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COMMISSION ON
GENETIC RESOURCES
FOR FOOD AND
AGRICULTURE

CGRFA/WG-AnGR-10/18/REPORT

Tenth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture

Rome, Italy, 27 – 29 June 2018

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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

**REPORT OF THE TENTH SESSION
OF THE
INTERGOVERNMENTAL TECHNICAL WORKING GROUP
ON ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE**

Rome, Italy, 27–29 June 2018

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2018

The documents prepared for the Tenth Session of the Working Group on Animal Genetic Resources for Food and Agriculture of the Commission on Genetic Resources for Food and Agriculture are available on the Internet at the following address:

<http://www.fao.org/ag/againfo/programmes/en/genetics/angrvent-docs.html>

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I. INTRODUCTION

1. The Tenth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture (Working Group) was held in Rome, Italy, from 27 to 29 June 2018. The members and alternates of the Working Group are given in *Appendix E*. The list of delegates and observers is available on the meeting Web site.¹

II. OPENING OF THE SESSION AND ELECTION OF THE CHAIR, VICE-CHAIRS AND *RAPPORTEUR*

2. Ms Deidre Januarie (Namibia), Chair of the Ninth Session of the Working Group, opened the session and welcomed delegates and observers.

3. The Working Group elected Mr Sipke Joost Hiemstra (Netherlands) as Chair and Mr Samuel Rezende Paiva (Brazil), Mr Carl Lessard (Canada), Ms Sahar Ahmad Abdul Hussain Al-Bayatti (Iraq), Mr Chang Yeon Cho (Republic of Korea), Mr Lonny Bong (Vanuatu) and Mr Joseph Sikosana (Zimbabwe) as Vice-Chairs. Mr Paiva was elected *Rapporteur*.

4. Mr Berhe Tekola, Director, Animal Production and Health Division, welcomed delegates and observers on behalf of Ms Maria Helena Semedo, Deputy Director-General, Climate and Natural Resources. Mr Tekola noted the importance of FAO's livestock-related work to efforts to meet the Sustainable Development Goals (SDGs), highlighting in particular the role of the Domestic Animal Diversity Information System (DAD-IS) in providing data for the calculation of SDG indicators. Recalling that, in 2017, the FAO Conference, at its Fortieth Session, had adopted the resolution *Reaffirming the World's Commitment to the Global Plan of Action for Animal Genetic Resources*,² he congratulated countries that had stepped up implementation efforts. He thanked the Governments of France and Germany for the generous financial support they had provided to programme delivery.

5. Mr René Castro Salazar, Assistant Director-General, Climate, Biodiversity, Land and Water Department, welcomed delegates and observers. He noted that FAO had taken several steps to strengthen its work on biodiversity, including through the creation of the Climate, Biodiversity, Land and Water Department, the establishment of the Biodiversity Mainstreaming Platform, which facilitates – in collaboration with FAO partners – the integration of biodiversity across agriculture sectors at national, regional and international levels. He also referred to the first Multi-stakeholder Dialogue on Mainstreaming Biodiversity across Agricultural Sectors, held recently at FAO headquarters. He emphasized the importance of integrated, cross-sectoral approaches to the management of genetic resources for food and agriculture.

6. Ms Irene Hoffmann, Secretary, Commission on Genetic Resources for Food and Agriculture (Commission), welcomed delegates and observers. She drew attention to the fact that the Working Group's agenda included, in addition to items specifically related to animal genetic resources, a number of items related to the broader work of the Commission. She noted, in addition, the significance of the Commission's work to the achievement of the SDGs, as confirmed by the FAO Conference in its Resolution 4/2017,³ and invited the Working Group to take these broader perspectives into account in its deliberations.

7. The Working Group, in consultation with the regions, replaced absent Members of the Working Group (Burkina Faso, Costa Rica, Fiji, Jordan, Sudan, Syrian Arab Republic, Tonga and Yemen) with Brazil, Egypt, Iraq, Oman, Qatar, Vanuatu and Zimbabwe.

8. The Working Group adopted the agenda as given in *Appendix A*.

III. STATUS OF IMPLEMENTATION OF THE GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES

¹ <http://www.fao.org/ag/againfo/programmes/en/genetics/angrvent-docs.html>

² C 2017/REP, *Appendix D*.

³ C 2017/REP, *Appendix E*.

9. The Working Group considered the *Review of implementation of the Global Plan of Action for Animal Genetic Resources*.⁴ It took note of the information documents *Detailed FAO progress report on the implementation of the Global Plan of Action for Animal Genetic Resources*,⁵ *Status and trends of animal genetic resources – 2018*,⁶ *Draft guidelines on developing sustainable value chains for small-scale livestock producers*⁷ and *Review of methods for identification and valuation of the ecosystem services provided by livestock breeds*.⁸

10. The Working Group took note of the *Review of methods for identification and valuation of the ecosystem services provided by livestock breeds*, but recommended revision and the addition of material, including concrete examples, that broadened the scope of the document to cover all continents and livestock production systems, socio-ecological systems and categories of breeds and addressed the question of how to scale up data collection from local to national level. It requested the Secretariat to revise the document accordingly, for consideration by the Commission.

11. The Working Group welcomed the *Draft guidelines on developing sustainable value chains for small-scale livestock producers*, noting that it would benefit from the inclusion of developed-country examples, material on a broader spectrum of livestock production systems, including integrated systems, and material on niche markets. It noted that the document contained highly technical language and would benefit from simplification in this regard. It requested the Secretariat to revise the document accordingly, for consideration by the Commission.

12. The Working Group further recommended that the Commission:

- i. endorse the proposed procedure of following the reporting format that was used for the preparation of the previous synthesis reports, with the potential inclusion of some additional questions, when undertaking the next review of progress in the implementation of the Global Plan of Action for Animal Genetic Resources (Global Plan of Action);
- ii. invite countries by February 2019 to complete the reporting process in a timely manner, submitting country progress reports by 30 June 2019, with the possibility of some flexibility with regard to the deadline;
- iii. call upon countries to continue implementing the Global Plan of Action, in order to contribute to global food security and sustainable rural development, and in particular to help achieve SDGs 2 and 15;
- iv. request FAO to strengthen partnerships with stakeholders and donors to continue technical and policy support for country implementation of the Global Plan of Action;
- v. invite donors to contribute to the implementation of the Global Plan of Action, including to a second call for proposals under the FAO Trust Account; and
- vi. request FAO and countries to continue raising awareness and improving the knowledge base of the important roles of livestock producers and of livestock species and breeds in the provision of ecosystem services in order to better target interventions for livestock producers.

IV. STATUS OF DEVELOPMENT OF THE DOMESTIC ANIMAL DIVERSITY INFORMATION SYSTEM

13. The Working Group considered the *Report on the status of the development of the Domestic Animal Diversity Information System*.⁹ It took note of the information documents *Detailed analysis*

⁴ CGRFA/WG-AnGR-10/18/2.

⁵ CGRFA/WG-AnGR-10/18/Inf.2.

⁶ CGRFA/WG-AnGR-10/18/Inf.3.

⁷ GRFA/WG-AnGR-10/18/Inf.4.

⁸ CGRFA/WG-AnGR-10/18/Inf.5.

⁹ CGRFA/WG-AnGR-10/18/3.

of the Domestic Animal Diversity Information System with focus on population data¹⁰ and Global survey of honeybees and other pollinators.¹¹

14. The Working Group reiterated the importance of DAD-IS as a key tool for animal genetic resources management and national SDG reporting. It thanked FAO for the development of the latest version of DAD-IS, noting the major improvements that had been made to the system and its regional node, the European Farm Animal Biodiversity Information System (EFABIS) as well as ongoing efforts to improve linkages with other systems. It recommended that the Commission:

- i. stress the importance of DAD-IS as the international clearing-house mechanism for animal genetic resources;
- ii. request FAO to further maintain and develop DAD-IS, continuing to collaborate with managers of national and regional systems to develop and refine procedures for exchange of data, completing work on the translation of the interface, providing additional training material and investigating the possibility of implementing descriptors for ecosystem services, production systems and the geographical distributions of breeds;
- iii. stress the need for countries to regularly update their national data in DAD-IS or FABIS-net and other relevant databases, including information on animal genetic resources both *in situ* and *ex situ*, and to provide information on population size and breed classifications, in order to ensure that decisions on the implementation of the Global Plan of Action and the achievement of the SDGs are informed by the most up-to-date data and information available;
- iv. request FAO to allocate regular programme resources to the continued maintenance and development of DAD-IS and continue to provide technical support to countries on the estimation of breed population sizes and on the use of DAD-IS; and
- v. request FAO to include in DAD-IS data fields for monitoring the diversity of domesticated honeybees.

V. ACCESS AND BENEFIT-SHARING FOR GENETIC RESOURCES FOR FOOD AND AGRICULTURE

15. The Working Group considered the *Draft explanatory notes describing, within the context of the ABS Elements, the distinctive features of animal genetic resources for food and agriculture*.¹² It took note of the information documents *Inputs by members and observers on access and benefit-sharing for genetic resources for food and agriculture*,¹³ *Outputs of the International Workshop on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture*,¹⁴ and *Proceedings of the International Workshop on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture – preliminary version*¹⁵ and *Access and benefit-sharing for genetic resources for food and agriculture: survey findings*.¹⁶

16. The Working Group reviewed and revised the table of distinctive features of animal genetic resources and the draft explanatory notes. The revised text is given in *Appendix B*.

VI. “DIGITAL SEQUENCE INFORMATION” ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

17. The Working Group reviewed the document *Review of the draft exploratory fact-finding scoping study on “digital sequence information” on genetic resources for food and agriculture*.¹⁷

¹⁰ CGRFA/WG-AnGR-10/18/Inf.6.

¹¹ CGRFA/WG-AnGR-10/18/Inf.7.

¹² CGRFA/WG-AnGR-10/18/4.

¹³ CGRFA/WG-AnGR-10/18/Inf.8.

¹⁴ CGRFA/WG-AnGR-10/18/Inf.9.

¹⁵ CGRFA/WG-AnGR-10/18/Inf.10.

¹⁶ CGRFA/WG-AnGR-10/18/Inf.11.

¹⁷ CGRFA/WG-AnGR-10/18/5.

The Working Group thanked FAO for providing the *Draft exploratory fact-finding scoping study on “digital sequence information” on genetic resources for food and agriculture*¹⁸ for review by the Working Group. It was noted that the document would benefit from further work on exemplifying the items identified in the terms of reference.¹⁹

18. The Working Group recommended FAO to further develop the current scoping study assessing “digital sequence information” (DSI) in the area of animal genetic resources and its role for all relevant stakeholders. The scoping study should reflect the most common and relevant applications of DSI in livestock breeding and sustainable use, and the interactions between livestock producers and stakeholders that assess and analyse genotypes using DSI, and analyse the role and impact of DSI for the conservation of animal genetic resources.

19. The Working Group stressed that access to DSI is important for the management of animal genetic resources, especially for breeding and research, and emphasized the importance of access to DSI for all stakeholders for the sustainable use and conservation of animal genetic resources. It noted, however, that countries that lack the resources and the infrastructure necessary to readily access DSI and the capacity to use it may thus fail to fully benefit from it.

20. The Working Group noted that more discussion on the terminology associated with the issue and on possible impacts on access and benefit-sharing is required and recommended that the Commission continue to consider the topic, taking into account developments in other fora, including the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture and the Conference of the Parties to the Convention on Biological Diversity.

VII. DRAFT WORK PLAN FOR THE SUSTAINABLE USE AND CONSERVATION OF MICRO-ORGANISM AND INVERTEBRATE GENETIC RESOURCES FOR FOOD AND AGRICULTURE

21. The Working Group considered the document *Draft work plan for the sustainable use and conservation of micro-organism and invertebrate genetic resources for food and agriculture*.²⁰ It welcomed the draft work plan as a timely response to the importance of micro-organism and invertebrate genetic resources and their relevance to the livestock sector.

22. The Working Group reviewed the priority areas identified by the Commission at its last session (pollinators, in particular honey bees; soil micro-organisms and invertebrates; biological control agents; micro-organisms of relevance to ruminant digestion; and micro-organisms of relevance to food processing and agro-industrial processes).²¹ It recommended that the Commission take the findings of the finalized report on *The State of the World’s Biodiversity for Food and Agriculture* as a baseline for future work on micro-organisms and invertebrates. It revised the list of functional groups of micro-organisms and invertebrates in the draft work plan as given below and recommended that the Commission address taxonomy and access and benefit-sharing for each functional group.

CGRFA-18	Pollinators, in particular domesticated honey bees
CGRFA-19	Biological control agents
CGRFA-20	Soil micro-organisms and invertebrates
CGRFA-21	Organisms used as dietary components of food/feed
CGRFA-22	Food processing and agro-industrial fermentation processes
CGRFA-23	Micro-organisms of relevance to livestock and human digestion

23. The Working Group recommended that the Commission consider the establishment of appropriate subsidiary bodies, for example team of technical experts, for the various functional groups of micro-organisms and invertebrates, and request FAO to continue raising awareness on the importance of micro-organisms and invertebrates for the provision of ecosystem services and

¹⁸ CGRFA/WG-AnGR-5/18/Inf. 12.

¹⁹ CGRFA-16/17/Report/Rev.1, paragraph 86.

²⁰ CGRFA/WG-AnGR-10/18/6.

²¹ CGRFA/16/17/Report/Rev.1, paragraph 79.

the resilience of production systems as well as building strong partnerships and collaborating with relevant initiatives and organizations to ensure that work on micro-organisms and invertebrates fills gaps and contributes to the mandate of the Commission.

VIII. DRAFT REVISED STRATEGIC PLAN FOR THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE (2018–2027)

24. The Working Group considered the document *Draft Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018–2027)*.²²

25. The Working Group noted the progress made in the implementation of the Commission's Multi-Year Programme of Work (MYPOW) and recommended that the Commission revise the MYPOW and the Session planning, as given in *Appendix C*. It noted that the proposed cross-sectoral goals of the Commission build on the global assessments prepared under its guidance, the strategic priority areas, long-term goals and targets of the Commission's global plans of action and other Commission activities undertaken in response to the global assessments. It requested the Secretariat to insert explicit reference to existing global plans of action in the revised Strategic Plan. Section III (Partnerships) of the revised Strategic Plan should take into consideration the needs and suggestions of regions.

26. The Working Group recalled FAO Conference Resolution 4/2017 on the contribution of the Commission to the achievement of the SDGs and recommended that the Commission strengthen reporting and awareness raising on the contribution of its work to the SDGs.

27. The Working Group recommended that the Commission update the MYPOW and Session planning on a regular basis and review the Strategic Plan as necessary. It thanked the Governments of Switzerland and Norway for their support to the MYPOW Multi-donor Trust Fund and recommended that the Commission encourage other donors to follow their example. It further recommended that the Commission invite countries and FAO to seek resources for projects on the characterization, sustainable use and conservation of biodiversity and genetic resources for food and agriculture.

IX. CLOSING STATEMENTS

28. As the meeting corresponded with the twentieth anniversary of the establishment of the Working Group, Mr Hiemstra invited Ms Elżbieta Martyniuk (Poland), Chair of the First Session, to say a few words. Recalling the early days of the Working Group, the ever-expanding scope of its work and the various milestones of the preceding two decades, including the preparation of two global assessments of animal genetic resources and the adoption of and recent reaffirmation of commitment to the Global Plan of Action, Ms Martyniuk thanked the numerous FAO staff members, country representatives – including all the Chairs of the Working Group's sessions – and other collaborators who had helped make these achievements possible.

29. Representatives from the regional groups took the floor to thank the Chair, the delegates and observers, the Secretariat, the support staff and the donors who had enabled their attendance at the session and the preceding global workshop for national coordinators.

30. Mr Tekola thanked the Working Group for its clear recommendations, noting they would serve as guidance for FAO's work as it strives to assist countries to achieve the SDGs. He thanked the Chair and the Bureau for having ensured an efficiently run meeting, Ms Januarie for her work over the preceding two years, Ms Martyniuk for her touching and informative speech and the donors for their invaluable support.

31. Ms Hoffmann reiterated the importance of the Working Group's recommendations for the Commission's work and for the development of the livestock sector in the context of efforts to

²² CGRFA/WG-AnGR-10/18/7.

achieve the SDGs. She thanked everyone who had helped to make the meeting a success, including the Chair for his guidance, the Secretariat and the support staff.

32. Mr Hiemstra concluded the meeting by noting that much had been achieved and thanking delegates and observers, the Bureau, the Secretariat and the support staff for their hard work, patience and cooperation.

APPENDIX A**AGENDA OF THE TENTH SESSION OF THE INTERGOVERNMENTAL TECHNICAL
WORKING GROUP ON ANIMAL GENETIC RESOURCES FOR FOOD AND
AGRICULTURE**

1. Election of Chair, Vice-Chair(s) and Rapporteur
2. Adoption of the agenda and timetable
3. Status of implementation of the Global Plan of Action for Animal Genetic Resources
 - 3.1 Review of implementation of the Global Plan of Action for Animal Genetic Resources
 - 3.2 Status of the development of the Domestic Animal Diversity Information System
4. Access and benefit-sharing for genetic resources for food and agriculture
5. “Digital sequence information” on genetic resources for food and agriculture
6. Draft work plan for future work on sustainable use and conservation of micro-organism and invertebrate genetic resources for food and agriculture
7. Draft Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018–2027)
8. Any other business
9. Adoption of the Report

APPENDIX B

ACCESS AND BENEFIT-SHARING FOR ANIMAL GENETIC RESOURCES
FOR FOOD AND AGRICULTUREI. DISTINCTIVE FEATURES OF ANIMAL GENETIC RESOURCES FOR FOOD
AND AGRICULTURE

A. Role of GRFA for food security	A.1 Genetic resources for food and agriculture (GRFA) are an integral part of agricultural and food production systems and play an essential role for achieving food security and the sustainable development of the food and agriculture sector.	+
	A.2 Plant, animal, invertebrate and micro-organism GRFA form an interdependent network of genetic diversity in agricultural and aquatic ecosystems respectively.	+
B. Role of human management	B.1 (a) The existence of most GRFA is closely linked to human activity. (b) Many GRFA can be regarded as human-modified forms of genetic resources.	+
	B.2 The maintenance and evolution of many GRFA depend on continued human intervention, and their sustainable utilization in research, development and production is an important instrument to ensure conservation.	+
C. International exchange and interdependence	C.1 Historically, GRFA have been widely exchanged across communities, countries and regions over often long periods of time, and a relevant part of the genetic diversity used in food and agriculture today is of exotic origin.	+
	C.2 Countries are interdependent with regard to GRFA and act both as providers of some GRFA and as recipients of others.	+
	C.3 The international exchange of GRFA is essential to the functioning of the sector, and its importance is likely to increase in future.	+
D. Nature of the innovation process	D.1 The innovation process for GRFA is usually of incremental nature and the result of contributions made by many different people, including indigenous and local communities, farmers, researchers and breeders, in different places and at different points in time.	+
	D.2 Many GRFA products are not developed out of an individual genetic resource, but with the contributions of several GRFA at different stages in the innovation process.	
	D.3 Most products developed with the use of GRFA can in turn be used as genetic resources for further research and development, which makes it difficult to draw a clear line between providers and recipients of GRFA.	
	D.4 Many agricultural products reach the market place in a form in which they may be used both as biological resources and as genetic resources.	
E. Holders and users of GRFA	E.1 (a) GRFA are held and used by a broad range of very diverse stakeholders. (b) There are distinct communities of providers and users with respect to the different subsectors of GRFA.	+
	E.2 The different stakeholders managing and using GRFA are interdependent.	+
	E.3 A significant amount of GRFA is privately held.	+
	E.4 An important part of GRFA is held and can be accessed <i>ex situ</i> .	
	E.5 An important part of GRFA is conserved <i>in situ</i> and on-farm under different financial, technical and legal conditions.	+
F. GRFA exchange practices	F.1 The exchange of GRFA takes place in the context of customary practices and existing communities of providers and users.	+
	F.2 An extensive transfer of genetic material between different stakeholders along the value chain occurs in research and development.	+
G. Benefits generated with the use of GRFA	G.1 (a) While the overall benefits of GRFA are very high, (b) it is difficult to estimate at the time of the transaction the expected benefits of an individual sample of GRFA.	
	G.2 The use of GRFA may also generate important non-monetary benefits.	+
	G.3 The use of GRFA may lead to external effects going far beyond the individual provider and recipient.	+

II. REVISED DRAFT EXPLANATORY NOTES DESCRIBING, WITHIN THE CONTEXT OF THE ABS ELEMENTS, THE DISTINCTIVE FEATURES OF ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE

1. The following draft explanatory notes aim to (i) provide relevant background information on the livestock sector to policy-makers developing, adapting or implementing ABS measures and (ii) clarify some of the issues raised in the ABS Elements as they are relevant to animal genetic resources for food and agriculture (AnGR).

Background information on animal genetic resources

2. ABS policy-makers may find it useful to receive some background information on the use and exchange of AnGR.²³ Explanatory notes should therefore explain that:

The livestock industry is a well-established, fast-growing sector. Animal husbandry has been practised worldwide for more than 10 000 years, leading to the development and use of a wide range of breeds under diverse production systems.

Substantial technical changes occurred in animal breeding at the end of the eighteenth century, leading to breed development, establishment of herd books and formation of breeder societies. Major developments in quantitative genetics in the mid-twentieth century supported the introduction of science-based tools to estimate breeding value, such as the selection index, and later the best linear unbiased prediction (BLUP) and Animal Model, which resulted in enhanced selection response and genetic progress in purebred populations. The rapid development of molecular genetics enabled the introduction of marker-assisted selection. DNA sequencing helped to determine genetic backgrounds of many production traits and other important traits in livestock species. Single nucleotide polymorphism (SNP) discovery and analysis led to the introduction of genomic selection. In the commercial production of meat and eggs, science-based crossbreeding methods and selection towards enhanced heterosis were introduced, to enhance yield and profitability of livestock production. Dissemination of genetic progress accelerated with the introduction of biotechnology and reproduction technologies in particular artificial insemination.

In general, two major processes led to breed development. The first relied on adaptation of livestock populations to specific environmental and husbandry conditions within extensive and mixed production systems. This resulted in the formation of many local breeds worldwide. The second major process was based on the selection of animals for their ability to yield specific products especially under improved nutrition and management conditions. This led to the development of highly performing, international breeds for commercial production.

AnGR are used by a wide range of stakeholders and the level of centralization and specialization of breeding activities is quite variable within the sector both at species and regional level. Traditionally, the management of AnGR and breeding lies in the hands of livestock keepers who combine breeding and production functions within the same populations. This can be done at a fairly local scale, selecting the animals to form the next generation from locally available herds and flocks, or at a regional or national scale by forming a common breeding population through breeding associations or herd book societies. In recent decades, a highly specialized breeding sector has developed for some livestock species and in some regions of the world. In the poultry sector in particular, relatively high reproduction rates and other biological features have enabled a large-scale breeding industry to centralize genetic improvement and the supply of improved animals to producers. Similar structures are present in the pig sector, although to a lesser extent, and also emerging in the dairy sector.

In livestock production only about 40 species are used, with some of them having a rather small contribution to total food production. The “big five” species – cattle, pig, sheep, goat and chicken – provide the majority of animal origin food products. In livestock breeding, the role of wild relatives of domesticated species is currently negligible.

²³ See also [Background Study Paper No. 45](#).

Since the 1980s, the livestock sector has been under severe pressure to enhance total contributions to food production. The driving force of this phenomenon, termed as the Livestock Revolution,²⁴ was the growing demand for animal origin products and the increase of intensive commercial production in developing countries. Between 1980 and 2014, global meat and milk production increased by 234 and 170 percent, respectively. The Livestock Revolution resulted in a significant shift of livestock production from temperate zones to the tropics and subtropics.

FAO estimates²⁵ show that in order to feed 9.1 billion people in 2050, annual cereal production will need to rise to about 3 billion tonnes and annual meat production will need to reach 470 million tonnes, if the current trends in consumption continue.

While animals are mainly used for food production and other provisioning services (e.g. fibre, pelt, traction), it is important to underline other regulatory and supporting ecological services they provide in a diverse range of agro-ecosystems (e.g. nutrient recycling and weed control). They also have important cultural values (e.g. identity, wealth and status, recreation and sports), which tend to be especially important in extensive and mixed production systems.

Identification and consultation of relevant governmental entities and non-governmental stakeholders holding, providing or using GRFA

3. The ABS Elements recommend consulting government entities and non-governmental stakeholders holding, providing or using GRFA.²⁶ Explanatory notes should explain that:

The competent authority for ABS will often not be the authority that is responsible for livestock and animal breeding or animal health and, therefore, it may benefit from direct consultations with relevant governmental authorities and stakeholders.

The livestock sector is characterized by a wide range of stakeholders, including individual livestock keepers and breeders, pastoralists and their associations, breeding and herd book associations, the breeding industry, breeding and research centres, conservation farms and facilities, genebanks, universities, researchers, extension and veterinary services, non-governmental organizations (NGOs), and relevant regulatory authorities. All these stakeholders should be consulted in the development and implementation of ABS for AnGR. Their involvement will be important to allow ABS policy-makers and regulators to gain insight into the specificities of farm animal research and development as well as existing use and exchange practices of the subsector in order to avoid regulatory restrictions that unnecessarily impede the use, development and conservation of AnGR and disrupt established AnGR exchange practices.

Integration of ABS measures with broader food security and sustainable agricultural development policies and strategies

4. The ABS Elements recommend considering ABS for GRFA in the wider context of sustainable agricultural development and food security.²⁷ Explanatory notes should therefore explicitly refer to policies and legislation in the areas of food security and livestock production, which could either integrate or refer to relevant provisions for ABS for AnGR:

Farm animals play an important role in providing food, sustaining livelihoods and providing countries with a variety of economic outputs. In parts of the world that are non- or hardly arable, keeping farm animals is a prerequisite. Examples of when livelihood depends solely on livestock keeping include among others: reindeer herders in the tundra; yak herders in Asia's high altitude zones; keepers of Bactrian camels and dromedaries in the desert and nomads relying on cattle, sheep and goats in the semi-arid steppes and

²⁴ See Delgado, C.H., Rosegrant, M., Steinfeld, H., Ehui, S. & Courbois, C. 1999. *Livestock to 2020. The next food revolution*. Food, Agriculture, and the Environment Discussion Paper 28.

²⁵ FAO. 2009. *How to feed the world in 2050* (available at http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf).

²⁶ ABS Elements, paragraph 15.II.

²⁷ ABS Elements, paragraph 15.III.

savannahs, to name just a few. Livestock may be especially important for poor people, who derive multiple benefits from their animals. Livestock contribute to the availability of food at the household level, both for direct consumption and the supply of products and services that are sold to buy other types of food and goods. Livestock development provides opportunities to achieve poverty alleviation and enhance livelihoods in low-input production systems, for example, through provision of environmental services and further development of niche market products. At the same time some livestock production systems use fodder that is suitable for human consumption. Moreover, they may also deplete natural resources such as water and land.

In many countries ABS measures have been or are being developed as stand-alone legislation or policy. It is, however, important to develop ABS measures in harmony with other related policies and to integrate them with these policies, such as agricultural development or poverty reduction strategies, and other livestock policies. It is likewise important to involve the livestock sector from the outset in the development and implementation of ABS measures to ensure that policy-makers have a full understanding of the domestic livestock sector, current flows of AnGR and potential implications of ABS measures on the domestic livestock production. Also ABS measures do not need to be stand-alone legislation. Several policies and regulations developed in other sectors can address ABS measures for AnGR.

Integration of implementation of ABS measures into the institutional landscape

5. The ABS Elements recommend identifying existing institutional arrangements that may be used to address ABS.²⁸ Explanatory notes should explain that:

Responsibility for the national ABS framework is often with one single competent authority. In fact, national interim reports on the implementation of the Nagoya Protocol show that many countries have chosen to select a single competent authority for ABS, rather than taking a sector or subsector-specific approach to ABS. However, several authorities within one country may share the responsibility for ABS and thus ABS for AnGR could fall under the competence of a specialized authority dealing with livestock matters. Whether such sharing of ABS competences is useful will depend on the institutional landscape and other country-specific circumstances.

Communication of, and awareness raising regarding ABS measures for potential providers and users of GRFA

6. The ABS Elements stress the importance of communicating ABS measures to potential providers, holders and users of GRFA.²⁹ Explanatory notes should explain that:

Like other subsectors, the livestock community is in many cases not yet aware of ABS and its potential implications for research and development. On the other hand, countries providing AnGR will increasingly expect recipients/users of their resources to be aware of and comply with applicable ABS measures. Similarly, research partners of international research projects will expect from each other understanding of and full compliance with relevant national ABS measures.

Awareness-raising measures at national level should target breeders, researchers and policy-makers in particular. Events such as animal shows, meetings of breeder associations and relevant scientific conferences provide excellent opportunities to provide information on ABS to relevant stakeholders and information multipliers. Breeder associations and research organizations may wish to establish and maintain an ABS help desk and facilitate communication with the national competent authority. Information could also be disseminated through publications, newsletters and other media and information channels. Bio-cultural Community Protocols as well as the ABS Elements may serve as awareness-raising tools.

²⁸ ABS Elements, paragraph 30.

²⁹ ABS Elements, 3.VI.

Access and benefit-sharing for genetic resources for food and agriculture: the international legal framework

7. The ABS Elements refer to three international instruments, which are part of the global framework for ABS for genetic resources: the CBD, the Nagoya Protocol and the Treaty. Explanatory notes should explain that:

In addition to these legally binding instruments, other instruments, such as the Global Plan of Action for Animal Genetic Resources (GPA), are worthy of being considered in the development and implementation of ABS measures for AnGR. The GPA, prepared by the Commission and adopted by the International Technical Conference on Animal Genetic Resources for Food and Agriculture in 2007, provides the international framework for the inventory, characterization, monitoring, sustainable use and conservation of AnGR as well as for capacity building for improved management of these resources.

Through the Interlaken Declaration on Animal Genetic Resources countries committed themselves “to facilitating access to [animal genetic] resources and the fair and equitable sharing of the benefits arising from their use, consistent with relevant international obligations and national laws”.³⁰ The Interlaken Declaration also recognizes private ownership and individual breeder improvement of genetic resources and their discretion in how they may choose to sell and maintain their property.³¹ Among the main aims of the GPA is “to promote a fair and equitable sharing of the benefits arising from the use of animal genetic resources for food and agriculture, and recognize the role of traditional knowledge, innovations and practices relevant to the conservation of animal genetic resources and their sustainable use, and, where appropriate, put in place effective policies and legislative measures”. In addition, the GPA aims “to meet the needs of pastoralists and farmers, individually and collectively, within the framework of national law, to have non-discriminatory access to genetic material, information, technologies, financial resources, research results, marketing systems, and natural resources, so that they may continue to manage and improve animal genetic resources, and benefit from economic development”.³²

The GPA provides, as one of the actions of GPA Strategic Priority 3, *Establish and strengthen national sustainable use policies*, for the development of “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”.³³

GPA Strategic Priority 4, *Establish national species and breed development strategies and programmes*, proposes as one action the provision of “information to farmers and livestock keepers to assist in facilitating access to animal genetic resources from various sources”.

According to the GPA “appropriate conservation measures should ensure that farmers and researchers have access to a diverse gene pool for further breeding and research”.³⁴

GPA Strategic Priority 9, *Establish or strengthen ex situ conservation programmes*, proposes to “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”.³⁵

With regard to international policies and regulatory frameworks relevant to AnGR, GPA Strategic Priority 21 proposes to “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”.³⁶

³⁰ Interlaken Declaration, paragraph 4.

³¹ Interlaken Declaration, paragraph 12.

³² Global Plan of Action for Animal Genetic Resources, paragraph 15.

³³ Global Plan of Action for Animal Genetic Resources, Strategic Priority 3, Action 2.

³⁴ Global Plan of Action for Animal Genetic Resources, paragraph 37.

³⁵ Global Plan of Action for Animal Genetic Resources, Strategic Priority 9, Action 3.

³⁶ Global Plan of Action for Animal Genetic Resources, Strategic Priority 21, Action 2.

The *Funding Strategy for the Implementation of the Global Plan of Action for Animal Genetic Resources*, adopted by the Commission in 2009, aims to enhance the availability, transparency, efficiency and effectiveness of the provision of substantial and additional financial resources, and to strengthen international cooperation to support and complement the efforts of developing countries and countries with economies in transition in the implementation of the GPA.

While not providing a “specialized instrument” for access and benefit-sharing for AnGR, the GPA, together with its Funding Strategy, could thus provide the basis for access and benefit-sharing arrangements that facilitate access to AnGR and ensure at the same time fair and equitable sharing of benefits.

Members reaffirmed their commitment to the implementation of the GPA in 2017 and, in adopting Conference Resolution 3/2017, invited countries “to consider the distinctive features of the subsector of animal genetic resources for food and agriculture in domestic access and benefit-sharing legislation, where appropriate, taking into account international developments in access and benefit-sharing”.³⁷

Rationale of access and benefit-sharing measures for genetic resources for food and agriculture

8. According to the ABS Elements, “ABS measures may be instrumental in furthering the achievement of food security and improving nutrition. (...) Therefore, ABS measures aimed at achieving food security and the conservation of GRFA should aim to facilitate and actively encourage the continued use and exchange of GRFA for research and development and benefit-sharing”.³⁸ Explanatory notes should explain that:

Continuous availability of AnGR research and development is indispensable to further enhance output, sustainability and efficiency of animal production and thereby contribute to food security and nutrition and rural development. Countries may wish to perform *ex ante* cost-benefit analysis in considering development of ABS measures and to identify what ABS regulations would do for users (breeders/producers) in the country as well as for sellers of AnGR. Countries may consider the potential benefits to AnGR gene flow in the absence of ABS measures or due to the exemption of AnGR from the access measures, when exchange of AnGR is based on private contracts.

The conservation of local and regional breeds is also of cultural importance and essential to maintaining traditional lifestyles, for example of many pastoral peoples and other farming communities.

Flows of germplasm, including international flows and possible gaps in ABS measures

9. The ABS Elements recommend that in developing, adapting and implementing ABS measures, the relevance of germplasm flows should be considered.³⁹ Explanatory notes should explain that:

AnGR are widely exchanged throughout the world with well-established protocols and markets for exchange. Livestock keepers and breeders in many parts of the world have contributed to the development of these breeds, and today livestock production in most regions depends on AnGR that originated or were developed elsewhere. Currently, major flows of germplasm in the commercially most relevant species take place between developed countries or from developed to developing countries. Genetic material of some breeds adapted to tropical and subtropical environmental conditions is also exchanged from developed to developing and among developing countries. In contrast to the commercially relevant breeds that are widely exchanged, most breeds are used locally and are not involved in international exchange. This may change, as traits needed to respond to future challenges of livestock production may be found in locally adapted breeds. This may not only increase the exchange of AnGR overall, but could possibly in the future also lead to some flow of germplasm from developing to developed countries.

³⁷ C 2017/REP, *Appendix D*.

³⁸ ABS Elements, Chapter 5.

³⁹ ABS Elements, paragraph 15 I.e.

The need to adapt livestock production to future challenges also highlights the importance of effectively conserving the full range of existing diversity, *in situ* and/or *ex situ*. Genetic diversity can be lost both at the level of breeds, when local breeds fall out of use and hence risk extinction, and at the within-breed level, when the effective population size of widely used breeds becomes too small because of the extensive use of a limited number of sires or parent animals.

Categories of genetic resources use covered by ABS measures

10. The ABS Elements stress that ABS measures need to be clear as to which GRFA are covered by relevant access provisions and which are not.⁴⁰ This consideration applies likewise to the temporal and the subject-matter scope of ABS measures. Explanatory notes should explain that:

AnGR made available for direct use, e.g. for consumption (eggs), slaughter/fattening or males/semen for reproduction, can also be used as genetic resources (for research and development, including breeding). Some countries are concerned that genetic resources that have been accessed without prior informed consent (PIC) and mutually agreed terms (MAT) could end up being used for research and development. Their ABS measures therefore regulate access to genetic resources for both direct use and research and development.

However, regulating access to AnGR for direct use may have a significant impact on trade of animals for slaughter and in animal reproductive materials (e.g. semen, embryos) and therefore on food security. If ABS measures do not regulate access to AnGR for direct use, they could still require the user to obtain PIC and share benefits should the intention change and animals or reproductive materials originally intended for direct use end up being used for research and development.

Development of AnGR in the course of livestock farming

11. Access to genetic resources for their “utilization”, as defined by the Nagoya Protocol, will usually trigger the application of ABS measures. According to the Nagoya Protocol, “utilization” means “to conduct research and development on the genetic and/or biochemical composition of genetic resources”.⁴¹ The ABS Elements point out that it may be difficult in some cases to decide whether GRFA are utilized within the meaning of the Nagoya Protocol as there are activities that may serve several purposes, including research and development, at the same time.⁴² Explanatory notes should explain that:

There is a need to clearly identify activities related to AnGR that are considered “utilization” and those which are not. States should review and identify activities associated with AnGR that can be considered “utilization”. Activities based on or involving the identification of various phenotypic, genetic or biochemical characteristics of accessed AnGR are usually considered research and development. On the other hand, trade in live animals or their reproductive materials, performing or improving reproductive biotechnology methods in given species (artificial insemination, embryo transfer, gonad grafting) and the multiplication of animals for commercial production, as well as the fattening of animals for slaughter or keeping them for milk or egg production will clearly not qualify as “utilization” and, therefore, dependent on the applicable laws, not trigger the application of ABS measures.

Policy-makers may also wish to address the “re-utilization” of AnGR previously generated through “utilization” with PIC and MAT. If “re-utilization” requires PIC and MAT just like the first utilization of AnGR, this could in the future create “permit pyramids” and complicate the future “utilization” of AnGR. Animal breeders could choose to avoid, rather than use, conserve and further improve AnGR. The ABS Expert Team suggested that governments consider distinctive solutions to this issue, including through supporting the

⁴⁰ ABS Elements, paragraph 36.

⁴¹ Nagoya Protocol, Article 2.

⁴² ABS Elements, paragraph 46–48.

development of subsector standards building on current best practices, such as the breeders' exemption in the plant sector, or putting in place multilateral solutions.⁴³

Research and development for food and agriculture

12. The ABS Elements refer to Article 8(c) of the Nagoya Protocol, which calls upon Parties to consider the importance of GRFA and their special role for food security in the development of ABS legislation or regulatory requirements. Explanatory notes should explain that:

To acknowledge the special role of GRFA for food security, governments could consider treating access to and utilization of genetic resources differently if they are intended to contribute to food and agricultural research and development. One option would be to waive the PIC and MAT requirements for access to AnGR for research and development in the livestock sector.

Commercial/non-commercial research and development

13. ABS measures sometimes distinguish between commercial and non-commercial utilization of genetic resources.⁴⁴ Explanatory notes should explain that:

In the livestock sector, non-commercial research aims to develop methods focusing on agricultural development, thus providing societal benefits and benefits to farmers (research to improve methods of genetic improvement and selection, research on adaptation and disease resistance of AnGR) and methods for control measures (veterinary checks, food safety and traceability). Public research is fundamental for the livestock sector, and has moved to precompetitive research on methods including sequencing and genotyping that are freely available.

Commercial research, carried out by the breeding industry, is focused on methods for genetic improvement of traits of interest (e.g. yield and content of products, reproduction, health, longevity, efficiency of using inputs) and improvement of husbandry conditions (feeding, housing, health care). This research is usually conducted on privately owned genetic stocks (selection) or outsourced (management).

Standardization of PIC and MAT

14. The ABS Elements encourage governments to consider the different options of authorization procedures, including the option of standardizing procedures, terms and conditions. The ABS Elements refer to the Standard Material Transfer Agreement of the Treaty, as an example. Explanatory notes should explain that:

The most common trade in AnGR is carried out between breeders and farmers, which is based on bilateral agreements, and the price usually reflects the value of the animals or their biological material. In the past, such transfers did not require PIC or MAT.

If a country chooses not to exempt AnGR from its ABS measures, the authorization process to obtain PIC will depend on the established ABS framework and the provider of the AnGR. To ensure efficiency in view of the high number of exchanges, standardization of PIC and MAT might be helpful.

Access to traditional knowledge associated with GRFA

15. The ABS Elements refer to the obligation of Parties to the Nagoya Protocol to take measures, in accordance with domestic law and as appropriate, with the aim of ensuring that traditional knowledge (TK) associated with genetic resources is accessed with the PIC or approval and involvement of the indigenous and local communities holding such traditional knowledge, and that MAT have been established.⁴⁵ Explanatory notes should explain that:

⁴³ CGRFA/TILE-ABS-3/16/Report, paragraph 20.

⁴⁴ ABS Elements paragraph 50.

⁴⁵ ABS Elements, paragraph 63.

Procedures for involving indigenous peoples and local communities (IPLC) in granting TK to AnGR are diverse, and under development in many countries. IPLC should be involved in decisions that concern their TK associated with AnGR, and the domestic ABS regulatory measures should respect Bio-cultural Community Protocols and specific institutional arrangements developed by these communities. In cases where several communities share TK associated with AnGR, and only one has granted PIC, a mechanism for benefit-sharing involving all relevant IPLCs could be considered. Bio-cultural Community Protocols are also useful to support *in situ* conservation of locally adapted breeds, which in some cases may be necessary to maintain endangered breeds and ensure their future availability.

Fair and equitable sharing of benefits for pre-existing AnGR

16. The ABS Elements note that many GRFA have been collected long before the application of national ABS measures. Therefore, national ABS measures should be clear as to whether they require the sharing of benefits arising from new or continued uses of genetic resources or associated TK accessed prior to the ABS measures having been put into place.⁴⁶ Explanatory notes should explain that:

AnGR have been widely exchanged throughout the world and most breeds are of mixed ancestry. Livestock keepers and breeders in many parts of the world have contributed to the development of these breeds, and today livestock production in most regions depends on AnGR that originated or were developed elsewhere. Over generations, AnGR have been integrated into domestic livestock populations.

It is important to note that there are no examples of any benefit-sharing arrangements for AnGR, or associated TK, accessed prior to the entering into force of the Nagoya Protocol, or prior to the introduction of national ABS measures. It would be extremely difficult, if not impossible, to track the progeny of past imported farm animals.

Model contractual clauses, codes of conduct, guidelines, best practices and/or standards for AnGR

17. In the context of bilateral, case-by-case and multilateral benefit-sharing arrangements, the ABS Elements also refer to the use of model contractual clauses, codes of conduct, etc.⁴⁷ Explanatory notes should explain that:

The fair and equitable sharing of benefits arising from the utilization of genetic resources is a key component of ABS measures. Benefits may include monetary and non-monetary benefits.

With respect to the livestock sector, there are established practices for the exchange of AnGR, and various types of private contracts and standard clauses used by the subsector. ABS measures may take these commercial exchange practices into account.

Benefit-sharing through pooling of benefits

18. The ABS Elements consider various benefit-sharing options to accommodate the incremental nature of the innovation process typical of many GRFA, including the pooling of benefits in a national benefit-sharing fund and multilateral solutions.⁴⁸ The feasibility of such benefit-sharing options may vary from subsector to subsector. Explanatory notes should explain that:

Processes to develop AnGR are incremental in nature, and are based on contributions of many people in different countries at different points of time. They involve continuous exchange of AnGR that are beneficial to farmers/breeders at each step of the breeding process.

Further globalization of animal breeding has enhanced the availability of highly producing AnGR, without restrictions, worldwide, and on a commercial basis. This has supported

⁴⁶ ABS Elements, paragraph 66.

⁴⁷ ABS Elements, paragraph 68.

⁴⁸ ABS Elements, paragraphs 69–71.

rapid enhancement of animal production in developing countries and improved food security.

However, there is also a need for increased access, availability and affordability of adapted and improved genetic material for small-scale farmers. At national levels, benefit-sharing mechanisms may involve returning improved breeding stock from selection programmes, in good sanitary state, to the original owners. At the global level, benefit sharing may be facilitated by projects supported by the *Funding Strategy for the implementation of the Global Plan of Action for Animal Genetic Resources*.

Benefit-sharing through cooperation agreements

19. The ABS Elements stress the importance of sharing monetary and non-monetary benefits and note that the terms and conditions of such benefit-sharing will often depend on the particularities and specificities of the subsector, the species, the concrete intended use, etc.⁴⁹ The ABS Elements note that GRFA are often exchanged in the framework of working collaborations and partnerships. ABS measures could therefore allow for benefit-sharing arrangements tailor-made to the subsector's collaboration and partnership practices.⁵⁰ Explanatory notes should explain that:

With respect to AnGR, the sharing of research results is of key importance, as it contributes to the generation of public knowledge on AnGR. Much of the resulting knowledge products and data are freely available. Other forms of non-monetary benefits that could be shared in cooperation agreements may include the provision of information on the estimated breeding value of sold breeding stock, its requirements related to management conditions and husbandry practices. Non-monetary benefits may also include capacity development, provision of extension services and technology transfer and cooperation in setting up *in situ* and *ex situ* conservation programmes.

In the AnGR sector a number of global consortia were established to further AnGR research and knowledge exchange, for example, the Swine Genome Sequencing Consortium (SGSC), the International Goat Genome Consortium (IGGC), the International Research Consortium for Animal Health (IRC) and networks such as EUGENA (European Gene Bank Network for Animal Genetic Resources).

Compliance and monitoring

20. The ABS Elements refer to the different types of compliance measures in the area of ABS, including: compliance of countries with an international instrument, such as the Nagoya Protocol; compliance of users with PIC and MAT; and compliance with domestic legislation of the providing country. The ABS Elements note that compliance measures may pose challenges to the food and agriculture sector if the ABS status of GRFA used in breeding is unknown to users.⁵¹ Explanatory notes should explain that:

Sometimes the unknown origin of AnGR in older collections, genebanks or in herds, may make it difficult to determine the countries of origin during the checks of user compliance.

⁴⁹ ABS Elements, paragraph 73.

⁵⁰ ABS Elements, paragraph 74.

⁵¹ ABS Elements, paragraph 76.

APPENDIX C
DRAFT REVISED STRATEGIC PLAN

ANNEX 1
MULTI-YEAR PROGRAMME OF WORK: MAJOR OUTPUTS AND MILESTONES
(2018–2027)

	17 th Session 2019	18 th Session 2021	19 th Session 2023	20 th Session 2025	21 st Session 2027
Sectoral matters					
Animal genetic resources		Review of implementation of the Global Plan of Action for Animal Genetic Resources		Presentation of <i>The Third Report on the State of the World's Animal Genetic Resources for Food and Agriculture</i>	Review of the Global Plan of Action for Animal Genetic Resources
Aquatic genetic resources	Presentation of the finalized <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>	Follow-up to <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>		Follow-up to <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>	
Forest genetic resources	Review of implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources		Presentation of <i>The Second Report on the State of the World's Forest Genetic Resources</i>	Review of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources	
Micro-organisms and invertebrates		Review of work on micro-organisms and invertebrates		Review of work on micro-organisms and invertebrates	
Plant genetic resources	Review of status and trends of seed policies		Presentation of <i>The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture</i>	Review of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture	Review of implementation of the (Second) Global Plan of Action for Plant Genetic Resources for Food and Agriculture
Cross-sectoral matters					
<i>The State of the World's Biodiversity for Food and Agriculture</i>	Follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>		Follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>		Follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>
Access and benefit-sharing (ABS)	Develop explanatory notes for subsectors of GRFA to complement the ABS Elements	Review of work on ABS		Review of work on ABS	
Biotechnologies		Review of the development of biotechnologies and their potential impact on the conservation and sustainable utilization of GRFA		Review of the development of biotechnologies and their potential impact on the conservation and sustainable utilization of GRFA	
"Digital sequence information on GRFA" *	Consider the use of "digital sequence information on GRFA" and the potential implications for conservation, sustainable use and ABS of GRFA		Consider the use of "digital sequence information on GRFA" and the potential implications for conservation, sustainable use and ABS of GRFA		
Climate change		Review of work on climate change and GRFA	Review of a country-driven global assessment of climate change effects and genetic resource adaptation and mitigation measures	Review of work on climate change and GRFA	
Nutrition and Health	Review of work on GRFA and nutrition	Concept note on biodiversity for food and agriculture and human health	Review of work on GRFA and nutrition and health		Review of work on GRFA and nutrition and health
Management	Progress report/ SDG update/ review of the Strategic Plan		Progress report/ SDG update/ review of the Strategic Plan		Progress report/ SDG update/ review of the Strategic Plan

* The term is taken from decision CBD COP XIII/16 and is subject to further discussion. There is a recognition that there are a multiplicity of terms that have been used in this area (including, *inter alia*, "genetic sequence data", "genetic sequence information", "genetic information", "dematerialized genetic resources", "*in silico* utilization", etc.) and that further consideration is needed regarding the appropriate term or terms to be used.

ANNEX 2
SESSION PLANNING FOR CGRFA-18

Activities in preparation of CGRFA-18 (2020/2021)

Sectoral matters	
Animal genetic resources	<ul style="list-style-type: none"> • Prepare draft outline, timeline and budget and develop process for collecting national data to support the preparation of <i>The Third Report on the State of the World's Animal Genetic Resources for Food and Agriculture</i> • Prepare synthesis progress report to provide a global overview of progress made to implement the Global Plan of Action • Prepare FAO progress report on the implementation of the Global Plan of Action and the Funding Strategy • Prepare international organizations progress report • Prepare brief report on the status and trends of animal genetic resources
Aquatic genetic resources	<ul style="list-style-type: none"> • Develop follow-up to <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i> • Prepare “in brief” version of <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i> • Publish country reports submitted for the preparation of <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>
Forest genetic resources	<ul style="list-style-type: none"> • Prepare FAO progress report on the implementation of the Global Plan of Action for Forest Genetic Resources • Prepare an update on the preparation of Second Implementation Report and <i>The Second Report on the State of the World's Forest Genetic Resources</i> (including collection of national data)
Micro-organisms and invertebrates	<ul style="list-style-type: none"> • Review of work on micro-organisms and invertebrates • Follow-up on previous recommendations by the Commission on this matter
Plant genetic resources	<ul style="list-style-type: none"> • Prepare FAO progress report on the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture • Prepare update on the preparation of <i>The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture</i>
Cross-sectoral matters	
<i>The State of the World's Biodiversity for Food and Agriculture</i>	<ul style="list-style-type: none"> • Prepare progress report on the implementation of the follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>
Access and benefit-sharing	<ul style="list-style-type: none"> • Prepare review of existing access and benefit-sharing instruments and their impact on genetic resources for food and agriculture and define future work • Follow-up on previous recommendations by the Commission on this matter
Biotechnologies	<ul style="list-style-type: none"> • Review of the development of biotechnologies and their potential impact on the conservation and sustainable utilization of genetic resources for food and agriculture
“Digital sequence information”	<ul style="list-style-type: none"> • Follow-up on previous recommendations by the Commission on this matter
Climate change	<ul style="list-style-type: none"> • Status of preparation of the global assessment of the role of genetic resources for food and agriculture for climate change adaptation and mitigation • Follow-up on previous recommendations by the Commission on this matter
Food security, nutrition and health	<ul style="list-style-type: none"> • Follow-up on previous recommendations by the Commission on this matter • Concept note on biodiversity for food and agriculture and human health
Management	<ul style="list-style-type: none"> • Prepare progress report of the Strategic Plan, MYPOW review and SDG reporting
Other matters	<ul style="list-style-type: none"> • Invite international instruments and organizations to report on their work in supporting the activities of the Commission and collate their inputs

APPENDIX D
LIST OF DOCUMENTS

WORKING DOCUMENTS

CGRFA/WG-AnGR-10/18/1/Rev.1	Provisional agenda
CGRFA/WG-AnGR-10/18/1 Add.1/Rev.1	Provisional annotated agenda and timetable
CGRFA/WG-AnGR-10/18/2	Review of implementation of the Global Plan of Action for Animal Genetic Resources
CGRFA/WG-AnGR-10/18/3	Report on the status of the development of the Domestic Animal Diversity Information System
CGRFA/WG-AnGR-10/18/4	Draft explanatory notes describing, within the context of the ABS Elements, the distinctive features of animal genetic resources for food and agriculture
CGRFA/WG-AnGR-10/18/5	Review of the draft exploratory fact-finding scoping study on "digital sequence information" on genetic resources for food and agriculture
CGRFA/WG-AnGR-10/18/6	Draft work plan for the sustainable use and conservation of micro-organism and invertebrate genetic resources for food and agriculture
CGRFA/WG-AnGR-10/18/7	Draft Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018-2027)

INFORMATION DOCUMENTS

CGRFA/WG-AnGR-10/18/Inf.1	Statutes of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture, and Members elected by the Sixteenth Regular Session of the Commission
CGRFA/WG-AnGR-10/18/Inf.2	Detailed FAO progress report on the implementation of the Global Plan of Action for Animal Genetic Resources
CGRFA/WG-AnGR-10/18/Inf.3	Status and trends of animal genetic resources – 2018
CGRFA/WG-AnGR-10/18/Inf.4	Draft guidelines on developing sustainable value chains for small-scale livestock producers
CGRFA/WG-AnGR-10/18/Inf.5	Review of the draft exploratory fact-finding scoping study on "digital sequence information" on genetic resources for food and agriculture
CGRFA/WG-AnGR-10/18/Inf.6	Detailed analysis of the Domestic Animal Diversity Information System with focus on population data
CGRFA/WG-AnGR-10/18/Inf.7	Global survey of honey bees and other pollinators
CGRFA/WG-AnGR-10/18/Inf.8	Inputs by Members and observers on access and benefit-sharing for genetic resources for food and agriculture
CGRFA/WG-AnGR-10/18/Inf.9	Outputs of the International Workshop on Access and Benefit-sharing for Genetic Resources for Food and Agriculture
CGRFA/WG-AnGR-10/18/Inf.10	Proceedings of the International Workshop on Access and Benefit-sharing for Genetic Resources for Food and Agriculture – Preliminary version
CGRFA/WG-AnGR-10/18/Inf.11	Access and benefit-sharing for genetic resources for food and agriculture: survey findings
CGRFA/WG-AnGR-10/18/Inf.12	Draft exploratory fact-finding scoping study on "digital sequence information" on genetic resources for food and agriculture
CGRFA/WG-AnGR-10/18/Inf.13	List of documents

OTHER DOCUMENTS

The contributions of livestock species and breeds to ecosystem services

Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture (full version)

Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture (in brief)

FAO. 2018. Farmer field schools for small-scale livestock producers – A guide for decision makers on improving livelihoods. FAO Animal Production and Health Guidelines No. 20. Rome. 56 pp.

Animal Genetic Resources - an international journal • Ressources Génétiques Animales - un journal international • Recursos Genéticos Animales - una revista internacional No. 58.

Animal Genetic Resources - an international journal • Ressources Génétiques Animales - un journal international • Recursos Genéticos Animales - una revista internacional No. 59.

APPENDIX E
**MEMBERS AND ALTERNATES OF THE INTERGOVERNMENTAL TECHNICAL
WORKING GROUP ON ANIMAL GENETIC RESOURCES FOR FOOD AND
AGRICULTURE, ELECTED AT THE SIXTEENTH REGULAR SESSION OF THE
COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE**

<i>Composition (no. of countries per region)</i>	<i>Country</i>
Africa (5)	Burkina Faso Cameroon Kenya Namibia Tunisia <i>First Alternate: Zimbabwe</i> <i>Second Alternate: Senegal</i>
Asia (5)	China India Philippines Republic of Korea Thailand <i>First Alternate: Lao People's Democratic Republic</i> <i>Second Alternate: Indonesia</i>
Europe (5)	Netherlands Norway Poland Slovenia Switzerland <i>First Alternate: France</i> <i>Second Alternate: Sweden</i>
Latin America and the Caribbean (5)	Argentina Costa Rica Cuba Guatemala Panama <i>First Alternate: Brazil</i> <i>Second Alternate: Jamaica</i>
Near East (4)	Jordan Sudan Syrian Arab Republic Yemen <i>First Alternate: Islamic Republic of Iran</i> <i>Second Alternate: Iraq</i>
North America (2)	Canada United States of America
Southwest Pacific (2)	Fiji Tonga <i>First Alternate: Vanuatu</i> <i>Second Alternate: Samoa</i>

