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**ANNUAL PROJECT PROGRESS REPORT 2008**

**and**

**OUTLOOK 2009**

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## Introduction

As in previous years, 2008 was part of an extended transitional period between the Medium-Term Plan 2001-2004 and new institutional and research orientations. The uncertainties about the financial recovery had severe repercussions on institutional operations and staff strength, and made a follow-up on a draft medium-term plan 2005-08 and a draft long-term strategic plan until 2015 obsolete. The re-definition of the Centre's role at national, regional and international levels in consideration of the demands and drivers in livestock research and development remained an uncompleted task in 2008, despite the guiding recommendations and measures taken by the Gambia Government and the Council of ITC.

The structure of the preceding ITC annual project progress report is again adopted, by highlighting the R&D activities and achievements under the respective institutional programmes and projects, with reference to the contributing sources of funding. Under the 'Outlook 2009', the report contains a short narrative of projects and activities under continued implementation or upcoming in 2009. This is in lieu of a separate annual workplan document for 2009, which appears, again, justified, because of the institutional circumstances and the limited number of activities, particularly at the regional level.

The provided information is largely based on the technical reports and forecasts of the project and activity leaders in charge.

The Centre-driven activities implemented in The Gambia and regional partner countries in 2008, in most cases special donor-funded projects, were executed in the framework of the institutional programme and project structure of ITC (Table 1) that defines and addresses the Centre's R&D priority areas in the low-input (LISIP) and market-oriented production systems (MOSIP) as well as those of cross-cutting nature (SOLIP).

Table 1. Institutional Programmes and Projects of ITC

Institutional Programme	Institutional Project	Contributing special funded projects in 2008
Low-Input Systems Improvement Programme (LISIP)	IP1: Disease risk and control for improved livestock productivity	INCO
	IP2: Strategic exploitation of indigenous animal genetic resources for sustainable development	
	IP3: Natural resource management for enhanced productivity and sustainable environments	IDRC IFAD
	IP4: Regional Project on Sustainable Management of Endemic Ruminant Livestock in West Africa (PROGEBE)	AfDB GEF
Market-oriented Systems Improvement Programme (MOSIP)	IP5: Developing meat and milk systems for market-driven enterprises	IDRC
	IP6: Appropriate feeds and feeding strategies in livestock systems for nutritional security	
	IP7: An application of biotechnology for improved animal health and production	INCO
Systems Overlap and Linkages Improvement Programme (SOLIP)	IP8: Consumer safety and public health aspects of food production systems	VLIR
	IP9: Socio-economics and policy dimensions of livestock base agriculture	CIDA
	IP10: Training, capacity building and information exchange	

The donor funded special projects that contributed to the implementation of the ITC Institutional Programs and Projects during the reporting period were:

- IDRC**            Scaling-up Agricultural Innovations and Food Security Systems in The Gambia and Sierra Leone. Integrated Peri-Urban Systems: Horticulture and Livestock in West African Cities (Phase 3). IDRC Grant 103202-001. Started January 2006 for 3 years until end of 2008. Presently it is extended for another year ending in Dec 2009.
- IFAD**            Enhancing the Local Natural resources Exploitation for Livestock Development. Small Grant 848. Start & duration: August 2006 for 1,5 years; extended until June 2008. Closed in Dec 2008
- VLIR**            Epidemiology and Control of Zoonotic Infections in The Gambia and Senegal. Flemish University Development Cooperation (VLIR-UOS) Own Initiative Project. Start & duration: 1/6/06-31/5/10 (4 years).
- INCO/EC**        EPIGENEVAC - Epidemiology and new generation vaccines for Ehrlichia and Anaplasma infections of ruminants. Research grant 003713 (1/7/05-30/6/06), extended/renewed until end of 2007. Project has ended in early 2008.
- CIDA**            Implications for Agricultural Development and Research (CIDA). Contribution Agreement No 704 1480. Started in May 2006 for 6 months of operations; extended by contract amendments until March 2008. Closed in March 08
- PROGEBE**      Regional project on Sustainable Management of Endemic Ruminant Livestock in West Africa. The project is mainly funded by GEF, AfDB, and Governments of the four countries: Gambia, Guinea, Mali and Senegal. It has started since 2008 and will last for at least six years.

## **Low-Input Systems Improvement Programme (LISIP)**

A larger segment of the livestock-based production systems in West Africa continues to use traditional husbandry methods, whereby producers essentially rely on browses and grasses from natural pastures/range lands and crop residues for livestock feed, with very little veterinary care provided to the animals. These systems are referred to as traditional, local unimproved or low input but they provide a living for the vast majority of resource-poor farmers in West Africa. Outputs from these systems are usually only marginally to moderately larger than subsistence requirements.

Tsetse-transmitted trypanosomosis, ticks and tick-borne infections, for example anaplasmosis, babesiosis, cowdriosis, and tick-associated diseases, such as dermatophilosis, together with gastrointestinal parasites constitute the major pathological parasitic complexes responsible for limiting animal health & production in low-input systems. It is argued that indigenous livestock found in these systems have useful traits such as disease resistance, which could add to sustainability of production, if properly exploited.

The Institutional Programme 'LISIP' contributes to technological options for better exploitation of trypanotolerant and other adaptive traits of indigenous breeds of cattle and small ruminants.

### **IP1: Disease Risk and Control for Improved Livestock Productivity**

The long-term objectives of this Institutional Project are to:

- characterize indigenous ruminant livestock and their productive environment;
- conduct participatory selective breeding of indigenous ruminant breeds and to assist in the creation of community/association managed dispersed nucleus breeding herds;
- study the resistance/resilience of endemic ruminant livestock to vector-borne and other diseases and to assess under what conditions susceptible genotypes may be used in traditional low input systems.

Activities under this program have come to a halt as a result of the end of the INCO/EC project during this reporting period. The lead scientist of this program, Dr Bonto Faburay had also left the centre in April 2008.

### **IP2: Strategic Exploitation of Indigenous Animal Genetic Resources for Sustainable Development**

The objectives of this Institutional Project are in addition to those of IP1 to:

- evaluate the biological and economic impact of stress factors that affect the stability of tolerance to diseases in pure and crossbred cattle;
- study the resistance/resilience of crossbred ruminants to vector-borne diseases and to assess under what conditions susceptible genotypes may be used in traditional low input systems.

## IP2-1: Pure breeding programme for N'Dama cattle, Djallonke sheep and West African Dwarf goat in The Gambia

Mamud Njie/Nerry Corr

The International Trypanotolerance Centre (ITC) at Station at Keneba in the Kiang West district of Lower River Region is where the pure breeding programmes for the indigenous **N'Dama cattle, West African Dwarf Goats and Djallonke Sheep** takes place. Active breeding takes place on-station. It is an open nucleus breeding programme. The activities of the programme includes daily management of the herds and data collection, e.g. heat detection (control mating), monthly weighing, weekly milk measurement, recording of births and birth weights treatments etc. At the end of 2008, there were about **370 N'Dama** cattle in Keneba and 140 small ruminants (sheep and goats) on station. Selection of genetic quality animals (elite males) and their dissemination is also a function of the station. The programme is designed in a **three tier scheme** (Nucleus, Multiplier and Farmer), recording of events is done on site. Data collection from the multipliers is done in collaboration with the Department of Livestock Services (DLS) field staff; however the processing of data collected from these multipliers is also a function of ITC Keneba, including monitoring of **Gambia Indigenous Livestock Multipliers Association (GILMA)** activities and the further dissemination of the offspring to farmers. Work on station is in progress, routine management of the herds and recording of daily events is an on going process.

Number of livestock population on station as 31/12/2008:

	Keneba herd	Niamina herds
Cattle	370	232
Sheep	35	
Goats	122	
Total	527	232

### Selection:

**Breeding Value Estimation:** Breeding value estimations and the selection of elite animals requires sophisticated computer software and up-to-date information on all animals including monthly weights. At the moment the required computer software which was used, SAS has a license that needs to be renewed annually has not been done. However due to the intervention of Prof. Dempfle, the breeding values were estimated in December 2007. Selection of the top elite bulls to replace breeding bulls of the nucleus herds in Keneba was done and potential bulls for multiplication were as well identified (See tables below).

### Replacement /New Breeding Bulls

The following bulls are selected as new breeding bulls for the nucleus herds in Keneba:

Animal Number	Date of Birth	Sire	Dam	Total Breeding Value
24548	18/08/2004	98554	92029	12.5
22624	02/11/2002	95403	90513	4.3 *
23632	15/09/2003	95516	95548	10.9
23693	16/11/2003	97710	95693	7.7

\* The sire of this bull is from the screening program, thus giving him chance for diversity in the gene pool.

### **Bulls selected for multiplier herds**

<b>SN</b>	<b>Tag Number</b>	<b>Total BVE</b>	<b>Weight</b>	<b>Station</b>	<b>Herd</b>
1	99634	10,4	268	Keneba	Breeding Bull (Keneba)
2	24587	9,4	175	Bansang	Tuba2
3	23682	9,1	179	Bansang	Tuba1
4	24628	8,2	177	Bansang	Tuba1
5	23693	7,7	178	Bansang	Tuba1
6	23600	7,4	193	Bansang	Tuba1
7	24560	7,2	182	Bansang	Tuba1
8	23660	6,4	222	Bansang	Tuba1
9	23664	6,4	155	Bansang	Tuba1
10	22622	6,0	224	Bansang	Tuba2
11	23608	6,0	207	Bansang	Tuba1
12	23574	5,6	177	Bansang	Tuba1
13	22550	5,0	259	Bansang	Tuba1
14	23528	4,9	237	Bansang	Tuba1
15	23543	4,6	176	Bansang	Tuba1
16	24575	3,6	161	Bansang	Tuba2

### **Dissemination of superior bulls to multipliers:**

The dissemination of bulls is a decisive step within pure breeding programme, as it is where the genetic progress realised on-station is spread to multiplier and to farmers. However, the dissemination activity has ceased for the last three years due to financial constraints. The routine monitoring of the multipliers and periodical visits and meetings with the GILMAs, the Farmers' Association responsible for the multiplication, have also come to a standstill. The above selection of bulls identified for multiplication indicates that work is in progress in the nucleus breeding herds in Keneba and Niamina, and there is an urgent need to re-establish contact with GILMA to disseminate these elite bulls.

### **General Situation**

The difficulties listed in last year's report (2007) are still lingering within the station; as the financial situation of the institution has still not improved.

### **Cattle**

1. Herds have been merged so that the 10 herdsmen left are able to cope, the consequence is that herds are too large and animals may not graze properly;
2. Supplementary feed for calves and mating bulls and recumbent animals is not available;
3. Necessary general maintenance of mating pens for bulls and small ruminants is very urgent;

4. Only one security guard at the herds, meaning that animals are vulnerable to theft, predators and unwanted mating by stray bulls.

### **Small ruminants**

1. The sheep and goat flocks needs to be increased.
2. The pens should be relocated in order to eradicate mange which had contributed to the high mortality.
3. Additional herdsman is needed urgently.
4. The poor physical and health status of the animals should be improved.

### **Station**

1. Insufficient fuel supply for generator (water pumps); hustle of driving every other week to collect fuel from ITC Kerr Serign station;
2. The generators are old and need profound maintenance and only one is functional;
3. Station vehicle is not good;
4. Due to lack of security guards, Keneba campus is vulnerable to theft and destruction of property by children and stray animals;
5. There are burst pipes and water leakages due the old taps which needs to be changed as many of them had been there since the station was built;
6. Lot of data has been generated but unprocessed.
7. Staff attrition.

### **Feed supplementation**

Groundnut hay should be purchased as the breeding programme rest on control mating. Breeding bulls are kept in pens and likewise breeding bucks, rams and young males of these small ruminants. When the dry season advances and the vegetation is burnt which has already started, some animals become recumbent and are therefore kept and supplemented. Dams at this stage do not have enough milk for their calves and so the calves need supplementation during this period.

The station had been given D15,000.00 dalasis to purchase feed in January but this do not go far enough considering the fact that transportation and labour comes out of it as the feed is only available from far villages.

### **Niamina Herds**

The two livestock assistants based in Kudang are carrying out the monitoring and data collection (monthly weighing, bleeding and treatment of sick animals) in the Niamina herds without having to go to Bansang or staff from Bansang having to go to Niamina by using a generator. Presently, there are about 232 heads of cattle, which are bled and weighed at monthly intervals. However these livestock assistants are not given any fuel to travel to the herds which is making it very difficult for monitoring to be effective. Results indicate that the prevalence of Trypanosomiasis is still fairly high in the zone, also reflected by the considerable presence of tsetse flies. There is the need to purchase bleeding materials, as the monthly bleeding of the animals is the guide to the trypanosome infection rate which determines intervention periods.

## **Outlook 2009**

The pure breeding programme is a well established program; its potentials have been demonstrated by its ability to supply elite bulls to multipliers farmers. The activities on station will continue and there are hopes that extension work on the dissemination of breeding bulls will commence when the financial situation of the institution improves. However the infrastructure has to improve for the aims and objectives of the programme to be realised. To sustain the pure breeding programme, financial and human resources must be mobilized, the organization setup restructured, and the infrastructures for both animals and staff should be upgraded.

### **IP2-2: Activities at ITC Bansang/Sololo station**

Dr Momodou Mbake

Sollolo is only partially active with few programs connected to the pure breeding program at Keneba, and achievements are minimal for the period under review. It must be recalled that the Bansang Station in the Central River Region is located in a livestock region with the following characteristics:

- a) Large animal population
- b) Cooperative livestock owners
- c) Excellent site for testing tsetse challenge of weaned animals from the Keneba nucleus herd.
- d) Four herds of cattle belonging to ITC and are located in Niamina East District CRR
- e) Excellent station facilities
- f) Excellent working relationship with the farming communities in the region.

A Research proposal entitled “Impact Assessment of Pure Bred Ndama Bulls used in Multiplier Herds (GILMA)” was submitted to Gambia Government in Dec 2007. As approval and funding is still being awaited, it is therefore imperative that funds be sought elsewhere (for example the PROGEBE project) to implement this proposal.

Activities were focused on surveillance of four ITC N’Dama herds in two villages in Niamina East, totalling 230 animals (97 bulls, 133 heifers). Cattle vaccination against the two major bacterial diseases: Haemorrhagic septicaemia and Black-quarter were done and revaccination was also done in February 2009. The major outbreak was Foot and Mouth disease in January 2009 is now under control. During the period under review, weighing of animals was done on monthly basis, but with lots of difficulties. Strategic blood sampling was conducted. In February 2009, an average trypanosomosis infection rate of 3% was detected in the herds. The peak periods infection rates were 30% in October and November 2008.

Altogether, 15 staff members are left after the restructuring exercise of 2006 (1 Veterinarian, 1 Tsetse officer, 3 Livestock Assistants, 1 Lab technician, 5 herdsman, 3 watchman, 1 multi-purpose staff). Lamin Darboe, who recently completed his Higher Diplomat in Animal Health, was transferred to Keneba station in November 2008.

The major constraints affecting the station are:

- Lack of research funds for the proper running of the ongoing activities,

- Lack of electricity but hoping to be connected with the national electric grid soon
- Lack of communication - telephone lines disconnected since July 2005, and
- Insufficient imprest for the station operations.

### IP3: Natural Resource Management for Enhanced Productivity and Sustainable Environments

The objective of this Institutional Project is to promote the maturation of emerging livestock production systems, with in view to specifically (1) elucidate further on the biophysical characteristics, economics of production and modalities of integration of *Moringa oleifera* into farming systems in The Gambia; (2) introduce *Moringa* cultivation into Sierra Leone as a feed security strategy.

Ansumana K Jarju

#### **Major IDRC & IFAD interventions: July to December 2008**

Intervention sites continued from July 2008 to October 2008, when the harvesting and processing of the resulting moringa biomass for subsequent project activities commenced. Consultancies were awarded for two studies. The first consultancy was a study on the non-adoption of the moringa technology by the women farmers at Banjulinding Horticultural Garden (BHG), while the second one was an economic assessment of rabbit/horticulture integration with the BHG experience as a case study.

The Acting Principal Investigator successfully defended his Doctoral thesis, titled “Evaluation of *Moringa oleifera* LAM and *Oxytenanthera abyssinica* (A. RICH) MUNRO as protein supplements and natural dewormers for West African Dwarf (WAD) goats”, at the Obafemi Awolowo University, Ile-Ife, Nigeria, on November 17, 2008. The thesis was a product of synergy between some activities in the IDRC- and IFAD-sponsored Projects, two ITC institutional projects that have been under the leadership of the Acting Principal Investigator since August 2006. The thesis is currently passing through mandatory administrative procedures at the Obafemi Awolowo University, Nigeria, and a copy will be sent to the IDRC Office in Kenya after the final approval by the University Senate.

Further training on moringa field management, biomass assessment and fodder utilization were planned for the second half of 2008 in Sierra Leone. As planned, the training came up in August 2008 at the various intervention sites, but biomass assessment could not be conducted at the time as none of the established moringa feed gardens was ready for harvest at the time. The sole responsibility was thereafter delegated to the CORAD Field Agents, although the established moringa fields showed prospects of eventual success. The non-readiness of the moringa fields at the time of my mission to Sierra Leone in August 2008, coupled with the delay in the transfer of genetically-improved goats from The Gambia and the observed less than optimum commitment to project activities on the part of our CORAD partners, stalled further project activities aimed at promoting the feed and food uses of moringa among the target beneficiaries.

As it became clear that it would not be possible to complete all activities as contained in the Project Document within its current lifespan, and in order to consolidate on the gains that have been made so far with the women groups identified for participation in the latter

part of the Project, an extension period of six months was mutually agreed upon in principle between the ITC and Dr. Francois Gasengayire in September 2008. The Acting Principal Investigator was thereafter mandated to prepare and forward a request for project extension for a period of six months to the IDRC Office in Kenya. He was also mandated to work with the ITC Acting Director General, Dr. Babou Jobe, to constitute a new multi-disciplinary research team that will be saddled with project implementation after the expiration of his current contract with ITC in December 2008. The request for extension and the constitution of a multi-disciplinary research team were done as mandated, and a transition period of three months whereby the new team works with the Acting Principal Investigator commenced in October 2008. An integration of the new team into the project implementation has since progressed satisfactorily. Fallout of the Project team restructuring exercise was the termination of the appointment of the erstwhile Junior Research Fellow, Ms. Maimuna Jallow, as she would have no roles to play in the emerging scenario.

Dr. Francois Gasengayire was on a mission to The Gambia in November 2008 to assess project implementation, and to deliberate with the ITC Management and the research team on a number of relevant issues, the proposed extension period inclusive. At the end of the mission, the extension request was accepted, but with a new duration of twelve months. A workplan for the period of extension was mutually agreed upon by Dr. Francois Gasengayire on one side, and the ITC Management and research team on the other side. It was agreed that the project should concentrate on activities in The Gambia during the extension period while project activities in Sierra Leone should be terminated. Mr. Ansumana K. Jarju was designated as the new project leader for the period of extension, while some advisory and supervisory roles were proposed for the out-going one; and these new roles are to be performed as consultancies. The Acting Principal Investigator was mandated to forward the Technical and Financial Reports for the period of July to November 2008 to the IDRC Office in Kenya by the end of November, in order to facilitate other administrative processes.

The activities reported in this document were formulated in accordance with the activity forecast for the reporting period.

### **Consultancies**

A consultant, Mr. Jerro Maane of the Project Implementation and Monitoring Unit, Department of State for Agriculture, The Gambia, was hired during the period being reported. He was contracted to carry out two studies with specific terms of reference, but the two had central themes revolving around some constraints to the uptake of moringa technology, and microlivestock-horticulture integration by some women farmers in peri-urban agriculture. The reports for the two studies have been submitted.

### **Out look for 2009**

#### **Proposed Activities for the period of extension: January to December 2009**

The key activities drawn up to consolidate the gains made between October 2006 and December 2008 in The Gambia and Sierra Leone are:

- ❖ Conservation technologies for moringa as food and fodder will be concluded and transferred to the farmers
- ❖ Moringa-Livestock enterprises in The Gambia will be strengthened
- ❖ National strategies for sustainable pathways for adoption are discussed in a National Conference where all stakeholders including development partners and NGOs are convened to internalize and map out the adoption pathway for The Gambia

**Objective 1: Strengthening of sustainable on-farm moringa conservation technologies according to production systems in The Gambia.**

The potentials of moringa to produce good quality leaf protein when the conditions are optimum have been investigated and well documented in the first two phases and the earlier part of the third phase of this project. Moringa conservation technologies such as multinutrient block formulation, drying and coarse-milling as well as ensilage have also been developed and promoted during the same periods. However, taking into cognizance the capacity and capability of the target end users (women farmers); an expansion of the available moringa conservation technologies to enhance practicability and sustainability appear beneficial. Technology delivery pathway will be broadened using a participatory approach (focus group discussions, rapid appraisals and FFS). Key issues affecting the adoption and adaptation process of the moringa innovation will be analyzed. During the proposed period of extension, moringa fodder will be dried and preserved in the form of hay for use as part of dry season supplementation feeding plan. This will commence from the moringa fodder that will be obtained on-farm from the harvests from the intervention sites in the Western and North bank Regions of The Gambia. The harvests are expected as from early October 2009.

The extension will allow us to collect data on adapted conservation methods for another six months, thus strengthening the chances of drawing stronger conclusions. In addition, the studies on the evaluation of the conservation technologies will be finalized.

**Objective 2: Strengthening of Moringa-Livestock Enterprises in The Gambia.**

In order to take advantage of the anticipated benefits of *Moringa oleifera*, sustained efforts have been made since the beginning of 2007 to make the plant itself firmly established and within the reach of the designated end users. Towards this end, a number of moringa feed gardens have been established in some women horticultural gardens in the Western and North Bank Regions of The Gambia in a participatory manner. So as to further facilitate the technology transfer process, the project team (comprising of personnel from ITC, NARI, DLS and PIMU) will further identify extension agents and relevant NGO personnel to train in the principles and practice of moringa cultivation and conservation techniques using the “Training of Trainers”, “Training of Farmers” and the “Farmer Field School” approaches. In addition, an “Association of Moringa Producers” will be formed and encouraged to take on the ownership of the technologies placed at the disposal of the farmers in a way that wealth creation opportunities are at the reach of the producers. Commercialization of moringa multinutrient block formulation, and commercial production of “Moringa hay” to as a complement/substitute for groundnut hay that is conventionally used for dry season feeding of high-producing milk animals will be encouraged in this regard. The use of moringa supplementation for the seasonal “fattening” of rams for Muslim festive period of Toubaski (Ed-el-Kabir) will also be

encouraged. The small ruminant stocks of the women farmers will be enlarged through the transfer of some on-station goats. The producers will have access to technological and institutional supports that will enhance their capacity and efficiency.

**Objective 3: Facilitation of the definition of technology adoption pathways by all the relevant stakeholders.**

At the end of the project, a restitution meeting with all the key partners and stakeholders from The Gambia and Sierra Leone is convened. National strategies for sustainable pathways for adoption are discussed in a National Conference where all stakeholders including development partners and NGOs internalize and map out the adoption pathway for each country. Proceedings from the National Conference will be made available to Government Agencies. All stakeholders and relevant policy makers will be invited to discuss the outcome of the 3-year project intervention efforts. The Conference will put the policy makers in a position to better appreciate the impacts of Government policies on urban agriculture, thus providing the impetus for modifications/improvements where necessary. The end of the project meeting will allow a reconciliation of the project objectives with the outcomes/outputs/services. In addition, Conference will allow the discussion and dissemination of the outputs to a wider audience.

**IP 4: Regional Project on Sustainable Management of Endemic Ruminant Livestock in West Africa (PROGEBE)**

Dr Moustapha Diaw

**1. Structure for project implementation and participation**

At the regional level, the Regional Coordination Unit (RCU) has been set up. It coordinates and oversees the project implementation in the four countries. The RCU, based in Banjul, The Gambia comprises two regional Coordinators respectively in charge of Global Environment Facility (GEF) and African Development Fund (AfDB) funds, the Head of Finance and Administration, an expert in Monitoring and Evaluation (M & E), an expert in communication and information exchange, one financial assistant, one administrative assistant, and additional support staff.

The RCU is supervised by a Project Regional Steering Committee (PRSC) which was also involved in the preparation of the project. Similarly, during the project implementation, the PRSC will incorporate the interests and experiences of a wide range of key stakeholders from other countries and international agencies, including international institutes focused on livestock research and production.

At the country level, a National Coordination Unit (NCU) is installed. It comprises a National Coordinator and a team of 3 experts (animal productions, natural resource management and monitoring and evaluation) and an HOFA. A National Steering Committee (NSC) oversees the National Coordination Unit, charged with the implementation of the project at the national level. The four National Steering Committees are the primary mechanism for stakeholder participation at the national level. Government policy makers, resource managers, researchers, and livestock industry representatives will play an integral role in the project implementation.

At the site level, each site has a Site Coordinator and support staff and these are guided by a local coordinating Committee which will promote public participation including representatives such as farmers, herders, traditional and elected local leaders, representatives of resource user, production and marketing associations, and others. The project will support significant training and capacity development for these bodies.

The main project partners are community based organizations, local authorities, ministries and institutes involved in livestock or environmental monitoring in the 4 member countries: International Trypanotolerance Centre (ITC) and National Environmental Agency (NEA) in The Gambia, IRAG and CNOSE in Guinea, IER and STP/CIGQE in Mali, CSE and ISRA in Senegal, International Livestock Research Institute (ILRI) in Nairobi, Kenya, International Centre for Livestock Research and Development in the Sub-Humid Zone (CIRDES) in Bobo-Dioulasso, Burkina Faso and Food and Agricultural Organization (FAO).

The two funding agencies have distinct executing agencies: United Nations Office for Project Services (UNOPS) is the agency to implement the GEF/UNDP funded part and ITC and Ministries in charge of livestock are the implementing agencies for the AfDB funded part.

## **2. Status on project start-up and implementation activities**

The project implementation has started in 2008 and progress been mainly made on management activities that allow, where needed, a reframing of the execution strategies. Initially formatted GEF and AfDB activities have been consolidated around five strategic intervention lines along which the project implementation will be conducted. In addition to management activities undertaken in during this first year, preparatory activities are initiated for each of the others strategic intervention lines.

### **2.1 Strategic intervention line1: Preservation of the genetic characteristic and improvement of the production and productivity of ERL**

To achieve the results attached to this strategic intervention line, a first step should be the characterization of ERL and its physical and socio-economical environments. To this regards, ILRI as key technical partner has collected necessary information for surveys sampling and undertaken exploratory mission to countries to discuss their 2009 technical programs.

An important aspect for the project is the work carried out in the four countries related to breeding for resistance of endemic livestock. In this regard all four countries have some level of experience and established projects related to ERL breeding. It is planned to build on past or ongoing experiences in the 4 countries and to use a participative approach to implement the Open Nucleus Genetic Improvement System. A consultant was hired to assess the situation of Keneba. The report is available.

Discussions are undergoing between the RCU, the NCUs and technical partners on the organization of a thematic visit on genetic improvement. The aim of this visit would be to share experiences and lessons learnt from the breeding program in The Gambia and Senegal. Its outputs will then facilitate the fine-tuning of countries activities plans on the subject. The TORs of this visit has been drafted and shared with NCUs and with ILRI.

## **2.2 Strategic intervention line2: Improvement of the valorization of ERL products**

Appropriate consultations have been undertaken with local authorities and communities to define the location of the two regional markets that need to be rehabilitated and equipped. The TORs related to the technical studies of national marketing and processing infrastructures such as local livestock markets, slaughtering areas and milk processing units, are being elaborated.

## **2.3 Strategic intervention line 3: Sustainable management of ERL ecosystems.**

Activities related to NRM will be launching with a thematic exchange visit in Mali. This visit will allow the different project experts and stakeholders to learn from the Malian experience in term of community based management of natural resources and exchange their knowledge on the subject. The outputs of this visit will facilitate the adjustment of countries strategies for this strategic intervention line. The TORs for this event have been drafted and largely shared.

## **2.4 Strategic intervention line 4: Policies, Legislations, Cooperation, Capitalization, Exchanges and Coordination**

Activities undertaken in 2008 are mostly related to Networking and visibility of the project.

An acronym for the project has been chosen and developed: “**PROGEBE**”: *Projet régional de gestion durable du bétail ruminant endémique en Afrique de l’Ouest/Regional Project on Sustainable Management of Endemic Ruminant Livestock in West Africa*

An open competition for a project logo was launched in the four countries covered by the project. A good number of responses were received covering the four countries. A winning logo was selected and the selected logo is used as from November 2008 onwards on all official documents of the project as well as for promotional purposes. The logo was launched during a ceremony in Mali, under the presidency of her Excellency Madame the Minister of Livestock and Fisheries of Mali in November 2008. At the occasion, the winner of the competition was handed over his price.

A web site is under construction and will be launched in January 2009.

As mentioned above, the visibility of the project would increase by increasing at the same time the visibility of ITC. In that prospect, the project intends to put sign boards indicating the presence of the project at the premises of ITC. The project is involved in discussions with potential partners for ITC such as AU/IBAR and CORAF.

## **2.5 Strategic intervention line 5: Project Management**

Activities implemented during this first year are mainly related to project management, specifically in terms of staffing, acquisition of logistics, elaboration of reference documents, monitoring and evaluation, resources mobilization, partnerships establishment and start-up of field activities.

### **a) Funding**

This regional project is funded by 2 main donors with additional financial support from the governments of the 4 countries involved and international and regional research centers. The project overall goal is the sustainable management of endemic ruminant livestock (ERL) breeds (N'dama cattle, Djallonke sheep, and West African Dwarf goat), the increase of its productivity and West Africa.

### **b) Staffing and start-up of field activities**

The Regional Coordination Unit is fully functional and almost fully staffed. A candidate has been identified for the position of capacity building/institutional development expert) funded by AfDB. Once hired, that resource will be posted at ITC to coordinate on his behalf all capacity building activities of the project and also ITC specific activities.

At National level, each Coordination Unit includes a Coordinator, 3 Experts (animal production, NRM and monitoring and evaluation) and support staff. In each country, the project operates through a National Coordination Unit, based respectively at Abuko for the Gambia, Conakry for Guinea, Bouguini for Mali, and Kolda for Senegal.

Serious delays have been experienced for the recruitments centralized at the level of UNOPS in particular regarding the site level coordinators and their teams.

A first meeting between the RCU and the four national coordinators was held on 9-10 July 2008 to discuss the next actions to be taken for the period covering to the end of 2008.

Several missions and visits were undertaken by the Regional Coordinator, the Deputy Regional Coordinator and the experts of M&E, communication and information exchange and the Head of Finance to the four countries to meet key stakeholders, the National teams and to establish working relations with all partners in terms of administrative and financial issues, monitoring and evaluation and communication and information exchange and start-up of field activities. Several mission reports are available as well as a list with key contacts in the different countries and at regional level.

The NCU in the 4 countries organized prospective missions to the sites of the project to meet local administrators, farmers' representatives, community-based organizations, staff of partner institutions and other stakeholders and to visit existing facilities which could be used by the project. In addition, ILRI organized missions to the four countries to its technical work plan.

### **c) Logistics**

The RCU is installed and now well established at the premises of the International Trypanotolerance Centre (ITC). In order to increase the visibility of the project based at ITC and to support the further development and upgrade of ITC, it has been suggested to the ITC management to consider alter the main entrance to the ITC premises.

All furniture, IT equipment have been delivered through the UNDP office Banjul. Internet connections as well as the telephone system are installed and functional.

Four vehicles for the four national units were ordered and delivered directly to the four national country offices through the National UNDP offices. All four National Coordination Units have identified their premises for the offices and are moving in.

#### **d) Reference documents**

A manual of procedures and monitoring, evaluation guide and a communication plan have been prepared and shared between the RCU and the NCU and they were discussed with the national teams during the tour in the four project countries before finalization. The purpose of the documents is to provide guidance and a uniform approach for project administrative and financial aspects at the national and regional level. The integration of the log frameworks has been carried out in close consultation with technical partners (ILRI, CIRES, ITC, etc.).

Different systems have been put in place *eg* for filing, equipment, supplies, financial and administrative procedures etc.

#### **e) Resources mobilization**

After the satisfaction of the conditions for the first disbursement, requests sent by the four NCU and the RCU have been satisfied.

The funds of the GEF part managed by UNOPS were available from the beginning and were used to install the office, provide all equipment and furniture and allow the team members to make the needed visits to the national counterparts.

#### **f) Monitoring and Evaluation**

Elaboration of activity reports has started from the second quarter. An annual work plan and budget has been drafted and discussed at Regional and National level.

The RCU has made an important effort to integrate the 2 existing log frames (GEF and AfDB) and to suggest a 'one project' approach in terms of implementing the field activities. In that respect, attempts are also made to integrate the respective budgets to one Project budget. However, the latter has proven to be more difficult as there are several rules and procedures distinct to the respective donors and executing agencies to be observed and respected.

#### **g) Partnership**

ILRI is a key partner in the execution of the GEF funded part of the project. In order to formalize their contribution, a Memorandum of Understanding (MoU) between ILRI, UNDP and UNOPS on the execution of the roles and responsibilities of all partners has been signed.

ILRI has started to establish their team comprising out of different members of ILRI staff. ILRI will develop baseline studies supporting implementation of field based activities covering all output/outcomes within their mandate as specified in the MoU and the GEF PRODOC.

After the initial meeting in Dakar, Senegal (11-13 February 08), a second meeting was organized to discuss progress on the technical and the financial planning for the first year. This meeting was organized in Banjul (12-14 May 2008). A third meeting was held in Nairobi between 7-10 October to further discuss the integration of the two logical frameworks to one project logical frame work and other project related implementation activities. In addition, ILRI toured countries to discuss the integration of its field activities in NCU technical work plan.

With CIRDES, a mission was undertaken to Bobodioulasso in November 2008. This mission has been an opportunity to meet CIRDES staff and clarify a certain number of aspects related its mandate and its practical implementation. A draft protocol was discussed to cover CIRDES responsibilities as technical partner in cryogenic conservation.

To support the strengthening of ITC and because of the critical role of capacity building in the project, an expert in capacity and institutional development for livestock has been recruited.

In all four countries capacity building and strengthening is aimed at assuring the sustainability of the project activities at field level and is important as part of the preparation of an exit strategy. Capacity building is foreseen at all levels ranging from the livestock owners, veterinary assistance and animal health input, marketing and commercialization, institutional development and policy makers.

In particular for ITC, the expert in capacity building and institutional development will be also a technical coordinator. Besides these efforts, also additional assistance is provided through the Gambia Government aiming at establishing ITC as a Regional Livestock Research Centre, overseen and supported by a board of governing bodies from interested countries in the region. To that effect, the lead is being taken by the AU-IBAR (based in Nairobi) to mediate and organize a meeting of technical experts. The regional organization, CORAF, identified ITC as one of the livestock center to involve in the implementation of its strategic plan.

#### **h) Inception Workshop (IW)**

After several postponing, a new date for the IW is now set for 20-23 January 2009.

#### **i) Budget.**

The project budget is about US Dollars 37, 374, 995. An amount of US \$ 1,497,000 (4% of the total amount) has been spent or disbursed. Because of the delay in getting funds from AfDB, 79% of the amount spent or disbursed came from GEF fund. The national coordinating units sent their request for funds.

### **Conclusion**

2008 has been critical in the start-up of the project activities in terms of strategies review, partnerships and team building, tools and reference documents elaboration and preparatory implementation activities. The results obtained mainly in the project

management area should be exploited in an efficient manner in order to get solid basis that could be adjusted as much as possible during the project lifetime.

It appears that delivering the project outputs in a timely manner will be the corner stone due to the kind of activities, the level of their interdependency and the diversity of partners. In this regards a proper communication strategy and anticipation capacities will be keys aspects.

### **Outlook in 2009**

In 2009, the focus will be on:

- Characterization of endemic ruminant cattle by ILRI,
- Preparing the rehabilitation of research centers among which is the Keneba station, starting consultations, sensitization, networking, and training to raise communities, authorities and technicians' commitment to actively participate in the programs in particular in the genetic program and in the community based management system of ERL ecosystems.

The staffing will be completed by the hiring of the site teams, and capacity building expert. The website of the project and the computerized management information system will be functional. The official launching project workshop will be held in 2009.

## **Market-oriented Systems Improvement Programme (MOSIP)**

Programme goals of MOSIP are the promotion of improved and sustainable livestock production, processing and marketing technologies in medium to high input systems in West Africa through the optimization of farm and market resources.

### **IP5: Developing Meat and Milk Systems for meat and milk production in urban and peri-urban areas**

The overall objective of the Project is to develop, evaluate and integrate crossbreds and other improved breeds in market-oriented farming systems for meat and milk production in urban and peri-urban areas, as a strategy for improving milk and meat production to meet the demands of the growing human population.

#### **IP5-1: Monitoring and management of ITC's on-station dairy cattle herd**

Lamin J Janneh

By end of year 2008 the crossbred dairy herd consisted of 29 cattle. These are 18 cows, 2 heifers, 1 service bull, and 8 suckling calves. The herd is kept under on-farm simulated management conditions and the animals were fed on feeds gathered from unimproved pasture fields. Feeding of concentrate diets in the forms of groundnut cake and rice-bran ceased by the end of 2007.

Data on productivity and all occurrences in the herd were recorded. Milking is done twice daily. A total of 9,340 liters of milk have been recorded for the herd. Average daily yield per lactating cow is estimated at 1.9 liters of milk valued at GMD57 (US\$ 2.2). The

average monthly milk offtakes from the herd is shown in figure 1. The centre continues in its' role as educational centre of attraction to numerous students of Agriculture and related sciences. The herd serves research and demonstration purposes for peri-urban milk production based on F1 crossbred cattle.

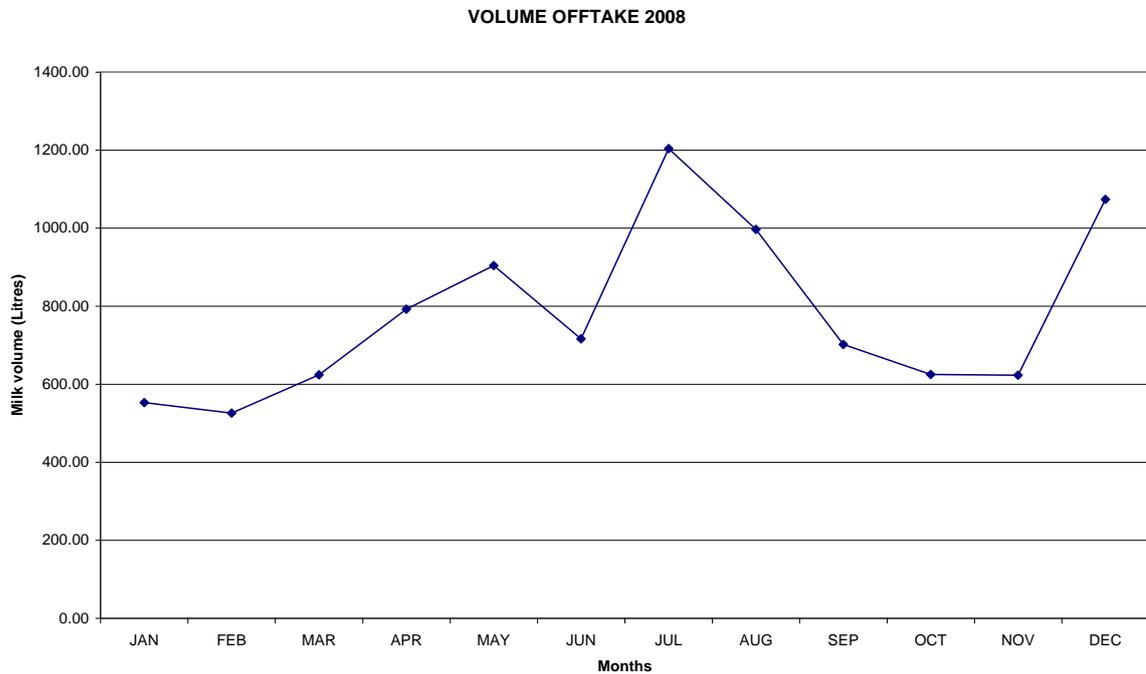


Figure 1. Average monthly milk production of ITC herd in 2008

Unlike the non-undulating production trend of year 2007, there were peak periods (2 to 3 times) within year 2008. The most prominent peak occurred during the rains i.e. in July and August. The trend sluggishly dropped during September to November before shooting up to the second peak in December as shown in figure 2. The drop in production from September to November is attributed to the strategic two months resting period before calving. A number of pregnant milking dams were subjected to this resting (drying) period starting from September to November. Most calving for the year 2008 occurred in November.

#### COMPARATIVE MILK VOLUMES

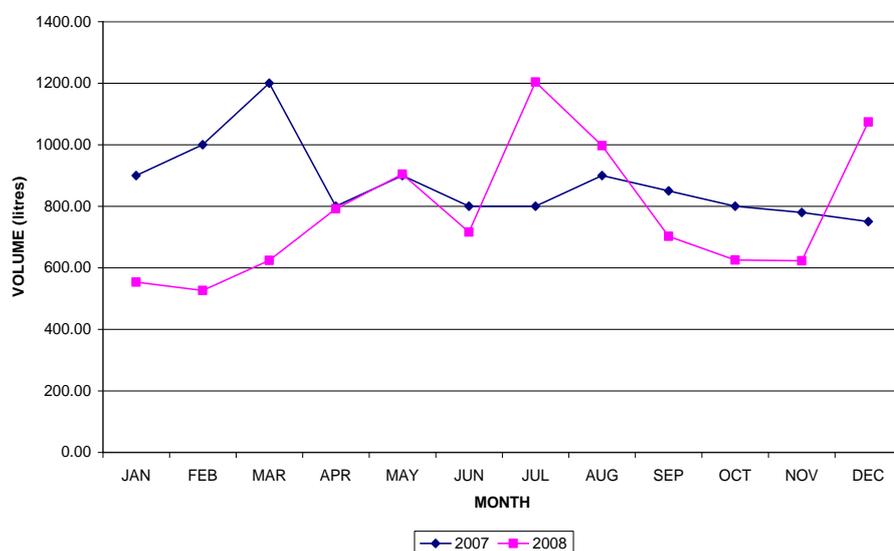


Figure 2: Comparative average monthly milk production of ITC herd in 2007 and 08

#### OUTLOOK 2009

The herd should continue to function as a model demonstration unit and a source of revenue for the centre. Information and data on productivity with age, emerging production problems, survival rates, productive lifespan, etc. are needed for future assessment of crossbred animals kept under such conditions.

For the long term outlook, a replacement scheme should be in place during 2009. When properly planned and executed, this replacement scheme could be a more viable source of revenue for the centre.

Depreciation on equipments (fixed costs) such as cattle and their sheds is almost at salvage value. The replenishment of these two principal fixed assets of the scheme is mandatory to the continuance of this model herd, the milk pasteurization, and dairy training unit.

#### IP6: Appropriate Feeds and Feeding Strategies in Livestock Systems for Enhanced Nutritional Security

The objectives of this Project are to develop feeding and management strategies in support of evolving production systems by (1) strengthening the feed resource base of urban integrated farming systems; (2) evaluation of in-vitro dietary combinations for urban livestock nutrition; (3) on-farm testing and technology transfer of supplementation and nutrient recycling options.

As activities under this institutional project overlaps with IP3, it has been reported under the latter heading.

## **IP7: Application of Biotechnology for Improved Animal Health and Production**

The objectives of this Institutional Project are to:

- enhance molecular diagnostic capabilities of ITC for epidemiological investigations of selected diseases of regional importance;
- create and strengthen institutional capacity in using DNA-based technologies for molecular characterization of: i) pathogens, ii) indigenous livestock resources;
- strengthen collaborative linkages of ITC with Advanced Research Institutes and with scientific networks for development and use of relevant agricultural biotechnologies in livestock research for development.

No activities were implemented under this program during this reporting period, except for the molecular characterization of Salmonella reported under IP8-1-3.

## **Systems' Overlap & Linkages Improvement Programme (SOLIP)**

The crosscutting nature of this Programme addresses the enhancement of human welfare (food security, quality of life, disposable incomes) and livelihoods through the use of improved technologies, methodologies, policies and information generated through innovative collaborative research and training in three distinct areas:

1. Adoption of socio-economically appropriate technological options and methods generated in partnership with stakeholders;
2. Epidemiology and risk assessment of diseases of veterinary public health importance, food safety issues; and
3. Training, capacity building and information exchange.

## **IP8: Consumer Safety and Public Health Aspects of Food Production Systems**

This Institutional Project addresses the identification and assessment of the importance of public hazards (zoonotic diseases), their impact on consumer safety, and development of recommendations for control and preventive measures.

### **IP8-1: Epidemiology and control of zoonotic infections in The Gambia and Senegal**

The 4-year research project financed by VLIR-UOS, the University Development Cooperation of Belgian-Flemish Universities, and implemented by ITC, ITM and Antwerp University in close collaboration with partner institutions in The Gambia and Senegal, started on 1 June 2006 and will run until 31 May 2010.

The objective of the project is to investigate the prevalence, epidemiological situation and risk factors of porcine cysticercosis, bovine brucellosis, and poultry salmonellosis in

selected peri-urban and rural areas in The Gambia and Senegal (Casamance). Based on the obtained results, appropriate packages for the prevention and control of these diseases will be designed, tested and their effects monitored in selected study sites, the results of which and recommendations will be transferred to the extension services in both countries. The project shall also strengthen the diagnostic and research capacity of ITC by training of scientists/research associates and laboratory technicians in the field of epidemiology, diagnosis and control of these zoonoses.

In 2008, the project activities were concentrating on continuation of cross-section surveys that involves field sampling, laboratory testing of samples, data encoding and statistical analysis.

### **IP8-1-1: Brucellosis Study**

Dr Adeniran Anani Bankole

The objectives of this study are:

- To determine the prevalence of brucellosis in herds that supply urban areas of Western Region and Kolda department with milk;
- To assess brucellosis contamination risk for milk consumers;
- To design sustainable prevention and control packages of brucellosis along the milk chain.

To achieve these objectives, some activities were carried out during 2008.

#### **1. Activities**

##### **1.1 Survey at farms' level**

The objectives of the survey at farms level are:

- to determine the prevalence and risk factors of brucellosis in the selected herds;
- to isolate *Brucella spp.* from hygroma fluid or milk collected from suspected herds.

To achieve this goal, a questionnaire for farmers and a bleeding form prepared for accessing the risk factors at herd level and for the animals sampled were applied in each herd.

##### **Survey in Kolda**

The large scale survey started in September 2007 was completed in April 2008. In 2008, two missions for a total of 13 days were undertaken to Kolda to sample the remaining herds. As results, 14 villages were visited, 26 herds surveyed and 605 serum samples collected. The complete results of brucellosis sampling activities in Kolda are shown in table 1.

Table 1. Blood sampling results in Kolda

Rural Community	No. of villages visited	No. of herds sampled	No. of samples collected
Bagadadji	1	2	30
Dioulacolon	12	24	481
Kolda Commune	1	2	54
Medina El Hadj	6	15	264
Ndorna	10	27	615
Salikegne	3	9	186
Sare Bidji	11	23	338
Total	44	102	1968

### Survey in the Western Region

The large scale survey at farm level in the Western Region (WR) started in February 2008 and completed in June 2008. Ninety six herds were surveyed in 36 villages of the WR four districts, and 2233 serum samples collected for 35 days in the field. The sampling results are shown in table 2.

Table 2. Blood sampling results in the Western region

Districts	No. of villages	No. of herds sampled	No. of samples collected
Kombo Central	8	19	492
Kombo East	8	27	634
Kombo North	11	21	422
Kombo South	9	29	685
Total	36	96	2233

### 1.2 Laboratory testing

All the collected serum samples from Kolda and the WR were stored in a deep freezer. The serology took place in ITC laboratory from September to December 2008. Three tests, Rose Bengal Test (RBT), indirect Enzyme-linked Immunosorbent Assay (i-ELISA) and Slow Agglutination Test (SAT) were applied to the 4201 sera. Results of the serological tests are shown below for the two study sites (table 3 and 4).

Table 3. Serological test results of Kolda samples

Rural Community	No. of villages	Sampled herds	Samples collected	ELISA positive	RBT positive	SAT positive
Bagadadji	1	2	30	0	0	0
Dioulacolon	12	24	481	0	1	0
Kolda Commune	1	2	54	0	0	0
Medina El Hadj	6	15	264	0	1	0
Ndorna	10	27	615	0	0	0
Salikegne	3	9	186	1	0	0
Sare Bidji	11	23	338	4	2	1
Total	44	102	1968	5	4	1

Table 4. Serological test results of Western Region samples

District	No. of villages	Herds sampled	Samples collected	ELISA positive	RBT positive	SAT positive
Kombo Central	8	19	492	25	13	11
Kombo East	8	27	634	81	67	57
Kombo North	11	21	422	4	1	1
Kombo South	9	29	685	0	2	0
Total	36	96	2233	110	83	69

## 2. Outlook 2009

Brucellosis study main activities planned for 2009 are shown in the table below:

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Second visit to positive herds for milk sampling	x	x	x	x								
<i>Brucella</i> isolation from milk and hygroma fluid		x	x	x	x							
Finalisation and submission of manuscript for publication on the pilot survey in the western region		x	x	x	x							
Prevalence determination for milk supplying herds in the Western Region and in Kolda and article draft		x	x	x								
Proposal on human brucellosis status in brucellosis 'hot spots' in the WR and Seek for approval by the Scientific and Publication Committee and Ethics Committee			x	x	x							
Study on human brucellosis in selected area in the WR						x	x					
Second visit in Belgium for VNTR analyses								x	x			
Draft and submission articles on risk analysis and management for milk consumers and on human brucellosis status in different 'hot spots'								x	x	x	x	x

## IP8-1-2: Cysticercosis study

Dr Arss Secka

Status quo of the three activities under implementation within the cysticercosis study component of the Epidemiology and control of zoonotic infections in The Gambia and Senegal project in 2008 are as follows:

### 1. Prevalence of porcine cysticercosis in selected areas of The Gambia and Senegal

Very little information is known on the prevalence of porcine cysticercosis in the selected study areas. It has not been reported in The Gambia for the last ten years, and only 25 cases of porcine cysticercosis from abattoir records in Senegal were reported in 1998 (OIE). A cross-sectional survey was designed to determine the prevalence and risk factors of porcine cysticercosis in Western region of The Gambia; Kolda, Ziguinchor and Bignona departments of southern Senegal. This survey comprises of several activities: sampling frame preparation, field sampling and questionnaire application, laboratory testing, statistical analysis, and publication.

The sampling frames for the four study sites were prepared and reported in ITC technical report 2007. Completion of the field sampling of pigs and questionnaire application in randomly selected villages and households in three study sites was also mentioned in the same report. Field sampling in Bignona department was done during the first quarter of 2008: 433 pig sera have been collected and administered questionnaires in 74 households within 15 villages/communities.

A total of 1705 pig sera samples collected from the four study sites were tested at ITC laboratory using Antigen Enzyme Linked Immunosorbent Assay (Ag-ELISA) technique that utilizes two monoclonal antibodies (B158C11A10 and B60H8A4 BIOT) from ITM Belgium to detect circulating antigens of *Taenia Solium*. The following table illustrates obtained results using two tests:

Table 1. Porcine cysticercosis prevalence by tongue palpation and Ag-ELISA in four study sites

Region /Department	Tongue inspection		Ag-ELISA	
	Proportion and (%) of positive villages/ communities	Proportion and (%) of positive pigs	Proportion and (%) of positive villages /communities	Proportion and (%) of positive pigs
KM/Western	1/15 (6.7%)	1/371 (0.3%)	9/15 (60%)	21/371 (5.7%)
Kolda	1/17 (5.9%)	1/449 (0.2%)	11/17 (64.7%)	59/449 (13.1%)
Ziguinchor	1/16 (6.3%)	1/452 (0.2%)	13/16 (81.3%)	40/452 (8.8%)
Bignona	1/15 (6.7%)	1/433 (0.2%)	13/15 (86.7%)	36/433 (8.3%)

To estimate the most probable prevalence using Bayesian approach, a third test using antibody-ELISA technique will be performed in the first quarter of 2009.

## **2. Human Cysticercosis Prevalence and Association with Epilepsy in The Gambia**

Epilepsy and other neurological disorders are important manifestations of neurocysticercosis infection in humans. Some studies have shown significant association of cysticercosis with epilepsy. This study aims to find out the prevalence and association of cysticercosis with epilepsy among epileptic people in The Gambia. The study utilized a case-control approach. It had involved selection of subjects, data gathering and analysis, serology, CT scanning, and treatment of cysticercosis positive individuals. This study is undertaken in the framework of a research work for PhD with the University of Antwerp, Belgium, in collaboration with the Institute of Tropical Medicine (ITM), Antwerp, ITC, and Royal Victoria Teaching Hospital (RVTH) of The Gambia.

The first version of this proposal was submitted to the Chairperson of the Research and Publication Committee (RPC) at RVTH during the first quarter of 2008 for consideration. It was accepted by the RPC. The revised second version was then forwarded to the chairman, Gambia Government/MRC Joint Ethics Committee to sought approval. By June 2008 this proposal was approved by The Gambia's Ethics Committee for implementation.

Serum samples are supposed to be collected from a sample size of 210 epileptic cases and matched controls of 420 non-epileptic people, and questionnaires administered. Serum samples were collected from 210 epileptic volunteer cases and 215 non-epileptic volunteer controls across the country during the last quarter of 2008. Questionnaires were applied on every volunteer. The remaining 205 control volunteers will be collected during the first quarter of 2009.

Serum samples of the 210 epileptic cases and 49 controls were tested at ITC laboratory using Antigen Enzyme Linked Immunosorbent Assay (Ag-ELISA) technique that utilizes two monoclonal antibodies (B158C11A10 and B60H8A4 BIOT) from ITM Belgium to detect circulating antigens of *Taenia Solium*. So far only three epileptic cases tested positive. The remaining samples will be tested using Ag-ELISA; and all samples will be further tested using Enzyme linked immunosorbent transfer blot (EITB) at the Institute of Parasitology in Switzerland in early 2009.

## **3. Epidemiological Investigation of Human Cysticercosis in Soutou Village**

*Taenia solium* cysticercosis affects both humans and pigs. High seroprevalence of 27 % porcine cysticercosis has been found at Soutou village during the survey described in one above. This tends to indicate some environmental contamination with the worm eggs. This study aims to find out the status quo of human cysticercosis and epilepsy in the human population of Soutou. It will utilize a descriptive epidemiological study approach. It will also involve recruitment of volunteers, data gathering and analysis, serology, CT scanning, and treatment of cysticercosis positive individuals. This study will be undertaken in the framework of a research work for PhD with the University of Antwerp, Belgium, in collaboration with the Institute of Tropical Medicine (ITM), Antwerp, ITC, and Bignona Hospital.

This proposal has already been sent to l'équipe cadre de district sanitaire, Bignona hospital, Senegal for consideration in October 2008. They have accepted the proposal and

we are now waiting for final approval of the authorities at the Ministry of Health Services of Senegal.

#### 4. Outlook 2009

The remaining sampling work for activity two will be completed in early 2009 as well as the remaining laboratory tests for both activity one and two. Activity three is expected to kick off as soon as approval is obtained.

Work plan for 2009 activities is shown below:

<b>Cysticercosis study: activities in 2009</b>	<b>Period</b>	<b>Expected output</b>	<b>Responsible</b>
Completion of sampling human epileptic controls	January-February	Additional 205 sera	A. Secka, RVTH
Completion of Ag-ELISA testing of human sera	January-February	Establish cysticercosis seroprevalence	A. Secka
EITB testing of human sera	March-April	Establish cysticercosis seroprevalence	A. Secka, Mr Felix
Ab-ELISA testing of porcine sera	April-May	Establish cysticercosis seroprevalence	A. Secka
CT-scanning and treatment of cysticercosis seropositive human volunteers	April-May	Cyticercosis diagnosed and treated	A. Secka, RVTH
Preparation, questionnaire administration, clinical examination, and sampling of human volunteers at Sotou	April-June	Data and serum samples obtained	A. Secka, Bignona Hospital doctors
Lab testing of collected samples, CT-scanning and treatment of seropositive volunteers	July-September	Cyticercosis diagnosed and controlled	A. Secka, Bignona Hospital doctors
Data encoding, statistical analysis, publication write ups, and reports	January-December	Publications and reports	A. Secka, Bignona Hospital doctors, RVTH, ITC, ITM and UA

#### IP8-1-3: Salmonellosis study

Dr Michael M Dione

The objective of the Salmonella project is to study the epidemiology and control of Salmonella spp. in animals and humans in The Gambia (Upper River Region) and Senegal (Casamance). This applied project is part of a research and development project on zoonotic diseases in The Gambia and Senegal. Several activities were organized during the year 2008.

##### 1. Trips, trainings, conferences and meetings

Ten field trips were organized: 7 to Casamance (Ziguinchor) and 3 to Upper River Region (Basse). Data were collected from farms (faeces and chicken carcasses) and restaurants (poultry dishes) in Casamance (Senegal) and from domestic animals in households in Upper River Region (The Gambia). Two missions were done in Dakar.

The first was to attend an international conference on ‘*the Strengthening of the Competitiveness in Semi-Industrial Poultry Farming in Africa*’ organized by the Veterinary School of Dakar (Ecole Inter-Etats des Sciences et Médecine Vétérinaires). During the conference, a poster was presented. It was entitled “*Epidemiological Investigation of Salmonella spp. along the Poultry Chain Production in Casamance (Senegal)*”. The second mission was to receive training at Pasteur Institute on serotyping and antimicrobial resistance testing of Salmonella. All the collected Salmonella specimens (335) were serotyped and their anti-microbial profiles tested against 22 antimicrobials. Training was also done at Medical Research Council (MRC, UK), The Gambia on molecular epidemiology such as Multiplex PCR, Multilocus Sequence Typing (MLST), Random Amplified Polymorphism DNA (RAPD), DNA Sequencing and Analysis of Sequence Data.

## **2. Research Activities**

### **Activity 1: Study of prevalence and antimicrobial resistance of Salmonella isolated from poultry broiler, farms, retail chicken carcasses and street-vended-restaurants in Casamance (Senegal)**

The field sampling and questionnaire administration were completed in Casamance. 57 farms, 285 chicken’s carcasses and 42 street-restaurants were sampled. After first isolation and identification of the specimens in ITC microbiological laboratory, the isolates were taken at Pasteur Institute (Dakar) during the period from Saturday 09<sup>th</sup> August to Thursday 23<sup>rd</sup> September 2008 for serological and antimicrobial tests.

261 isolates were confirmed as *Salmonella* out of 335 and 18 different serovars were identified. The commonest serovars were *S. Brancaster* (57.9%), *S. Goelzau* (10.7%), *S. Kentucky* (8.4%), *S. Hadar* (7.3%), *S. Agona* (5.7%) and *S. Poona* (3.1%). The proportion of farms from which *Salmonella* was detected in chicken feces, carcass skin and muscle was 35.1 %, 38.6% and 29.8% respectively. *Salmonella* were found in 14.3% of the restaurants. The prevalence on skin and muscle was significantly associated to the detection of *Salmonella* in faeces ( $P \leq 0.001$ ). High levels of resistance were found to commonly used antibiotics both in human medicine and in poultry production systems in Senegal, particularly to the complex Trimethoprim + Sulfamethoxazole, Tetracyclin, Trimethoprim, Streptomycin and Sulphonamides. *Salmonella* serovars were susceptible to fluoroquinolones and third-generation cephalosporins. A large proportion of isolates belonging to 11 serovars showed multiple resistances to two or more antibiotics.

Using these preliminary results, an article has been drafted and submitted for review to the co-authors for publication in an international journal. The Salmonella collection is stocked at ITC and MRC freezer rooms for further analysis. The questionnaire is being typed in access database for analysis of risk factors.

### **Activity 2: Molecular Characterization of Non-Thyphoidal Salmonella from chicken and chicken products in Senegal**

The *Salmonella* collection from Casamance was transported to MRC Laboratories for molecular characterisation. A duplicate of the isolates was stored at ITC freezer. Two types of analysis are being done: RAPD for the screening and identification of different fingerprints and MLST on the unique fingerprints detected. The MLST has been already

started on the 18 single serovars obtained after conventional serotyping. The PCRs were completed and the sequencing started. The RAPD has been tested on the 18 serovars and has shown to be working.

**Activity 3: Molecular relationships between human and domestic animals isolates of Non-typhoidal *Salmonella*, and epidemiological implications in Upper River Region (The Gambia)**

Twelve human cases of Salmonellosis were obtained so far by the MRC GEMS program (Diarrheal Disease in Infants and Young Children in Developing Countries) study in Upper River Region. All concerned households were visited, questionnaires were administered to people and domestic animals (chicken, sheep and goats) sampled. Fifteen isolates were suspected as *Salmonella* and will be further serotyped at Pasteur Institute Dakar in March 2009. The study is continuing in Upper River Division and more human cases are expected.

**Outlook for 2009**

Salmonella study activities 2009		2009											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
RAPD (Senegal isolates)	MRC												
MLST (Senegal isolates)	MRC												
Serotyping (Basse isolates)	PI												
RAPD (Basse isolates)	MRC												
MLST (Basse isolates)	MRC												
Writing up thesis (articles)	ITC/ MRC /UA												
Visit to Belgium (course)	RAs												
Formulation of package prevention/control of salmonellosis (leaflet/poster)	ITC/ ISRA/ NADA												
Attendance at International conferences	RAs												

**IP9: Socio-economics and Policy Dimensions of Livestock-based Agriculture**

The overall objective of this Institutional Project is to provide stakeholders in the livestock-based agriculture with information that can be used to define appropriate policies, develop suitable technologies, and facilitate transfer to the users. This includes the socio-economic characterization and profitability studies of livestock enterprises and intervention schemes.

IP9-1: Analysis of policy reforms to promote the performance of small and medium livestock enterprises in West Africa (The Gambia, Burkina Faso, Mali): Implications for agricultural development and research

This study under the CIDA project was completed in March 2008, and the end of project report has been submitted.

IP10: Training, Capacity Building and Information Exchange

In 2008, the range of activities attributable to IP 9 was low, again, the main reasons to mention were the reduced levels of training activities within ITC-assisted/executed projects, the alarming low levels of professional-technical staff at the Centre, and a further decline in networking between ITC and national institutions and other collaborators in the sub-region.

However, the support to ITC staff training continued, which is documented in the following table for the year 2008-09:

Staff Name	Training Title	Institution	Status
Sidat Trawally	French Course (DELF/DALF)	Alliance Franco Gambienne	On-going, until April 2009
Sidat Trawally	Accounting Training (ACCA preparation)	Jollof Tutors	On-going until June 2009
Nerry Corr, LA, Station Manager	MSc in International Animal Health	Edinburgh Univ. – Online	On-going
Modou Lamin Ceesay, Tsetse Entomologist	MSc in International Animal Health	Edinburgh Univ. – Online	On-going
Lamin J. Janneh, LA	Higher Diploma in Animal Health	Gambia College	Completed in June 2008
Lamin K. Darboe, LA	Higher Diploma in Animal Health	Gambia College	Completed in June 2008

Of the professional cadres, Mr. Vincent O. Asaolu, Research Fellow/Animal Scientist, completed his PhD research work with the defense of his dissertation on “Evaluation of *Moringa oleifera* LAM and *Oxytenanthera abyssinica* (A. RICH) MUNRO as protein supplements and natural dewormers for West African Dwarf goats” on 17 November 2008 at the Department of Animal Science, Obafemi Awolowo University, Ile Ife, Nigeria.

Mr Asaolu also attended the 10th World Conference on Animal Production in November 2008. He presented a poster entitled, "Evaluation of *Moringa oleifera* and bamboo leaves as feed supplements for ruminants using in vitro gas production technique". The abstract is contained in the "*Book of Abstracts for the 10th World Conference on Animal Production*", Page 83.

Drs. Adeniran Bankole, Michel Dione and Arss Secka, Research Associates/Veterinarians, are implementing research work for PhD in the framework of the VLIR-AU-ITM-ITC Project on the epidemiology and control of zoonotic infections in The Gambia and Senegal.