WEST AFRICA LIVESTOCK INNOVATION CENTRE

WALIC ANNUAL REPORT 2018

Elite breeding bull and heifers on road to University of Cape Coast, Ghana

January 2019

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Executive Summary

This report highlights the Research and Development projects and the ITC transformation process to WALIC implemented in 2018 and the outlook for 2019. The limited core and research funds received in 2018 was used mainly to conduct few research and development projects such as Genetic Improvement supported by Nema project, and the elaboration of a National Strategy and Action Plan funded by AU-IBAR's Genetics project. It also further documented initiatives undertaken on the transformation process of ITC to WALIC.

Genetic Improvement Program

The routine breeding and selection process for elite breeding bulls, bucks, and rams were implemented throughout the year. Data gathered on control mating of breeding females, calving, weights, milk off-takes, weaning, treatments, livestock movements between stations, and mortality counts were recorded on the central database. An improved N'Dama breeding bull selected from the nucleus herd and two heifers were exported to University of Cape Coast, Ghana to be used for breeding on the university farm. By end of the year, 44 young bulls and 32 heifers are undergoing exposure to natural tsetse challenge and performance testing for eventual selection and dissemination. Selected elite breeding bulls would be eventually s disseminated to the multiplier tier. Good heifers would be used as replacement breeding females at the nucleus herd. Bulls with very low breeding values would be culled.

Nema Project Support

Implementation of planned project activities have advance greatly having reached key milestones. The long awaited truck has been delivered to Keneba and put in great use of transporting animals and feeds. Supplementary animal feeds ad veterinary drugs were procured by the project and delivered to WALIC Keneba station. The last batch of breeding animals have been procured and delivered by the project. This stock consist of 78 cows, 68 goats and 78 sheep. Planned coaching by West Africa Rural Foundation for the Gambia Indigenous Livestock Multiplier's Association (GILMA) members was not implemented. From the 4 hectares of cultivated pasture fields, about 100 tonnes of biomass and maize stovers were harvested and stored for feeding the animals during the long stressful dry season.

P2RS Project Support

Following the training and equipping of 11 artificial inseminating technicians in 2017, 62 cows were inseminated in 2018. About half of the inseminations were done on station and the remaining ones on farms in West Coast Region and North Bank Region.

AU-IBAR Supported Project

The initiative to elaborate a National Strategy and Action Plan (NSAP) for the management of animal genetic resources in The Gambia is supported by AU-IBAR. The new National Advisory Committee (NAC) was inaugurated during their first working meeting in 2017. The recruited consultant has taken all required processes to elaborate the NSAP document. The draft NSAP is now ready for validation. AU-IBAR is also supporting the rehabilitation of the bulls mating pens and provision of animal watering facility at Keneba. Works on the rehabilitation of the bull mating is in progress, but the watering facility has not yet to take-off.

National and regional workshops

WALIC was ably represented in one (1) national and three (3) regional workshops. The national workshop held in The Gambia on 27-29th September was supported by AU-IBAR and organized

by the Department of Livestock Services. The workshop focused on veterinary legislation and issues of the national livestock policy hub.

The three regional workshops were held at Nairobi, Dakar and Lomé, respectively. The first one was organized by AU-IBAR for the Steering Committee of the Genetics project. The second one was organized by the Regional Animal Health Centre of Mali for the ECOWAS member states to conduct One Health Zoonotic Diseases prioritization exercise. The last one was a Steering Committee meeting organized by AU-IBAR and Secretariat of the Sub-regional Focal Point for the Management of Animal Genetic Resources West Africa. .

Transformation process of ITC to WALIC

The new name of the Centre was adopted and all necessary changes in documentation and vehicle registration numbers were changed accordingly. The planning and preparations for the first council meeting is on the way. Country sensitisations and resource mobilisation are pursued for launching WALIC.

Outlook for 2019

Activities prevue for the year 2019 include the 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 2018, some achievements were registered on the Research and Development agenda and revitalisation/transformation process of International Trypanotolerance Centre (ITC) to West Africa Livestock Innovation centre (WALIC). As indicated in the Outlook for 2018 in the ITC Annual Report 2017, the main work plan for 2018 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 2019, 4) Conclusion, and 5) List of staff members.

Implemented Research and Development activities for the year 2018 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) P2RS project support on artificial insemination (AI),
4) AU-IBAR Supported project for the elaboration of NSAP, and
5) 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 are shared extensively with stakeholders and partners. Selected elite N'Dama breeding bulls, bucks and rams are disseminated to multiplier cattle herds, sheep and goat flocks around the country through the Gambia Indigenous Livestock Multipliers Association (GILMA). The bulls have been integrated into their new owners' herds. Selection of breeding bulls uses a young sire scheme that utilizes 36 months performance records of candidate animals, their siblings, and dams milk production.

Nema supported project activities are designed to strengthen the genetic improvement program through the provision of new animals, feeds, veterinary drugs and supplies, truck, tractor with accessories, pasture fields establishment, and training of the GILMA associations. Activities implementation are going on smoothly. Planned activities for 2018 included continuation of the establishment of pasture field and completion of the animal restocking process.

Following the training and equipping of 10 AI technicians held in 2017, inseminations of cattle with Holstein-Friesian semen is raised from the P2RS project was used to train and equip eleven (11) Artificial Insemination (AI) selected from research, extension and farmer groups. N'Dama cows and their crosses in different locations around the country have been inseminated with conventional or sexed Holstein semen to produce dairy F1 crossbreds.

The genetics project of AU-IBAR is supporting a national effort to elaborate a National Strategy and Action Plan for the management of Animal Genetic Resources (AnGR) in the Gambia. This would provide the country a framework for better management of AnGR as per the Global Plan of Action on AnGR.

The transformation process of ITC to WALIC has reached a milestone of constituting a new regional Governing Council as the governance oversight body for the new Centre. Inaugurating this new Council is still a top agenda. Once the Council is inaugurated, it would develop a road map for launching WALIC.

Outlook for 2019 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 West Africa Livestock Innovation Centre (WALIC) 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 WALIC genetic improvement program at Keneba were undertaken in 2017. 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 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 transported to a high challenge area of tsetse (Kudang area) until 36 months of age, when their breeding values are estimated

There is a geneticist, a pasture manager, four field assistants, herdsmen and other staff assigned to the day to day running of the program and other technical matters.

The essential infrastructure 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 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 program has collaborated with other research institutions in the sub-region, through which production performances of the N'Dama and other parameters relation to production have been calculated.

1.1.2 Nucleus herd and flock structure at Keneba and Niamina

There are nine 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 five 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 2018 is shown in tables 1 and 2. The heifers and young bulls under performance testing at Niamina East are also presented in table 1.

Table 1. Nucleus cattle herd structure and size

Herd	Calves	Heifers	Nema	Young Bulls	Cows	Teaser Bulls	Breeding Bulls	Total per herd
BB							6	**6**
Herd 1	16	4	14		29	1	.	**64**
Herd 2	14	2	18		27	1	.	**62**
Herd 3	23	1	15		30	1	.	**70**
Herd 4	17	2	16		27	1	.	**63**
Herd 5	16	4	17		26	-	.	**63**
Missra		16						**16**
Sambelkunda		16						**16**
Touba1				22				**22**
Touba2				22				**22**
Total Count	86	45	80	44	139	4	6	404

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	149	60	41	1	3	254
Sheep	93	31	6	-	3	133

1.1.3 Herd management

Herd management is the role of herdsmen, field assistants and a senior animal breeder/geneticist 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 continue to improve substantially (see daily weight gain registered in 2018 in table 4) over the years. However, decreasing calf mortalities and increasing weaning weights have been attributed to intervention measures to combat or control the incidence of CBPP that started in 2015, which coincided with the stress period. The calf holding area established in 2013 was maintained through the year 2018. 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, allows better monitoring, reduced mortality rates, and produced healthier and stronger calves.

Mating System*:*

*H*erdsmen and technicians as usual, were sensitized on the importance of getting actual dates of dam mating and the identity of mating bull 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 2019. The yield from the pasture field was stocked in the feed store for use in the dry period of 2019. By the end of 2018, 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 WALIC 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. The year 2017 was a very critical year for the nucleus herds. There was a drop in total birth as shown in table 3. A high number of pregnant cows died and those that delivered shortly succumb to the disease (CBPP). Most orphaned calves could not survive. An increase in calving was realized in 2018 with lower calf mortality.

Table 3: Calving and calf mortality rate in 2018

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
2017	45	32	11	21	28.8
2018	72	61	31	30	15.2

The decreased number of calving in the past is attributed mainly to nutritional stress and incidence of contagious bovine pleuropneumonia (CBPP) cases in 2017 as shown in table 5. Out of 25 samples collected in 2017, 6 samples were found to be positive of CBPP, and this constitutes 24% on extrapolation. The episode led to the deaths of 50% of the total population of at cattle at the nucleus herds. In 2018, samples were further collected and there were still some positive samples. Field Assistants ensured vigilance to report and act on any CBPP case.

- **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 seven year period are indicated in the table below:

Table 4: Average weights and gain of calves

Table 4: Weaning weights and average daily weight gains at 12 months

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
2017	19.6	59.5	0.11
2018	16.8	62.9	0.13

There had been a significant drop in weaning weight and average daily weight gain in 2017 but slightly increased in 2018. Further increase is projected in 2019. The decrease over the years was attributed to the death of most dams when the calves were very young as a result of CBPP. Those that survived bottle feeding had very stunted growth.

- **Exits**

Table 5. Exits of cattle from the nucleus

S/n	Animal category	Quantity	Reason for exit	Remarks
1	Bulls	1	Teaser	Cruelly Chopped
2	Young Bulls	1	Culled	
3	Young Bulls	1	Multiplier/Breeding	Ghana
4	Young bulls	2	Lost/stolen	
5	Young bulls	2	Mortality	
6	Young bulls	1	Accident	
6	Cows	1	Emergency slaughter	
7	Cows	14	Mortality	
8	Heifer	2	Lost/stolen	Niamina
9	Heifer	2	Mortality	Niamina
10	Heifer	2	Breeding	Ghana
11	Heifer (Nema)	4	Mortality	
12	Calves	12	Mortality	
13	Calves	1	Strangled	
	Total exits	46		

The number of animals that exited the herds due to mortality could be attributed to CBPP, since some animals were found to be positive (see annex). All the animals drink from the same source, hence serve as a potential source of infection. Another batch of sample is planned for 2018. There could be a confounding factor to the high mortality such as feed shortage caused by bush fires. Two third of the grazing site of ITC cattle was burnt. Another important factor was the timing of vaccination against CBPP, which was conducted in the stress period.

- **Animal movement**

A total of 13 weaners were moved from Keneba station to Niamina during the year 2018. These weaners would be undergoing performance test under high tsetse challenge until the age of 36 months. Similarly, 8 mature heifers were moved from Niamina to Keneba station as replacement breeding females at the nucleus herd. The low number of transfers was as a result of restricted movement due to the outbreak of FMD in the whole country.

Table 6. Movement of various categories of livestock between stations

Animal Category	Origin	Destination	Number
Weaners	Keneba	Bansang (Niamina)	13
Heifers	Bansang (Niamina)	Keneba	8
Total			**21**

- **Mating and milk offtake**

Mating is recorded as it occurs by a designated bull to cows/heifers coming to heat. There have been a good number of cows mated in 2018. A total of 111 cows were mated. This shows an increase of 7%. Only 8 cows repeated 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. There was a significant drop in milk yield in the rainy season but increased in other seasons. The drop in the rainy season may be explained by the long dry spelt.

Table 7: Average morning milk yield by season in 2018

Season	Average Morning Yield (ML)
Rainy Season (June-September)	535.8
Early Dry Season (October-January)	670.4
Late Dry Season (February-May)	234.4

1.1.5 Herd health interventions

The cattle herds were vaccinated against Black quarters and Haemorrhagic septicaemia, whilst the Small Ruminants were also vaccinated against Peste des Petites Ruminants (PPR) during the year 2018. 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

Parameter	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
No. of cattle weighed	82	82	84	83	80	80	76	73	76	76	75	76
No. of blood samples	82	82	84	83	34	80	76	72	76	77	75	76
No. Positive for trypanosomes	1	0	1	0	0	0	1	1	3	13	41	5
Trypanosomes infection rate (%)	1.2	0.0	1.2	0.0	0.0	0.0	1.3	1.4	3.9	16.9	54.7	6.6
No. treated for tryps with PCV < 20%	11	6	8	11	1	6	8	2	3	8	44	6

UPTAKE OF BREEDING PROGRAMME OUTPUTS

One elite N'Dama bull and two heifers selected from the nucleus herd were exported to the University of Cape Coast in Ghana as breeding stock. They were transported on land through a truck sent by recipient as seen in the picture below. We have been informed that the animals have arrived safely and already integrated into their university cattle herd where the bull is offering his services.

Figure 1. Breeding animals on route to Ghana

1.2 Nema project support

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. WALIC (formally ITC) is the main partner/beneficiary for the sub-component on *Support to Livestock.* WALIC received 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 WALIC for the project's lifespan is US$585,050.

Although there were delays in the procurement process, works and services, some planned activities for 2018 have been implemented with great success.

- **Truck delivery to Keneba**

A new truck was delivered to Keneba for livestock transportation between stations and farms.

- **Development of 10-hectare pasture field**

The main activities that were carried out during this period are as follows;

1. Sowing of the Brachiaria
2. Weeding
3. Harvesting

Sowing of *Brachiaria*:

- **Clearing of the field:**

Clearing was virtually easy, the areas that had corn grown were grazed by cattle so there was no need for clearing.

- **Harrowing**

The 4 ha which was established last year (2017) was harrowed except for the area which had a 30% re-growth. Three additional hectares was harrowed in order to expand the field. In total 7 ha was harrowed. Due to the dry spell between harrowing and sowing, a lot of weeds germinated resulting to the re-harrowing of the area.

Seeds:

- Significant change in the price per kilo from the Brazilian suppliers $44 compared to $11 last year.
- Considering that we may need to purchase seeds until we have the irrigation system fully in place, $44 is on the high side
- The balance of seeds from last year's stock was about 25 kg, these seeds were used for the 2018 season.

Sowing:

Sowing began on 21st July 2018, as the seed driller did not perform to expectation it was all done manually

Sowing of Brachiaria on the 21st July 2018

Lessons learnt

- *Brachiaria* has a high biomass and is palatable to livestock.
- It is drought tolerant, however 8 months of dry season results only to a 30% regrowth
- After harrowing, there was no rains to sow, it delayed sowing resulting to weeds growing along with the *Brachiaria.*
- Manual sowing is tedious, time consuming and requires labour which is always scarce in Keneba
- Germination from the first sowing was poor, due to the dry spell in July
- Re – sowing was done on 3 ha as germination was poor.
- Due to labour shortage and not available the time in need, it is necessary to have permanent pasture attendants to carry out the routine management in the field
- There has been a tendency of over grazing with the old Pannicum field during the last dry season, this resulted to a sparse re-growth.

Weeding

- started with the 30% regrowth area of the *Brachiaria*,
- A group of youths from the neighbouring village of Karantaba was contracted to carry out the weeding.

Weeding of the re-growth 30% re-growth part of the Brachiaria.

- The rest of the field (4 ha) was contracted to women kafo who only did it after completing weeding in their rice fields.

Lessons learnt

- The dry spell in July have severe effect of the germination of the Brachiaria
- Lack of labour at the time it was needed most resulted into numerous weeds growing tall thus making weeding very difficult
- Overgrazing during the critical period of the dry season have severely affected the performance of the Pannicum

Recommendations:

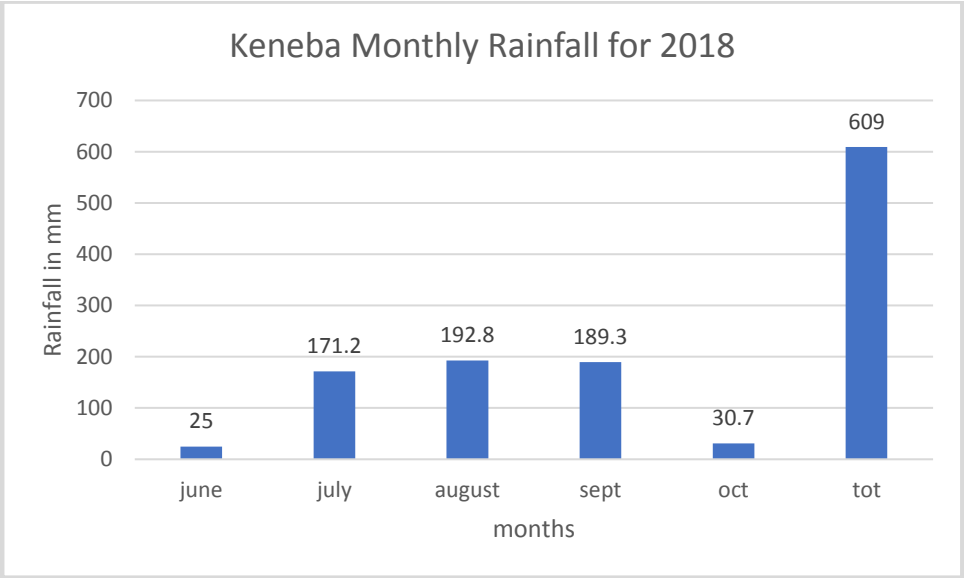
- To employ at least 4 pasture attendants to carry out the day to day activities of the pasture so that there is no delay in implementing activities.
- Expedite the process of the irrigation facilities so that we progress in the development of the pasture.
- A pair of draught oxen and shine hoe should be made available to ease weeding in between the row of plants

Harvesting of seeds from the Brachiaria:

- Some seeds of *Brachiaria* have been harvested and are being dried
- The seeds amounting to about 25 kg will be tested to ascertain their viability

Rainfall pattern in Keneba in 2018

This year the rainfall was low, the highest recorded was in August during the first 10 days and the last 10 days. *Brachiaria* requires at least 800mm of rainfall to be able to perform well, therefore the amount of rain that came down in Keneba this year was far too small, and this resulted in a decline in the expected biomass yield.



As seen above the 2018 rainy season has been very poor, a total of 609 mm of rain is not sufficient to sustain any grass species. This have an immediate effect on the performance of all the grass species.

Harvesting of *Brachiaria*

The harvesting of the biomass started in December 2018, prior to the commencement of the harvest, attempts were made to see if the bailer could be managed to facilitate the harvest. An expert engineer on tractors and bailers came to Keneba to see what can be made in order to use the machine. The attempts were futile as the swipper and bailer both did not work.

Arrangements were then made to have 4 persons contracted for 3 months to do the harvesting and storing manually. Harvesting has now been completed and presently they are moving the biomass to the feed barn. The estimated yield for the 4 hectares would have been more than 100 tons, however due to the factors mentioned above the amount harvested could be estimated to be about 60 tons. This amount when judiciously utilized for strategic feeding of the animals will go a long way into the dry season.

Attempting to make the swipper and the bailer work

Way forward

A discussion was held with the officer in charge of WALIC, during the discussion it was suggested that some actions be taken to revitalize and utilizes the old pastures that have some irrigation facilities. The responsibility to set the buster pump at the old pastures was vested on the officer in charge, while the pasture manager should find out from Brazil the cost of 50kg of *Brachiaria* and 50 kg of *Pannicum maximum* C1.

- **Feed supplement and herd health management**

Large quantities of groundnut hay and rice bran were purchased by the end of 2018 for supplement feeding of the breeding animals at the nucleus herd in Keneba station. High numbers of assorted antibiotics, anthelmintics, anti-inflammatory, wound dressing products and acaricidal products were purchased and delivered to WALIC for use in maintaining the animals' health and improved productivity.

- **Procurement of animals**

Procurement of the second and final batch of animals comprising of 78 N'Dama cows, 78 Djallonke sheep, and 68 West Africa Dwarf goats has been implemented in 2018. The sheep and goats are integrated into the nucleus flocks at Keneba station. The purchased cattle have also been transferred to Keneba station following two months' of quarantine period at Sololo station.

1.3 P2RS Supported Project

Artificial insemination (AI) is widely used technique for improving cattle productivity through crossbreeding and upgrading of one breed of cattle with other breeds to acquire certain production traits like increased milk or meat production. AI and F1 cattle crossbred production was initiated by ITC since 1995 but its practice had stopped over seven years and no private practitioners took it up as business. Currently, farmers' rely on a Senegalese technician to provide farmers' needed AI services which is expensive and unsustainable. This matter was tabled with the P2RS project team to discuss possible solutions to alleviate this situation. A joint proposal with the Department of Livestock Services was submitted to and approved by the P2RS project team for implementation. The main goal of this support was to train and equip selected technicians on Cattle AI so that farmers' access to such services would be enhanced.

With support of the P2RS project, a 10-day training workshop equivalent to 13 days, started on Monday 30th October and ended on Friday 10th November 2017 was implemented at the ITC headquarters in Kerr Serigne. Eleven technicians comprising of 4 from Department of Livestock Services (DLS), 4 from International Trypanotolerance Centre (ITC), 1 from National Livestock Owners Association (NaLOA), 1 from GILMA, and 1 from National Agricultural Research Institute (NARI) were trained and provided with Artificial Insemination equipment and supplies to enable them carry out cattle insemination as needed by livestock producers around the Gambia.

By end of 2018, 62 cows were inseminated with Holstein semen by AI technicians within West Coast and North Bank Regions. Twenty seven (27) inseminations were done on station, whilst the remaining 35 were on farm.

1.4 AU-IBAR supported project

With support of the AU-IBAR to the government of The Gambia through the ministry of agriculture since 2016, the initiative was taken up to elaborate a National Strategies and Action Plans for Management of Animal Genetic Resources.

Members of the constituted 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 held on 6 - 7th June 2017 at the Paradise Suites Hotel, Banjul, The Gambia.

The terms of reference (TOR) for a consultant was prepared and shared widely with stakeholders in July 2017 for interested persons to send in their expression of interests. Dossiers of two applicants were received and forwarded to the genetics project of AU-IBAR to process the contracting of the most suitable consultant to elaborate a National Strategy and Action Plan (NSAP) for management of animal genetic resources in The Gambia. A contract was awarded to Dr Badara Loum to elaborate the document. .

A draft NSAP document was produced by the consultant in 2018. Several dates were proposed for the validation but could not be implemented within 2018. The validation is thus deferred to early 2019.

AU-IBAR is also supporting the rehabilitation of bull mating pens and provision of animal watering at Keneba. The two planned works were contracted to two different contractors to implement planned works. Works on the rehabilitation of the bull mating pens is in progress, and 75% of it has been accomplished. The second contractor tasked to provide the watering facility is yet to start this work.

1.5 Demonstration Crossbred Dairy Cattle Herd At Headquarters

There are two cattle herds and a flock of goats in WALIC headquarters- Kerr Serigne. The first herd is composed of backcrosses and the second one is composed of N`Dama cows, backcrosses and F1s (Holstein-Friesian x backcrosses) as shown in table 1 and figure 1. 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 WALIC Keneba field station.

Table 1. Cattle herd and goat flock composition

Category	N'Dama herd	F1/Backcrossed herd	Goat flock
Mating male	0	0	1
Breeding females	4	16	11
Calves/Kids	0	7	7
Weaners	0	0	0
Young bulls/bucks	1	8	4
Heifers/young females	0	14	7
Herd/Flock size 2018	5	45	30

Figure 1. New born calves 2018 from artificial insemination (AI)

Main activities implemented in 2018

- *Monthly weighing*

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

- *Daily milking and milk measurement*

Milking is done twice daily in the morning and evening; off-takes are measured and recorded into the database

- *Supplementary feeding*

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

- *Vaccination*

Cattle are vaccinated against Black quarters and Haemorrhagic Septicaemia diseases, and goats against Peste de Petit Ruminants (PPR) disease

- *Deworming*

This activity is done in July, September and October i.e. 3 time per year.

- *Spraying*

Sprayed all animals using acaricides (Antitic and Pour -On) in July, August, September and October to control ecto-parasites.

- *Data collection and entry*

Data collected from all these activities is recorded and entered into the database. Captured animal entries, exits and movements are presented on table 2.

Table 2. Entry and Exit

Animal Category	Calving/Kidding	Mortality	Sold/cull	Lost	Movement
N'Dama	0	0	0	0	0
F1/Back Cross	6	6	3	0	0
Goats	11	12	0	0	8
Total	17	18	3	0	8

- *Feed purchasing*

This involves irregular supply of spent grain from Banjul Breweries with no cost apart from compensating them with 3 litres of milk for each supply we receive from them. Apart from the spent grain, the centre also buys ground-nut cake, rice-bran and ground hay.

- *Feed collection*

Station labourers cut and collect Andropogon and maize stovers from the surroundings and Radville Farms at Nema kunku, respectively.

- *Random blood and faecal sampling*

This is done at random periods. When an animal is sick or has an undesirable condition, blood or faecal sample is collected and processed to determine its condition.

- *Pasture production and utilization*

20mx20m area was cultivated with *Pannicum maximum* grass by station labourers as an extension of pasture production on station. When the grass reached a certain height, calves were introduced to it for grazing. Due to lack of proper fencing, this activity is pending.

- *Artificial Insemination*

This activity was carried out on station with semen from exotic breeds (Holstein-Friesian) to provide milking dams with high yielding capacity for revenue generation and food security.

- *Treatment*:

This happens when an animal gets sick or has an undesirable condition. Conducted health intervention activities and treatments are summarised in table 3 and 4.

Table 3. Health intervention activities

Activity	Period											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weighing	x	x	x	x	x	x	x	x	x	x	x	x
Deworming						x	x	x		x		
Spraying					x	x	x	x	x	x	x	
Vaccination						x						x
Milking	x	x	x	x	x	x	x	x	x	x	x	x
Supplementation	x	x	x	x	x	x	x	x	x	x	x	x
Data collection	x	x	x	x	x	x	x	x	x	x	x	x

Cows artificially inseminated	7	7
Treatment	Whenever there is disease condition or sick animal	

Table 4. Treatment records- 2018

Diseases	Period											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Respiratory	1			2								
Helminths									5		1	
Skin infections	4	2					4		6	3	6	2
Mastitis									1			
Arthritis				1			2					
Wound/abscess		1				1		3				
Trypanosomosis		1				2			1		5	3
Eye infection		1										
Bloat		1										

Although this herd is not operated for profit, its draft financial statement presented on table 5 shows a deficit of 137,587 Dalasi. This deficit is due to the smaller volume of revenue earned compared to incur expenditures. The main reason for this scenario is due to few lactating dams, long calving interval, and feed shortages.

Table 5. Financial statement of the farm in 2018

Expenditure		Revenue	
Item	Amount (D)	Item	Amount (D)
Groundnut hay	1,600	Fresh milk	310,000
Groundnut cake	23,000	Manure	1,990
Rice bran	32,500	Culled animals	5,250
Salt	1,500		
Casual labour	143,100		
Drugs	6,075		
Rope	3,500		
Fuel for feed collections	54,500		
Car maintenance	20,100		
Herdsmen salaries	226,052		
Totals	454,827		317,240
Surplus/deficit	(137,587)		

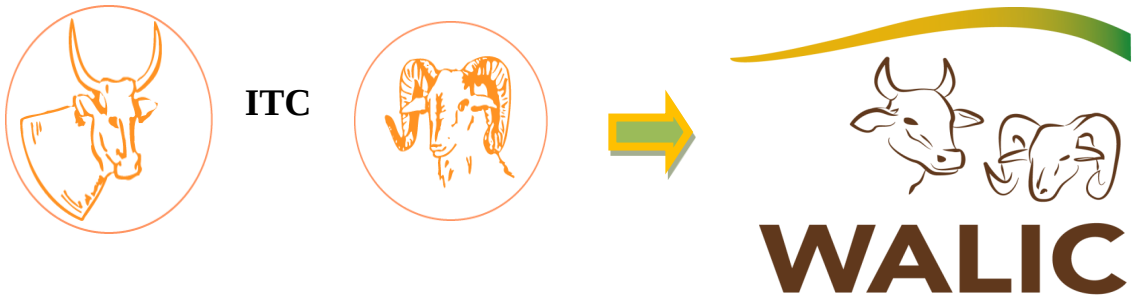
1.6 National, Regional and International Workshops

WALIC was represented at the following national and regional workshops organized within 2018:

Table 1. List of attended workshops

S/n	Conference/workshop	Period	Venue
1	Fifth Steering Committee meeting of the Genetics project of AU-IBAR	8th Aug 2018	Nairobi, Kenya
2	Veterinary Legislation and National Livestock Policy Hub Workshop	27-29th Sept 2018	Ocean Bay Hotel, The Gambia
3	One Health Zoonotic Diseases Prioritization Regional Workshop organised by Regional Animal Health Centre in Mali	3rd-7th Dec 2018	Novotel Hotel, Dakar, Senegal
4	Steering Committee meeting of the Sub-Regional Focal Point West Africa for AnGR Management	4th Dec 2018	Lomé, Togo

2. Transformation process of ITC to WALIC



2.1 Name change from ITC to WALIC

With the enactment of WALIC Act 2016 and repealing of ITC Act 1982, this calls for the adoption of the new name for the Centre. Upon approval by the minister of agriculture, the new name of the Centre – West Africa Livestock Innovation Centre (WALIC) – was adopted with effect from 1st March 2018. The official launching of the Centre is not yet effected as this must be preceded by mobilisation of sufficient human and financial resources to implement the new programmes.

2.2 Constitution and Inauguration of the new WALIC Governing Council

The new governing Council of WALIC has been constituted as a regional body of different stakeholders summing up to 15 members as cited in the WALIC Act 2016. Membership of the Council comprises of 5 ECOWAS member states, Experts, Development partners, CORAF, ECOWAS Commission, AU-IBAR, Farmer organizations and Non-Governmental Organizations. It had been planned to organize the first Council meeting in 2018 but it did not work due to financial constraints.

2.3 Mobilisation of financial resources

Having realized that the allocated monthly government subvention cannot finance all needs of the Centre for its full operations, project proposals were written and submitted for funding. An application for FAO-TCP was sent to the FAO representation office to The Gambia in October 2018. It is entitled *strengthening the capacity of West Africa Livestock Innovation Centre and characterization of local livestock breeds.* Expected two (2) main outputs to realize are: 1) WALIC becomes functional and operational, and 2) local indigenous food animals and poultry breeds in The Gambia are characterized at phenotypic and molecular levels.

3. Outlook 2019

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 Sololo) would 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 in the form of improved Breeding Bulls, Bucks and Rams is expected to be disseminated to multiplier livestock farmers in late 2019.

There has not been introduction of new breeding bulls from the community herds into the nucleus herd for more than a decade now. The Open Nucleus Breeding Scheme (ONBS) is designed to have periodic introduction of new sires from outside into the scheme. Plans are on the way now to start a screening program targeting 30 community herds during the first year in 2019.

3.1.2 Nema project support

The activities that were planned for 2018 but not realized would be taken up in 2019. Hence, we expect that the solar operated irrigation system would be installed to facilitate irrigation for pasture development and growth during the long dry season. New additional pasture field established within the fenced 10 hectare fields at Keneba station during the 2019 rainy season.

3.1.3 AU-IBAR supported project

Plans are on the way to validate the draft National Strategy and Action Plan (NSAP) for the management on animal genetic resources in early 2019 with technical and financial support from AU-IBAR. In addition, AU-IBAR is also financing the rehabilitation works of the bull mating pens and drilling of a new bore hole with overhead tank and watering troughs for watering the nucleus herd animals at the animal holding site outside the camp.

3.2 Transition to WALIC

WALIC would continue to mobilize resources through partnership and collaboration with the governments of member countries, CORAF/WECARD, and ECOWAS commission. The new WALIC governing Council would be installed during its first meeting slated for 2019 to work on a roadmap leading to the launching of the new WALIC.

4. Conclusion

Substantial achievements on research and development activities were attained as per the small staff size and limited financial resources available for the Centre’s operations. The genetic improvement program is progressing well. Some improved breeding bucks and rams are expected for dissemination in 2019, whilst bulls would be available in 2020.

All lined up activities for implementation under the IsDB support through Nema project have been realized except for the installation of solar operated irrigation system and remaining five hectares of pasture yet to be established. A draft National Strategy and Action Plan (NSAP) for the management of animal genetic resources has been elaborated and ready for validation. Furthermore, an FAO-TCP project proposal had been elaborated and submitted to the FAO rep Office in Banjul.

The main success on the revitalization and transformation process of ITC to WALIC was the constitution of the new Governing Board, although it is yet to be inaugurated to perform its

oversight governing functions of the new Centre. The new name of the Centre, WALIC, has been adopted and currently in use for all of its operations. Launching and operationalization of WALIC is still hampered by lack of sufficient start up financial and human resources.

5. WALIC Staff List as at 31st December 2018

No.	SN	Title	NAME	POSITION HELD
Kerr Serigne Station				
Finance & Admin. Staff				
1	1	Dr	Arss Secka	Officer-In-Charge
2	2	Mrs	Fatou Bittaye	Accounting officer
3	3	Mr	Lamin F Janneh	Admin. officer
4	4	Mr	Sheriffo Kanteh	Driver
5	5	Mr	Ebrima Sohna	Driver
Support Staff				
6	6	Mr	Amadou Keita	Lab Technician
7	7	Mr	Ousman Barrorw	Cleaner
8	8	Mr	Sajar Drammeh	Cleaner
9	9	Mr	Alieu B Cham	Gardener
10	10	Mr	Abdou Touray	Security Guard
11	11	Mr	Lamin Jammeh	Security Guard
12	12	Mr	Alagie Jammeh	Security Guard
13	13	Mr	Musa Cham	Security Guard
14	14	Mr	Omar Manjang	Security Guard
15	15	Mr	Omar Jammeh	Security Guard
16	16	Mr	Yusupha Cham	Security Guard
17	17	Mr	Pa Omar Tunkara	Security Guard
18	18	Mr	Biran Corr	Security Guard
19	19	Ms	Mariama Faburay	Security Guard
20	20	Mr	Lamin K Darboe	Sen Livestock Assistant
21	21	Mr	Fatou Janneh	Livestock Assistant
22	22	Mr	Sainey Fatty	Herdsman
23	23	Mr	Alagie Mbye	Herdsman
24	24	Mr	Adama Kujabi	Herdsman
25	25	Mr	Demba Ceesay	Herdsman
26	26	Mr	Mustapha Badjie	Herdsman
27	27	Mr	Kausu Jawara	Enumerator
28	28	Mr	Kutubo Bojang	Labourer
29	29	Mr	Ousman Sillah	Labourer
30	30	Mr	Bakary Gibba	Labourer
31	31	Mr	Wuyeh Sanyang	Labourer
32	32	Mr	Ello Jallow	Labourer
Keneba Breeding Station				
Operation Staff				
33	1	Mr	Modou Jeng	Station Manager
34	2	Mr	Nerry Corr	Pasture Manager
35	3	Mr	Yusupha Wally	Livestock Assistant

36	4	Mr	Omar Marong	Tractor Operator
37	5	Mr	Sheriffo Sanyang	Truck Driver
38	6	Mr	Ansumana Jarju	Field Assistant
39	7	Mr	Tijan Tamba	Field Assistant
40	8	Mr	Ebrima Kolley	Field Asst.
41	9	Mr	Issaha Barry	Herdsman
42	10	Mr	Lamin Ceesay	Herdsman
43	11	Mr	Lamin Marri	Herdsman
44	12	Mr	Fabakary B Ceesay	Herdsman
45	13	Mr	Fabakary Drammeh	Herdsman
46	14	Mr	Kebba Jallow	Herdsman
47	15	Mr	Jamanty Ceesay	Herdsman
48	16	Mr	Ousman Baldeh	Herdsman
49	17	Mr	Alieu Saidy	Herdsman
50	18	Mr	Njobo Bah	Herdsman
51	19	Mr	Masanneh Bah	Herdsman
52	20	Mr	Alkali Kebbeh	Herdsman
53	21	Mr.	Kulayma Sillah	Herdsman
54	22	Mr	Sunkaru Manneh	Herdsman
55	23	Mr	Abdoulie Minteh	Herdsman
56	24	Mr	Fanding Ceesay	Security Guard
57	25	Mr.	Momodou Manjang	Security Guard
58	26	Mr	Saidy Ceesay	Security Guard
59	27	Mr	Siyaka Ceesay	Security Guard
60	28	Mrs	Tumbul Samateh	Cleaner
Bansang / Sololo Station				
Operation Staff				
61	1	Mr	Modou S Gaye	Station Manager
62	2	Mr	Lamin Jamanka	Herdsman
Support Staff				
63	3	Mr	Momodou B Jallow	Multi-purpose
64	4	Mr	Lansana Jarra	Night Watchman
65	5	Mr	Momodou Fatajo	Day Watchman
66	6	Mr	Kalifa Touray	Night watchman
67	7	Ms	Rohey Jagne	Cleaner
Kudang sub-station				
Operation staff				
68	1	Mr	Massaneh A. Bojang	Senior Livestock Assist.
69	2	Mr	Alagie Bah	Herdsman
70	3	Mr	Alanso Sidibeh	Herdsman
71	4	Mr	Madi Camara	Herdsman
72	5	Mr	Sulayman baldeh	Herdsman
73	6	Mr	Sheriffo Bayo	Herdsman