



International Trypanotolerance Centre

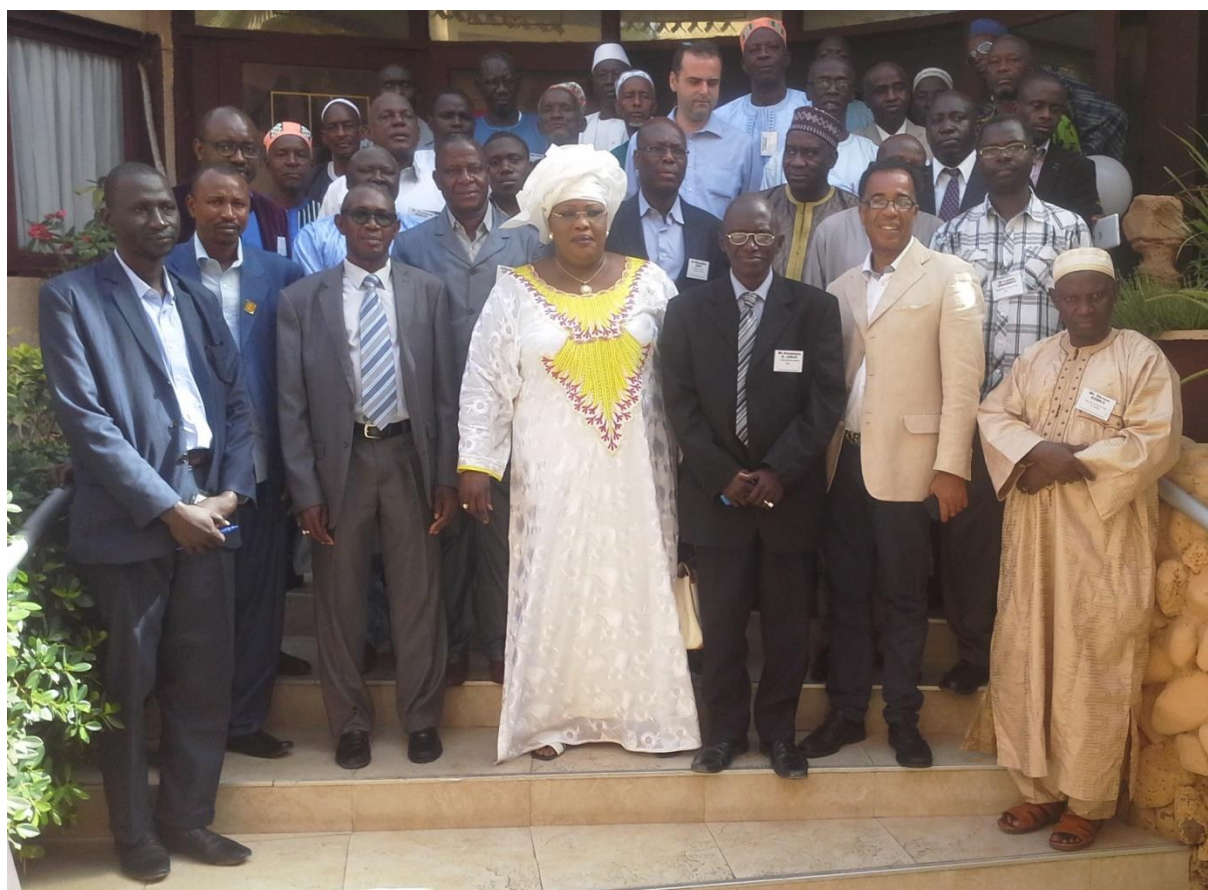
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ITC Annual Report 2015 and Outlook for 2016



Participants at the Validation Workshop of the Regional Transhumance Study Report at Hôtel L'Océan Atlantic City, Yoff Ranrhar, Dakar, Senegal on 5th May 2015

January 2016

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Executive Summary

This report highlights the Research and Development projects and the ITC transformation process to WALIC implemented in 2015 and the outlook for 2016. The limited core and research funds received in 2015 was used mainly to conduct few research projects such as genetic improvement, publication of the work on CBPP vaccination response in cattle and seroprevalence of bacterial zoonoses, and completion of the transhumance project activities. It also further documented initiatives undertaken on the transformation process of ITC to WALIC.

Genetic Improvement Program

Fifteen of the top 30 elite breeding bulls, bucks and rams selected around the end of 2014 were further disseminated to livestock multiplier farmers around The Gambia in 2015. There has been a slight reduction in the nucleus cattle size compared to the 2014 overall figures. WAAPP Gambia support to the breeding program is expected to commence in early 2016. This support would cover restocking of the nucleus small ruminant flocks, infrastructure rehabilitation, mobility, fuel and logistic support for monitoring disseminated animals at the multiplier tier. The recently launched project on *Building Resilience to Recurring Food Insecurity* administered by the Nema project would also enhance the capacity of ITC's Genetic Improvement program starting in early 2016.

Monitoring of CBPP vaccination response

This work has been published by the Bulletin of Animal Health and Production in Africa (BAHPA) journal. The reference and abstract of this scientific article plus three others could be found under sub-heading 1.6 Publications.

Seroprevalence of Bacterial Zoonoses

Although not yet successful, the process of publishing this work is still on.

Regional Transhumance project

The regional report on the impact of transhumance on the management of animal genetic resources in West Africa was validated through a regional workshop held at Dakar, Senegal in May 2015. It brought together 37 participants representing actors and stakeholders involved in the management of endemic ruminant livestock from Guinea, Mali, Senegal and The Gambia.

The regional report was improved, finalized and circulated to stakeholders in the four countries. Policy briefs targeting policy makers were elaborated in both English and French languages and circulated widely within the four countries of the project.

National and regional workshops

ITC was ably represented in three (3) national and four (4) regional workshops. The national workshops were held in The Gambia and organized by the Ministry of Higher Education Research Science and Technology (MOHERST), National Livestock Policy Hub, and Ministry of Health and Social Welfare (MoHSW). These workshops focused on training on EBOLA disease, livestock policy, and national research stakeholders consultation, respectively.

The four regional workshops were held at Dakar, Senegal (3) and Lomé, Togo (1). Organisers of the Dakar workshops include ITC, AU-IBAR and ECOWAS; while the Togo workshop was staged by CORAF/WECARD.

Transformation process of ITC to WALIC

The process of enacting a new WALIC Act by the Government of The Gambia (GoTG) was vigorously pursued by the Honourable Minister of Agriculture, Mr Ismaila Sanyang, during the second half of 2015. The WALIC Act has been approved by the Cabinet of the Government of The Gambia, and it has been submitted to the National Assembly for debate and adoption prior to the signature by the President of the Republic of The Gambia.

Resource mobilization from national and regional projects was intensely sought after. Some funds were secured for enhancing the capacity of ITC from the following projects and grants: 1) Building Resilience to Recurring Food Insecurity, 2) West Africa Agriculture Productivity Project, and 3) EU Grant to the Ministry of Agriculture.

Outlook for 2016

Alongside the implementation of the genetic improvement program and activities of committed national projects, ITC would also be an implementing partner of two regional projects: 1) *Project on the Valorisation of Local Animal Genetic Resources and Aquaculture* in UEMOA (PROGEVAL), and 2) *Introgression of Sahelian Zebu Cattle into Trypanotolerant Bos taurus populations of West Africa* (Introgression project).

Similarly, the transformation process to WALIC would be pushed further as the political will of the Government of The Gambia and other West African countries is still very encouraging. The new WALIC Act is expected to be enacted during the first half of 2016 followed by launching of WALIC during the latter part of the year.

Introduction

Despite the limited financial and human resources available to the centre, great strides have been achieved in 2015 on the research agenda and revitalisation/transformation process of ITC to West Africa Livestock Innovation centre (WALIC). As indicated in the outlook for 2015 in the ITC Annual Report 2014, the main work plan for 2015 consisted of the continuation of Research and Development activities as well as the transformation Process of ITC to WALIC. This 2015 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 2015, 4) Conclusion, and 5) Financial statement.

Implemented Research and Development activities for the year 2015 are as follows:

- 1) Breeding and selection of elite breeding male animals using the Open Nucleus Breeding Scheme (ONBS),
- 2) Monitoring of CBPP vaccination response in cattle,
- 3) Seroprevalence of Bacterial Zoonoses,
- 4) Regional Transhumance Project,
- 5) Participation at national and regional workshops, and
- 6) Publications

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. Fifteen (15) elite breeding animals (4 bulls, 6 bucks and 5 rams) were disseminated to multiplier tier livestock farmers around the country in 2015.

Continuation of the transformation process of ITC to WALIC has attained important milestones. The new WALIC Act is at an advance stage leading to its enactment by the Government of The Gambia in the foreseeable short term. .

Outlook 2016 would focus on continuation of ongoing and new research and development projects (Genetic improvement, PROGEVAL, Nema, WAAPP and Introgression project) as well as the enactment of the new WALIC Act and launching of the new centre.

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 2015. 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.

1.1.2 Nucleus herd and flock structure at Keneba and Niamina

There are ten herds 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 2015 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 decrease of 74 cattle, 4 goats and 10 sheep in 2015 below the figures by end 2014.

Table 1. Nucleus cattle herd structure and size

Herd	Calves	Heifers	Young Bulls	Cows	Teaser Bulls	Breeding Bulls	Total per herd
Herd 1	10	5		34	1	.	50
Herd 2	14	10		31	1	.	56
Herd 3	15	5		38	-	.	58
Herd 4	15	4		35	1	.	55
Herd 5	16	4		36	1	.	57
Missra		36					36
Sambelkunda		35					35
Touba1			42				42
Touba2			41				41
Total Count	70	99	83	173	4	6	436

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	104	53	14	1	3	175
Sheep	16	5	1	1	1	24

1.1.3 Herd management

Herd management is the role of herdsman, 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 herd has improved substantially over the years resulting in higher weaning weights but some high mortality have been registered both among calves and cows following the CBPP vaccinations in March/April 2015, which coincided with the stress period. The calf holding area established in 2013 was maintained through the year 2015. 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:

Herdsman and technicians 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 2015. The yield from the pasture field was stocked in the feed store for use in the dry period of 2016. By the end of 2015, 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 as shown in table 3 below:

Table 3. Calving and calf mortality rate in 2015

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

The decreased number of calving is attributed mainly to nutritional stress and incidence of Contagious bovine pleuropneumonia (CBPP) cases that resulted to deaths of many cows as shown in table 5.

- **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 four year period are indicated in the table 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

- **Exits**

A total of 143 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	4	Multiplier	Disseminated
2	Bulls	15	Culled	Sold out
3	Young bulls	1	Lost/stolen	
4	Young bulls	8	Mortality	
5	Young bulls	1	Emergency slaughter	
6	Cows	4	Emergency slaughter	
7	Cows	7	Culling	Sold out
8	Cows	3	Attacked by hyenas	
9	Cows	46	Mortality	
10	Heifer	7	Mortality	
11	Heifer	1	Snake bite	
12	Calves	48	Mortality	

- **Animal movement**

A total of 51 weaners were moved from Keneba station to Niamina during the year 2015. These weaners would be undergoing performance test under high tsetse challenge until the age of 36 months. Similarly, 21 mature heifers were moved from Niamina to Keneba station as replacement breeding females at the nucleus herd. This activity was partly funded by the West Africa Agricultural Productivity Project (WAAPP Gambia) through the provision of fuel.

Table 6. Movement of various categories of livestock between stations

Animal Category	Origin	Destination	Number
Weaners	Keneba	Bansang (Niamina)	44
Weaners	Ker Seringe	Bansang (Niamina)	7
Heifers	Bansang (Niamina)	Keneba	21
Bulls	Keneba	Kerr Seringe	1
Cows	Kerr Seringe	Keneba	4
Total			77

- **Mating and milk offtake**

Mating is recorded as it occurs by a designated bull to cows/heifers coming to heat. A conception rate of 78.4% resulted from 125 mating and 27 return 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 6.

Table 7: Average morning milk yield by season in 2015

Season	Average Morning Yield (ML)
Rainy Season (June-September)	723.0
Early Dry Season (October-January)	618.0
Late Dry Season (February-May)	248.7

- **Exchange of Breeding Stock**

In order to reduce the risk of inbreeding among small ruminants, one ram and three bucks were exchanged with similar animals from farmers' flocks and stocked in the nucleus flocks as breeding sires. The exchanged ram was prompted by the death of the breeding ram during the ECOWAP technology fair held in November 2015 at Dakar, Senegal.

- **Dissemination of elite breeding male animals (multipliers)**

The dissemination process of elite male breeding animals from the nucleus selected in 2014 continued in 2015. An additional 15 elite breeding males (4 bulls, 6 bucks and 5 rams) were disseminated to farmers' herds and flocks around the country as multipliers.

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 2015. 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	147	147	134	130	128	129	127	127	127	147	158	154
No. of blood samples	147	147	134	130	128	0	127	127	0	124	147	154
No. Positive for trypanosomes	1	2	0	0	0	0	3	0	0	27	30	28
Trypanosomes infection rate (%)	0.7	1.4	0	0	0	0	2.4	0	0	21.8	20.4	18.2
No. treated for trypanosomes with PCV < 20%	2	2	0	2	12	0	4	0	0	29	43	54

1.1.6 Cattle herd and goat flock at Kerr Serigne

There is a F1 crossbred cattle herd (N'Dama x Holstein-Friesian) 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. N'Dama demonstration herd



Figure 2. F1-Backcrosses demonstration herd

Table 8. Cattle herd and goat flock composition

Category	N'Dama herd	F1/Backcrossed herd	Goat flock
Mating males	1	1	1
Breeding females	5	17	20
Calves/Kids	10	14	34
Weaners	6	17	0
Young bulls/bucks	0	1	0
Heifer	0	0	0
Total herd size in 2015	22	50	55
Increase over 2014 herd size	-9	11	23

The total **mortalities** in 2015 for cattle is 25 (6 N'Dama, 4 F1/Backcrossed, 15 goats), and the total number culled/sold is 19 (4 N'Dama, 3 F1/Backcrossed, 12 goats).

The **movement** of animals between stations is illustrated below:

- 7 Cows moved from Kerr Serigne to Keneba station
- 3 Calves moved from Kerr Serigne to Keneba station
- 7 Weaned calves moved from Kerr Serigne to Kudang station
- 1 mating buck received from Keneba

Main activities implemented in 2015 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 anthelmintic 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*
Two new additional plots of *Panicum maximum* were developed on station, harvested and used to feed calves and weaners. Calves and weaners are rotationally grazed on the re-growths of the harvested pasture.

Table 9. Milk production of cattle at the headquarters in 2015

Months	Daily averages (L)		Monthly totals (L)		Monthly production (L)
	N'Dama	Crosses	N'Dama	Crosses	All cows
Jan	5.2	36.9	162.5	1,142.8	1,305.3
Feb	3.4	41.1	96.5	1,151.4	1,247.9
March	3.3	41.3	102.8	1,279.3	1,382.1
April	6.6	36.2	197.0	1,086.3	1,283.3
May	6.2	36.4	192.4	1,130.0	1,322.4
June	8.3	41.8	248.7	1,254.7	1,503.4
July	8.0	36.5	248.1	1,132.1	1,380.2
August	7.6	32.4	236.4	1,003.0	1,239.8
September	8.8	35.9	264.0	1,077.3	1,341.5
October	12.0	35.0	374.5	1,085.1	1,459.6
November	10.5	37.0	315.0	1,109.7	1,424.7
December	9.4	47.1	290.3	1,461.4	1,751.7
Ave./total	7.4	38.1	2,728.2	12,910.1	16,641.9

Based on the financial statement of the farm, it is found to have positive balance as indicated in the table 10 below. More efforts need to be put in place to enhance the productivity and outputs from the farm.

Table 10. Financial statement of the headquarters farm in 2015

Expenditure		Revenue	
Item	Amount (D)	Item	Amount (D)
Groundnut hay	5,500.00	Fresh milk	596,850.00
Groundnut cake	14,000.00	Manure	1,900.00
Rice bran	36,200.00	Culled animals	111,040.00
Salt	680.00		
Casual labour	142,220.00		
Drugs	225.00		
Rope	3,000.00		
Fuel for feed collections	96,000.00		
Car maintenance	15,000.00		
Herdsmen salaries	195,116.20		
Totals	507,941.20		709,790.00
Marginal surplus			201,848.80

1.2 Monitoring of CBPP vaccination response in cattle

The objective of this research activity was to determine the response of ITC cattle herds located in Niamina East District vaccinated against CBPP using the T₁₄₄ or T_{1SR} strains Lyophilized CBPP vaccines with PANVAC Quality Control Certificate. It specifically monitored the antibody levels against CBPP 2 days before vaccination, 2 weeks and 3 months

post vaccination. Results from this study was drafted into a manuscript entitled *CBPP T₁₄₄/T_{1SR} vaccine induced good immunoresponse in vaccinated cattle* for publication with the Bulletin of Animal Health and Production in Africa (BAHPA) in 2015. The manuscript has already been accepted and published in BAHPA.

1.3 Seroprevalence of Bacterial Zoonoses

ITC has been part of a consortium working in collaboration with the Medical Research Council (MRC) in The Gambia, the Central Veterinary Institute (CVI) of Wageningen University (WUR), Centre for Infectious Disease Control of RIVM, and Utrecht University of the Netherlands. The objective of this project is to estimate the extent of the problem of *Brucella spp.*, *Leptospira spp.*, and *Coxiella burnetii* infection among humans and small ruminants in The Gambia. This project is two years long, started in September 2014 and expected to finish in August 2016. Both Lenny Hogerwerf and Eveline Germeraad from the RIVM in The Netherlands, were in The Gambia and had worked with ITC and MRC teams from 19th September to 19th December 2014. The fieldwork for the whole study and the lab tests for *Brucella spp.* were completed in 2014. A resulting manuscript from this work, entitled *Low seroprevalence of brucellosis in humans and small ruminants in The Gambia* was submitted to PLoS one journal in 2015 for possible publication. Lab tests for Q-fever and leptospirosis were also completed in 2015.

1.4 Regional Transhumance Project

This project “*Assessment of the impact of transhumance on the sustainable management of animal genetic resources*” is one of the projects submitted under the First call for Proposals related to the FAO Trust Account in support of the Global Plan of Action (GPA) for Animal Genetic Resources for the biennium 2013-2014 and approved for funding by the Commission on Genetic Resources for Food and Agriculture. This regional project was implemented in four PROGEBE countries: Gambia, Guinea, Mali and Senegal.

The objectives of the project were to: 1) identify adverse impacts of transhumance on the management of endemic ruminant genetic resources, 2) propose mitigation strategies to adverse impacts, and 3) promote the implementation of the proposed mitigation strategies.

The expected outputs of the project are as follows:

- Hotspots of transhumance in each country are identified
- Knowledge on the incidence of transhumance on the biodiversity improved
- Specific strategies for the mitigation of the negative impacts of the transhumance proposed

In 2014, one regional and four national consultants were recruited to implement the study. All national consultants conducted the study in their respective countries and validated their report during the national validation workshops in the last quarter of 2014. The regional consultant did a desk review on the impact of transhumance on the management of animal genetic resources, oversee the work of the national consultants, attended the national validation workshop, and synthesise all four national reports into one regional report.

The regional report was validated during a one-day regional validation workshop held on the 5th May 2015 at Dakar, Senegal. The workshop brought together 37 participants representing actors and stakeholders involved in the management of endemic ruminant livestock from Guinea, Mali, Senegal and The Gambia.

Outputs of the workshop yielded the following:

- Main results of the study presented and information gathered from stakeholders for improving the report;
- Major effects of transhumance that limit the conservation of endemic ruminant livestock at regional level were discussed and validated;
- Relevant priority actions for the control and reduction of negative effects of transhumance were discussed and validated; and
- Major recommendations for policy makers and other actors in transhumance were made for the sustainable conservation of endemic ruminant livestock breeds.

The regional report was improved, finalized and circulated to stakeholders in the four countries. Policy briefs targeting policy makers were elaborated in both English and French languages and circulated widely within the four countries of the project.

The project has finally ended with the submission of the final technical and financial reports to the Food and Agricultural Organization (FAO) of the United Nations.

1.5 National and Regional Workshops

ITC was represented at the following national and regional workshops organized in 2015:

Table 1. 2015 National and Regional workshops

S/n	Conference/workshop	Period	Venue
1	Regional Validation Workshop for the Draft Regional Transhumance Study Report organised by ITC and PROGEBE	5 th May 2015	Dakar, Senegal
2	National Training Workshop on Ebola Virus Disease organised by the Ministry of Health and Social Welfare (MOHSW)	9 th July 2015	Kanifing, The Gambia
3	National Research Stakeholders Workshop organised by the Ministry of Higher Education Research Science and Technology (MOHERST)	1-2 nd September 2015	Cape Point Bakau, The Gambia
4	Regional Consultation Workshop on the Evolution of National Centres of Specialization (NCoS) for Research and Development in West Africa organised by the CORAF/WECARD Secretariat	12 - 16 th October 2015	Lomé, Togo
5	Training on EXTRAPOLATE for the National Policy Hub members of The Gambia organised by the VET-GOV project team from AU-IBAR	19 – 23 rd October 2015	Bijilo, The Gambia
6	Second General Assembly of the Sub-Regional Focal Point for Animal genetic Resources for West Africa organised by the GENETICS project team of AU-IBAR	28 - 31 st October 2015	Dakar, Senegal
7	ECOWAP 10 Conference: <i>10 years Review and 2025 Outlook for Food and Nutrition</i>	15 - 20 th November 2015	Dakar, Senegal

During the ECOWAP 10 conference, ITC team presented selected elite breeding West Africa Dwarf goat bucks and Djallonke rams; a documentary video on ITC's origin, programmes and projects and transformation process to WALIC; posters, pamphlets and documentations on various programmes of the centre.

1.6 Publications

ITC published four articles at two international scientific journals in order to communicate results of implemented studies with the wider world as its contribution to the generation of knowledge.

The references and abstracts of the published articles are as follows:

1.6.1 Growth rate and manure outputs of small ruminants

Secka Arss, Saho Mama and Ansumana Ceesay. Growth Rate and Manure Quality of Small Ruminants under Rural Production in The Gambia. *Bull. Anim. Hlth. Prod. Afr.*, (2015), 63, 221 - 228

Abstract

A three-month long on-farm participatory study was undertaken in four villages within The Gambia. The objectives of the study were to determine the average daily weight gain (ADWG) and faecal outputs of small ruminants under the traditional management system.

Thirty four young bucks and rams used in this study are 6 to 12 months old were owned and managed by 18 farmers. They comprise of Djallonke sheep (DS), Crossbred sheep (Djallonke x Sahelian sheep) (DSS), and West African Dwarf Goats (WADG). All the animals were weighed every fortnight. Their faecal droppings were collected either overnight or over 24 hour period, three times a week. The mineral contents of the collected faeces were determined. Collected data was partitioned on the basis of species (sheep vs goats) and sheep breeds, and analysed using descriptive statistics and linear regression models.

Results showed no significant differences ($p > 0.05$) in ADWG: 25.6g for DS, 40.0g for DSS, and 34.8g for WADG goat. Overnight faecal outputs were: 218g for DS, 151g for DSS and 129g for WADG. The 24 hour faecal outputs were 487g, 347g and 275g for the DSS, DS and the WADG, respectively. Goat manure contained 2.3% nitrogen, 1.0% phosphorus and 0.9% potassium; while sheep manure had 2.0% nitrogen, 0.9% phosphorus, and 0.6% potassium. Nitrogen and potassium contents of sheep manure were significantly ($p < 0.05$) lower than goats manure. The mineral contents of Djallonke and Crossbred rams manure were not significantly different ($p > 0.05$).

In conclusion, the crossbreed sheep grew faster and produced more daily faecal output than both WADG and Djallonke sheep. Follow up sheep and goat fattening trials utilising leguminous dual purpose varieties of cowpea and groundnut are recommended. In addition, participatory studies like this should have a control component on station for comparison purposes.

Keywords: Average Daily Weight Gain, Faeces, Gambia, Minerals, Goat and Sheep

1.6.2 CBPP vaccination response

Secka Arss, Ceesay Ansumana, Bojang Massaneh, Janneh Bai and Camara Saibane. CBPP T₁₄₄/T_{1SR} vaccine induced good immunoresponse in vaccinated cattle. *Bull. Anim. Hlth. Prod. Afr.*, (2015), 63, 229 - 234

Abstract

The Gambia experienced a sudden epidemic outbreak of Contagious bovine pleuropneumonia (CBPP) in cattle in August 2012 after its last reported cases in 1971. The objective of this study was to monitor the immunological response in terms of antibody detection in vaccinated cattle against CBPP using freeze-dried live attenuated T144 or T1SR strains.

Blood samples were collected from 136 cattle 2 days before vaccination, 135 cattle 2 weeks post-vaccination, and 114 cattle at 3 months post-vaccination. The extracted serum samples were tested for the presence of antibodies against *Mycoplasma mycoides* subsp *mycoides* Small Colony variant (MmmSC) using IDEXX Contagious Bovine Pleuropneumonia enzyme immunoassay Antibody Test Kit.

Results show that the proportion of cattle with detectable antibodies against CBPP antigens was 15% (9 – 22%), 67% (59 – 75%), and 28% (20 – 37%) at 2 days before vaccination, 2 weeks post vaccination, and 3 months post vaccination, respectively. The proportion of animals with detectable antibodies post-vaccination was significantly higher ($p < 0.05$) than pre-vaccination stage. The seroprevalence of CBPP in the monitored cattle before vaccination was 15% (9 – 22%).

Based on the results obtained, it could be concluded that the vaccinated animals have responded well to the vaccination. Assuming that CBPP vaccine efficacy could be associated to detection of antibodies 2 weeks post-vaccination, then this vaccine's efficacy could be in the range of 59 - 75%. In order to prolong the protection of vaccinated animals, it is recommended that animals should be re-vaccinated 12 months post-vaccination. A longer and more robust longitudinal study involving more animals should be undertaken to determine CBPP vaccine efficacy under local conditions.

Keywords: Contagious bovine pleuropneumonia, cattle, ELISA, The Gambia

1.6.3 Participatory Institutional Diagnoses of GILMA

O.F. Olaniyan, N.N. Fall-Diop, B. Faye, A. Secka, O.B. Smith and M. Kebbeh. Assessment of institutional capacities of the Gambia Indigenous Livestock Multipliers' Associations. *Animal Genetic Resources*, 2015, 57, 119–126. © Food and Agriculture Organization of the United Nations, doi:10.1017/S207863361500020X

Abstract

This exploratory study aims to understand and improve the performance of Gambia Indigenous Livestock Multipliers' Associations (GILMA – Fulladu and Saloum) as a way of enabling them to better respond to the challenges faced in fulfilling their institutional responsibilities. Using participatory institutional diagnosis, the GILMA members and experts were able to examine their associations and to stimulate collective reflection as a means of making the associations more efficient and effective. The findings of this diagnosis showed that functioning of both GILMAs was closely linked to the operations of their technical partners. This resulted to GILMAs which clearly lack defined vision and mission. Main issues to address include capacity development of GILMA's executive committee in terms of institutional management, group facilitation, participatory planning, effective strategies for partnership and ownership. Overall, this study developed pathways for revitalizing GILMAs

into vibrant and self-sustaining indigenous ruminant livestock multipliers' associations that can effectively carry out specific roles and responsibilities within the three-tier Open Nucleus Breeding Scheme of the International Trypanotolerance Centre.

Keywords: Association, breeding, GILMA, indigenous, multiplier

1.6.4 Sustaining N'Dama cattle in The Gambia

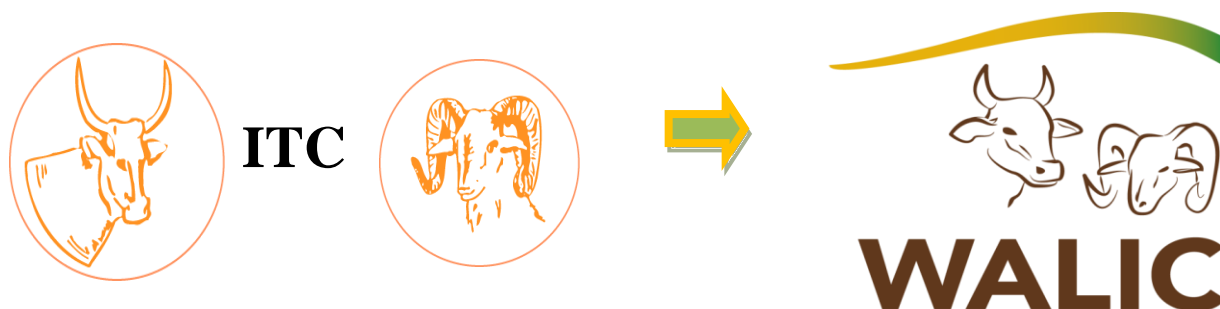
Olawale F Olaniyan. Sustaining N'Dama cattle for the resource-poor farmers in the Gambia. *Bull. Anim. Hlth. Prod. Afr.*, (2015), 63, 1, 83-92

Abstract

N'Dama cattle which is endemic to West and Central African countries is a part of global livestock biodiversity that needs to be sustainably conserved in order not to lose its unique genetic characteristics which are important for meeting the challenges of insufficient animal protein production, food insecurity, rural poverty and climate change. This study assesses the genetic improvement, sustainable production, utilization and conservation of this breed of cattle in order to strengthen them through relevant technical strategies and policy measures. Review of relevant literature and policy documents, participatory group discussions were used while the information gathered was analysed through content analysis. Efforts to sustainably improve, utilize and conserve the adaptive traits of N'Dama cattle which are able to tolerate trypanosomosis and survive on low-quality feed will serve as impetus for the farmers. Particularly, strengthening of open nucleus breeding scheme, institutional support of the multipliers, financial and technical support of the extension services, and favourable policy environments are the packages that would maximize the potentials of N'Dama cattle in terms of food production and reliable income generation for the resource poor farmers in a country such as The Gambia.

Keywords: N'Dama; Production; Utilization; Conservation; Policy; Nucleus breeding.

2. Transformation process of ITC to WALIC



2.1 New WALIC Act

There is urgent need to come up with a new Act from the Government of The Gambia that would repeal the old 1982 ITC Act to take into account the use of the new name change from *International Trypanotolerance Centre (ITC)* to *West Africa Livestock Innovation Centre (WALIC)*. The new WALIC Act would also allow for the changes in the composition and size of the New Governing Board as stipulated in the new 10-year Strategic Plan (2013-2022) for WALIC.

The process of enacting a new WALIC Act by the Government of The Gambia (GoTG) was vigorously pursued by the Honourable Minister of Agriculture, Mr Ismaila Sanyang, during the second half of 2015. The WALIC Act has been approved by the Cabinet of the Government of The Gambia, and it has been submitted to the National Assembly for debate and adoption prior to the signature by the President of the Republic of The Gambia.

The inauguration process of the new WALIC would kick start following the finalization of this new Act.

2.2 Resource mobilization

2.2.1 Islamic Development Bank (IsDB)

The IDB is financing a project on Building Resilience to Recurring Food Insecurity in collaboration with the Government of The Gambia. The project has been approved in 2014, and implementation of activities is schedule to begin in 2015. This five year project would be under the administration of National Agricultural Land and Water Management Development Project (Nema).

The project has several components, but the main partner/beneficiary for the sub-component on *Support to Livestock* is the International Trypanotolerance centre (ITC). 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 would be USD585,050.00.

In the last quarter of 2015, ITC's requests to the project for the procurement of Tractor, Truck, Veterinary Supplies and Animal Feed, and wooden posts for the new 10-hectare

pasture field were under processing. It is expected that these items would be supplied in the first quarter of 2016.

2.2.2 West Africa Agriculture Productivity Project (WAAPP)

The general objective of WAAPP Gambia (2012-2016) is to enhance the generation and accelerate the adoption of improved technologies in the country commodities aligned with the sub-region's priorities as outlined in the agricultural policy of the ECOWAS countries (ECOWAP). The project is expected to increase yields and productivity by at least 15% in the following 8 commodities: rice, maize, groundnut, vegetables, livestock, early millet, cowpea and findi/fonio.

WAAPP has four components namely:

- 1) **Enabling conditions for sub-regional cooperation in generation and adoption of agricultural technologies.** This component aims at strengthening and harmonizing systems (rules, mechanisms and procedures) governing the registration and dissemination of technologies & products (genetic materials, pesticides and other agro chemicals) to make them available for domestic and cross border trade and distribution.
- 2) **National Centres of Specialization (NCOS) - Strengthening of Research Systems.** The aim of component Two is to enhance and improve the performance of national agricultural research systems by; upgrading core research facilities; strengthening the capacities of Researchers; provide technical support to Research and Development (R&D) with the active participation of producers and agribusiness partners; conducting on farm surveys and alleviating constraints along the value chain system etc.
- 3) **Support to demand driven technology generation, dissemination and adoption.** This component is responsible for the enhancement of demand driven self-sustaining initiatives. It is through this component that the CARGS is establish to among other things coordinate the funding of Agricultural Research Grant Schemes in a transparent manner.
- 4) **Project Coordination, Monitoring and Evaluation:** Component Four of the project aims at ensuring a timely implementation of project activities, monitoring of progress and making sure that the project is implemented in accordance with the guidelines and procedure agreed on by the Gambia and the Donor.

ITC submitted a proposal to WAAPP Gambia in October 2015 requesting for support to its ongoing 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 is 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;

- Rehabilitation of breeding infrastructure;
- Research equipment, mobility and consumables;
- Monitoring of disseminated multiplier animals; and
- Operational support

2.2.3 European Union Grant to the Ministry of Agriculture, The Gambia

ITC presented a proposal for funding from the EU grant to the Ministry of Agriculture during a 3-day retreat session at the Tendaba camp organized in late December 2015. Some funds are expected from this grant to support our research and development program on community based breeding and institutional support.

2.2.4 Multinational Seeds for Agriculture Recovery in the Ebola-Affected Countries (SAR_EAC) project (Cattle and Small Ruminants Component)

A regional project proposal was elaborated and submitted to CORAF/WECARD Secretariat for the livestock component of the SAR_EAC project targeting Guinea, Sierra Leone and Liberia. The project aims to enhance food security and economic growth in the target countries. With a total budget of US\$1 million for a five year duration, the proposed project is expected to have the following results: 1) Community-based Livestock Multiplication Centres (CMC) are established and strengthened, 2) essential infrastructures supporting ruminant production and processing of livestock products are constructed and equipped, 3) capacities of farmers and other actors along the livestock value chain are strengthened, and 4) ITC's breeding program is enhanced.

Funding for the implementation of the project is expected to come from the African Development Bank (AfDB). As the Bank has changes at the top Executive level and the headquarters moving back to Abidjan, the funds were not yet made available in 2015.

3. Outlook for 2016

3.1 Research and Development Activities

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

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.

Restocking with new sheep, goats and cattle at the nucleus flocks and herds at Keneba station would be pursued through the continued breeding of the present stock and introduction of new stock from the Nema IsDB Resilience and WAAPP projects. New small ruminants pens would also be constructed at Sololo station.

Some small ruminants and mating bulls pens at Keneba station would be repaired; and a new livestock feed store and quarantine pens constructed. There would also be some refurbishment of staff quarters, offices, bore holes and one Land Rover.

A new truck for transporting animals and tractor with accessories would also be procured for the progressive establishment and development of additional new 10 hectares pasture field at Keneba station.

Part of the expected funds secured from the WAAPP project would also be used to support the monitoring of elite breeding bulls, rams and bucks disseminated to farmers around The Gambia since 2011 up to date.

3.1.3 Seroprevalence of Bacterial Zoonoses

The collaborating team would continue to work on revising the manuscript of the article that resulted from this work for publication.

3.1.4 PROGEVAL project

Case studies of Genetic Improvement programmes in West Africa would be undertaken under the regional project entitled *Project on the Valorisation of Local Animal Genetic Resources and Aquaculture* in UEMOA (PROGEVAL) in early 2016. The study would be coordinated by CIRDES based in Burkina Faso. The general objective of this case study is 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 are 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.

Methodology of the study would include literature review, analyses of the genetic improvement programmes, and collation and analyses of collected data. Six documents would be elaborated as outputs from this study.

3.1.5 Introgression project

This 36-months long regional study entitled *Introgression of Sahelian Zebu Cattle into Trypanotolerant Bos taurus populations of West Africa* was launched in 2012 and covered three countries: Benin (INRA-B), 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 joining the project 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

3.2 Transformation process of ITC to WALIC

ITC will 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 following the enactment of the new WALIC Act and mobilisation of sufficient financial resources to recruit additional staff to start implementing programs of the new 10-year Strategic Plan (2013-2022).

4. Conclusion

Some great successes on research and development activities and the revitalization and transformation process of ITC to WALIC were attained despite major challenges and limitations on human and financial resources.

In conclusion, ITC has achieved the following during 2015:

- Fifteen elite breeding males (4 bulls, 6 bucks and 5 rams) have been disseminated to livestock multiplier farmers around The Gambia,
- Funds have been committed from two national projects (Nema and WAAPP) to enhance ITC's capacity on genetic improvement of endemic ruminant livestock species,
- Three scientific articles have been published with BAHPA and one article with Animal Genetic Resources journal,
- ITC effectively participated at three national and four regional workshops organized by ITC and partners in West Africa,
- The implementation of two new regional projects (PROGEVAL and Introgression) in 2016 would involve ITC's participation,
- The new WALIC Act is expected to be enacted by mid-2016, and
- Resource mobilization and advocacy for launching WALIC would be intensely pursued in 2016.

5. Financial statement for 2015

Income Statement for the year ended 31st December 2015

	2015 GMD	2015 GMD
Income:		
Gambia Govt	2,764,492.79	
FAO	1,478,954.53	
Sundry:		
Milk	436,313	
Cattle sales	391,155	
Miscellaneous	12,053	
House rent	528,964	
Total income		5,611,932.32
Expenditure :		
Personnel	3, 086,279.88	
Terminal benefits	98,664.82	
Petrol and diesel	581,765.00	
Telephone	47,134.37	
Casual workers	133,245.00	
Vehicle spares	92,140.00	
Local Travel	14,520.00	
Training and workshop	1,097,470.48	
Electricity and water	271,017.05	
Feed and drugs	87,033.5	
Insurance	19,618.03	
Office supplies	20,463.00	
Cleaning materials	31,525.00	
Other admin and prof matters	136,733.16	
Generator spares	7,200.00	
Consultancy	531,010.36	
Security services	162,000.00	
Lab supplies	1,150.00	
General repairs and maintenance	37,931.83	
Operations and maintenance	46,643.00	
Total expenditure		(6,503,544.48)
Deficit before finance charges		(891,612.16)
Bank charges		(29,832.80)
(Deficit)/Surplus for the year		(921,444.96)
Exchange difference		617,214.15
Net loss for the year		(304,230.81)