

RECOMMENDATION REPORT ON IMPROVING SOUTH AFRICA'S REPORTING IN FOOD AND AGRICULTURAL ORGANIZATION'S DOMESTIC ANIMAL DIVERSITY INFORMATION SYSTEM

Directorate: Genetic Resources

Sub-directorate: Farm Animal Genetic Resources

—March 2021—



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& rural development

Department:
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REPUBLIC OF SOUTH AFRICA



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ACRONYMS

AnGR	Animal Genetic Resources
ARC	Agricultural Research Council
DAD-IS	Domestic Animal Diversity Information System
DALRRD	Department of Agriculture, Land Reform and Rural Development
FAnGR	Farm Animal Genetic Resources
FAO	Food and Agricultural Organization
PDA's	Provincial Departments of Agriculture
SDG	Sustainable Development Goal United Nations
UN	United Nation

1. Introduction

The Domestic Animal Diversity Information System (DAD-IS) of the Food and Agricultural Organization (FAO) is a contact and conversant tool that assists countries in developing policies and strategies for the management of animal genetic resources (AnGR) (www.fao.org/dad-is/en/). It plays a major role as a clearinghouse mechanism and early warning system for breed risk status for AnGR used for food and agriculture (www.fao.org/dad-is/en/). It gives access to databases of breed-related information, images and links to other online resources on livestock diversity. Additionally, it makes it possible to evaluate the diversity of livestock breeds at national, regional and global levels, including the status of breeds with regard to their risk of extinction. This system also provides tools to monitor national breed populations that assist in making informed decisions on the management of Farm Animal Genetic Resources (FAnGR) (www.fao.org/dad-is/en/). Therefore, DAD-IS provides countries with a tool that can be used to meet their reporting commitments with respect to the Sustainable Development Goal's target and indicators and the Global Plan of Action for AnGR. DAD-IS uses the breed information provided by countries to automatically calculate the categories or assign risk categories to a breed (extinct, critical, endangered, critical-maintained, endangered-maintained, not at risk, unknown, vulnerable or cryo-conserved only) (www.fao.org/dad-is/en/). The grouped parameters that DAD-IS uses to calculate categories are as follows:

- a. Breeding population. It is determined by the overall population size which is also determined by three parameters, i.e., population size, number of breeding females and males and population trends-inbreeding.
- b. Reproduction capacity. It is the capacity of a breed to reproduce. It is divided into high and low reproductive capacities. The species with a high reproductive capacity can produce a large number of offspring in a limited time, e.g., pigs and chickens. Those with low reproductive capacity can take more time to produce a new generation of breeding animals, e.g., cattle, sheep and goats.
- c. Active conservation programme. This is when the government, breed associations/society or individuals have programmes to conserve rare breeds or if it is an active conservation programme including cryo-conservation or if it is maintained by a commercial company or research institution (www.fao.org/dad-is/en/).

The Department of Agriculture, Land Reform and Rural Development (DALRRD) Directorate: Genetic Resources, Sub-directorate: Farm Animal Genetic Resources (FAnGR) is a national focal point for conservation and sustainable use of FAnGR and represents South Africa (SA) as a member of the Commission on Genetic Resources for Food and Agriculture. The commission requires the country to regularly update information of its FAnGR in order to achieve the Sustainable Development Goal (SDG) target 2.5, which is linked to the maintenance of the genetic diversity of farmed and domesticated animals of the Agenda 2030 and the Sustainable Development (United Nations, 2020), through regularly updating the national data (cryo-conserved material and breed population size) in DAD-IS. It is therefore important for SA, through the DALRRD Directorate: Genetic Resources, Sub-directorate: FAnGR to report accurate information to DAD-IS and also avoid under-reporting for a breed's risk status to be categorised properly.

2. Discussions

This section reviews South Africa's reporting in DAD-IS, census/survey at breed and/or species level in the country and the breeds listed in the DAD-IS breed datasheet (SA webpage). It also provides a comparison with other selected countries' reporting on parameters used for calculating breed risk status such as population and conservation programme data.

2.1 South Africa's reporting in DAD-IS

The DAD-IS requires countries to fill in the breed data sheet online at <http://www.fao.org/dad-is/en/> when reporting breed information. The parameters contained in the breed data sheet are the local name, uses, origin and development, additional information, qualities information, morphology information, colours, horn information, performance information, milk information, prolificacy, management conditions, population data, conservation programme, organisations and publications (<http://www.fao.org/dad-is/en/>). With the exception of population data and a conservation programme, most of the parameters mentioned above do not need to be reported on a regular basis since they are not used in the assigning of risk status and are often incomplete for some of the breeds. It is also necessary to report on landraces (indigenous and locally developed breeds) as well as locally adapted and regularly introduced breeds in DAD-IS. This has been done to most of the breeds that are registered according to the Animal Improvement Act, 1998 (Act No. 62 of 1998) listed in the breed data sheet.

The Sub-directorate: FAnGR filled the DAD-IS breed data sheet online for several breeds in the fourth quarter (March 2020) of the financial year 2019/2020. The parameters that were reported on were population data and conservation programmes. The recent reporting (March 2020) on breed population and conservation programme data (for in vivo and cryo- preserved genetic materials) was based on the information requested from government research stations/institutions/farms at provincial level, breeders societies and the Agricultural Research Council-Animal Production. However, there might be information missing from communal and private farms that have not been accounted for. In addition, some farmers keep both commercial and stud herds, which suggest that since the breed population data were also extracted from breeders societies, the breeds that are used for commercial purpose might not have been considered for reporting. This also implies that a breed might be assigned the wrong risk status category as DAD-IS calculates it automatically based on the breed information provided by the country.

2.2 Census/survey at breed and/or species level in South Africa

DAD-IS recommends that a census or survey at breed or species level should be done on a regular basis (e.g., every five years) to have accurate livestock breed information. The last breed survey in South Africa was done in 2014 and it was only conducted in a few provinces, namely, Limpopo, North West, KwaZulu-Natal and the Free State. Furthermore, based on the reported information in DAD-IS, the results from the survey were not recorded in the data sheet for any breed.

2.3 Breeds listed in DAD-IS breed datasheet: SA webpage

Only FAnGR breeds (both landraces and locally adapted and regularly introduced breeds) registered according to the Animal Improvement Act, 1998 (Act No. 62 of 1998) must be entered into DAD-IS breed datasheet. Based on the amendment in the Animal Improvement Act, 1998 (Act No. 62 of 1998), as indicated by the Government Gazettes (No. 690 of 10 June 2016 and No. 664 of 17 May 2019), it was noticed that there are FAnGR breeds that are listed in the DAD-IS breed datasheet but are not recognised as breeds in South Africa; for example, Bantu goat breed, Australian feral goat breed, Finnish Landrace sheep, Hottentot sheep and the Walrich Vleis Merino.

2.4 Other selected countries' reporting

The Sub-directorate: FAnGR focuses and regularly reports on the population and cryo-conservation data of FAnGR breeds of five species (cattle, goats, sheep, pigs and chickens), however, the tables below show the number and percentages of breeds per species as currently recorded in the DAD-IS breed datasheet. The comparison presented here will be on the five species that the sub-directorate is mandated to concentrate on. Data based on the last year in which a Member State reported and updated the breed population and cryo-conservation data was used to calculate the numbers and percentages. Four Member States (Namibia, Mongolia

and the United Kingdom) including South Africa were selected because DAD-IS recently reported that their reporting in DAD-IS has improved (<http://www.fao.org/dad-is/state-of-reporting/en/>).

All four Member States reported the population data for goats, sheep and cattle breeds. In terms of reporting the population data for goats, pigs, sheep and cattle breeds in the DAD-IS breed datasheet, South Africa reported less data as compared to Namibia, Mongolia and the United Kingdom. South Africa and the United Kingdom did not do well in terms of reporting the population data of chicken breeds as compared to Namibia and Mongolia. The number and percentages of breeds per species for which population data was reported in DAD-IS by selected Member States (South Africa, Namibia, Mongolia and United Kingdom) are presented in Table 1.

Table 1. Number and percentages of breeds per species for which population data were reported in DAD-IS by selected Members States (South Africa, Namibia, Mongolia and the United Kingdom)

Species	Member States											
	South Africa			Namibia			Mongolia			United Kingdom		
	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported
Goat	16	5	31	12	10	83	13	13	100	20	15	75
Pig	13	0	0	5	3	60	0	0	0	16	16	100
Sheep	46	13	28	13	10	77	24	23	95	132	77	58
Cattle	80	33	38	39	32	82	9	9	100	128	68	53
Chicken	7	0	0	13	6	46	1	1	100	179	0	0
Deer	0	0	0	0	0	0	1	1	100	9	0	0
Dog	6	0	0	0	0	0	0	0	0	0	0	0
Dromedary	1	0	0	0	0	0	0	0	0	0	0	0
Duck	0	0	0	2	1	50	0	0	0	31	0	0
Emu	1	0	0	0	0	0	0	0	0	0	0	0
Goose	0	0	0	0	0	0	1	1	100	20	0	0
Horse	37	0	0	10	10	100	6	6	100	94	34	35
Muscovy Duck	0	0	0	0	0	0	0	0	0	1	0	0
Ostrich	3	0	0	0	0	0	0	0	0	0	0	0
Rabbit	0	0	0	0	0	0	0	0	0	5	0	0
Turkey	0	0	0	0	0	0	0	0	0	18	0	0
Yak	0	0	0	0	0	0	1	1	100	0	0	0
Alpaca	1	0	0	0	0	0	0	0	0	0	0	0
Ass	0	0	0	1	1	100	0	0	0	0	0	0
Buffalo	1	0	0	0	0	0	0	0	0	0	0	0
Camel	0	0	0	0	0	0	4	4	100	0	0	0

South Africa is the only Member State that reported on in vivo conservation programmes for goat, pig, sheep and cattle breeds except for chicken breeds in the DAD-IS breed datasheet, although the reporting is not good when considering the number of breeds captured for each species. The number and percentages of breed per species for which in vivo conservation programme data were reported in DAD-IS by selected Member States (South Africa, Namibia, Mongolia and the United Kingdom) are presented in Table 2.

Table 2. Number and percentages of breeds per species for which in vivo conservation programmes were reported in DAD-IS by selected Member States (South Africa, Namibia, Mongolia and the United Kingdom)

Species	Member States											
	South Africa			Namibia			Mongolia			United Kingdom		
	Total No. of breeds	No of breeds reported	% of breeds reported	Total No. of breeds	No of breeds reported	% of breeds reported	Total No. of breeds	No of breeds reported	% of breeds reported	Total No. of breeds	No of breeds reported	% of breeds reported
Goat	16	1	6.25	12	0	0	13	0	0	20	0	0
Pig	13	1	7.69	5	0	0	0	0	0	16	0	0
Sheep	46	4	8.70	13	0	0	24	0	0	132	0	0
Cattle	80	8	10	39	0	0	9	0	0	128	0	0
Chicken	7	0	0	13	0	0	1	0	0	179	0	0
Deer	0	0	0	0	0	0	1	0	0	9	0	0
Dog	6	0	0	0	0	0	0	0	0	0	0	0
Dromedary	1	0	0	0	0	0	0	0	0	0	0	0
Duck	0	0	0	2	0	0	0	0	0	31	0	0
Emu	1	0	0	0	0	0	0	0	0	0	0	0
Goose	0	0	0	0	0	0	1	0	0	20	0	0
Horse	37	0	0	10	0	0	6	1	16.67	94	0	0
Muscovy Duck	0	0	0	0	0	0	0	0	0	1	0	0
Ostrich	3	0	0	0	0	0	0	0	0	0	0	0
Rabbit	0	0	0	0	0	0	0	0	0	5	0	0
Turkey	0	0	0	0	0	0	0	0	0	18	0	0
Yak	0	0	0	0	0	0	1	0	0	0	0	0
Alpaca	1	0	0	0	0	0	0	0	0	0	0	0
Ass	0	0	0	1	0	0	0	0	0	0	0	0
Buffalo	1	0	0	0	0	0	0	0	0	0	0	0
Camel	0	0	0	0	0	0	4	2	50	0	0	0

South Africa reported cryo-conservation data for pig, sheep, cattle and chicken breeds, while Mongolia reported for goat, sheep and cattle breeds. Namibia and the United Kingdom did not report any data on cryo-conservation for any breeds per species. Mongolia reported better than all the three countries in terms of reporting cryo-conservation data for goat, sheep and cattle breeds while South Africa reported better than Mongolia, Namibia and the United Kingdom regarding pig and chicken breeds. However, the reporting for South Africa is concerning when considering the number of pig and chicken breeds captured in DAD-IS breed datasheet. The number and percentages of breeds per species for which cryo-conservation programmes was reported in DAD-IS by selected Member States (South Africa, Namibia, Mongolia and the United Kingdom) are presented in Table 3.

Table 3. Number and percentages of breeds per species for which cryo-conservation programmes were reported in DAD-IS by selected Members States (South Africa, Namibia, Mongolia and the United Kingdom)

Species	Member States											
	South Africa			Namibia			Mongolia			United Kingdom		
	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported
Goat	16	0	0	12	0	0	13	3	23.08	20	0	0
Pig	13	1	7.69	5	0	0	0	0	0	16	1	0
Sheep	46	2	4.35	13	0	0	24	11	45.83	132	0	0

Species	Member States											
	South Africa			Namibia			Mongolia			United Kingdom		
	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported	Total No. of breeds	No. of breeds reported	% of breeds reported
Cattle	80	2	2.5	39	0	0	9	8	88.89	128	0	0
Chicken	7	1	14.29	13	0	0	1	0	0	179	0	0
Deer	0	0	0	0	0	0	1	0	0	9	0	0
Dog	6	0	0	0	0	0	0	0	0	0	0	0
Dromedary	1	0	0	0	0	0	0	0	0	0	0	0
Duck	0	0	0	2	0	0	0	0	0	31	0	0
Emu	1	0	0	0	0	0	0	0	0	0	0	0
Goose	0	0	0	0	0	0	1	0	0	20	0	0
Horse	37	0	0	10	0	0	6	0	0	94	0	0
Muscovy Duck	0	0	0	0	0	0	0	0	0	1	0	0
Ostrich	3	0	0	0	0	0	0	0	0	0	0	0
Rabbit	0	0	0	0	0	0	0	0	0	5	0	0
Turkey	0	0	0	0	0	0	0	0	0	18	0	0
Yak	0	0	0	0	0	0	1	1	100	0	0	0
Alpaca	1	0	0	0	0	0	0	0	0	0	0	0
Ass	0	0	0	1	0	0	0	0	0	0	0	0
Buffalo	1	0	0	0	0	0	0	0	0	0	0	0
Camel	0	0	0	0	0	0	4	0	0	0	0	0

3. Conclusion and recommendations

South Africa through the DALRRD Directorate: Genetic Resources has been complying and cooperating with the Commission on Genetic Resources for Food and Agriculture towards accomplishing the Sustainable Development Goal (SDG) targets and indicators through reporting on population and conservation programme data (for in vivo and cryo-preserved genetic materials) that the Sub-directorate: FAnGR managed to acquire from stakeholders. The conservation and sustainable use of FAnGR is not the responsibility of a single entity – it requires collective effort and all relevant stakeholders need to work together and play their part to protect FAnGR breeds and prevent them from being at risk of extinction. In order for the reporting of the parameters in the DAD-IS breed datasheet to be improved, it is recommended that the following be executed:

a. Population data:

For the reporting on breed population data, a census or survey at breed and/or species level should be done regularly (every five years). For the census or survey to be successful, the Sub-directorate: FAnGR must collaborate with relevant stakeholders (e.g., breeders societies, Provincial Departments of Agriculture (PDAs), individual farmers, universities, research institutions/farms/stations, commodity organisations, etc.). The cooperation from the aforementioned relevant stakeholders with the Sub-directorate FAnGR will also be required.

b. Conservation programme (In Vivo and Cryo-preservation):

Strengthening the existing collaboration for cooperation with relevant stakeholders such as breeders societies of South Africa, private companies (e.g., Taurus, Embryo Plus), research institutions/farms/stations (e.g., ARC.), Institutions of Higher Learning (e.g., Grootfontein Agricultural Development Institute), etc. is necessary. The DALRRD Directorate: Genetic Resources should consider having its own cryo-conservation centre in

which genetic materials of landrace breeds will be preserved and maintained in order to complement conservation efforts executed by other institutions, e.g., ARC-Animal Production and private companies like Embryo Plus.

- c. Other parameters (local name, uses, origin and development, additional information, qualities information, morphology information, colours, horn information, performance information, milk information, prolificacy, management conditions).

Strengthening the existing collaboration for cooperation with relevant stakeholders such as breeders societies of South Africa, research institutions/farms/stations, Institution of Higher Learning, etc. is needed. Use of peer-reviewed publications complementing conservation efforts could also be vital.

- d. Update list of breeds in DAD-IS

Notices of amendments in the Animal Improvement Act, 1998 (Act No. 62 of 1998), as indicated in the Government Gazette, should be checked regularly for any changes in the FAnGR register and the breeds listed in DAD-IS breed datasheet updated accordingly. Frequent communication with the Deputy Director: Animal Production concerning the amendments with regard to FAnGR breeds registered would be highly important.

- e. Formal appointment of provincial coordinators

The Directorate: Genetic Resources should consider proposing a new organisational structure that would take the formal appointment of provincial coordinator for conservation and sustainable use of FAnGR into consideration. The appointment should also be extended to the districts where each district will have a coordinator. This will help with the flow of information, particularly when the reporting of breed information is required or requested.

- f. Design of national online system

A national online system that would allow each province through their provincial coordinator to enter breed information, particularly on population data and active conservation programmes (for in vivo and cryo-preserved genetic materials), should be developed. This will assist the national coordinator to consolidate the breed information with ease.

4. References

South Africa. 1998. Animal Improvement Act No. 62 of 1998. Available at: <<https://www.gov.za/documents/animal-improvement-act>>. [Accessed on: 26 September 2020]

South Africa. Department of Agriculture, Forestry and Fisheries. 2016. *Animal Improvement Act, 1998 (Act 62 of 1998) regulation: amendments*. Government Gazettes (No. 690 of 10 June 2016). Pretoria: Government Printing Works. Available at: <www.gpwonline.co.za>. [Accessed on: 26 September 2020].

South Africa. Department of Agriculture, Forestry and Fisheries. 2019. *Animal Improvement Act, 1998 (Act 62 of 1998) regulation: amendments*. Government Gazettes (No. 664 of 17 May 2019). Pretoria: Government Printing Works. Available at: <www.gpwonline.co.za>. [Accessed on: 26 September 2020].

United Nations. Statistical Commission. 2020. *Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development*. A/RES/71/313, E/CN.3/2018/2, E/

CN.3/2019/2, E/CN.3/2020/2. New York: United Nations. Available at: <<https://unstats.un.org/sdgs/indicators/indicators-list/>>. [Accessed on: 16 November 2020].

United Nations. General Assembly. 2015. Resolution adopted by the General Assembly on 25 September 2015: Transforming our world: the 2030 Agenda for Sustainable Development. Seventieth session. A/RES/70/1. Available at:

<https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf>. [Accessed on: 16 November 2020].

www.fao.org/dad-is/en/

www.fao.org/dad-is/state-of-reporting/en/

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