Workshop report "Finalization on operational structure of the African Animal Genetic Resources Information System (AAGRIS)" 15-16th January 2015

AU-IBAR

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Finalization on operational structure of the African Animal Genetic Resources Information System (AAGRIS)

15-16th January 2015

African Animal Genetic Resources

AU-IBAR OFFICE PREMISES,

Nairobi, Kenya.

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Background

The African Union Interafrican Bureau for Animal Resources (AU-IBAR) within the scope of its mandate, and with the overall objective to enhance the information and knowledge management capacity of Member States and Regional Economic Communities to swiftly respond to disease emergencies and to properly plan interventions in animal production, marketing and trade as well as to attract investment into the sub-sector, has developed the Animal Resources Information System (ARIS). The need for an all-encompassing African database/information system was expressed by Member States and thus the conception of Animal Resources Information System (ARIS) managed by AU-IBAR.

The African Information Resource System (ARIS) first version was established in 2002 and has undergone some improvements since 2010 and rebranded as ARIS 2. Currently, ARIS covers five core areas; Animal Production, Animal Health, Trade and Marketing, Capacity, Fisheries and Aquaculture. The main goal of ARIS2 is to help position Member States at national level, Regional Economic Communities at regional level and AU-IBAR at continental level as primary and reliable sources of African animal resources information. The objective of ARIS2 is to collate, analyse and make available in a timely manner, reliable and up-to-date data, information and knowledge on animal resources so as to support planning and decision making. ARIS2 is a well-outlined system with multi-use, multi-lingual, multi-level and interoperability features. It has integrated a modular approach where modules and fields are expandable to meet user's needs. ARIS 2 is based on an open source system and is planning to be sustainable as a regular tool/information system in Africa. Currently, majority of the data within ARIS2 is animal health related including; disease reports (emergency and routine), disease control reports, surveillance and mapping activities.

Despite, the presence of an animal production module in ARIS 2, the sub-module on AnGR is yet to be fully operationalized and completed with adequate data and Information. It was thus opportune to promote the establishment of the African Animal Genetic Resources Information System (AAGRIS) sub-module. This proposed information system will only be realized once comprehensive needs assessment on AnGR data and information requirements/needs by various stakeholders is undertaken. The information and data collected should address local, national, sub-regional, regional and continental-level issues.

It was agreed that a clear understanding of these needs should be undertaken through the recruitment of a consultant. The primary objectives of the consultancy were to identify stakeholder priority information and data needs and develop a relevant AAGRIS structure founded on these outcomes. This undertaking was pertinent in order to ensure the issue of relevance and functionality of the proposed structure is addressed as well as promote a sense of ownership among stakeholders and Member States.

Rationale:

The lack of adequate information has continued to be a major constraint to livestock development, poverty reduction and food security in Africa. This deficiency can be attributed to, the lack of an efficient and effective Information system in Africa that has resulted to poor quality data, uncoordinated data collection, analysis and information dissemination within the AU member states. African union Member States do have some data and information on their AnGR, but the lack of a common data collection point has resulted to poor presentation of relevant evidence to initiate evidence-based analysis that would better inform policy making as well as the establishment of relevant conservation and breeding initiatives that would improve their animal breeds. As evidenced by the absence of robust and policies, it is apparent there is disconnect between evidence/data and policy formulation processes.

It is apparent that Africa requires a customized information system on Animal Genetic Resources (AnGR) that meets her specific needs. Currently, the Animal Production module in ARIS is yet to be fully utilized and populated with relevant data and information drawn from member countries, thus fulfilling its function especially in relation to AnGR. Under the recently launched Genetics project, an African Animal Genetic Resources Information System (AAGRIS) will be set-up. This outfit will function as a “one-stop-shop” where a wide range of end-users will be able to obtain relevant information to acquire knowledge, inform policy makers, raise awareness and promote best practices in the management of AnGR.

Through the concluded needs assessment consultancy, a proposed structure and data and information needs as voiced by member states and relevant stakeholders has been documented. The meeting provided an opportunity to deliberate on the consultancy findings and establish the necessary data and information needs of AAGRIS, focussing mainly on those that are unique and presently not available in other existing AnGR information systems.

It was pertinent to also identify the data and information that needed to be collected, reliable data and information sources and feedback approaches.

Meeting proceedings

Opening Remarks:

The Chairperson, Dr Simplice Nouala, the Head of Animal Production Unit (APU) welcomed everyone to the meeting after wishing all a happy new year. He reiterated AU-IBAR’S commitment to collaborate and work closely with the implementing partners as well as the member states in the actualization of AAGRIS. In his opening remarks, he highlighted the need to agree on fundamental issues on the data and information content of AAGRIS and structure of AAGRIS.

He outlined the specific objectives of the meeting being;

1) Establish the data and information content of AAGRIS

2) Establish the AAGRIS structure
3) Establish strategies that can be adopted for effective data collection, verification, updates and feedback.
4) Agree on a roadmap outlining the key activities and roles

Adoption of workshop programme

Dr. Simplice Nouala presented the meeting's agenda (Appendix 1) that comprised of four main sessions being; (i) Introductory presentation of ARIS and the proposed AAGRIS and DAGRIS, (ii) Consultants presentation on needs assessment and subsequent discussion on data and information content of AAGRIS followed by (iii) presentation on the structure of AAGRIS and in-depth discussions on the technical feature of the AAGRIS prototype. (iv) The final session entailed the development of a roadmap towards the operalization of AAGRIS.
The Agenda was adopted without amendments.

A quick introduction session of all participants was undertaken before the commencement of the workshop (Annex 2).

Introductory presentations

Animal Resources Information System (ARIS) and the proposed AAGRIS

A detailed presentation on ARIS and the proposed AAGRIS was given by Dr. Mbole-Kariuki, with a brief history on the creation of ARIS and its subsequent evolution to ARIS2. The present data collection, analysis and dissemination structure of ARIS2 was presented with the key issue of highlighting the process that may be adopted in the implementation of AAGRIS.
The need for AAGRIS was highlighted indicating the apparent lack of information and data on animal genetic resources (AnGR) in Africa. Through the Genetic project, it is envisaged that these information and data gaps will be bridged with the development of an African information System. The presentation highlighted a key feature of AAGRIS that it will be tailored to suit stakeholders' needs. AAGRIS will collate information drawn from sub-national and national levels and its management will be sub-delegated to the AU member states. AAGRIS is targeting users including government institutions, livestock keepers, universities, research institutions, policy makers among others. The proposed information system is expected to improve the accessibility and availability of information, data, tools and protocols and more importantly to capture policy makers' attention through availing primary indicators that will be crucial in decision-making and subsequent resource allocation.
A bottom-up approach was adopted and a consultative needs assessment was undertaken to highlight the key information and data needs of various stakeholders. The discussions entailed descriptions of the shell modules which Dr. Ibrahim Gashash highlighted were basically modules created but are yet to be populated with the relevant information. He

also highlighted the availability of forums for discussion that have been improved upon by allowing e-members to contribute directly without having to login into the ARIS account.

Domestic Animal Genetic Resources Information System (DAGRIS)

An overview of DAGRIS was also given by Dr. Mwai Okeyo, whereby he shared issues related to key features of DAGRIS;

- Ability to support of multi-sites per country under one global site and using a single code base
- Each site having consistent look and feel, with the possibility of customization to the needs/desires of each country
- Ability to integrate with third party web services; e.g. consume images from Flickr, link documents via CG-DSpace
- Ability to geo-reference breed level-data
- Ability to generate statistical reports on collected data.

He also shared information on DAGRIS web frame work (Drupal), the open sources tools (Operating System, Web Server, MySQL, Programming Language).

The main data and information content found within DAGRIS includes mainly breed descriptions- Bibliography Information, Breed, breed names, Breed Country, Breed Image, Breed Population, study Location, trait etc. He also presented to the audience DAGRIS database structure, DAGRIS site structure (Public – available to anyone who access the site and administrative – reserved to site administrators and editors). He emphasised on the ability of DAGRIS to be accessed with various forms of technologies (from desktops to tablets).

The system overview showed data and information flow between the c-dagris and the global DAGRIS and operated by various system soft wares. Most of the software in use is open source software such as Drupal. The presentation was highly informative.

Most of the discussions focused on the technical aspects of DAGRIS with commendations on the operations and structure of DAGRIS from the floor. Queries on how DAGRIS documents transboundary breeds were also raised.

Data and Information content of AAGRIS

Presentation - needs assessment findings:

The AU-IBAR consultant – Samuel Chari, gave a presentation on his needs assessment findings. He described the methodology adopted being a well-structured questionnaire and that over 60% of respondents provided feedback.

Based on the consultative needs assessment, seven main categories (species and breeds, inventory and monitoring, conservation and sustainable utilization, training and capacity development, policy and legal frameworks, diseases and news trends) were identified and were material for the subsequent deliberations on the data and information content of AAGRIS.

The members raised questions on the methodology approach (Questionnaire) that was adopted interrogating the queries posed and if were closed. The Consultant shared with members that the questionnaire was open-ended and no suggestions or proposals were made to bias data and information needs identified.

Discussions:

AAGRIS Categories

Through extensive deliberations to determine the categories to be included or excluded in AAGRIS, six main data and information categories were finally agreed upon by members. The information and data necessary to be collected within these categories was also established.

1. **Species and breeds:** This category will focus on species and breed descriptions. It will mainly capture information on phenotypic and molecular characterization of African Animal genetic resources. The information and data will encompass breed history, scientific and local names, photos, spatial distribution maps, genetic features, performance (production and reproduction), socio-economic value and indigenous knowledge. Some aspects of this category are available in DAGRIS and thus the need to ensure interoperability between the two systems.
2. **Inventory, monitoring and surveillance:** This category will capture information and data on various aspects of population trends and status of breeds. The focus will be on population size, herd structure/demography, threats and their relative rankings as well as opportunities. To avoid duplication, since some aspects are already captured in DAGRIS, interoperability between the systems will be a priority.
3. **Conservation and breed improvement programmes:** Information and data on past and on-going conservation initiatives (*In-vivo*, *In-vitro* and *Ex-situ*). Information on the virtual Gene banks will also be availed. Reports on case studies and success stories capturing lessons learnt and best practices were included in this category. Additional information from National Action plans related to conservation will also be included.
4. **Capacity development:** A category that will focus on the building of the technical capacity of all users. Publications, E-learning tools and resources, Animal genetic Resources characterization, inventory and monitoring tools and protocols.
5. **News trends:** Information on upcoming events (symposiums, workshops, conferences etc.), proposal calls, scholarship vacancies and consortium opportunities was considered key and will be the main components of this category. The category will also be linked directly to the information sharing networks – DAD-NET Africa and S-RFP.
6. **AnGR Institutions:** This will be an institutional and experts database that captures all available contact information on information on the Sub regional Focal points, breeders' associations, training institutions, national, regional and international AnGR associated organizations.

It was agreed that AAGRIS will not collect data on disease because this already has been collected and housed in the Animal Health module of ARIS. Data and information on policy will be collected but will be stored under the policy module of ARIS.

AAGRIS represents the animal genetic sub-module of the Animal production module in ARIS2 and will function as a "one-stop-shop" that contains all available information on African AnGR.

Data sources, verification, updates and feedback

Deliberations on the data sources, methods of verification, updates and feedback were undertaken. There was consensus that feedback was a necessity and the partners must ensure this is achieved. During the discussions, Dr. Carlos Quiros highlighted that it was not an issue of lack of information as there was a vast amount of information available but rather the greatest challenge faced was determining which information was most relevant, accessible and available in consumer friendly forms.

It was evident that the importance of feedback could not be overemphasized, especially as an incentive to entice and encourage stakeholders to input (data and information) regularly into AAGRIS. It was pertinent to target end-users so as to inform the data better.

Data and information verification was also considered very important and the members agreed that this should be undertaken at various administrative, academic and national levels as per the respective categories

Through the subsequent deliberations, one of the queries posed on "*what strategies to adopt for effective data collection, verification, updates and feedback".* This generated numerous potential data sources, methods of data collection, verification and feedback for the agreed upon categories as represented below.

Species and breeds category:

For the Species and breeds category, members agreed that to avoid duplication of data it will be important to link this category to DAGRIS managed by ILRI. The data will be collected by Researchers in research intuitions and universities, farmer groups, breeder societies, Agricultural ministries through their extension work, Agribusiness communities as well as through identified individual farmers. It was agreed that this information will be collected but verified by National Focal points and National Co-ordinators. However, data collection methods/tools should be based on the proposed harmonized AnGR tools for animal characterization, inventory and monitoring in Africa

Feedback is key and the primary indicators that will be shared will focus on performance data of livestock reared in various production systems, promotion of farmer networks and

bets practices through exchange visits and current market prices and trending livestock investments. Table 1 summarizes the outcomes of the discussions.

Table 1: Data sources, verification, updates and feedback strategies for the species and breeds category

Category	Data collector	How	Verification	Updates	Feedback
Species and breeds (DAGRIS)	Researchers Universities Farmer groups\Breed societies Agricultural Ministries (extension workers etc) Agribusiness communities Individual farmers	Surveys Questionnaires Mobile telephony – ODK system Literature Existent data from statistics Farm records Slaughter houses	National focal points National Co-ordinators NAC	Variable based on the data to be collected (to be discussed in smaller groups)	Performance data in various production systems Enhanced farmer networks comparisons and exchanges, benchmarking learning- Trending market prices – product and input prices

Inventory and Monitoring category;

For this subcategory, members agreed that it should be interoperable with DAD-IS (FAO) to avoid data and information duplication. Presently, there is information on population data from some African countries found within DAD-IS, however the issue of poor/irregular update of population data by member states was raised. It was also evident that most of the present data in FAO is estimated data.

The members agreed that data can be collected through the use of the harmonized inventory tools that will be developed within the project. Other sources of data could be relevant literature, animal markets, animal slaughter houses, national census reports.

Data collection can be carried out be ministries specifically the statistics departments, NGO's, breeder and farmer associations, individual farmers such as pastoralists. This data verification should be done by the NC's and NACs. The aggregation of the collected data should be undertaken every two years and updated in AAGRIS.

Feedback should focus on highlighting the population size trends of the AnGR and identify AnGR threats that can be shared with policy makers to come up with relevant policies to tackle these issues.

Table 2: **Data sources, verification, updates and feedback strategies for the inventory and monitoring category**

Category	Data collector	How	Verification	Updates	Feedback
Inventory (DAD-IS)	Farmer groups\Breed societies Agricultural Ministries (extension workers etc) Statistics departments –ministry level? Individual farmers (e.g. pastrolists, ranchers) NGOs- Heifer international VSF SNV	Surveys Questionnaires National census Literature Existent data from statistics Farm records Slaughter houses Animal markets Animal product agencies	National focal points National Co-ordinators NAC Statistical departments -ministries Vet offices Livestock monitoring Committees	Aggregation twice a year	Population dynamics Threats and opportunities – farmers/policy makers Market demand trends – available products, utilization etc

Conservation and breed improvement programmes category:

Reports/publications, case studies, success stories, documentaries etc. should be relevant data and information sources on conservation and breed improvement programmes. This may be availed by conservation initiatives in member countries, universities, livestock ministries and NGOs. Collection of this information will be a continuous process as well as its update.

In order to encourage continual inputs from the stakeholders, easy accessibility to information on conservation and breeding will be made readily available through the virtual library. Summary of discussions highlighted in table 3.

Table 3: Data sources, verification, updates and feedback strategies for the conservation and improved programmes category

Category	Data collector	How	Verification	Updates	Feedback
Conservation and improved programmmes	Researcher institutions Donors Universities Farmer groups\ Breed societies Livestock Ministries Conservancies CBO /NGO Community organizations	Reports/publications Case studies Success stories Inventories Documentaries Academic thesis	Self done	Continous	Access to virtual library

Capacity development

Under this category, data sources included research institutions, universities, Agribusiness communities amongst others. This information could be in availed in form of CDs, Reports, documentaries, training modules/resources (e-tools) etc. Considering that the information and data was from accredited institutions, members agreed that the verification should be done prior publication by the relevant bodies.

Feedback should be two way, whereby the end users should comment on the training modules and their relevance as well as user friendliness and the feedback incorporated by the developers to improve the tools. Feedback will also address the training gaps and needs. A summary of these discussions is found in table 4.

Table 4: Data sources, verification, updates and feedback strategies for the Capacity development category

Category	Data collector	How	Verification	Updates	Feedback
Capacity building	Research institutions Universities Farmer groups Breed societies Agricultural Ministries NGOs Agribusiness communities Development Agencies (e.g FAO) Media	CDs Reports/publications Social Media – you tube (custom made) Documentaries Training modules/resources	Self done Co-partners	Continuous	Two way traffic Assessment by client Number of hits and comments Training gaps and needs

AnGR institutions:

Easy access to relevant networks and institutions dealing with AnGR issues across the region and continent will be an important feedback for the stakeholders. The data and information will be collected by Sub-Regional Focal points (S-RFPs), breeder and farmer associations, relevant funding agencies amongst others. This will be undertaken through continuous completion of registration and inventory forms.

Table 5: Data sources, verification, updates and feedback strategies for the AnGR institutions category

Category	Data collector	How	Verification	Updates	Feedback
AnGR Institutions	S-RFP Breeder associations Relevant associations National, regional, international NC's Funding agencies Training institutions AnGR Experts database	Inventory and registration forms	Co-partners Relevant Government offices	Quarterly	Access to ANGR directory – regional and continental

News trends

Members agreed that the relevant AnGR news will be sourced from all available sources and made available to all stakeholders through AAGRIS. It was also proposed that this category should be linked to the information networks (DAD-Net Africa and S-RFPs).

Policy and legal frameworks:

A consensus was reached that this would not be a category in AAGRIS but rather housed within the policy documents sub module already existent in ARIS2. The relevant data and information will be collected from relevant government ministries, Regional Economic communities (RECs),S-RFPs, research institutions such as IFPPRI, government gazettes etc. The updating of this information will be a continuous process and eased policy legislations assessment, analysis and gaps will be realized.

Table 6: Data sources, verification, updates and feedback strategies for the Policy and legal frameworks category

Category	Data collector	How	Verification	Updates	Feedback
Policy and legal frameworks	Relevant government ministries RECs S-RFP Donars Development agencies Research institutions – IFPPRI Government gazettes	Inventories FAO EU Globallex	Relevant Government offices	Continuous	Policy and legislation Assessment /analysis/gaps

The proposed AAGRIS is envisioned as an information system that will avail all relevant information to stakeholders through eased accessibility. It was agreed that linkage to already existent information systems such as DAD-IS and DAGRIS was necessary to avoid duplication of information.

AAGRIS structure

Presentation:

The AU-IBAR Consultant gave a brief but detailed presentation on the proposed AAGRIS structure. He presented the proposed prototype, which comprised of three main tiers; the user tier, middle tier and back end tier. He shared some recommendations on the technical features of AAGRIS which were deliberated upon by the Information technologists in the meeting.

Discussions

The discussion session on the AAGRIS structure was facilitated by the ARIS webmaster, Mr. Philippe Ouedraogo who emphasized that the development of the AAGRIS structure should not be the primary focus but rather the data and information contents as well as the methods of data collection. Technical deliberations on the System Development Tools Platforms, security of ARIS and also the issue of interoperability were undertaken. The ARIS team clarified that presently ARIS has excellent security levels and thus country data could not be accessed without authorization from the appointed country administrators. From the presented structure of ARIS, it was agreed that the flow of information should not only be upwards but also adopt a feedback approach critical for the end users.

The issue of interoperability was also discussed. In regards to interoperability with DAGRIS, it was highlighted that while Drupal has capacity for system-to-system interoperability via Web Services, this functionality has not been programmed into DAGRIS. However, AAGRIS developers can get the DAGRIS data structures and migrate the data into AAGRIS if an agreement is reached.

According to the consultants assessment, AAGRIS interoperability with DAD-IS, indicated that the proposed AAGRIS interoperability interface was recommended as XML or REST web services which cannot send or receive data from DAD-IS at a system level. AAGRIS will therefor resort to use of a web link to DAD-IS. This will require some legal agreement to be arrived at. It was proposed that AAGRIS developers can also get the DAD-IS data structures and migrate the current African data into AAGRIS if agreement is reached.

The general consensus was that AAGRIS will be a combination of a data collection and web portal systems. The web portal will be mainly used for the display of the analyzed data as well as a linkage to the already existent AnGR information systems (DAD-IS and DAGRIS) while the data collection system will be for collection and compilation of data from member states and other relevant stakeholders. The linkage to DAD-IS and DAGRIS will require have some legal agreements to be put in place before accessibility. This will be undertaken in-depth after further consultations with the implementing partners (FAO and ILRI).

It was also clarified that operations and management of AAGRIS will be within the already existent ARIS2 and not be considered as a stand-alone information system.

Development of a roadmap outlining key activities and roles

In order to implement the activity, a roadmap was jointly agreed on, key roles and responsibilities were allocated to collaborating institutions. The table below outlines the activities, Institutions responsible and coordinating the outlined activities as well as the expected time frames.

Activities	Responsible	Timeframe
Design of tools for data collection –check already existent tools	AU-IBAR, ILRI, FAO	January-March
Data collector net works – setup or complied	AU-IBAR	End of march
Develop the technical specifications of AAGRIS	AU-IBAR FAO ILRI	May
Assess the capacity, limitations and strengths of ARIS,DAD-IS,DAGRIS – Cross talking with the IT teams in DAD-IS and DAGRIS	AU-IBAR FAO ILRI	May
Develop the categories in ARIS (Establish minimal data at global interphase)	AU-IBAR	June
Establish legal issues of interoperability, data sharing, IPR	all	To be initiated in March
Design and develop AAGRIS	AU-IBAR FAO ILRI	November
Training of trainers	AU-IBAR	2016
Pilot AAGRIS in selected countries	AU-IBAR	2016

Recommendations and other arising issues

1. Proposed development of the categories that currently do not exist (e.g. Conservation and breed improvement programmes, capacity development – e-tools etc.) in the first AAGRIS version
2. All joint activities should be undertaken collaboratively
3. Focus should also be put on processes to ensure effectiveness
4. The aspect of adding commercial value to AAGRIS through advertisement or subscriptions was raised but Dr. Nouala clearly highlighted AU-IBAR's role was to serve the member states and thus such an approach was not acceptable within the AU regulations.

Annexes

Annex 1: Agenda

Day 1: Thursday 15th January 2015

Time	Item	Resource person
Session 1: Opening		
10:00 - 10:15	***Welcome Remarks***	Dr. Simplice Nouala
10:20 – 11:00	**Health break**	
Session 2: Introductory Presentations		
11:00 - 12:00	***Presentation on African Animal Genetic Resources Information System - AAGRIS – APU module hosted in ARIS*** ***Plenary discussions***	AU-IBAR All
12:00 – 13:00	***Presentation on DAGRIS (Overview)*** ***Plenary discussions***	ILRI All
13:00 – 14:00	**Lunch**	
Session 3: Data and Information Content - AAGRIS		
14:15 – 15:15	***Information and data content in AAGRIS*** ***Q&A session***	Consultant
15:15 – 17:00	***Plenary discussions and agreement on data and information content in AAGRIS***	All

Day 2: Friday 16th January 2015

Session 4: AAGRIS structure		
9:00 – 10:30	***Presentation on proposed AAGRIS structure*** ***Q&A session***	Consultant
10:30-	**Health break**	
11:15- 12:15	***Plenary discussions and agreement on AAGRIS structure***	All
12:15 - 13:00	***Recommendations and Way forward*** ***Closure***	All
13:00 - 14:00	**Lunch**	

Annex 2: In attendance:

Dr. Simplice Nouala (*Chairperson*)

Genetics team:

Dr. Mary Mbole-Kariuki

Dr. Ng'uetta Bosso

Dr. Edward Nengomasha

Dr. Pissang Tchangai

Animal Resources Information System team:

Dr. Ibrahim Gashash

Mr. Philippe Ouedraogo

Implementing partners-ILRI

Dr. Mwai Okeyo

Dr. Carlos Quiros

NAGRC&DB

Mr. Richard Batanda

AU-IBAR Consultant:

Mr. Samuel Chari