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ITC Annual Report 2016 and Outlook for 2017

Typical N'Dama Breeding Bull that are disseminated to multiplier-tier farmers

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Executive Summary

This report highlights the Research and Development projects and the ITC transformation process to WALIC implemented in 2016 and the outlook for 2017. The limited core and research funds received in 2016 was used mainly to conduct few research and development projects such as Genetic Improvement, Nema and WAAPP projects support, Introgression project, PROGEVAL project, and AU-IBAR supported project. It has also further documented initiatives undertaken on the transformation process of ITC to WALIC.

Genetic Improvement Program

Major infrastructure rehabilitation works, restocking of the small ruminants flocks and nucleus cattle herd, vehicle overhaul, purchase of research equipment and tools, fuel for operations, and monitoring of disseminated elite animals with farmers were done with support from Nema and WAAPP projects.

The breeding and selection activities were continued, and more than 15 elite bulls are expected to be disseminated to multipliers in early 2017. A case study of the breeding programme under the PROGEVAL project was successfully completed. A new Cattle Breeding Strategy Plan was developed with support from the regional Introgression project.

Nema Project Support

A new 10-hectare pasture plot has been demarcated at Keneba station and fenced. The Pasture manager that would develop the plot has been recruited and posted at the site. A new tractor with accessories has been delivered to Keneba for the pasture development work. Designs and specs for the solar operated irrigation system and quarantine pens have been completed. Cattle, sheep and goats were also procured towards optimising the nucleus flock and herd sizes. Feeds for supplementary feeding of the animals and veterinary supplies for herd health interventions were procured, delivered and utilized. The first training workshop for the Institutional Capacity Strengthening of the Gambia Indigenous Livestock Multipliers Association was conducted.

WAAPP Project Support

Sheep and goats were procured for the Nucleus breeding flocks. Breeding Infrastructure, housing, and administrative offices were rehabilitated. The Land Rover overhauled and now in use. A new laptop computer was purchased and delivered. Disseminated breeding male cattle, sheep and goats at the multiplier tier were monitored during undertaken missions. Fuel for operation of vehicles and generators was also provided.

AU-IBAR Supported Project

The initiative to elaborate a National Strategy and Action Plan for the management of animal genetic resources in The Gambia is supported by AU-IBAR. A National Advisory Committee and National Coordinator for AnGR management was appointed.

National and regional workshops

ITC was ably represented in six (6) national and six (6) regional workshops. The national workshops were held in The Gambia and organized by ITC, Department of Livestock Services, and National Livestock Policy Hub. These workshops focused on case studies, strategic plan development, and livestock policy issues.

The six regional workshops were held at Banjul, The Gambia; Dakar, Senegal; Abidjan, Ivory Coast; Ouagadougou, Burkina Faso.; and Niamey, Niger.

Transformation process of ITC to WALIC

The new WALIC Act 2016 was formally enacted. The accompanying Memorandum of Understanding and Rules of Procedure are being processed. Efforts to the constitution of the new WALIC Governing Board have yielded 6 confirmed positions out of the 15 members Board.

Outlook for 2017

The year 2017 would be characterized by continuation of started and new Research and Development projects (Genetic improvement, Nema project support activities, AU-IBAR Genetics project support for the development of a National Strategy and Action Plan for management of Animal Genetic Resources) as well as the mobilisation of resources for the launching of WALIC.

Introduction

Although there was very limited financial and human resources available to the centre during the year 2016, major achievements were registered on the Research and Development agenda and revitalisation/transformation process of ITC to West Africa Livestock Innovation centre (WALIC). As indicated in the outlook for 2016 in the ITC Annual Report 2015, the main work plan for 2016 consisted of the continuation of Research and Development activities as well as the transformation process of ITC to WALIC. This technical report is presented in four sections: 1) Research and Development activities, 2) Revitalization and transformation process of ITC to WALIC, 3) Outlook for year 2017, 4) Conclusion, and 5) Financial statement.

Implemented Research and Development activities for the year 2016 are as follows:

1) Breeding and selection of elite breeding male animals using the Open Nucleus Breeding Scheme (ONBS) approach,
2) Nema Project supported activities,
3) Introgression project,
4) WAAPP Project supported activities,
5) PROGEVAL project,
6) AU-IBAR Supported project, and
7) Participation at national and regional workshops.

The outputs from these research activities benefitted several livestock farmers, researchers, extension agents, and decision makers. Results of research activities were shared extensively with stakeholders and partners. More than fifteen (15) elite N'Dama breeding bulls are expected to pass the selection process which would be completed in early 2017 for dissemination to multiplier farmers. .

The transformation process of ITC to WALIC has attained important milestones. The new WALIC Act 2016 has been enacted paving the way forward to the launching of WALIC which would be preceded by the constitution and inauguration of the new WALIC Governing Board. .

Outlook for 2017 would focus on continuation of on-going and new research and development projects (Genetic improvement, Nema project support activities, AU-IBAR Genetics project support for the development of a National Strategy and Action Plan for management of Animal Genetic Resources) as well as the mobilisation of resources for the launching of WALIC.

1. Research and Development Activities

1.1 Genetic Improvement through Breeding and Selection for Elite Breeding males of Endemic Ruminant Livestock Breeds

1.1.1 Introduction

The breeding program was established at the International Trypanotolerance Centre (ITC) in The Gambia in 1994 with the goal of increasing milk and meat production without losing its tolerance to common diseases. The programme operates as an Open Nucleus Breeding Scheme with a three tier structure: Nucleus, Multiplier and Farmer. The breeds of interest and of national relevance are N'Dama cattle, West Africa Dwarf goats and Djallonke sheep. Elite

breeding males selected from the nucleus are passed on to the multipliers for multiplication and further dissemination of their offspring to other farmers. Through this way the genetic improvement of the national herd is cumulative and could reach about 1% over generations.

Many routine and new activities for strengthening the ITC genetic improvement program at Keneba were undertaken in 2016. Resource mobilization and partnership building with national and regional initiatives has been the key driving forces of the program throughout the year under reporting.

The day to day management of the nucleus herds and flocks including health and nutritional components alongside the breeding component ensures more effective and efficient flow of elite breeding males from the nucleus to the end users through multipliers. The herd health program adheres to routine and basic health practices designed to prevent and control enzootic diseases affecting ruminants locally. Local feed resources are being utilized to support physiological functions under the low input system which commensurate with local production systems at community level.

The centre has a well-established recording system to account for pedigree and other performance traits such as milk yield and daily weight gain, which are the core of the defined breeding goal. On a monthly basis, animals are weighed from birth through weaning and until 36 months of age. All weaned calves at 12 months of age are transferred to high tsetse challenge area in Niamina East district (Kudang area) until 36 months of age, when their breeding values are estimated. Elite males obtained from the selection are disseminated to multiplier herds as prescribed under the three tier scheme. The females are further allowed to go through their first lactation and subsequently selected phenotypically on milk production potentials and finally used as replacements. The adopted Open Nucleus Breeding approach gives room for screening from commercial production population and multiplier levels.

There is a Senior Animal Production Officer, a Pasture manager, three field assistants, herdsmen and other staff assigned to the day to day running of the program and other technical matters.

The essential infrastructure for breeding is in place. There is a laboratory to support diagnostics and the necessary office equipment for the collection, storage and process of data to aid management decisions. Even though the centre is funded by the Gambia government, it received some support from national projects such as the West Africa Agricultural productivity Project (WAAPP) and the project for Building Resilience to Recurring Food Insecurity under the administration of National Agricultural Land and Water Management Development Project (*Nema*).

The International Trypanotolerance Centre through the Genetic Improvement Programme has collaborated with CIRDES on the regional PROGEVAL project, through which production performances of the N'Dama and other production parameters of the breeding programme have been calculated.

1.1.2 Nucleus herd and flock structure at Keneba and Niamina

There are ten herdsmen assigned to the five herds. Their daily functions include herding, milking, help in the monthly weighing of all the animals, monitor and report cows in heat for mating, provision of feed supplements where necessary and stock checking. At the small ruminants unit only three herders are available.

For ease of management, monitoring and recording for data and genetic analysis, the herds have been divided into five herds. The herds comprise of calves, heifers, cows, teaser and

breeding bulls. The teaser bulls have been vasectomised and are used for heat detection among heifers and cows on a daily basis. The composition of the five cattle herds, sheep and goats flocks as of December 2016 is shown in tables 1 and 2. The heifers and young bulls under performance testing at Niamina East are also presented in table 1.

There has been a net increase of 99 cattle, 21 goats and 68 sheep by end 2016 over the 2015 value. There are 342 breeding heifers and cows, 148 does, and 80 ewes.

Table 1. Nucleus cattle herd structure and size

Herd	Calves	Heifers	Nema	Young Bulls	Cows	Teaser Bulls	Breeding Bulls	Total per herd
BB							5	5
Herd 1	20	13	18		34		.	85
Herd 2	23	7	18		35	1	.	84
Herd 3	26	3	17		41	-	.	87
Herd 4	20	9	15		35	1	.	80
Herd 5	17	7	16		32	1	.	73
Missra		26						26
Sambelkunda		28						28
Touba1				41				41
Touba2				38				38
Total Count	**106**	**93**	**84**	**79**	**177**	**3**	**5**	**547**

Table 2: Nucleus flock structure and size

Species	Does/ Ewes	Lambs/ kids	Rams/bucks >90 days old	Teaser bucks/ rams	Breeding Rams/bucks	Total
Goats	148	32	12	1	3	196
Sheep	80	5	5	-	2	92

1.1.3 Herd management

Herd management is the role of herdsmen, field assistants and a Senior Animal Production Officer at station level. The management process involves the following:

- Monitoring the activities of the teaser bulls every morning,
- Facilitate natural servicing of females in heat in a timely manner,
- Monitoring the health status of all animals,
- Provision of feed supplement to those animal with very poor body condition score especially lactating cows,
- Separation of calves from their dams and supplement them with hay during the day time,
- Making sure that animals drink enough water, and
- Stock checking.

The following pragmatic interventions were instituted with the goal of improving the overall herd and flock management:

Calf Management: The overall calf management at the nucleus herd has improved substantially (see daily weight gain registered in 2016 in table 4) over the years. However, increased calf mortalities and lower weaning weights had been attributed to orphaned calves

that lost their dams to incidence of CBPP in 2015, which coincided with the stress period. The calf holding area established in 2013 was maintained through the year 2016. This facility within the campus premises provided the calves enough shade, feed, and portable water *ad-lib*. Calves are admitted into the holding area when their dams are released for grazing and reunited with them for suckling upon return. This intervention reduced heat stress problems, allowed better monitoring, reduced mortality rates, and produced healthier and stronger calves.

Mating System*:* Herdsmen and technicians were sensitize on the importance of getting actual dates of dam mating and the identity of mating bulls used. This data is quickly fed into the database once it is collected. More vigilance was exercised in herding the dams in all herds to avoid mating by unknown bulls, and heat detection of dams coming into oestrus was intensified. Teaser bulls were released early each morning and upon return from herding to identify dams on heat. Dams on heat were randomly allocated to a breeding bull in the mating pen for a period of at least 48 hours.

Nutrition*:* The feed reserve base for the breeding stocks in the cattle nucleus herds and small ruminant flocks were beefed up by the end of the year in preparation for the critical months of the dry season in 2017. The biomass from the pasture field was stocked in the feed store for use in the dry period of 2017. By the end of 2016, about 15 tonnes of groundnut hay was purchased and stored for use during the critical period of the dry season.

1.1.4 Data collection, entry and analyses

Data collection is a routine practice that provides essential information for analysis and improvement. It is the recipe for genetic analysis and the basis for estimating genetic parameters. Data obtained from the field is inputted into the ITC Breeding Database by the Animal breeder/geneticist. Entering the data is timely and accurate to prevent the outliers in subsequent analysis. After entry, the data is checked for possible errors.

All entries are obtained from weekly records of different activities such as mating, calving, milking, exits/culling, entries, treatment and mortalities. Data on monthly weights, trypanosomosis infection status, and Packed Cell Volume (PCV) levels of cattle are also entered into the database.

- **Annual calving and mortality rate**

There has been steady increase in the number of calves born each year and fall in calf mortality rate from 2010 to end 2014. The trend had shown a decrease in birth through 2015 but increased in 2016 with higher mortalities as shown in table 3 below:

Table 3: Calving and calf mortality rates over seven year period

Year	Total Births	Stock Actual			Calf mortality (%)
		Total	Male	Female	
2010	69	42	11	31	39
2011	88	44	19	25	50
2012	80	59	29	30	26.3
2013	93	85	42	43	8.6
2014	115	104	61	43	9.6
2015	62	57	25	32	8.1
2016	79	64	25	39	18.9

The decreased number of calving is attributed mainly to nutritional stress and incidence of contagious bovine pleuropneumonia (CBPP) cases since 2015.

- **Weight at birth, weaning and gain**

The average calf weights at birth, weaning and average daily weight gain (ADWG) at 12 months of age over a five year period are indicated in the table 4 below:

Table 4: Average weights and gain of calves

Year	Birth Weight (kg)	Weaning weight at 12 months (kg)	ADWG at 12 months (kg)
2012	21.4	67.0	0.13
2013	22.2	84.4	0.17
2014	23.0	76.1	0.15
2015	21.5	69.8	0.13
2016	17.0	74.9	0.16

- **Exits**

A total of 76 cattle exited the nucleus herd due to various reasons as indicated in table 5.

Table 5. Exits of cattle from the nucleus

S/n	Animal category	Quantity	Reason for exit	Remarks
1	Bulls	1	Died	Teaser Bull
2	Young Bulls	3	Culled	
3	Young bulls	1	Lost/stolen	
4	Young bulls	15	Mortality	
5	Cows	1	Emergency slaughter	
6	Cows	6	Attacked by hyenas	
7	Cows	7	Mortality	
8	Heifer	4	Mortality	
9	Heifer	1	Snake bite	
10	Heifer	1	Lost	
11	Heifer	6	Culled	
12	Heifer (Nema)	6	Mortality	
13	Heifer (Nema)	3	Lost	
14	Heifer (Nema)	1	Attacked by hyenas	
15	Calves	15	Mortality	

- **Animal movement**

A total of 35 weaners were moved from Keneba station to Niamina during the year 2016. These weaners would be undergoing performance test under high tsetse challenge until the age of 36 months. Similarly, 28 mature heifers were moved from Niamina to Keneba station as replacement breeding females at the nucleus herd.

Table 6. Movement of various categories of livestock between stations

Animal Category	Origin	Destination	Number
Weaners	Keneba	Bansang (Niamina)	35
Weaners	Ker Serigne	Bansang (Niamina)	2
Heifers	Bansang (Niamina)	Keneba	28
Heifers	Nema	Keneba	94
Cows	Kerr Serigne	Keneba	3
Total			**162**

- **Mating and milk offtake**

Mating is recorded as it occurs by a designated bull to cows/heifers coming to heat. A total of 79 mating were recorded in 2016 with 4 returning to heat. Weekly records for milk off take of individual lactating cows were recorded and the average morning yields by season are shown in table 7.

Table 7: Average morning milk yield by season in 2016

Season	Average Morning Yield (ML)
Rainy Season (June-September)	582.0
Early Dry Season (October-January)	704.0
Late Dry Season (February-May)	298.4

1.1.5 Herd health interventions

The cattle herds were vaccinated against Black quarters and Hemorrhagic septicaemia, whilst the Small Ruminants were also vaccinated against Peste des Petites Ruminants (PPR) during the year 2016. All animals were strategically dewormed during the rainy season, while ectoparasite control, hoof trimming, and treatment of sick animals were carried out as required. Random blood and faecal samples were collected from the animals at Keneba and processed at the laboratory to determine infections, then followed by appropriate treatments.

All weaners, heifers and bulls at Niamina East district (Sambelkunda, Missra and Touba villages) undergoing performance testing for at least two years are bled every month to determine their blood packed cell volume (PCV) and trypanosome infection status. Breakdowns of the sampling results and treatments are shown in table 7.

Table 8. Number of cattle in Niamina herds weighed, sampled and treated monthly

Item	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
No. of cattle weighed	150	150	150	143	133	138	137	130	133	137	132	133
No. of blood samples	23	0	150	143	135	138	135	61	129	137	32	131
No. Positive for trypanosomes	4	0	2	2	2	0	1	1	3	10	4	7
Trypanosomes infection rate (%)	15.4	0	1.3	1.4	1.5	0	0.7	1.6	2.3	7.3	12.5	5.3
No. treated for tryps with PCV < 20%	11	0	8	7	10	4	6	1	1	5	12	21

1.1.6 Cattle herd and goat flock at Kerr Serigne

There is a F1 crossbred cattle herd (N'Dama x Holstein-Friesian or Jersey) mixed with backcrosses to N'Dama, another cattle herd of pure N'Dama breed, and a flock of goats at ITC headquarters located at Kerr Serigne. The purpose of these herds is to serve as demonstration of livestock models that could be adopted by different categories of farmers at peri-urban areas of The Gambia for income generation, milk and meat production. In addition to revenue generation for the centre, the N'Dama cattle herd and goat flock also produce replacement breeding females for the nucleus herd and flock at ITC Keneba field station.

Figure 1. F1-Backcrosses demonstration herd

Table 8. Cattle herd and goat flock composition

Category	N'Dama herd	F1/Backcrossed herd	Goat flock
Mating males	0	1	1
Breeding females	5	17	22
Calves/Kids	2	13	22
Weaners	0	11	0
Young bulls/bucks	4	20	5
Heifer	0	5	5
Total herd size in 2016	22	68	55
Increase over 2015 herd size	-11	18	0

The total **mortalities** in 2016 for cattle was 5 (3 N'Dama, 2 F1/Backcrossed), 19 goats and 2 goats lost; and the total number culled/sold is 2 (1 N'Dama, 1 F1/Backcrossed).

The major activities implemented in 2016 were:

- *Monthly weighing*

All station animals are weighed at the end of every month to determine weight gains/losses and body conditions and results incorporated into the database

- *Daily milking and milk measurement*

Milking is done daily and off-take measured and recorded daily and monthly records incorporated into the database

- *Supplementary feeding*

Animals are supplemented with groundnut cake, rice-bran and spent grain from Banjul Breweries to provide them with energy, protein and other essential elements required for maintenance and production

- *Vaccination*

Cattle were vaccinated against Blackquarters and Hemorrhagic Septicaemia diseases, and goats against Peste de Petit Ruminants (PPR) disease

- *Deworming*

Done at the beginning and end of the rainy season with anthelminthic to control helminthosis in the animals

- *Spraying*

Using acaricides to control ectoparasites mainly ticks on animals

- *Data collection and entry*

Data collected from all these activities is recorded and entered into the database

- *Feed purchasing*

This involves buying concentrates such as groundnut cake and rice bran. The spent grain from Banjul Breweries is supplied on irregular basis with I.T.C. providing fuel for transportation of this stuff

- *Treatments* implemented when necessary

- *Pasture production and utilization*

The new plots of *Pannicum maximum* developed on station last year has produced extra biomass to feed the station animals. Calves and weaners were rotationally grazed on the re-growths of the harvested pasture. Two hectares of pasture would be developed by next year to cater for the feed needs of the station animals.

The farm had made a marginal profit of D196,991 based on the expenditure revenue calculations presented on table 10 below. Urban small scale commercial dairy production is a profitable venture. Compared to last year's profit margin, this year had registered a drop of about D5,000. New initiatives would be pursued in 2017 to inseminate the backcrossed dams latest 2 months post calving with Holstein and Jersey semen. This is expected to produce more dairy animals that can boost the milk output of the farm.

Table 9. Financial statement of the headquarters farm in 2016

Expenditure		Revenue	
Item	Amount (D)	Item	Amount (D)
Groundnut hay	24,150.00	Fresh milk	666,570
Rice bran	7,500	Culled animals	20,337.5
Salt	3,400		
Casual labour	143,525		
Rope	2,000		
Fuel for feed collections	102,000		
Car maintenance	12,225		
Herdsmen salaries	195,116.20		
Totals	489,916.2		686,907.5
Marginal surplus			**196,991.3**

1.2 Nema project

The Islamic Development Bank (IsDB) and the Government of The Gambia is financing a project on *Building Resilience to Recurring Food Insecurity in The Gambia*. The project has been approved in 2014, and implementation of activities started in 2015. This five year project is under the administration of National Agricultural Land and Water Management Development Project (Nema).

The project has several components, beneficiaries and service providers. International Trypanotolerance Centre (ITC) is the main partner/beneficiary for the sub-component on *Support to Livestock.* ITC would receive support towards its Open Nucleus Breeding Scheme (ONBS) for it to operate more effectively, and also build the Institutional and technical capacity of the Gambia Indigenous Livestock Multipliers Association (GILMA). Total budgetary allocation to ITC for the project's lifespan is US$585,050.

Although there were delays in the procurement process, works and services, most of the planned activities for the year 2016 have been implemented with great success.

- Procurement of Tractor with accessories and Truck

The tractor with accessories is intended for the pasture development and other farm works, while the Truck would play big role in the movement of animals between stations and farms as well as other functions. The procurement process attained important milestones in 2016, where the tractor with accessories was delivered by the end of the year. The truck would be delivered in early 2017.

- Development of 10-hectare pasture field

In a bid to address feed constraints face by the breeding animals at Keneba station during the long dry season, a 10-hectare pasture field is going to be established to compliment the already established 8-hectares pasture field. The new pasture site is already demarcated, and fenced since April 2016. Late arrival of the tractor and absence of other necessary inputs postponed the cultivation of the first four hectares.

The recruitment process of a new pasture manager has been completed leading to the employment of Mr Nerry Corr with effect from 1st November 2016. He is entrusted with the responsibility to develop and maintain the new and already established pasture field at ITC Keneba station.

- Feed supplement and herd health management

A total of 15 tonnes of groundnut hay were purchased by the end of 2016 for supplement feeding of the breeding animals. Large quantities of assorted antibiotics, anthelmintics, anti-inflammatory, wound dressing products and acaricidal products were purchased and delivered to ITC for use in maintaining the animals' health.

- Construction of a quarantine facility

Quarantine facilities for cattle, sheep and goats is planned to be constructed at ITC Keneba station. The design stage and elaboration of the specifications for these facilities have now been completed by Mahfouz Engineering. Invitation for bids from suitable contractors is expected to be launched in early 2017 leading to the awarding of contracts to construct the structures.

- Procurement of animals

In a bid to optimise the number of breeding female cattle, sheep and goats present in the breeding nucleus and flocks, a contract was signed by the project and a supplier for the procurement and delivery of 100 cows, 75 ewes and 65 does to ITC Keneba station. Except for the remaining 6 cows, all the animals requested for have been delivered and integrated into breeding cattle herds and small ruminant flocks.

- Capacity enhancement of GILMA

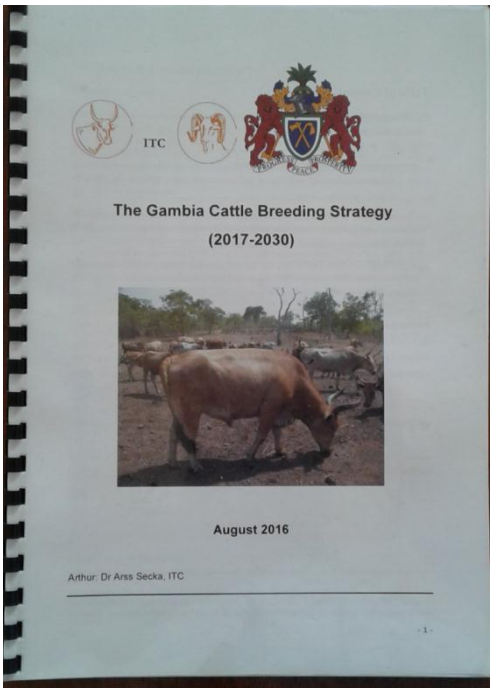
A contract was entered into between ITC and the West Africa Rural Foundation (WARF) based in Dakar, Senegal to implement the recommended action plan following the Participatory Institutional Diagnoses (PID) of the Gambia Indigenous Livestock Multiplier's

Association (GILMA) in 2014. WARF would undertake three missions to The Gambia to help support the revitalisation process of GILMA.

The first workshop on the *Strategic Reflection and Planning* for the GILMA was held in December 2016. This workshop was implemented by WARF with facilitation by ITC and the Department of Livestock Services. This workshop resulted into a renewed vision, mission and activity plan for the year 2017 for each GILMA.

1.3 Introgression project

This 36-months long regional study entitled *Introgression of Sahelian Zebu Cattle in Trypanotolerant Bos taurus populations of West Africa* was launched in 2012 and covered three countries: Benin (INRAB), Burkina Faso (INERA) and Mali (IPR/IFRA). It is funded by the World Bank, managed by CORAF/WECARD, and coordinated by INERA of Burkina Faso. Other partners include CIRDES of Burkina Faso and SERIDA of Spain. The aim of this project is to improve the sustainable conservation of the biodiversity of local cattle breeds in West Africa.



Following the review workshop of the project on Multi Donor Trust Fund held last September at Dakar, Senegal, it was recommended that the activities of the project should be implemented in additional eight West African countries during the remaining six months of the project lifespan (January to June 2016). The new countries that

joined the project in 2016 are as follows: Niger, Cameroun, Mauritania, Chad, Ivory Coast, Sierra Leone, Guinea, and The Gambia.

During the project implementation phase, ITC would undertake the following activities for The Gambia:

- Inventory, phenotypic and molecular characterization of cattle breeds,
- Determine the prevalence of trypanosomosis infection in cattle, and
- Strengthen the capacities of livestock innovation platform and research laboratory

The above three planned activities were not implemented due to severe reduction of the allotted budget and late disbursement of funds. The main revised task of the project was to elaborate a new Cattle Breeding Strategy Plan.

A draft outline of the Cattle Breeding Strategy Plan was agreed with the regional project coordination team. Following a detailed literature review on cattle production system, breeds characterization, legislation and regulatory text on animal genetic resources management; a one-day consultative workshop with stakeholders was organized on 19th July 2016 to gather inputs for the strategy plan.

Compilation of the literature review results and outputs of the consultative meeting resulted into a draft cattle breeding strategy which was widely circulated to stakeholders for prior reviewing in advance to the validation meeting held on 3rd August 2016. Relevant comments and issues raised during the validation meeting were incorporated during the finalization of the strategic plan.

The finalized Cattle Breeding Strategy for The Gambia was presented at the regional Introgression workshop held on 11-13th August 2016 at Ouagadougou, Burkina Faso. All participating countries presented their strategies during this workshop. Hard copies of the final Cattle Breeding Strategy Plan were circulated to collaborating institutions and partners in The Gambia.

1.4 West Africa Agriculture Productivity Project (WAAPP) Gambia

ITC submitted a proposal to WAAPP Gambia in October 2015 requesting for support to its on-going genetic improvement program for endemic ruminant livestock species covering the locally well adopted Djallonke sheep and West African Dwarf goats for consideration. The proposal was approved for funding in November 2015 during the World Bank mission to The Gambia.

The general objective of this proposal was to solicit for institutional support from WAAPP Gambia for maintaining the operations of the centre particularly the genetic improvement program and develop the capacity of its staff.

A total budget of $96,050.00 was approved to finance the following activities during the first half of 2016:

- Restocking of small ruminants nucleus flocks

A total of 25 young does and 50 young ewes were procured and integrated into the nucleus goats and sheep flocks at the ITC Keneba breeding station in April 2016.

- Rehabilitation of breeding infrastructure

Twelve houses both senior and junior at Keneba and Sololo stations were rehabilitated through painting, fixing ceilings, doors and shelves, tiling, sanitary fittings and improve plumbing system. In addition, the goat and small ruminant pens were reroofed with corrugated sheets, new water pump with pipes and a major stop valve installed at the pasture field, the training centre, and the bull mating pens at Keneba station also repaired. The borehole and water tank at Sololo station was repaired and two new small ruminant pens constructed. The conference hall, administrative block and labs at Kerr Seringe were also rehabilitated. There was a plan to construct a new feed barn and procure a new generator for Keneba station but was unrealized as they are under budgeted. Their budgets were then diverted to restructure and renovate the old and dilapidated bull mating pens at Keneba.

- Research equipment, mobility and consumables

The Keneba station Land Rover with the registration number ITC 11 TA which was non-functional for more than one year was generally overhauled and maintenance. It is now operated effectively for the breeding program activities. A new laptop computer was procured and delivered to ITC Keneba station.

- Monitoring of disseminated multiplier animals

Both the north and south banks of The Gambia has been trekked on three missions to visit farmers that had received breeding bulls, bucks and rams that served as breeders at their cattle herds and small ruminant flocks. These farmer beneficiaries from the ITC breeding programme were interviewed on different issues surrounding the performance, productivity, challenges and constraints faced during production.

- Operational support

Monthly fuel supplies to run the vehicles and generators in all the stations were received consecutively for the duration of six (6) months February to July 2016. It has greatly facilitated our operations.

1.5 PROGEVAL Project

Case studies of Genetic Improvement programmes in West Africa were undertaken under the regional project entitled *Project on the Valorisation of Local Animal Genetic Resources and Aquaculture* in UEMOA (PROGEVAL) in 2016. The study was coordinated by CIRDES based in Burkina Faso. The general objective of this case study was to evaluate the successes and difficulties of six selected breeding programmes and made recommendations for their improvement for the benefit of farmers.

The six selected programmes were as follows:

- ITC's Genetic Improvement programme, The Gambia;
- Azawak cattle selection programme at Toukounous, Niger;
- Zootechnic Research Centre (CRZ) at Kolda, Senegal;
- Toumondi of Ivory Coast;
- Azawak project of Burkina Faso; and
- Sheep and goats selection programme of Kolokopé, TOGO.

Utilized methodology for this study entailed literature review, analyses of the genetic improvement programme, and collation and analyses of collected data. Mr Momodou Jeng of ITC did the data analyses of the ITC's breeding programme. He conducted a thorough literature review on animal breeding programme, analysed important production and genetic parameters, gathered opinions of key stakeholders in the livestock sub-sector on the breeding programme through a one day consultative meeting. A draft report of this study was

circulated to relevant stakeholders for comments and reviewing. The final report accommodated many relevant issues raised during the document reviewing. The report was finally transmitted to the project coordination team at CIRDES in Burkina Faso.

1.6 AU-IBAR supported project

The proposal entitled "The Gambia National Strategies and Action Plans for Animal Genetic Resources" submitted to AU-IBAR for funding was accepted in August 2016. The objective is to prepare the National Strategies and Action Plans for the sustainable use, development and conservation of Animal Genetic Resources of The Gambia.

The requested detailed budget and work plan of activities was elaborated and sent to AU-IBAR. Members of the newly formed National Advisory Committee (NAC) and National Coordinator for Animal Genetic Resources were appointed by the Ministry of Agriculture. The inauguration and first working meeting of the NAC was planned in consultation with AU-IBAR for December 2016 but could not be implemented due to the political stalemate after the December Presidential election 2016.

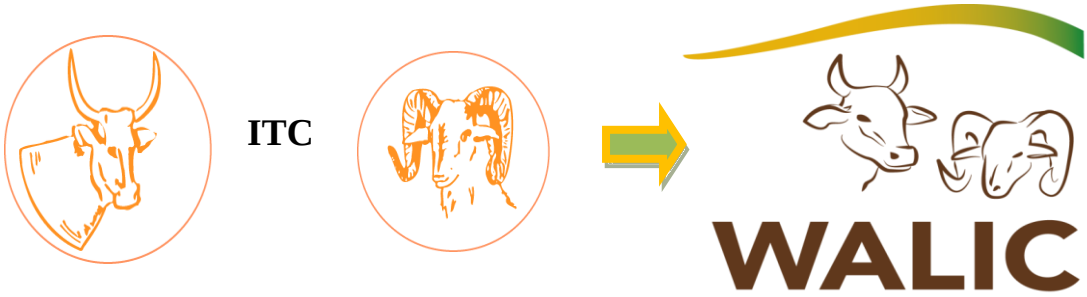
1.7 National and Regional Workshops

ITC was represented at the following national and regional workshops organized in 2016:

Table 10. List of National and Regional workshops organised in 2016

S/n	Conference/workshop	Period	Venue
1	Regional Launching Workshop of the Introgression project	19-20th January 2016	Abidjan, Ivory Coast
2	CORAF Regional Validation Workshop for regulation on circulation and use of Animal Genetic Resources in West Africa	5-6th April 2016	Dakar, Senegal
3	Regional Planning Meeting of the National Centre of Specialization (CNS) on Livestock of Niger	18-22nd April 2016	Niamey, Niger
4	Consultation meeting for the analyses of ITC Breeding Programme under the PROGEVAL project	30th June 2017	ITC Kerr Serigne
5	Consultative meeting for the elaboration of The Gambia Cattle Breeding Strategy under the Introgression project	19th July 2016	Bijilo, The Gambia
6	First Seminar on ACCP Fellowship on climate change	28th July 2016	ITC Kerr Serigne
7	Validation workshop of The Gambia Cattle Breeding Strategy	3rd August 2016	Bijilo, The Gambia
8	Validation workshop of the Regional Strategy Document for Genetic Improvement of AnGR	11-13th August 2016	Ouagadougou, Burkina Faso
9	Second Seminar on ACCP Fellowship on climate change	8th August 2016	ITC Kerr Serigne
10	Launching of the Regional Livestock Policy Hub	24-25th October 2016	Bakau, The Gambia
11	Launching of the National Livestock Policy Hub of the Gambia	26-28th October 2016	Bakau, The Gambia
12	Third General Assembly of the Sub-Regional Focal Point for Animal Genetic Resources for West Africa	23-25th November 2016	Ouagadougou, Burkina Faso

2. Transformation process of ITC to WALIC



2.1 Constitution of the new Governing Board for WALIC

The kick start of the operations of WALIC must be preceded by the constitution and inauguration of the new Governing Board. This was pursued intensely by the Ministry of Agriculture. Letters were sent to the ECOWAS, Directors of CORAF/WECARD and AU-IBAR; President of ROPPA – a regional farmer organization, Ministers of Agriculture or Livestock of Senegal, Ghana, Guinea, Nigeria, Sierra Leone, Liberia and Niger to formally request them to represent their institutions at the Governing Board. Good responses were received from the addressees expressing their willingness to serve at the Governing Board. Resource mobilization was initiated to hold the first inauguration meeting of the Board in Banjul, The Gambia by early 2017.

3. Outlook for 2017

3.1 Research and Development Activities

3.1.1 Genetic Improvement programme

All of the activities currently being carried out at all the field stations (Keneba, Kudang and Bansang/Sololo) will be continued in pursuit of our efforts to improve the performance of the three ruminant livestock breeds without affecting their resistance to a number of diseases or reducing their adaptability to the environment in which they have thrived well over several generations. These animals constitute a valuable animal genetic resource for millions of livestock producers in the region. The main output of the breeding programme which is improved Breeding Bulls is expected to be disseminated to multiplier cattle farmers in early 2017.

Cattle, sheep, and goats restocking at the nucleus flocks and herds at Keneba station would be continued through breeding of the present stock and introduction of new stock from the Nema IsDB Building Resilience Project in The Gambia.

Works on the construction/rehabilitation of Bull mating pens at Keneba station is expected to finish in early 2017.

3.1.2 Nema project

The activities that were planned for 2016 but not realized would be taken up in 2017. Hence, we are anticipating that the truck would be delivered, the solar operated irrigation system

installed, four hectares of pasture field established, quarantine pens constructed, feed supplements and veterinary supplies delivered, and continuation of the GILMA capacity enhancement activities are expected in 2017.

3.1.3 AU-IBAR supported project

The deferred inauguration and working meeting of the National Advisory Committee (NAC) would be done in 2017. Results of the first NAC meeting would set the action plan for the elaboration and formal endorsement of the National Strategy and Action Plan for the management of Animal Genetic Resources.

3.2 Transformation process of ITC to WALIC

ITC would continue to mobilize resources through partnership and collaboration with the governments of member countries, CORAF/WECARD, and ECOWAS commission. The new WALIC would be launched as soon as sufficient financial resources are mobilize to operate and recruit new staff to start implementing programmes of the new 10-year Strategic Plan (2013-2022).

4. Conclusion

Substantial achievements on research and development activities, the revitalization and transformation process of ITC to WALIC were attained despite major challenges and limitations on human and financial resources.

In conclusion, ITC registered successes in the following areas during the year 2016:

1) The PROGEVAL Case study on ITC's Breeding Programme and the elaboration of Cattle Breeding Strategy under the Introgression Project were successfully completed,
2) Most of the activities funded by Nema and WAAPP projects to enhance ITC's capacity on genetic improvement of endemic ruminant livestock species as well as the Capacity enhancement of GILMAs were attained,
3) ITC effectively participated at six (6) national and six (6) regional workshops organized by ITC and partners (AU-IBAR, CORAF, CNS-Livestock Niger, INERA Burkina Faso, and Department of Livestock Services of The Gambia, etc.),
4) The new WALIC Act 2016 has been enacted,
5) Secured funding from AU-IBAR for the elaboration of NSAP for The Gambia, and
6) Constitution of the new Governing Board for WALIC initiated.

5. ITC Staff List as at December 2016

S/No.	NAME	POSITION	STATION
1	MR SAINEY FATTY	Herdsman	Kerr Serigne
2	MR ALHAGIE MBYE	Herdsman	Kerr Serigne
3	MR SHERIFFO KANTEH	Driver	Kerr Serigne
4	MR OUSMAN BARROW	Cleaner	Kerr Serigne
5	MR SARJA DRAMMEH	Cleaner	Kerr Serigne
6	MR EBRIMA M. BADJIE	Mechanic	Kerr Serigne
7	MR LAMIN K. DARBOE	Livestock Assistant	Kerr Serigne
8	MR LAMIN F. JANNEH	Admin Clerk	Kerr Serigne
9	MS FATOU BITTAYE	Accounts Clerk	Kerr Serigne
10	MR NUHA S. BOJANG	Livestock Assistant	Kerr Serigne
11	MR ABDOULE BALDEH	Senior Herdsman	Kerr Serigne
12	MR LAMIN DRAMMEH	Senior Acccountant	Kerr Serigne
13	DR ARSS SECKA	Research Scientist	Kerr Serigne
14	MR KUNDU SAIDY	Herdsman	Kerr Serigne
15	MR ADAMA KUJABI	Herdsman	Kerr Serigne
16	ME EBRIMA J. SENGHORE	Field Driver	Kerr Serigne
17	MR ABDOU TOURAY	Night Watchman	Kerr Serigne
18	MR SAIDOU JADAMA	Night Watchman	Kerr Serigne
19	MR KAWSU JAWARA	Field Assistant	Kerr Serigne
20	MR CHARLES K JATTA	Gardener	Kerr Serigne
21	MR MOMODOU JARJUE	Gardener	Kerr Serigne
22	MR ANSUMANA CEESAY	Snr Livestock Assistant	Kerr Serigne
23	MR LAMIN JAMMEH	Day-time Security	Kerr Serigne
24	MR AMADOU CEESAY	Day-time Security	Kerr Serigne
25	MR ALAGIE JAMMEH	Night Security	Kerr Serigne
26	MISS MARIAMA FABURAY	Day-time Security	Kerr Serigne
27	MR MAMUDOU SIDIBEH	Night Security	Kerr Serigne
28	MR MAMADOU DRAMMEH	Night Security	Kerr Serigne
29	MR SULAYMAN KANBASA	Night Security	Kerr Serigne
30	MR MOMODOU JENG	Senior Animal Production Officer	Keneba
31	MR ANSUMANA JARJU	Driver / Field Assistant	Keneba
32	MR KEBBA JALLOW	Herdsman	Keneba
33	MR JAMANTY CEESAY	Herdsman	Keneba
34	MR MUSA JALLOW	Herdsman	Keneba
35	MR FABAKARY B CEESAY	Herdsman	Keneba
36	MR FABAKARY DRAMMEH	Herdsman	Keneba
37	MR SUNKARU MANNEH	Herdsman	Keneba
38	MR ALAGIE J BAH	Herdsman	Keneba
39	MR KULAYMAN SILLA	Herdsman	Keneba
40	MR ALIEU SAIDY	Herdsman	Keneba
41	MR FANDING CEESAY	Herdsman	Keneba
42	MR TIJAN TAMBA	Field/Lab Assistant	Keneba
43	MR SAIDY CEESAY	Gate Security	Keneba
44	MRS TUMBUL SAMATEH	Cleaner	Keneba
45	MR EBRIMA S. KOLLEY	Field Assistant	Keneba
46	MR ABDOULIE MINTEH	Herdsman	Keneba
47	MR SIAKA K. CEESAY	Night Security	Keneba
48	MR ALFUSAINEY TAMBA	Herdsman	Keneba
49	MR ALKALI KEBBEH	Herdsman	Keneba

50	MR CHERNO DANSO	Night Security	Keneba
51	MR MOMODOU MANJANG	Watchman	Keneba
52	MR OUSMAN BALDEH	Herdsman	Keneba
53	MR LASANA JARRA	Herdsman	Bansang
54	MR KALIPHA TOURAY	Labourer	Bansang
55	MR ALAGIE BAH	Herdsman	Bansang
56	MR MOMODOU FATAJO	Watchman	Bansang
58	MR MASANNEH A. BOJANG	Snr Livestock Assistant	Kudang
59	MR MODOU S GAYE	Livestock officer	Kudang
61	MR MADI CAMARA	Herdsman	Kudang
62	MR SULAYMAN BALDEH	Herdsman	Kudang
63	MR SHERIFFO BAYO	Herdsman	Kudang
64	MR ALASSO SIDIBEH	Herdsman	Kudang