicant of each proposal within three weeks after receipt of proposal.

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