NATIONAL STRATEGY AND ACTION PLAN FOR ANIMAL GENETIC RESOURCES IN THE GAMBIA




FINAL REPORT:

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ACRONYMS

AI	Artificial Insemination
AnGRs	Animal Genetic Resources
Au- IBAR	African Union- Inter African Bureau for Animal Resources
BCC	Banjul City Council
CRR/N	Central River Region/ North
CRR/S	Central River Region/South
DLS	Department of Livestock Services
GBoS	Gambia Bureau of Statistics
GDP	Gross Domestic Product
GILMA	Gambia Indigenous Livestock Multiplier Association
GMD	Gambian Dalasi
GoTG	Government of The Gambia
KMC	Kanifing Municipal Council
LRR	Lower River Region
LSR	Livestock Sector Review
MT	Metric Ton
NAC	National Advisory Committee (for Animal Genetic Resources)
NASS	National Agricultural Sample Survey
NBR	North Bank Region
NDP	National Development Plan
NSAP	National Strategy and Action Plan (for Animal Genetic Resources)
NLC	National Livestock Services
URR	Upper River Region
WAD	West African Dwarf Goat
WALIC	West African Livestock Innovation Centre
WCR	West Coast Region
YBK	Yorro-Beri-Kunda

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1.0 Introduction/Background

Data from the recently concluded National Livestock Census 2016/17 has shown that in 2016, mortality due to disease incidences decimated the National Cattle Herd by 5.4% (15,852 heads) and the Goat and Sheep Flocks by 23.8% (78,373 heads) and 23.3% (40, 351 heads) respectively.

Apart from disease incidence, the threat to erosion of animal genetic resources diversity in The Gambia is compounded due to encroachment (human settlements, double cropping of rice, cashew plantations etc) and the destruction of habitat of vectors of diseases allowing genepool dilution of indigenous breeds as they are gradually replaced by more productive but less tolerant imported breeds/crosses.

Notwithstanding the on-going, it is noteworthy that in the past, considerable efforts were made by projects and communities to minimise the impact of the degradation of the traditional grazing areas through the demarcation of cattle tracks, elaboration of appropriate land use plan, local conventions with the communities and the involvement of traditional leaders *(Alkalos* and *Seyfos*).

To guard against the mentioned threat, the international community (109 countries) in 2007 adopted the *Global Plan of Action for Animal Genetic Resources* (and *The Interlaken Declaration on Animal Genetic Resources*) confirming their commitment for the conservation and sustainable use of animal genetic resources for food and agriculture. Translating the Global Plan of Action into national action plan require the preparation of National Strategy and Action Plan which will spearhead the move towards more effective and sustainable utilisation, conservation and development of animal genetic resources.

1.1 Objectives of the Assignment (TOR)

The overall objective of the assignment is to produce an endorsed National Strategy and Action Plan (NSAP) for Animal Genetic Resources for The Gambia. Other specific objectives are:

- Initiate preparation of the elements of the National Strategy and Action Plan (NSAP)
- Undertake assessments to provide the basic information necessary to enable the preparation of NSAP
- Prepare a draft set of strategic priorities and actions for the sustainable use, development and conservation of the AnGRs
- Prepare first draft consultation document
- Undertake Consultations to review the draft NSAP
- Finalize the National Strategy and Action Plan
- Establish a process for monitoring and evaluation
- Present the final NSAP at a validation workshop and
- Facilitate formal endorsement of the NSAP

2.0 National Strategy

2.1 Technical Approach and Methodology

The Technical Approach for the development of the NSAP is consistent with the provisions of the Guidelines for the development of NSAP prepared by FAO and comprised the following 9 (Nine) Phases/Steps:

Phase 1 and 2: Establishment and Maintenance of National Focal Point and Establish of Multi-stakeholder National Advisory Committee and Assignment of Responsibilities

The National Advisory Committee (NAC) for the Management of Animal Genetic Resources (AnGR) in The Gambia was established in May – June 2017 with the following key responsibilities:

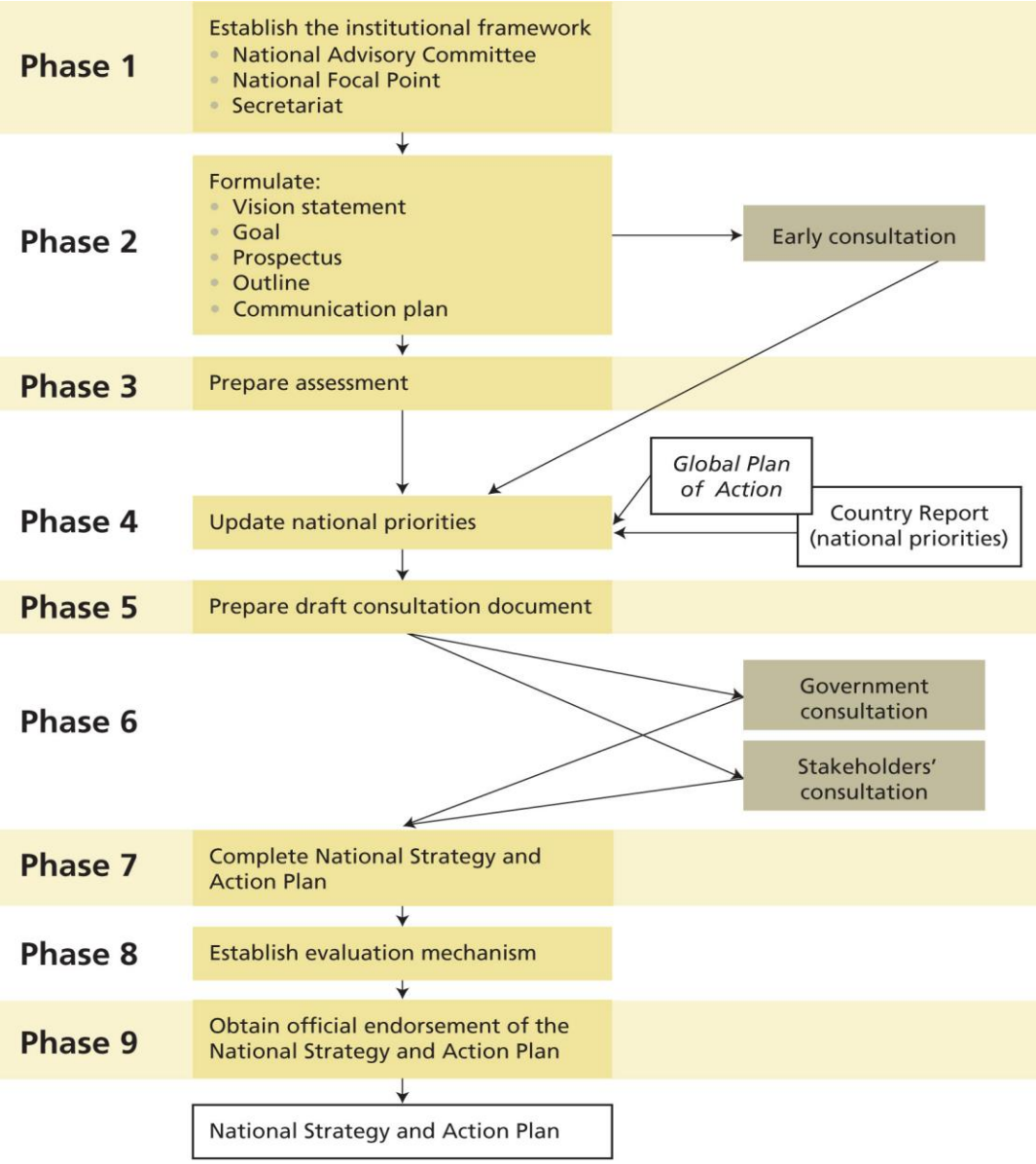
- Overseeing the preparation of the National Strategy and Action Plan (NSAP)
- Providing support for the identification of strategic priorities and actions
- Mobilizing financial resources and support for the preparation and implementation of the NSAP.
- Providing support for the official endorsement of the NSAP by the Ministry of Agriculture
- Monitoring and evaluating progress in the implementation of the NSAP
- Updating and revising elements of the NSAP when required.

The NAC's key representatives (20 in number) are drawn from the followings;

1. The Ministry of Agriculture
2. Governmental Organisations
3. Breeders, Farmers, Herders and other Livestock Producer Organisations
4. Artificial Insemination Association
5. Extension Services
6. The Private Sector
7. Civil Society Organisations.
8. Research Institutions

The Ministry of Agriculture and the West African Livestock Innovation Centre (WALIC) in collaboration with the Genetics Project of AU-IBAR Centre organised the official Inauguration and First Working Meeting of the NAC at the Paradise Suites Hotel in Banjul on 6-7th June 2017.

Figure 1: Preparation of National Strategy and Action Plan (Source: FAO 2009)



At this meeting, the NAC was officially inaugurated by the Minister of Agriculture of The Gambia, followed by a keynote address from Dr Bosso Nguetta, Technical Assistance to the Genetics Project (on behalf of the Director of AU-IBAR). A geneticist (working in WALIC) and WALIC were designated National Coordinator and National Focal Point for Animal Genetics Resources respectively. Furthermore, the Director General of DLS was assigned the chairmanship of the NAC.

WALIC as the Focal Point for the Management of Animal Genetic Resources, has the following responsibilities:

- Providing secretariat support for the preparation of the National Strategy and Action Plan (facilitating secretariat functions during the preparation process and support ongoing implementation activities).
- Providing the interface for enhancing country participation and contributions in the area of international developments pertinent to Animal Genetic Resources Management.
- Interagency coordination and cross-sector communication and collaboration.
- Briefing on progress made in the various preparatory phases of the NSAP
- Supporting and facilitating the preparation of written materials such as assessments, prospectuses
- Planning and implementing the consultation processes
- Interacting with the media; and establishing a network among national and international experts, institutions and organisations
- Support for the preparation and implementation of the National Strategy and Action Plan.

Phase 3: Assessment for Provision of Basic Information Necessary to Enable Preparation of the NSAP

2.2 The Gambia – a Country Overview

The Gambia in West Africa occupies an area of 10, 689 sq km. A small sub-tropical country between latitudes 13º28N and 16º36W, it is bordered to the north, south and east by Senegal and has an 80km coast on the Atlantic Ocean to the west. The country's borders roughly correspond with the path of the River Gambia. The capital city is Banjul.

The human population of the country stands at 1,857,181 persons (Source: Gambia Bureau of Statistics; Population and Housing Census Report, 2013.) and this represents an increase of 26.7% when compared to figures derived from the Population and Housing Census, 2003.)

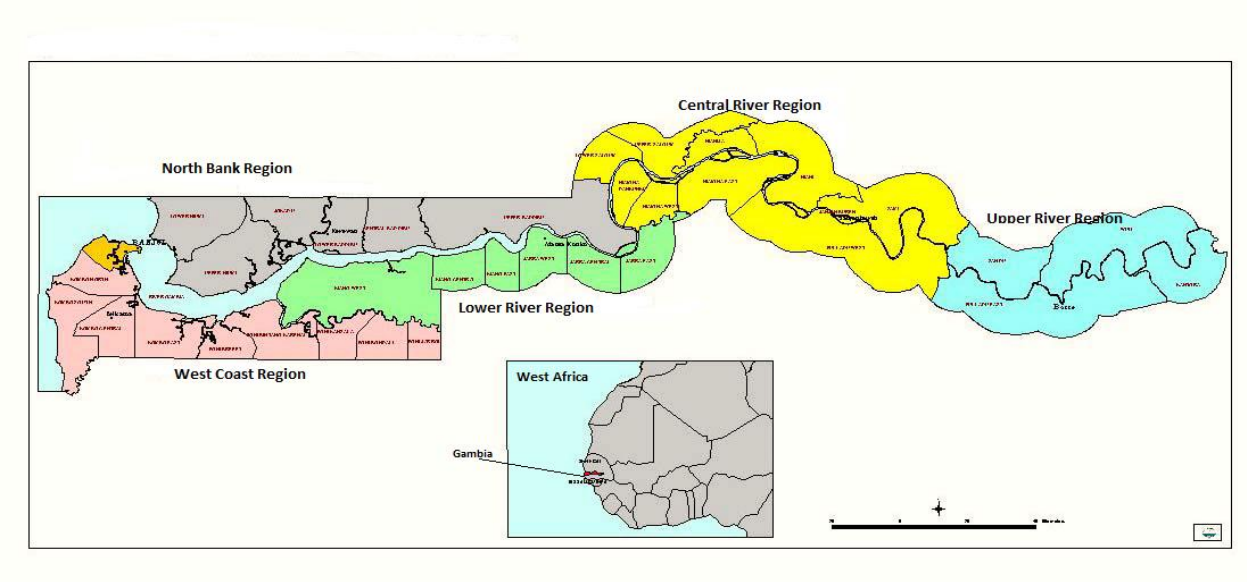
The Gambia is within three Agro-ecological Zones: Sahelian, Sudano-sahelian, and Sudano-guinean. The country has a sub-tropical climate with two variations of distinct dry and rainy seasons. The dry season commonly known as 'Harmattan' usually starts mid-October and ends around mid-June every year with an average temperature of 32°C / 89.6°F. The rainy season (rainfall averaging 1020 mm and ranging from 800mm in the east to 1700mm at the western end of the country) usually starts around mid- June and ends around mid-October with August being the wettest month of the year, temperatures can reach up to 41°C/105.8°C.

The Gambia has a total area of 11,300 km2 (4388 sq. miles) out of which approximately 1,300 km2 comprise water bodies. The country has an 80-km Atlantic coastline with an exclusive fishing zone of 200 nautical miles within the continental shelf. The agricultural land is 6,550 km2 and the arable land is 588,000 hectares, of which, 334,000 hectares are under cultivation. It has a forest area of 4750 km2 (i.e. 47.5 per cent of the land area).

Agriculture remains a key sector in the Gambian economy serving as a driver for socio-economic development, providing food, income and employment (for 75 percent of the country's working

population), contributing 25% to the country's GDP. The Gambia's annual GDP growth rate stabilized around 6% from 2009 to 2011 when the country experienced a negative GDP growth rate of -4.60% (Source: Trading Economics - Central Bank of The Gambia, 2014.) The negative growth rate registered in 2011was attributable to the crop failure experienced in the 2011/2012 cropping season. However, in 2013 the GDP annual growth rate recovered and reached 6.1 %. (Source: Trading Economics - Central Bank of The Gambia, 2014.) Annual GDP growth for 2017 is estimated at 4.6% (Source: GBoS).

Fig 2: Map of The Republic of The Gambia



Agricultural production is predominantly rain-fed. It is characterized by a highly variable and largely unpredictable weather and rainfall patterns that seldom exceed five months in any given cash crops including rice, maize, millets, sorghum, groundnuts and vegetables. Livestock production and fisheries also contribute significantly to the livelihood of the population.

Among the key factors militating against the country's key policy objective of meeting the food requirements of the population and moving towards commercialisation of agricultural production, (through enhanced agricultural production and productivity) may be cited the following:

- Climate change and the resultant climate effects such as droughts, floods and erratic rainfall distribution,
- Land degradation and declining soil fertility,
- Inadequate availability and access to production inputs and credit,
- Inappropriate agricultural farming practices/production techniques,
- Inadequate support services (research and extension services),
- Salt water intrusion and
- Challenges associated with land tenure.
- Relatively low levels of agricultural mechanisation.

Production from the agricultural sector meets only about 50% of the national cereal requirements. The increasing demand for food for the growing population is largely met by imports of rice, wheat

flour, livestock products and other food items that constitute a huge drain on the country's limited foreign exchange earnings.

2.3 Assessment of the Roles and Values of Animal Genetic Resources in The Gambia.

The livestock subsector in The Gambia contribute 4.8% to the agricultural GDP and it constitutes a valuable animal genetic resource the potential of which though underutilised, remains an important complementary attribute of the farming and livelihood support system of most rural and peri-urban households in the country. The real contribution of the livestock subsector to the country's overall GDP is grossly underestimated due to the following facts:

- Animal traction is used in the production of 73.4% of all field crops in The Gambia. Draught power requirements for most farm operations in the country are met largely through the usage of animal traction. The provision of draught power for farm operations (from planting to evacuation of farm produce) is not costed and factored in the subsector's contribution to the national GDP.
- Draught power is also useful in the rural socio-economy as a mean of transport for serving the weekly markets "*Lumoos"* and providing transportation networks and (ambulance services) for remote rural communities.

- The cost of the total tonnage of farmyard manure provided at the national level for the production of field crops and horticultural produce is normally not taken into account when calculating the subsector's contribution to the GDP. It is noteworthy that the results of the National Livestock Census 2016 revealed that the majority of cattle herd owners (22.3%) stated that their main purpose of keeping cattle is for manure production (whilst 22.2% gave milk production as their main reason).

2.3.1 Meat Production in The Gambia

Table 1 shows the compilation of data pertinent to potential meat (beef, mutton, goat meat, poultry meat and pork) production in The Gambia and it is based on data derived from the results of the National Livestock Census 2016 and slaughter figures. The data demonstrates that the country has an annual Potential Meat Production of 6, 213 MT. The monetary value of meat potentially produced in 2016 stood at GMD 1,637, 805, 700. In Comparison, estimated total meat produced in 2008 was 4, 032 MT (Source: LSR 2010).

Table 1: Annual Potential National Meat Production (Kgs) and Values (GMD) (2016-2017).

Species	Population	Off-take Rate (%)	Number	Av. Carcass weight (Kg)	Meat Produced (Kg)	Av. Price /Kg	Total Value -Production
Cattle	292, 837	11.9	34, 848	110.0	3, 833, 280	250	958, 320, 000
Sheep	172, 662	22.3	38, 504	14.0	539, 056	300	161, 716, 800
Goats	328, 336	25.1	82, 412	14.0	1, 153, 768	300	346, 130, 400
Pigs	14, 830	50	7, 415	40.0	296, 600	250	74, 150, 000
Chicken	937, 951	40	375.180	1.0	375, 180	250	93, 795,000
Ducks	18, 468	40	7, 387	2.0	14, 774	250	3, 693, 500
TOTAL	-	-	-	-	**6, 212, 658**	-	**1, 637, 805,700**

*Computed from National Livestock Census 2016 Data and Slaughter Figures (2017)

2.3.2 Potential Annual Milk Production

According to the results of the National Livestock Census (2016), the number of lactating N'Dama cows in The Gambia is 44, 385 producing on average 1.5 litre of milk a day for 305 days (lactating period). It therefore follows that the estimated potential total annual milk production of cattle in the country is 20, 306, 137.5 litres with a monetary value of GMD1, 015, 306, 875.

The Census results also confirmed that 52% of milk produced is exclusively used for domestic consumption whilst the rest is sold in the open market.

2.3.3 Potential Annual Egg Production

Given that the total chicken population of the country stands at 937, 951 birds (National Livestock Census 2016), it is reasonable to assume that at least, 80% of them will be hens thus making a layer population of 750, 360 birds. It is calculated that each hen lays about 40 eggs per year hence total production is estimated to amount to 30, 014, 400 eggs per annum with a monetary value of GMD 150, 072,000.

2.3.4 Monetary Value of Livestock Products (2017)

The total estimated value of livestock products in 2017 was GMD 2, 803, 184, 575 {See Table 2} and it represents the aggregation of the total values of meat, eggs and milk produced annually in The Gambia.

Table 2: Summary of Annual Production of Meat, Eggs and Milk (2017)

Livestock Product	Total Volume in Kgs/Litres	Total Monetary Value (GMD)
Meat	6, 212, 658 Kgs	1, 637, 805, 700
Eggs	30, 014, 400 Pieces	150, 072, 000
Milk	20, 306, 137.5 litres	1, 015, 306, 875
	Total Monetary Value	**2, 803, 184, 575**

2.4 Assessment of Current and Future Demand and Trends for Animal Genetic Resources

The current human population of the country is 1,882,450 persons (Source: Gambia Bureau of Statistics; Population and Housing Census Report, 2013.) and this represents an increase of 38.3% when compared to figures derived from the Population and Housing Census, 2003.) The demand for meat and milk is on the increase mainly due to population growth and rapid urbanisation. If the anticipated demand for livestock and livestock products has to be met, it will come from increased productivity of livestock rather than numerical increase in heads. It therefore follows that genetic improvement of the indigenous breeds will be the most sustainable method of increasing productivity and efficiency of production.

In The Gambia, it is noteworthy that the demand for animal and animal products far exceeds the supply generated from domestic production hence the gap is met through imports. Generally it is estimated that about 40% of all cattle slaughter stock is imported from neighbouring countries.

In addition, between 2011 and 2016, The Gambia annually imported on the averages about 8, 440 MTs of meat and meat products and 19, 817 MTs of milk and dairy products (Source: Gambia Bureau of Statistics – GBoS).

2.5 Assessment of the Status of Relevant and National Biological Diversity, Agricultural and Livestock Development Strategies, Plans Legislations and Policies of AnGRs

2.5.1 Overview of Animal Production and Related Biological Diversity

The livestock production system practised is predominantly traditional and small-scale and generally not commercially oriented hence it is characterised by poor management, low productivity, low offtake rates and high disease incidence resulting in high mortality rates for all the livestock species produced.

2.5.2 Production Systems

2.5.3 Cattle Production

In The Gambia, cattle production forms and important integral component of the agro-pastoral/ mixed farming system providing manure, milk, meat and a reserve source of income for satisfying socio-cultural and other obligations as the exigencies may demand. The production systems practised are as follows:

- **Extensive System** – this is the predominant system which is based on production of both livestock and crops (mixed farming) and it is characterised by usage of indigenous breeds of low productivity (N'Dama and Gobra/Zebu) with little no improvement programmes. Transhumance and internal migration are practised in search of pastures and water during the dry season.
- **Semi-intensive System -** Selected animals (including draught animals) are given supplementary feeding using agro-industrial by-products and crop residues for increase meat, milk, manure and draught power.
- **Intensive System –** This system is practised mainly in the urban and peri-urban area using pure breeds (mostly European breeds) and crosses of N'Dama and European breeds with the objective of increasing productivity (both milk and meat). Artificial Insemination (AI) is practised for improving performance.

Cattle are reared in all the administrative regions of the country but production is concentrated in the rural areas. Cattle herds are managed by herdsmen who are responsible for their overall supervision. The animals are tethered overnight to pegs and are herded in the morning for grazing in communal rangelands (mainly marginal and fallow lands) for 6 - 8 hours daily. Communal rangelands are the main source of feed for the cattle herds. During the dry season however, they have access to crop residues once field crops are harvested.

Cattle are rarely given feed supplements although draught animals are supplemented with crop residues and agro-industrial by-products. Lactating cows are milked once or twice daily. Herders are either family members or contract herders who are paid in cash or kind (milk or animal). Animals are not individually tagged, and reproduction and production performance records are not maintained. The milk that is produced is sold unprocessed either as raw or fermented milk. Culled animals are sold for slaughter. Breeding females or males are sold to other breeders.

N'Dama cattle with their crosses in the smallholder commercial dairy production in the peri-urban areas are placed under semi-intensive to intensive management. Various forms of housing, zero-grazing, grazing with supplementation and inputs for disease control are provided. Individual animals are tagged and some production records are maintained. Produced milk is also sold either raw or as fresh pasteurised milk or yoghurt. Culled cows and bulls are sold for meat.

It is noteworthy that analysis of estimates of the cattle population from 1990/1992 (NASS, LSR) placed the National Cattle Herd numbers at 340, 000 heads however the National Livestock Census of 1994 confirmed the population to be 304, 852. Similarly, estimates derived from the NASS 2002 and 2014 also gave the cattle population as 323, 000 and 497, 083 respectively whilst the National Livestock Census of 2016 confirmed the population to be 292, 837. In the 1980s it was generally accepted by many livestock specialists in The Gambia that the country was nearing the threshold of the carrying capacity for the national cattle herd hence the population has stabilised around 300, 000 heads (Sumberg, 1988 and others). The slight reduction in the cattle population

registered in the NLC of 2016 is perhaps attributable to the outbreak of Contagious Bovine Pleuro-Pneumonia (CBPP) in 2012.

Table 3: The Gambia Livestock Populations by Species and Years.

Species/ /Years	1991[1]	1993/94 [2]	2002 [3]	2014 [4]	2016 [5]
Cattle	340, 000	279, 000	323, 00	479, 083	292, 837
Sheep	167, 000	116, 000	129, 000	53, 189	172, 662
Goats	191, 000	214, 000	228, 000	359, 835	328, 336
Oxen	NA	17, 000	17, 000	NA	32, 209
Horses	17, 000	18, 000	18, 000	4, 593	22, 070
Donkeys	43, 000	33, 000	33, 000	22, 941	65, 650
Pigs	NA	NA	8, 000	8, 192	14, 830
Chicken	550, 000	NA	858,000	609,180	937, 951

Sources:
[1] Livestock Sector Review, 1991; [2] National Livestock Census, 1993/94; [3] NASS, 2003 [4] NASS, 2014; [5] National Livestock Census, 2016

Table 4: Livestock Populations by Species and Region

Species/Regions	**BCC**	**KMC**	**WCR**	**NBR**	**LRR**	**CRR/N**	**CRR/S**	**URR**
Cattle	0	5	37, 643	64, 483	26, 371	44, 541	44, 211	75, 583
Sheep	409	3, 485	22, 429	21, 073	11, 699	17, 751	28, 872	60, 927
Goats	166	3, 920	66, 667	60, 306	26, 462	46, 588	38, 294	85, 933
Draught Cattle	0	0	3, 895	11, 538	1, 735	5, 372	9, 088	3, 581
Horses	0	0	504	5, 443	787	3, 908	3, 119	8, 299
Donkeys	0	40	5, 916	13, 715	5, 263	7, 969	8, 563	24, 184
Pigs	0	2, 064	9, 904	2, 444	102	49	73	194
Chicken	1, 543	48, 974	331, 416	169, 387	60, 535	76, 319	107, 247	142, 530

Source: NLC 2016

2.5.4 Small Ruminant and Poultry Production

Small Ruminants and Poultry play an important role in the livelihood of the rural populations in The Gambia and they are raised to generate income and to meet the nutritional requirements of the rural families. They are also sold to meet other family needs and to fulfil socio-cultural obligations of the owners. These short cycle species of livestock are easier to sell and they therefore serve as ready sources of income for the purchase of food during lean periods. The precarious and erratic nature of rainfall coupled with the concomitant crop failures observed in recent years is forcing the farmers to rely more on small ruminants and poultry to meet the food and other requirements of the families. Furthermore, given the prolific nature and short generation interval of these species, they contribute significantly to the enhancement of food security and poverty alleviation in the rural communities. For these reason the ownership of sheep and goats is wide spread in all the regions.

The validated National Livestock Census Report 2016 confirmed that in The Gambia, there are 172, 662 and 328, 336 Sheep and Goats respectively. With 60, 927 sheep the URR has 35.9% of the National Sheep Flock. Similarly with a population of 85, 447 or 26.2% of the caprine population, the URR has the highest population of the specie when compared to all other regions in the country. (See Table: 4.)

The production system practised is mainly extensive and traditional. However, intensive production of fattened rams targeting the "*Tobaski"* (local name for Muslim feast of "*Eid UL Adha*" Eid) is also very popular.

At the National Livestock Show and "*Tobaski"* Ram Sale in 2017, a total of 33,090 "*Tobaski*" Rams were presented for sale to the public at the Livestock Show Ground in Abuko. The rams presented for sale originated from the regions within the country and also from countries in the sub-region (the Republics of Senegal, Mali and Mauritania).

Table 5: Origin and Numbers of Rams Presented for Sale at the NLS 2017

Origin	Number
1. KMC	4,293
2. CRR/N	2,534
3. CRR/S	2,095
4. NBR	2,433
5. URR	1,511
6. WCR	3,432
7. LRR	130
8. Senegal	15, 862
9. Mali	379
10. Mauritania	421
TOTAL	**33,090**

Productivity of Small Ruminants under the traditional system is considered low owing to the inadequate nutrition, poor management practices and high mortality rate due to frequent disease outbreaks. Unlike cattle more Sheep and Goats are sold annually as evidenced by higher off-rate of 23.6 % and 25% respectively. The production of sheep and goat meat was estimated at 550 and 1,028 tones, representing 0.3 and 0.6 kg per inhabitant respectively (Livestock Sector Review 2010).

The local poultry population according to the 2016 NLC is 937, 951. Traditional poultry production that predominates is extensive in nature and birds are poorly housed and fed. Small flocks (10 to 15 birds) which are in most cases owned and managed by women and children are kept in the backyard of the owners. They are confined during the night in kitchens or locally made shelters to minimize predation whilst during the daytime birds are left to scavenge in the backyards; and supplementary feeds such as millet and brans as well as water are provided for the birds.

The poultry flocks are made up of local breeds that are low producers of meat and eggs compared to exotic breeds. But given their size, the birds are easier to sell or slaughter for home consumption and for that reason they serve as a ready source of income and protein for the rural population.

During the past decades small-scale commercial poultry farmers have established poultry farms mainly in the peri-urban areas (although is gradually gaining momentum in rural communities also) and they are engaged in the production of broilers and eggs. However the operation of most of the farms is constrained by lack of day old chicks and expensive feed.

2.5.5 Situation of Cattle Genetic Resources: Main Cattle Breeds and their Characteristics

Data derived from the results of the NLC 2016 has demonstrated that the overwhelming majority of all cattle (98%) in The Gambia (286, 220 heads) are classified as belonging to the N'Dama breed. The remaining 2% comprises Zebus, "*Gobras"* (crosses of N'Dama and Zebu cattle) and crossbreds of N'Dama with Jersey, Holstein- Friesian and other European breeds.

The National Livestock Census 2016 results showed that out of a total cattle population of 292, 837 heads, 286, 220 (97.7%) belong to the N'Dama breed (See Table 1) whilst Zebu/*Gobra* and other breeds account for 1.4% of the population (i.e.4, 083 heads). Draught cattle (35, 209 heads) account for 12% of the cattle population (and they provide the draught power requirements for most farm operations in The Gambia).

Table 6: Cattle Numbers by Breed and Region

Region	Cattle Breeds			Draught Cattle		Total- All Cattle
	N'Dama	ZEBU/GOBRA	Other	N'Dama	ZEBU/GOBRA	
KMC	5	0	0	0	0	5
WCR	33,111	447	190	3,778	117	37,643
LRR	23,640	994	2	1,628	107	26,371
NBR	52,165	773	7	10,812	726	64,483
CRR North	38,753	405	11	4,644	728	44,541
CRR South	34,869	252	2	8,299	789	44,211
URR	71,002	885	115	3,514	67	75,583
The Gambia	**253,545**	**3,756**	**327**	**32,675**	**2,534**	**292,837**
(%)	**86.6**	**1.3**	**0.1**	**11.1**	**0.9**	**100**

Source: NLC 2016

The Census results indicated that 63% of cattle in the country are located in Upper River and Central River Regions and the average herd size ranged from 40 to 63 animals in all regions.

N'Dama cattle breed is known for its innate tolerance to *trypanosomosis* (Murray et al., 1982; Paling et al., 1992); resistance to *dermatophylosis*, heart water, *anaplasmosis* and *babesiosis* (Leeflang and Blockamp, 1978; Murray et al. 1991); and relative resistance to helminths (Claxton and Laperre, 1991). Their physiological adaptation to harsh environmental elements makes them more resistance to heat, drought and feed scarcity than other breeds.

N'Dama cattle is the predominant cattle breed preferred by the majority of Gambian farmers due to its adaptive traits to a production system challenged with low input availability, inadequate access to basic veterinary healthcare, feed scarcity during the long dry season and high prevalence of vector borne diseases and parasites. The N'Dama is a dual purpose breed for both of the meat and milk production. The breed also provides most of the draught power requirements for farm operations of crop farmers from sowing to evacuation of produce from the fields/farms after the crops are harvested.

2.5.6 Production and Reproductive Performance of Gambian N'Dama Cattle

The establishment of the International Trypanotolerance Centre (ITC) now West African Livestock Innovation Centre (WALIC) in The Gambia in 1984, provided researchers the opportunity to exhaustively evaluate the production and reproductive performances of Gambian N'Dama cattle and the indigenous small ruminant breeds in the country. Researchers such as Phillip Jeannin and Kwaku Agyemang and many others published the results of the research in the mentioned areas in 1987 and 1991 respectively. (See Tables 7 and 8).

Table 7: Reproductive Performance of Village N'Dama Herds

Parameter	Value
Age at first calving	5 to 6 years
Average calving rate	47 to 52%
Calving interval	23 to 25 months
Calf mortality (1st year of life)	14 to 24%
Mortality rate of 3 to 7 years old	0.9%
Mortality rate of 7 to 10 years old	4.2%
Mortality rate of more than 10 years old	5.6%
Mean live weight of dry female cows	225 kg (s.d 29)
Mean live weight of lactating cows	207 Kg (s.d. 27.8)

Source: Jeannin P et al. (1987)

Table 8: Production Parameters of Village N'Dama Cattle

Parameters	No. of records	Mean	SD	Range
Lactation length, days	668	420	138.6	70 – 1018
Milk offtake, kg	668	404.3	183.1	29 – 1071
Fat percentage, %	531	5.1	1.0	2.2 – 7.9
Protein percentage, %	533	3.2	0.3	2.3 – 4.1
Fat yield, kg	531	18.8	10.5	1.1 – 60.8
Protein yield, kg	333	11.6	5.9	0.5 – 33.3
Calf birth weight, kg	668	17.5	2.7	8 – 24
Calf weaning weight, kg	582	88.1	27.3	26 – 203

Average postpartum cow weight, kg	642	225.7	28.2	149 – 329
Calving interval, d	326	641	200.8	319 -1069
Productivity index 1, kg	348	73.5	33.7	0 -153
Productivity index 2, kg	348	32.6	14.4	0 – 64.2
Productivity index 3, kg	348	140.6	64.2	0 – 269.7

- Index 1 = [(Live weight of calf at weaning + Lactation milk offtake/9) x 365]/subsequent calving interval.
  = kilograms live weight of weaner calf produced plus live weight equivalent of milk offtake for human use **per cow** maintained per year.
- Index 2 = (Index 1/average postpartum weight of cow) x 100
  = kilograms live weight of weaner calf produced plus live weight equivalent of milk offtake for human use **per 100 kg of cow** maintained per year
- Index 3 = (Index 1/average postpartum weight of cow $^{.73}$) x 100
  = kilograms live weight of weaner calf produced plus live weight equivalent of milk offtake for human use **per 100 kg of metabolic weight of cow** maintained per year.

(Source: Agyemang *et al.*1991).

2.5.6 The Djallonke Sheep

The results of the NLC 2016 show that the overwhelming majority of sheep in The Gambia comprise of the Djallonke breed (See Table 9.). Out of the total Sheep population of 172, 662, 96.4% (or 166, 467 heads) belong to the Djallonke breed, and the remaining 4.4% are Sahelians and Crossbreeds (Djallonke with Sahelians).

Table 9: Distribution of Sheep by Breed and Region

	Djallonke		Sahelian		Crossbreed		Total	
Region	Number	%	Number	%	Number	%	Number	%
BCC	231	56.5	90	22	88	21.5	409	0.2
KMC	3,485	70.8	707	14.4	730	14.8	4,922	2.9
WCR	22,429	96.1	672	2.9	224	1.0	23,325	13.5
LRR	11,699	98.7	127	1.1	26	0.2	11,852	6.9
NBR	21,073	96.8	468	2.1	230	1.1	21,771	12.6
CRR/N	17,751	93.9	872	4.6	289	1.5	18,912	11.0
CRR/S	28,872	98	447	1.5	142	0.5	29,461	17.1
URR	60,927	98.2	501	0.8	582	1.0	62,010	35.9
The Gambia	**166,467**	**96.4**	**3,884**	**2.3**	**2311**	**1.3**	**172,662**	**100**

Source: NLC 2016

2.5.7 West African Dwarf Goat

According to the results of the 2016 NLC, the total goat population in The Gambia is 328, 336 distributed in all the regions of the country. The majority (99.5%) of the caprine population belong to the West African Dwarf (WAD) breed (See Table 10).

Table 10: Goats Population Distribution Pattern by Breed and Region

	W/African Dwarf		Sahelian		Crossbreed		Total	
Region	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
BCC	166	100.0	0	0.0	0	0.0	166	0.1
KMC	3,359	85.7	282	7.2	279	7.1	3,920	1.2
WCR	66,523	99.8	72	0.1	72	0.1	66,667	20.3
LRR	26,404	99.8	51	0.2	7	0.0	26,462	8.1
NBR	60,184	99.8	90	0.1	32	0.1	60,306	18.4
CCR /N	46,319	99.4	231	0.5	38	0.1	46,588	14.2
CRR/ S	38,201	99.8	66	0.2	27	0.1	38,294	11.7
URR	85,447	99.4	46	0.1	440	0.5	85,933	26.2
The Gambia	**326,603**	**99.5**	**838**	**0.2**	**895**	**0.3**	**328,336**	**100**

The horns curl outwards and backwards in males and are fairly strong; they are light, sharp and pointing upwards and backwards in females. Ears are short to medium length, narrow and carried horizontally. Toggles are present occasionally in both sexes. Males are normally bearded and with a weak mane; female occasionally have beards. The neck is strong and fairly long. The chest is broad and deep, girth much greater than height (60-70cm). The back is straight and long. The croup is well developed. The legs are extremely short. The udders are usually short and well developed. The predominant breed colour is dark-brown with black points.

3.0 Opportunities Impacts and Gaps

In The Gambia, N'Dama cattle are the most adapted indigenous breed for smallholder producers in mixed crop-livestock farming system that they practise. However, due to its relatively small body size and low productivity (milk and meat offtake), some small livestock farmers in beef and milk production schemes cross them with other cattle breeds. Few crossing occurs between N'Dama and Zebu or their crosses also during transhumance at transit and host sites in both north and south banks of the eastern half of the country. Another crossing also occurs at the smallholder commercial peri-urban dairy production system in the West Coast Region where N'Dama cows are crossed with Holstein-Friesian or Jersey through artificial insemination to produce F1 stocks for milk production. However, given that these crossbreeding programmes are not regulated, the ongoing could lead to genetic dilution of the N'Dama breed in the national herd.

Similarly small ruminant Djallonke and WAD goat are also crossed with the bigger sahelian breeds particularly by farmers in the fattening schemes of sheep for the "*Tobaski"* market hence leading to possible gene pool dilution of the indigenous breeds.

The increasing demand for beef and dairy products create opportunities for investing in the livestock sector. N'Dama breed would continue to be the breed of choice under the smallholder traditional mixed farming system that is the predominant production system practised by the overwhelming majority of resource poor farmers in The Gambia. Peri-urban dairy and beef production schemes in West Coast Region practising semi-intensive to intensive production systems using N'Dama crossbreds and pure breeds are on the increase.

The main threats to indigenous livestock breeds in the country are the prevalence of diseases (eg: The NLC showed that in 2016 disease outbreaks were responsible for 53.4% of all exits from the national cattle herd), the absence of policy for conservation of local breeds, climate change and the almost non-existence of strong breed associations/societies.

Phase 4:

4.0 Strategic Priorities and Actions for Sustainable use, Development and Conservation of NSAP

In preparing the Draft Set of Strategic Priorities and Actions for Sustainable Use, Development and Conservation of NSAP, it is recommended in the *Global Plan of Action* (agreed by 169 countries) that countries focus on the analysis of existing Country Reports, agriculture- and biodiversity-related national strategies, plans and initiatives and the *Global Plan of Action*. In this regard the following **Four Strategic Priority Areas** of the *Global Plan of Action* are deemed as relevant:

- **Strategic Priority Area 1**: Characterisation, Inventory and Monitoring of Trends and Associated risks
- **Strategic Priority Area 2**: Sustainable Use and Development
- **Strategic Priority Area 3**: Conservation
- **Strategic Priority Area** 4: Policies, Institutions and Capacity Building.

4.1: Review and Identification of Strategic Directions and Actions Contained in the Country Report and /or any Existing Strategies and Programmes Relevant to Animal Genetic Resources

Table 11: Progress Made in Implementing Existing National Strategic Priorities

Strategic Priority Areas of the *Global Plan of Action*	**National Strategic Priorities as contained in the Country or other relevant Strategies**	**Status of Implementation of Each Strategic Priority**		
		Completed	**Initiated**	**Remains a Priority**
Characterisation, Inventory and Monitoring trends and Associated Risks	1. Characterisation of breeds		Not Initiated	Remains a Priority.
	2. Conduct complete Inventory of the location, population status of animal genetic resources	Completed; National Livestock Census Conducted in 2016		
	3. Inventory, Analysis and validation of indigenous technical knowledge		Not Initiated	Remains a Priority?
Sustainable Use and Development	1. Put in Place an Information Management System for Sustainable Use and Development of Animal Genetic Resources		Not Initiated	Remains a Priority
	2. Strengthen Breeder Associations.		Initiated but not completed	Remains a Priority
	3. Broaden and Sustain the 3- tier Cattle and Small Rum. Breeding Programmes		Initiated but not completed. Gaps: Links between stakeholders.	Remains a Priority
Conservation	1. Conservation of Animal Genetic Resources within the framework of the Gambia Environmental Action Plan	Not initiated		Remains a Priority
	2. Reverse the trend of erosion of livestock genetic resources; GOTG to promote sustainable use, development and conservation of AnGR (NDP 2018-2021)		Initiated not completed	Remains a Priority
Policies, Institutions and Capacity Building	1. Develop Conservation Policy, Legislations, regulations and Procedures		Not Initiated	Remains a Priority
	2. Put in place a well-trained cadre of geneticists and technicians		Initiated but not completed	Remains a Priority

	3. Increase the productivity of endemic livestock through the rural sector support policy.		Initiated but not completed	Remains a Priority

4.2: Review and Identification of Relevant Strategic Priorities and Actions Contained in the *Global Plan of Action.*

Table 12: Review and Identification of Relevant Strategic Priorities and Actions Contained in the *Global Plan of Action.*

Strategic Priorities	**Action**	**Status of Action**	
		Achieved	**To be addressed**
Strategic Priority Area 1 Characterisation, Inventory and Monitoring Trends and Associated Risks			
1. Inventory and characterize animal genetic resources, monitor trends and risks associated with them, and establish country-based early warning and response systems	1. Conduct or complete inventories of the location, population status, trends and characteristics of animal genetic resources	Partly Achieved	
	2. Expand characterization and monitoring of trends in and risks to animal genetic resources		To be addressed
	3. Encourage the establishment of institutional responsibilities and infrastructure for monitoring trends in animal genetic resources (for example population size and genetic diversity), including identification, registration and pedigree systems.	Partly achieved	
	4. Promote participatory approaches to characterization, inventory and monitoring of trends and associated risks that foster collaboration among all stakeholders, including livestock keepers and researchers	Partly achieved	
	5. Undertake international cooperative monitoring of trends and associated risks, inventory and characterization activities among countries sharing transboundary breeds and similar production systems.		To be addressed
	6. Strengthen global and regional information systems and networks for inventory, monitoring and characterization. *Inter alia*, the Domestic Animal Diversity Information System (DAD-IS) and the Global Databank for Animal Genetic Resources for Food and Agriculture should be strengthened to obtain, evaluate and condense information from national databases and monitoring systems, and distribute this information, highlighting threats and needs.	Initiated	
	7. Establish or strengthen existing breed endangerment early warning and response systems, through the further development of national, regional and global risk monitoring mechanisms, and the inclusion of early warning criteria in existing databases.		To be addressed

2. Develop international technical standards and protocols for characterization, inventory, and monitoring of trends and associated risks	1. Develop agreement on a common set of minimum criteria means and indicators for animal genetic diversity, including for assessing endangerment status, and methods to assess environmental, socio-economic and cultural factors related to animal genetic resources management.		*To be addressed*
	2. Develop technical standards and protocols for phenotypic and molecular characterization, including methods for the assessment of quantitative and qualitative production traits, nutrient utilization, functional traits and economic valuation. This makes possible the assessment of comparative breed performance in different production environments		*To be addressed*
	3. Develop protocols for participatory monitoring of trends and associated risks, and characterization of local breeds managed by indigenous and local communities and livestock keepers.		To be addressed
	4. Strengthen research and development of methods for characterization, and breed evaluation, valuation and comparison. Develop interoperability protocols for information systems.		To be addressed
Strategic Priority Area 2 Sustainable Use and Development			
3. Establish and Strengthen national sustainable use policies	1. Review existing national policies on sustainable use to assess their impacts on animal genetic resources management		To be addressed
	2. Develop, as necessary, national policies that incorporate the contribution of animal genetic resources to sustainable use, which may include setting strategic objectives for breeding and sustainable use; conducting economic and cultural valuation of animal genetic resources; and developing approaches, including mechanisms, to support wide access to, and the fair and equitable sharing of, benefits arising from the use of animal genetic resources and associated traditional knowledge.	Partly achieved	
4. Establish National species and breed development strategies and programmes	1. Develop long-term planning and strategic breeding programmes and consider a number of elements, including: efforts to improve underutilized breeds, especially within low to medium external input production systems; assessments of the impact of exotic animal breeds and the development of measures for producers to realize positive impacts and prevent negative impacts; training and technical support for the breeding activities of pastoralist and farming communities; and the integration of improved husbandry practices in animal genetic resources development programmes. Whereas plans and programmes developed will be national,	Partly achieved	

	in some cases cooperation with other countries may be required		
	2. Assess breed development programmes and revise as appropriate, with the aim of meeting foreseeable economic and social needs and market demands, bearing in mind scientific and technological parameter. The information about breeds and production systems could be made available to consumers.	Partly achieved	
	3. Establish and develop organizational structures of breeding programmes, especially breeders' organizations and breeding schemes, including recording systems.	Partly achieved	
	4. Incorporate consideration of the impacts of selection on genetic diversity into breeding programmes and develop approaches to maintain the desired variability.	Partly achieved	
	5. Establish or strengthen recording schemes to monitor changes in non-production traits (e.g. health, welfare) and adjust breeding goals accordingly.		To be addressed
	6. Encourage the development of backup collections of frozen semen and embryos from current breeding schemes to ensure genetic variability.		To be addressed
	7. Provide information to farmers and livestock keepers to assist in facilitating access to animal genetic resources from various sources.	Partly achieved	
5.Promote agroecosystems approaches to the management of animal genetic resources	1. Assess environmental and socio-economic trends that may require a medium- and long-term policy revision in animal genetic resources management.		To be addressed
	2. Integrate agro-ecosystem approaches in national agricultural and environmental policies and programmes of relevance to animal genetic resources, where appropriate, particularly those directed towards pastoralist and rural smallholder communities, and fragile environments	Partly achieved	
	3. Establish networks to enhance interaction among the main stakeholders, scientific disciplines and sectors involved		To be addressed
6. Support indigenous and local production systems and associated knowledge systems of importance to the	1. Assess the value and importance of indigenous and local production systems; identify trends and drivers of change that may affect the genetic base, and the resilience and sustainability of the production systems.		To be addressed
	2. Support indigenous and local livestock systems of importance to animal genetic resources, including through the removal of factors contributing to		To be addressed

maintenance and sustainable use of animal genetic resources	genetic erosion. Support may include the provision of veterinary and extension services, delivery of micro-credit for women in rural areas, appropriate access to natural resources and to the market, resolving land tenure issues, the recognition of cultural practices and values, and adding value to their specialist products.		
	3. Promote and enable relevant exchange, interaction and dialogue among indigenous and rural communities and scientists and government officials and other stakeholders, in order to integrate traditional knowledge with scientific approaches.		To be achieved
	4. Promote the development of niche markets for products derived from indigenous and local species and breeds, and strengthen processes to add value to their primary products.	Partly achieved	
Strategic Priority Area 3 Conservation			
7. Establish national Conservation policies	1. Set and regularly review conservation priorities and goals.		To be addressed
	2. Assess factors leading to the erosion of animal genetic resources and formulate appropriate policy responses. Establish or strengthen information systems on animal breeding approaches as well as on different gene banks, as they affect animal genetic diversity, in order to enable breeders and countries to make appropriate choices in their improvement programmes.		To be addressed
	3. Establish institutional structures and policies, as appropriate, including specific measures to conserve breeds at risk of extinction, and to prevent breeds from becoming at risk. A combination of *in situ* and *ex situ* measures is necessary	Partly achieved	
	4. Provide and catalyse incentives for producers and consumers to support conservation of animal genetic resources at risk, as evaluated by individual countries, provided that such incentives are consistent with existing international agreements.		To be addressed
8. Establish or strengthen *in situ* Conservation programmes	1. Set and regularly review *in situ* conservation priorities and goals	Partly achieved	
	2. Encourage the development and implementation of national and regional *in situ* conservation programmes for breeds and populations that are at risk. This may include support, either directly for breeders of threatened breeds, or measure to support agricultural production systems that manage areas of importance to breeds at risk, the encouragement of breed organizations, community-based conservation organizations, non-governmental organizations and other actors to participate in conservation efforts provided that such support or such measures are consistent with existing international agreements.	Partly achieved	

	3. Promote policies and means to achieve the sustainable use of a diversity of local breeds, without the need for support from public funds or extra funding, through *in situ* conservation		To be addressed
9. Establish or strengthen *ex situ* conservation programmes	1. Set and regularly review *ex situ* conservation priorities and goals		To be addressed
	2. Establish or strengthen national and regional facilities for *ex situ* conservation, in particular cryogenic storage. Support the efforts of countries within a region that have opted to establish a regional facility.		To be addressed
	3. Establish modalities to facilitate use of genetic material stored in *ex situ* gene banks under fair and equitable arrangements for storage, access and use of animal genetic resources.		To be addressed
	4. Develop and implement measures to secure *ex situ* collections from loss of genetic diversity resulting from disease outbreaks and other threats, in particular by establishing backup samples.		To be addressed
	5. Identify and fill gaps in *ex situ* collections.		To be addressed
	6. Develop procedures for replenishment of genetic material taken from gene banks, by systematically developing links with live populations, or establishing *in vivo* populations of breeds at risk at off-farm locations, such as zoos and parks.		To be addressed
10. Develop and Implement regional and global long-term conservation strategies	1. Assist countries to develop and implement conservation plans for breeds and populations, particularly transboundary breeds and populations, combining *in situ* and *ex situ* measures.		To be addressed
	2. Establish integrated support arrangements to protect breeds and populations at risk from emergency or other disaster scenarios, and to enable restocking after emergencies, in line with the national policy.		To be addressed
	3. Establish regional and global networks of gene banks for animal genetic resources and harmonize approaches to conservation in gene banks and to facilitating exchange.		To be addressed
	4. Facilitate the establishment of core collections of animal genetic diversity, at the appropriate regional or species level		To be addressed
11. Develop approaches and technical standards for conservation	1. Undertake research, including participatory research to develop in situ and ex situ methods and technologies, including for conservation breeding. Elaborate standardized methods and guidelines for their use, where necessary.		To be addressed
	2. Document and disseminate knowledge, technologies and best practices.	Partly addressed	
	3. Promote the use of appropriate genetic indicators to complement phenotypic characterization as a basis to make decisions on conserving animal genetic resources.		To be addressed

	4. Review the impact of zoo-sanitary standards on the conservation of animal genetic resources, and in particular, their accessibility.		To be addressed
Strategic Priority Area 4 Policies, Institutions and Capacity –Building			
12. Establish or strengthen national institutions, including National Focal Points, for planning and implementing animal genetic resources measures, for livestock sector development	1. Annalise national institutional capacity in support of holistic planning of the livestock sector	Partly achieved	
	2. Establish or strengthen fully functional National Focal Points for animal genetic resources	Achieved	
	3. Develop strong national coordination between the National Focal Point and stakeholders involved in animal genetic resources, such as the breeding industry, government agencies, civil society organizations, and networks and advisory committees.	Partly achieved	
	4. Develop and implement intervention tools, as appropriate, for national planners to shape the future development of the livestock sector in accordance with national priorities, including in relation to the deployment of animal genetic resources, and the effects of animal production systems on the environment.	Partly achieved	
	5. Promote coordination and synergy between the different authorities dealing with various aspects of planning, within and across ministries, as well as with other stakeholders, and ensure their participation in the process	Partly achieved	
13. Establish or strengthen national educational and research facilities	1. Identify the short-term, medium-term and long-term needs for research and education, and promote the formation of the relevant cadres of experts, nationally or through international training.		To be addressed
	2. Review national research and education capacities in relevant fields, and establish targets for training to build the national skill base.		To be addressed
	3. Establish or strengthen, in partnership with other countries, as appropriate, relevant research, training and extension institutions, including national and regional agricultural research systems, to support efforts to characterize, inventory and monitor trends and associated risks, sustainably use and develop, and conserve animal genetic resources		To be addressed
	4. Review the national educational needs of livestock keepers, while respecting traditional knowledge and indigenous practices		To be addressed
14. Strengthen national human capacity for characterization,	1. Establish or strengthen training and technology transfer programs, and information systems for the inventory, characterization and monitoring of trends and associated risks; sustainable use and		To be addressed

inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation	development; and conservation, particularly in developing countries with economies in transition.		
	2. Establish or strengthen collaborative networks of researchers, breeders and conservation organizations, and other public, civil and private actors, within and between countries, for information and knowledge exchange for sustainable use, breeding and conservation		To be addressed
	3. Establish or strengthen community-based organizations, networks and initiatives for sustain able use, breeding and conservation	Partly achieved	
15. Establish or strengthen international information sharing, research and education	1. Establish or strengthen international research and education, in particular, to assist developing countries and countries with economies in transition to better use and develop animal genetic resources		To be addressed
	2. Continue to develop the FAO Domestic Animal Diversity Information System (DAD-IS), as a global communication tool and clearing-house mechanism for animal genetic resources.	Achieved	
	3. Develop means for reporting on the status and trends of national animal genetic resources that may also assist governments in relevant reporting in other international fora, to reduce the overall reporting burden.	Partly achieved	
	4. Establish and strengthen the development of national databases to enable information sharing among countries		To be addressed
16. Strengthen international cooperation to build capacities in developing countries and countries with economies in transition, for: • characterization, inventory, and monitoring of trends and associated risks; • sustainable use and development; • conservation of animal genetic resources	1. Build or strengthen technical cooperation and establish facilities for technology transfer and exchange of experience, and enhance educational and other training opportunities, between countries, considering the particular interests of developing countries and countries with economies in transition.		To be addressed
	2. Establish or strengthen international collaboration in the characterization, use and development, and conservation of transboundary breeds		To be addressed
17. Establish Regional Focal Points and strengthen international networks	1. Support the establishment of country-driven Regional Focal Points for animal genetic resources, where appropriate.	Partly achieved	
	2. Establish or strengthen and maintain regional	Partly achieved	

	networks, including regional databases, if required, for the use, development and conservation of animal genetic resources.		
	3. Link regional activities on animal genetic resources to regional organizations.	Partly achieved	
	4. Maintain and strengthen the FAO Global Focal Point for animal genetic resources to promote international networking and collaboration	Partly achieved	
18. Raise national awareness of the roles and values of animal genetic Resources	1. Provide targeted, effective information through media, public events and other means to raise awareness about the important roles and values of animal genetic resources. This should address their specific characteristics and the consequent special policy needs for their sustainable use, development and conservation, including livestock keepers' contributions, needs, and all relevant rights that may exist at national level. Target audiences include policy-makers, all major stakeholders within the livestock sector and related sectors, and the general public.		To be addressed
19. Raise regional and international awareness of the roles and values of animal genetic resources	1. Support regional and international campaigns to raise awareness of the status of animal genetic resources for food and agriculture, and seek to develop wide support at the government and institutional levels, as well as among the general public.		To be addressed
20. Review and develop national policies and legal frameworks for animal genetic resources	1. Periodically review existing national policies and regulatory frameworks, with a view to identifying any possible effects they may have on the use, development and conservation of animal genetic resources, especially with regard to the contribution and needs of local communities keeping livestock		To be addressed
	2. Consider measures to address any effects identified in reviews of policy and legal frameworks. Measures may include policy or legislative changes, or adjustments at the level of implementation, taking into account the need to balance the goals and objectives of the relevant legal instruments and policies, and the interests of different stakeholder		To be addressed
	3. Encourage consistency of national law and policies concerning animal genetic resources with relevant international agreements, as appropriate		To be addressed
	4. Ensure that relevant research results are taken into consideration in the development of national policies and regulations on animal genetic resources		To be addressed
21. Review and develop international policies and regulatory	1. Review existing international agreements that impact upon the use, development and conservation of animal genetic resources, with a view to ensuring that international policies and regulatory frameworks take into account the special		To be addressed

frameworks relevant to animal genetic resources	importance of animal genetic resources for food and agriculture for food security, the distinctive features of these resources needing distinctive solutions, the importance of science and innovation, and the need to balance the goals and objectives of the various agreements, as well as the interests of regions, countries and stakeholders, including livestock keepers.		
	Review the implications and impacts of international agreements and developments relevant to access to animal genetic resources and sharing the benefits of their use upon animal genetic resources stakeholders, especially livestock keepers.		To be addressed
22. Coordinate the Commission's efforts on animal genetic resources policy with other international fora	1. Develop cooperation with and strengthen the involvement and contributions of international organizations and fora in supporting the work of the Commission on Genetic Resources for Food and Agriculture on animal genetic resources.	Partly achieved	
23. Strengthen efforts To9 mobilize resources, including financial resources, for the conservation, sustainable use and development of animal genetic resources.	1. Assist all stakeholders to strengthen capacity-building, including by exchange of experience, by enhancing research and educational activities, and by providing training opportunities, technology transfer and financial resources, at national, regional and international levels, as detailed in PART III1 below.		To be addressed
	2. Develop a follow-up process to implement the *Global Plan of Action* for Animal Genetic Resources		To be addressed
	3. Strengthen cooperation and coordination of conservation, sustainable use and development of animal genetic resources at national, regional and international levels, including through ex situ backup systems for the protection against the risk of emergency or disaster scenarios		To be addressed

- **Phase 5 and 6**: Prepare Draft Consultation Document and Conduct consultations with Government & Stakeholders' (Completed).

(Phase 5 and 6 are presented in a separate document. The document gives details of the consultation process (consultations both with the Government and with Stakeholders.)

- **Phase 7:** Complete National Strategy and Action Plan
- **Phase 8**: Establish evaluation mechanism for the National Strategy and Action Plan
- **Phase 9:** Obtain official endorsement of the National Strategy and Action Plan by Government and key Stakeholders.

Strategic Priority Area 1:

5. Characterisation, Inventory and Monitoring of Trends and Associated Risks

5.0 Characterization of Breeds

5.1 The Gambian N'Dama

Bio-morphometric and molecular characterization of the Gambian N'Dama cattle breed has not yet been finalized. The Gambian N'Dama is a larger variety (and it's less compact than the Guinean N'Dama) and has typical unicolor of fawn, white or blond with or without speckles. However, it should be noted that the Gambian N'Dama has a wide range of colour variability from white to black.

Both males and females have a pair of small to medium horns. The average birth weights are 18 kg for male calves and 17 kg for females; whilst average mature weights are 310 kg for males and 235 for females.

In the area of breed classification, it essential to conduct advance bio-morphometric/phenotypic and molecular characterization of the Gambian N'Dama cattle breed. In this regard, both phenotypic description with quantified parameters and genetic structure specifying the presence (or absence) of any admixture of genes from other cattle breeds in the population will be established. For the characterisation of the breed, representative samples will be taken from N'Dama cattle countrywide and data on specific measurements in addition to descriptive traits will be collected and analysed using molecular methods.

Fig 3: Colour Variability of the Gambian N'Dama

Fig 4: Gambian N'Dama **Fig 5:Guinean N'Dama (SierraLeone)**

5.2 Djallonke Sheep

Bio-morphometric and molecular characterization of the predominant small ruminant breed in The Gambia (Djallonke Sheep and West African Dwarf Goats) have not also yet been finalized**.** The Djallonke sheep is classified as being small (40-60cm in height) with an average weight of 25-30 kg and 20-25kg for males and females respectively.

The sheep has a strong and broad head, a flat forehead, a wide muzzle and a profile strongly bulging in male. The eyes are not prominent. Horns are usually present in males and usually absent in females. They are fully well developed in males, wide at the base, curving backwards, outwards and then forwards, maximum curvature usually one and spirals. The horns are short and fine when present in females. The ears are short (10cm), narrow and usually pendent or semi-pendent. The neck is long and fine. The chest is fairly deep. The chest circumference is on the average about 20% greater than withers height. The withers are higher than tail-head but less pronounced than in Sahelian sheep. The back is long in relation to the height, usually dished. The croup is poorly developed. The legs are short. The tail descends to the hocks and it is fairly thick at the base but very fine at the end.

Figure 6: Djallonke Sheep and West African Dwarf Goats

Fig 7: Sahelian/ Djallonke Cross NLS 2017 Fig 8: Sheep Presented for the Sale at the NLS 2017

5.3 West African Dwarf Goat

West Africa Dwarf Goat is a small goat breed (height-30-50cm) found throughout West Africa with average weights of 20-25kg and 18-22kg for males and females respectively. The breed is characterised by having a strong head, bulging forehead with a straight profile.

Goats belonging to the breed have narrow muzzles and the lower jaw is slightly longer than the upper. The horns curl outwards and backwards in males and are fairly strong; they are light, sharp and pointing upwards and backwards in females. Goats belonging to the breed have narrow muzzles and the lower jaw is slightly longer than the upper.

Fig 9: West African Dwarf Goats (WAD)

5. 4 Inventory and Monitoring of Trends and Associated Risks

A comprehensive National Livestock Census (NLC) was conducted in 2016 by the Department of Livestock Services with assistance from FAO through a TCP (Technical Cooperation Project.) The Census was aimed at the generation of high quality data on all species of livestock (including, cattle, small ruminants, equines, pigs and poultry) and their characteristics, for the monitoring of key performance indicators in the country's livestock subsector. The activity was also aimed at strengthening the capacity of staff of the Department of Livestock Services to enable DLS conduct Livestock Censuses and pave the way for future censuses to be conducted on a regular basis.

Information derived from the Census among others, covered the following;

- herd/flock structure,
- regional distribution patterns,
- ownership patterns by gender and regions,
- management practices for different species of livestock,
- mode of payment of herdsmen/keepers,
- purpose of keeping livestock/poultry,

- utilization of milk by Region
- and access to water and veterinary services.

6.0 Sustainable Use and Development

6.1 The Genetic Improvement Program at WALIC (ITC), DLS and GILMA.

6.1.1 Pure Breeding of N'Dama Cattle, Djallonke Sheep and West African Dwarf goats

N'Dama cattle, the predominant indigenous cattle breed in The Gambia, is the breed of choice to for farmers and it has the potential to meet the increasing national demand for meat and milk products of its performance can be improved. In addition to being trypanotolerant, the breed possesses important attributes such as heat tolerance, adaptation to harsh environments and ability to survive on poor quality feeds.

In this context, the N'Dama Cattle Breeding Programme has the objective of genetically improving the breed in order to meet future market demands and challenges. The Programme is implemented through the collaboration of the WALIC, The Department of Livestock Services (DLS) and (Gambia Indigenous Livestock Multipliers Association.) The programme operates as an open nucleus breeding scheme at Keneba (WALIC) Wassu, Basse and YBK (DLS) multiplication herds with individual multiplier farmers (GILMA).The schemes serve to produce elite off springs that are distributed to livestock farmers to enhance animal genetic resources improvement at community level.

6.1.2 The Genetic Improvement Programme at WALIC

The overall purpose of the genetic improvement programme at WALIC and in its mandate countries is to increase animal output per head among trypanotolerant N'Dama cattle, Djallonke sheep and West African Dwarf goats while retaining their resistance to diseases. The Breeding Programme based in the field station at Keneba, LRR currently (July 2018) has the following:

240 Breeding cows
6 Breeding bulls
45 Young bulls
38 Heifers
5 Teaser bulls
128 Djallonke Sheep
263 WAD Goats

The improvement schemes are designed as a three-tier scheme: nucleus – multiplier – village production /farmer. Breeding goals have been set to increase milk and meat production for cattle and goats, and to increase meat production in sheep. Statistical methodologies are used, and selection is based on a model, which includes all available information of relatives and considers all (measurable) environmental factors. The breeding programme tailored to involve stakeholder's

participation, including the definition of breeding goals, uses simple infrastructure and logistics which is deemed inexpensive for implementation by NARS.

Selection of males and females is based on total breeding value being the sum of breeding value for daily weight gain and breeding value for milk yield. The cattle breeding programme is complemented by an annual screening of village cows with respect to milk yield. For both cattle and small ruminants, village multiplication herds and flocks have been established to receive breeding males from the nucleus and to sell rams, bucks and bulls to village producers.

The routine breeding and selection process for elite breeding bulls rams and bucks are 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. In 2017/18, sixteen (16) out of the 20 selected elite breeding bulls were disseminated to livestock farmers that have satisfied the laid down criteria for a multiplier farmer.

6.2 Animal Traction

The results of the NLC 2016 revealed that the total number of draught cattle in The Gambia is 35, 209 comprising mostly N'Dama (92.8%) and the remaining (7.2%) is made up of Zebu and Gobra cattle. In addition, the census results placed the population of donkeys and horses at 22, 070 and 35, 510 heads respectively.

The draught power requirements for farm operations in The Gambia are met largely through animal traction and it is used on 73.4% of all field crops. Pertinent to the species used for animal traction, horses, cattle, donkeys and mule are used (36%, 33%, 30% and 1% respectively) for the production of field crops.

7.0 Conservation of N'Dama Cattle and Indigenous Small Ruminant Breeds

In-situ breeding by smallholder producers, complimented by the Open Nucleus Breeding Scheme (ONBS) operated by WALIC and the breeding programmes supported by the DLS and GILMA enhance efforts to conserve indigenous breeds and increase its populations. There are no *ex-situ* or *in vitro* cryo-conservation of animal genetic materials such as semen, ova, embryo or tissue cells developed in the country for indigenous breeds.

8.0 Policies, Institutions and Capacity Building

8.1 The Agricultural Policy Environment/Agricultural Policy Framework

The Government of The Gambia recognises the role of the Agriculture and Natural Resource Sector as a livelihood provider for the majority of its people as well as a major provider of the foreign exchange for the country. The long standing vision of national food security has redirected focus and efforts to create the impetus for the paradigm shift from traditional /subsistence agriculture to more market-oriented, modern, commercialised agricultural production system farming systems with efficient value chains.

The Government of The Gambia is committed to achieving food and nutrition security for all at all times. Such commitment is highlighted in key national policies and strategies including the Vision 2020 (2006), MDGs and the PRSP II (2007-2011), the ANR Policy (2009-2015 and 2017 -2026), GNAIP (2009) and the NDP (2018-2021).

"The Programme for Accelerated Growth and Employment (PAGE)" was launched by the government of the Gambia in 2011 as a development strategy and investment programme for 2012 to 2015. The Programme for Accelerated Growth and Employment (PAGE)" recognises agriculture as the potential sector as the pathway to reach the countries long-term development goals, particularly for reducing poverty and achieving food security. The PAGE emphasizes fiscal adjustment, together with infrastructure investment and structural reforms to support inclusive growth. It is based on five pillars namely: (i) Accelerating and sustaining economic growth; (ii) Improving and modernizing infrastructure; (iii) Strengthening human capital stock and enhancing access to social services; (iv) Improving governance and increasing economic competitiveness; and (v) Reinforcing social cohesion and mainstreaming cross-cutting issues.

The Gambia National Agricultural Investment Programme (GNAIP) (2010-2015), was a national strategic framework that guided the planning and implementation of current and future programmes for the agricultural sector. It defined the parameters of partnership in the agricultural sector, specific commitments to the Government and partners (including ensuring alignment and the commitments to increase aid to the sector)

8.2 Livestock Policy

The Medium-Term Agriculture and Natural Resources Policy Objectives and Strategies and the FAO-supported National Agricultural Development–Horizon 2010 provided the policy framework of the government for the sector for the period 1995-2008. (ANR Policy 2017-2026). The document focused on the following subsectors:- crop production, livestock, land &water, rural water supply & sanitation, cooperative development, forestry and rural finance

For the livestock sub-sector, the policy advocates the adoption of an intensification approach to its development. Successful approaches to intensification of livestock production have already been tried in The Gambia. They include ram fattening schemes and the establishment of compost pens for improved meat, milk, manure productions and the provision of draught power. Thus, these activities and their needed technical, financial and institutional support for their widespread dissemination constitute the core of the sub-sector policy strand for the 2017/2026 ANR Policy.

8.3 National Development Plan (2018 – 2021)

The National Development Plan (2018-2021) was formulated by Government through an extensive consultative process, thorough reviews of all sectors of the economy and society, and it outlined government's response to the deep-seated challenges facing the country in the transition from 22 years of dictatorship to the "New Gambia."

In a ground breaking development, Gambians on 2nd December 2016 went to the polls and elected a new government that ended 22 years of dictatorship and ushered in a "new Gambia".

This historic change (results of the 2nd December 2016 Election) that brought about a new democratic dispensation with the promise of expanded freedoms, security and safety for citizens also underscored the urgent need for vigorous action to tackle the country's myriad of political, social, and economic problems. The systematic breakdown of the country's laws and institutions, the crisis in the economy, the need for national reconciliation to heal the wounds and divisions arising from decades of a brutal dictatorship, the rising frustration of all segments of society, but particularly so with the youth, all required immediate attention on the part of the new Government.

The vision and overall goal of the National Development Plan will be realized through **Eight Strategic Priorities**, namely:

- Restoring good governance, respect for human rights, the rule of law, and
- empowering citizens through decentralization and local governance;
- Stabilizing the economy, stimulating growth, and transforming the economy;
- Modernizing agriculture and fisheries for sustained economic growth, food and nutritional security and poverty reduction;
- Investing in people through improved education and health services, and building a caring society;
- Building infrastructure and restoring energy services to power the national economy;
- Promoting an inclusive and culture-centred tourism for sustainable growth;
- Reaping the demographic dividend through an empowered youth; and
- Making the private sector the engine of growth, transformation, and job creation.

8.4 The Livestock Subsector and the NDP (2018-2021)

In the implementation of the NDP, provisions have been made for programmes that are designed to enhance improvement of the productivity of livestock and increasing income through:

- Market development and construction of livestock infrastructure
- Sustainable exploitation and marketing of cattle, small ruminants and livestock products
- Establishment of market information system for the livestock subsector
- Organisation of Livestock Shows and Fairs
- Establishment of mechanisms for facilitating access to production credit for livestock farmers
- Promotion of rangeland development and provision of livestock watering points.

Among the key results expected from the implementation of the NDP are the following that are relevant to the livestock subsector:

- An Animal Health Act
- Increase in mutton production 5%
- Increase in beef production
- Increase in goat meat production 11%
- Increase of poultry meat by 8%
- Increase of milk production to 28.4 million litres per annum by 2021.

The Gambia ratified the Convention on Biological Diversity (CBD) which states in its Article 8 that genetic resources should be conserved in the "surroundings where they have developed their distinct properties which, with respect to livestock is a reference to the farming and pastoral communities that have nurtured local breeds". In addition, the CBD spells out that "the knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biological diversity are respected, preserved and maintained clearly." The Spirit of CBD calls for a participatory approach to animal genetic resources conservation.

The National Development Plan (2018-2021) takes cognition of the need to address the issue of Conservation of Indigenous Animal Genetic Resources. In this regard the Plan, seeks to reverse the erosion of livestock genetic resources and Government will adopt a comprehensive approach to promote the sustainable use, development, and conservation of animal genetic resources to increase food production and food security, reduce poverty and contribute to rural development.

The on-going development and subsequent implementation of the National Strategy and Action Plan for the Management of Animal Genetic Resources is geared towards achieving the above.

The NDP emphasises the need for a revised agriculture policy framework that is essential in addressing the many shortcomings that are contributing to the poor performance of the sector. In this regard, an updated policy will help government create the needed public good services and complement private sector investments in the sector.

8.5 Legislative and Regulatory Texts on Animal Genetic Resources Management

From 1944 to 2005, the Government has passed five Regulations/Acts for the livestock sub-sector. They mainly focus on animal diseases control, veterinary drugs and practice control, food hygiene and marketing. These regulations are:

1) Diseases of Animal Act (1944),
2) Medicines Act (1984),
3) The Veterinary Council Act (2000),
4) Food Act (2005), and
5) The Gambia Livestock Marketing Act (2008).

Unfortunately, there are no regulations on livestock breeding or genetic resource management. Pertinent to legislation in the livestock subsector, all the mentioned regulations are either obsolete or require review to take cognisance of present day realities. In this regard the following initiatives have been taken so far:

- The Performance of Veterinary Services (PVS),
- The GAP Analysis Mission,
- The Veterinary Legislation Support Programme (VLSP) Identification Mission, carried out by the World Organization for Animal Health (OIE),

- and the study carried out by a Consultant (Hawa Sisay- Sabally) hired by the Project-Sustainable Management of Globally Significant Endemic Ruminant Livestock in West Africa (PROGEBE),

All this initiatives revealed serious gaps in a number of institutional and regulatory areas within the livestock subsector. These needed attention and urgent improvement in order to make the Gambian Veterinary Services more effective in the provision of services to the livestock sector.

Following a request from the Hon. Minister of Agriculture in 2017, AU-IBAR agreed to assist the Republic of The Gambia in the process of reviewing and updating its veterinary legislation. Subsequently, the Minister appointed a five-man Task Force to spearhead the process, while AU-IBAR designated an expert to provide technical support to the Task Force. This initiative is nearing completion with the final mission of the TA currently taking place in February 2019.

9.0 Updated Draft National Strategic Priorities and Actions

Table 13: Updated Draft Strategic Priorities and Actions

Strategic Priority Areas in the *Global Plan of Action*	**National Strategic Priorities**	**National Priority Actions**
1. Characterisation, Inventory and Monitoring of Trends and Associated Risks	1. Characterisation of the Gambian N'Dama, indigenous small ruminant breeds, indigenous swine breeds and indigenous chicken breeds.	1. Conduct bio-morphometric and molecular characterisation of the Gambian N'Dama (and indigenous small ruminant breeds).
		2. Representative sample taken from N'Dama cattle and small ruminant breeds countrywide and analysed using molecular methods.
		3. Established absence or presence of genes (admixtures) from other breeds.
	2. Inventory and Monitoring of Trends Associated with Risks.	1. Comprehensive National Livestock Census completed in 2016. However, it must be repeated every decade to establish trends.
		2. Strengthen the DLS Livestock Statistic Unit to enhance the reliable collection of data on the location, population status of animal genetic resources.
		3. Contribute effectively to the strengthening of global and regional information systems and networks for inventory, monitoring and characterisation e.g. – Domestic Animal Diversity Information System (DAD-IS) Disease outbreak monitoring and reporting by DLS to be improved in this regard.
	3. Inventory, Analysis and Validation of Indigenous	4. The DLS, WALIC (possibly with support from FAO) and other stakeholders to initiate the Inventory, Analysis and

	Technical Knowledge on AnGRs Management.	Validation of Indigenous Technical Knowledge on AnGRs Management.
2. Sustainable Use and Development	1. Broaden and Sustain the 3 –tier Cattle and Small Ruminant Programmes at WALIC, DLS and GILMA	1. Strengthen and improve the schemes at WALIC designed as a three-tier breeding scheme: nucleus – multiplier – village production /farmer.
		2. Strengthen Breeder Associations such as GILMA to enhance capacities in sustainable use and development of AnGRs.
	2. Review existing national policies on sustainable use to assess their impacts on animal genetic resources management	1. WALIC, DLS, NARI and other relevant stakeholders to conduct the review of existing national policies of sustainable use to assess impact on animal genetic resources management.
3. Conservation	1. Reverse the trend of erosion of livestock genetic resources; GoTG to promote sustainable use, development and conservation of AnGRs. (NDP 2018-2021)	1. WALIC, DLS, NARI and other stakeholders to assess factors leading to the erosion of AnGRs.
		2. Provide incentives packages for producers/multipliers of indigenous breeds with outstanding performances (or qualities) to support conservation of animal genetic resources.
	2. Establish national conservation policies	1. Establish institutional structures and policies and take specific measures to conserve indigenous breeds and enhance their sustainable usage and development.
	3. Strengthen the existing *In-situ* breeding programmes and encourage participatory research to develop *ex-situ* methods and technologies for conservation breeding.	1. Strengthen the Open Nucleus Breeding Schemes (ONBS) operated by WALIC with support from DLS and GILMA and enhance efforts to conserve and increase populations of indigenous breeds.
		2. Develop national capacity for the utilisation of *ex-situ / in vitro* cryo-conservation methods for the preservation of animal genetic materials such as semen, ova, embryo for conservation of indigenous breeds.
4. Policies, Institutions and Capacity Building	1. Develop Conservation Policy, Legislations, Regulations and Procedures	1. In 2017 the GoTG requested assistance from AU-IBAR to review the Veterinary and related legislations in the livestock subsector. The request was granted and the process is ongoing. However, MoA should consider requesting AU-IBAR to expedite matters.
		2. Put in place a critical mass of well-trained animal geneticists and technicians. WALIC, (DLS, NARI) should take the leading role in this endeavour.
	2. Strengthen national institutions including National Focal Point and Coordinator for the planning and	1. MoA to consider support (to WALIC and DLS) for strengthening ANnGRs Focal Point and Coordinator for planning and implementation of activities geared

	implementation of animal genetic resources measures, for livestock subsector development.	towards the livestock subsector development.
		2. Enhance coordination between the National Focal Point and stakeholders involved in animal genetic resources management (breeders, GoTG agencies, civil society and advisory committees).

Table 14: Action Plan Elements

Strategic Priority	Action	Tasks	Expected Output	Timeframe	Expected Costs (USD)	Lead Implementing Agencies and Partners	Sources of Financing
1Characterisation, Inventory and Monitoring of Trends and Associated Risks	1. Conduct bio-morphometric and molecular characterisation of the Gambian N'Dama, indigenous small ruminant breeds, indigenous swine breeds and indigenous chicken breeds.	1. Collect samples nationwide. 2. Conduct phenotypic characterisation of breeds 3. Conduct bio-morphometric and molecular characterisation of breeds.	Phenotypic, Bio-morphometric and molecular characterisation of Gambian N'Dama cattle, indigenous small ruminant, swine and chicken breeds completed.	2019-2024	*200,000.00*	WALIC and DLS	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
	2. Conduct Inventory and Monitoring of Trends Associated with Risks.	2. Contribute effectively to the strengthening of global and regional information systems and networks for inventory, monitoring and characterisation.	Disease outbreak monitoring and reporting by DLS improved. Regular contribution to Domestic Animal Diversity Information System (DAD-IS) network.	2019-2024	*20,000.00*	DLS and WALIC	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
2. Sustainable Use and Development	1. Broaden and Sustain the 3 –tier Cattle and Small Ruminant Breeding Programmes in the country. 2. Strengthen and improve the schemes at WALIC designed as a three-tier breeding scheme: nucleus –	1. Procurement of breeding animals. 2. Procurement of straws for artificial insemination. 3. Training of farmers and technicians on animal breeding.	The 3 –tier breeding and programmes at WALIC, DLS and GILMA broaden and sustained.	2019-2024	*30,000.00*	WALIC and DLS	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).

	multiplier – village production /farmer.						
	3. Review existing national policies on sustainable use to assess their impacts on animal genetic resources management	1. Conduct the review of existing national policies of sustainable use to assess impact on animal genetic resources management.	1. Impact of existing national policies on AnGRs Management assessed.	2019-2024	*30,000.00*	WALIC, DLS, and NARI.	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
3. Conservation	1. Reverse the trend of erosion of livestock genetic resources; GoTG to promote sustainable use, development and conservation of AnGRs. (NDP 2018-2021)	1. Assess factors leading to the erosion of AnGRs.	1. Factors leading to the reversal of livestock genetic resources assessed.	2019-2024	*20,000.00*	WALIC and NARI .	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
	2. Provide incentives packages for producers/multipliers of indigenous breeds with outstanding performances (or qualities) to support conservation of animal genetic resources	1. Promote sustainable use, development and conservation of AnGRs	1. Sustainable use, development and conservation of AnGRs promoted.	2019-2029	*30,000.00*	WALIC and DLS	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
	3. Establish national conservation policies	1. Establish institutional structures and policies and take specific measures to conserve indigenous breeds and enhance their sustainable usage and development	1. Institutional structure and policies for the conservation of animal genetic resources established.	2019-2024	*30,000*	DLS and WALIC	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
	4. Strengthen the existing *In-situ* breeding programmes and encourage participatory research	1. Strengthen the Open Nucleus Breeding Schemes (ONBS) operated by WALIC with support from DLS	1. Efforts to conserve and increase population of indigenous breed enhanced.	2019-2029	*35,000*	WALIC and DLS	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).

	to develop *ex-situ* methods and technologies for conservation breeding.	and GILMA and enhance efforts to conserve and increase populations of indigenous breeds. 2. Develop national capacity for the utilisation of *ex-situ / in vitro* cryo-conservation methods for the preservation of animal genetic materials such as semen, ova, embryo for conservation of indigenous breeds. 2. Establishment of a Gene Bank for AnGRS	2. National capacity for the utilisation of ex-situ/in vitro conservation methods developed. 3. Gene Bank for the conservation of animal germplasm established.	2019-2029 2019-2029	*25,000.00* *25,000*	WALIC and DLS WALIC and DLS	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR). NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).
4. Policies, Institutions and Capacity Building	1. Develop Conservation Policy, Legislations, Regulations and Procedures.	1. Enhancement of the development of national conservation policies, legislations, regulations and procedures 2. Expedite on-going assistance from AU-IBAR to review the veterinary and related legislations in the livestock subsector in The Gambia. 3. Put in place a critical mass of well-trained animal geneticists and technicians.	1. Conservation Policy, Legislations, Regulations and Procedures developed and national capacities in AnGRs management developed.	2019-2024	*25,000.00* ***GRAND TOTAL* ($470,000)**	WALIC and DLS	NDP, FAO (TCP) MoA and MoA Projects, (AU-IBAR).

10.0 Monitoring and Evaluation and Progress Reporting

It is recommended that this report puts in place a system for monitoring, evaluating and reporting on the status of implementation of the National Strategy and Action Plan for Animal Genetic Resources given that Progress Reports will lay the foundation/basis for future actions at the national level and will help meet international reporting requirements. In this regard, it is proposed that, as a monitoring and reporting tool, periodic assessment of the progress made in the implementation of the NSAP will be made and progress reports prepared. Actions taken will be analysed and assessed to determine whether the expected outcomes/desired results are being achieves or not. Where it is established that action was not taken or did not achieve the desired outcomes, the situation will be reviewed and corrective measures/solutions sought.

10.1 Progress Reporting and Framework for Evaluation

The National Advisory Committee (NAC) will coordinate the preparation of an annual synthesis report detailing progress made by each lead agency in the implementation of the NSAP.

The Evaluation Framework for the NSAP for Animal Genetic Resources is provided in Table 15. The Framework proposes a strategy for the monitoring and evaluation of the progress in the implementation of the NSAP. The Framework provides the following:

- A listing of the National Strategic Priorities to be implemented as identified in the Action Plan.
- The Lead Agency responsible for the implementation of each Strategic Priority
- The Actions to be taken and a description of the associated tasks
- Evaluation criteria (to be developed by the NAC in consultation with the Lead Agencies.)
- Output achieved
- Opportunities and challenges to implementation
- Future actions required.

The NAC, in cooperation with each lead agency will develop evaluation criteria to assess their performance pertinent to each strategic priority for which they are responsible.

The monitoring of progress on an annual basis is a prerequisite for the enhancement of the preparation for the appropriate responses to possible obstacles that may be encountered in the NSAP implementation process. In this regard, the annual progress report will assist in the preparation of the AWPB (Annual Work Plan and Budget) for the subsequent year of implementation.

Table 15: NSAP for Animal Genetic Resources: Evaluation Framework

Lead Agency	Strategic Priority	Action	Tasks	Evaluation Criteria	Output Achieved	Opportunities /Challenges	Future Actions Required
WALIC	1.Characterisation, Inventory and Monitoring of Trends and Associated Risks	1. Conduct bio-morphometric and molecular characterisation of the Gambian N'Dama (and indigenous small ruminant breeds).	1. Collect samples nationwide. 2. Conduct phenotypic characterisation of breeds 3. Conduct bio-morphometric and molecular characterisation of breeds.	Phenotypic, Bio-morphometric and molecular characterisation of Gambian N'Dama cattle and indigenous small ruminant breeds completed.			
		2. Conduct Inventory and Monitoring of Trends Associated with Risks.	2. Contribute effectively to the strengthening of global and regional information systems and networks for inventory, monitoring and characterisation.	Disease outbreak monitoring and reporting by DLS improved. Regular contribution to Domestic Animal Diversity Information System (DAD-IS) network.			
WALIC	2. Sustainable Use and Development	1. Broaden and Sustain the 3 –tier Cattle and Small Ruminant Breeding Programmes in the country. 2. Strengthen and improve the schemes at WALIC designed as a three-tier breeding scheme: nucleus – multiplier – village production /farmer.	1. Procurement of breeding animals. 2. Procurement of straws for artificial insemination. 3. Training of farmers and technicians on animal breeding.	The 3 –tier breeding and programmes at WALIC, DLS and GILMA broaden and sustained.			

WALIC		3. Review existing national policies on sustainable use to assess their impacts on animal genetic resources management	1. Conduct the review of existing national policies of sustainable use to assess impact on animal genetic resources management.	1. Impact of existing national policies on AnGRs Management assessed.			.
	3. Conservation	1. Reverse the trend of erosion of livestock genetic resources; GoTG to promote sustainable use, development and conservation of AnGRs. (NDP 2018-2021)	1. Assess factors leading to the erosion of AnGRs.	1. Factors leading to the reversal of livestock genetic resources assessed.			.
DLS		2. Provide incentives packages for producers/multipliers of indigenous breeds with outstanding performances (or qualities) to support conservation of animal genetic resources	1. Promote sustainable use, development and conservation of AnGRs	1. Sustainable use, development and conservation of AnGRs promoted.			
		3. Establish national conservation policies	1. Establish institutional structures and policies and take specific measures to conserve indigenous breeds and enhance their sustainable usage and development	1. Institutional structure and policies for the conservation of animal genetic resources established.			
WALIC		4. Strengthen the existing *In-situ* breeding programmes and encourage participatory research to develop *ex-situ*	1. Strengthen the Open Nucleus Breeding Schemes (ONBS) operated by WALIC with support from DLS and GILMA and enhance	1. Efforts to conserve and increase population of indigenous breed enhanced.			

		methods and technologies for conservation breeding.	efforts to conserve and increase populations of indigenous breeds. 2. Develop national capacity for the utilisation of *ex-situ / in vitro* cryo-conservation methods for the preservation of animal genetic materials such as semen, ova, embryo for conservation of indigenous breeds.	2. National capacity for the utilisation of ex-situ/in vitro conservation methods developed.			
WALIC	4. Policies, Institutions and Capacity Building	1. Develop Conservation Policy, Legislations, Regulations and Procedures.	1. Enhancement of the development of national conservation policies, legislations, regulations and procedures 2. Expedite on-going assistance from AU-IBAR to review the veterinary and related legislations in the livestock subsector in The Gambia. 3. Put in place a critical mass of well-trained animal geneticists and technicians.	1. Conservation Policy, Legislations, Regulations and Procedures developed and national capacities in AnGRs management developed.			

11. Conclusions and Recommendations

The genesis of the preparation of this Draft Report on National Strategy and Action Plan for Animal Genetic Resources started with the preparation of The Gambia's Country Report titled: "Contribution to the State of the World Animal Genetic Resources" in 2003. The report provided information on the status of Animal Genetic Resources in the country 16 years ago. It laid the foundation for setting country, regional and global priorities in maintaining and enhancing the contribution of animal genetic resources to food and agriculture.

The current initiative kick started with the establishment of the National Advisory Committee (NAC) that was inaugurated by the Minister of Agriculture on 6th June 2018 and this was followed by the appointment of a National Consultant who was given the task of preparing this Draft Report following Guidelines provided by FAO.

The process of preparing the NSAP went through different stages which included Open National Consultative Meeting (Government Consultation- 1st August 18); National Consultative Workshop (Stakeholder Consultations- 14th August 2018) and finally Consultative Meeting with AU-IBAR Consultant and WALIC staff on 4th October 2018 (Dr Giorgio Balarini, RON Mission.)

The formulation process culminated in the preparation of the Draft NSAP which is now being presented at the Validation Worksop with the intention of subjecting it to further stakeholder scrutiny to enhance its quality and also give it a national character.

Finally, it is envisaged that once it is endorsed by Government, the requisite policy framework will be in place and the political will to implement the NSAP will be pronounced by policy makers and other stakeholders. The proposed Action Plan has already given insight into the possible institutions and agencies that might provide the requisite funding. However the options stated are not exhaustive and hopefully other possible avenues and funding mechanisms could, in due course be exploited.

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