



# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## Item 4 of the Provisional Agenda

### INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE

#### Tenth Session

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### DRAFT EXPLANATORY NOTES DESCRIBING, WITHIN THE CONTEXT OF THE ABS ELEMENTS,\* THE DISTINCTIVE FEATURES OF ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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\*) The *Elements to Facilitate Domestic Implementation of Access and Benefit-sharing for Different Subsectors of Genetic Resources for Food and Agriculture* (ABS Elements) are available in all official UN languages at: <http://www.fao.org/nr/cgrfa/cross-sectorial/abs/>

## I. INTRODUCTION

1. Sustainable Development Goal (SDG) Target 2.5 and SDG Target 15.6 require countries to “promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed”.
2. In 2015, at its Fifteenth Regular Session, the Commission on Genetic Resources for Food and Agriculture (Commission), welcomed the *Elements to Facilitate Domestic Implementation of Access and Benefit-sharing for Different Subsectors of Genetic Resources for Food and Agriculture* (ABS Elements) and invited the Director-General of FAO to bring them to the attention of the Conference.<sup>1</sup> The FAO Conference, at its Thirty-Ninth Session in June 2015, welcomed the ABS Elements and invited Members to consider and, as appropriate, make use of them. The Conference also noted the complementarity between the work of the Commission and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (Nagoya Protocol) in regard to access and benefit-sharing (ABS) for genetic resources.<sup>2</sup>
3. In 2017, at its last session, the Commission “agreed to produce non-prescriptive explanatory notes describing, within the context of the ABS Elements, the distinctive features and specific practices of different subsectors of genetic resources for food and agriculture (GRFA), to complement the ABS Elements”.<sup>3</sup>
4. The Commission invited Members, observers and other stakeholders to provide relevant inputs for such explanatory notes by electronic means, including on their practical experiences in implementing national ABS measures related to GRFA, and the distinctive features and the specific practices of different subsectors of GRFA.<sup>4</sup>
5. The Commission also requested the Secretariat to convene, in collaboration with the Secretariats of the International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty) and the Convention on Biological Diversity (CBD), an international workshop to assist countries to raise awareness of distinctive features and specific practices of subsectors of GRFA in the context of the ABS Elements. It requested that the open-ended workshop be attended by at least one representative per region of each of the Commission’s intergovernmental technical working groups on plant, animal, forest and aquatic genetic resources and seven regionally representative experts from the subsectors of micro-organism and invertebrate GRFA.<sup>5</sup>
6. The International Workshop on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture (Workshop) was held in Rome, Italy, from 10 to 12 January 2018. The Workshop considered inputs received from Members, observers and other stakeholders and provided a forum for participants to exchange information, experiences and views. As requested by the Commission, the Workshop provided outputs for subsequent elaboration into non-prescriptive explanatory notes describing, within the context of the ABS Elements, the distinctive features and specific practices of different subsectors of GRFA.<sup>6</sup> More information on the workshop, including submissions received from Members, observers and other stakeholders, is available on the Commission’s website. The outputs of the workshop as well as the Proceedings have been made available to the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture (Working Group).<sup>7</sup>
7. This document proposes draft non-prescriptive explanatory notes describing, within the context of the ABS Elements, the distinctive features and specific practices of animal genetic resources for food and agriculture (AnGR). It briefly introduces the ABS Elements (II) and presents the distinctive features of AnGR (III). It further identifies, taking into account the outputs of the workshop, areas where explanatory notes could further the aim of the ABS Elements to assist governments in taking into

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<sup>1</sup> CGRFA-15/15/Report, paragraph 22(ii).

<sup>2</sup> C 2015/REP, paragraph 52.

<sup>3</sup> CGRFA-16/17/Report, paragraph 25 (iii).

<sup>4</sup> CGRFA-16/17/Report, paragraph 25 (iv).

<sup>5</sup> CGRFA-16/17/Report, paragraph 25 (v).

<sup>6</sup> CGRFA-16/17/Report, paragraph 25(v), e–g.

<sup>7</sup> CGRFA/WG-AnGR-10/18/Inf.9; CGRFA/WG-AnGR-10/18/Inf.10.

account, in the development, adaptation or implementation of ABS measures, the importance of AnGR, their special role for food security and the distinctive features of AnGR, while complying, as applicable, with international ABS instruments (IV).

## II. ELEMENTS TO FACILITATE DOMESTIC IMPLEMENTATION OF ACCESS AND BENEFIT-SHARING FOR DIFFERENT SUBSECTORS OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE

8. The Nagoya Protocol has been hailed as a giant step towards the implementation of the third objective of the Convention on Biological Diversity (CBD): the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to them. Implementing this third objective should contribute to the conservation of biological diversity and the sustainable use of its components, the other two objectives of the CBD.

9. The Nagoya Protocol requires its Contracting Parties to consider, in the development and implementation ABS measures, the importance of GRFA and their special role for food security.<sup>8</sup> It also explicitly recognizes the importance of genetic resources for food security, the special nature of agricultural biodiversity, its distinctive features and problems needing distinctive solutions, the interdependence of all countries with regard to GRFA as well as their special nature and importance for achieving food security worldwide and for sustainable development of agriculture in the context of poverty alleviation and climate change, and acknowledges in this regard the fundamental role of the Treaty.<sup>9</sup>

10. In 2011, the Commission initiated a process that ultimately led to the preparation of the ABS Elements. The Commission established an Ad Hoc Technical Working Group on Access and Benefit-sharing for Genetic Resources for Food and Agriculture that, *inter alia*, identified “relevant distinctive features of the different sectors and subsectors of genetic resources for food and agriculture”.<sup>10</sup> The Working Group, at its Seventh Session in October 2012, welcomed the report of the Ad Hoc Working Group. It reviewed and highlighted several features of genetic resources for food and agriculture that it considered of particular relevance to AnGR.<sup>11</sup>

11. In 2013, the Commission replaced the Ad Hoc Working Group by the Team of Technical and Legal Experts on Access and Benefit-Sharing (ABS Expert Team) and mandated the latter to prepare, in collaboration with the Commission’s Working Groups on plant, animal and forest genetic resources, draft ABS Elements, which would be “*voluntary tools to assist national governments, not new international access and benefit-sharing instruments*”.<sup>12</sup> On this occasion, the Working Group provided specific recommendations on AnGR for the ABS Elements.<sup>13</sup>

12. In 2015, at its Fifteenth Regular Session, the Commission welcomed the ABS Elements. Subsequently, the FAO Conference, the highest Governing Body of FAO, at its Thirty-Ninth Session, welcomed the ABS Elements and invited Members to consider and, as appropriate, make use of them.<sup>14</sup>

13. The ABS Elements aim to assist governments considering developing, adapting or implementing ABS measures to take into account the importance of GRFA, their special role for food security and the distinctive features of the different subsectors of GRFA, while complying, as applicable, with international ABS instruments.

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<sup>8</sup> Nagoya Protocol, Article 8(c).

<sup>9</sup> Nagoya Protocol, Preamble.

<sup>10</sup> CGRFA-14/13/6.

<sup>11</sup> CGRFA/WG-AnGR-7/12/Report, paragraph 32.

<sup>12</sup> CGRFA-14/13/Report, paragraph 40(xv).

<sup>13</sup> CGRFA/WG-AnGR-8/14/Report, paragraph 23.

<sup>14</sup> C 2015/REP, paragraph 52(c) & (d).

14. The ABS Elements recommend, in particular, to:

- Consider, in the development, adaptation or implementation of ABS measures, the distinctive features of the subsector of GRFA concerned, including its activities, socio-economic environment and use and exchange practices;
- identify and consult relevant governmental entities and non-governmental stakeholders holding, providing or using GRFA;
- integrate ABS measures with broader food security and sustainable agricultural development policies and strategies;
- consider and evaluate available options for ABS measures;
- integrate the implementation of ABS measures into the (existing) institutional landscape;
- communicate and raise awareness of ABS measures; and
- assess *ex ante* and monitor the effectiveness and impact of ABS measures for GRFA.

15. The ABS Elements also provide guidance with regard to issues of particular relevance to ABS for GRFA, including AnGR:

- They point out, for example, that in the case of many GRFA, it may be difficult to determine with certainty their “country of origin”. ABS measures usually require that the providing country that is the country of origin has given its prior informed consent (PIC) to the use of a genetic resource for research and development. But GRFA have often been widely exchanged across regions, countries and communities, often over long periods of time, and many different stakeholders have contributed to their development, in different places and at different points in time.<sup>15</sup> AnGR have been distributed widely, among many communities, across various regions, over long periods of time and far beyond their centres of domestication. Through this movement and exchanges, AnGR have acquired in various production environments and under diverse husbandry conditions distinctive features in different regions and countries. For most regional and international breeds, it will therefore be difficult, if not impossible, to identify one specific country as their origin. Both purebred populations of international breeds as well as synthetic breeds and crossbreeds are of mixed origin. The sector uses specific technical terms, such as native, locally adapted and exotic breeds, to describe the status of a breed in a given country.
- The ABS Elements also point out that significant amounts of GRFA are privately held, in particular in sectors such as the livestock sector. They, therefore, recommend that ABS measures need to be clear as to whether they apply to privately held or only to publicly held GRFA and point out that ABS measures may have a significant impact on the exchange of GRFA.<sup>16</sup>
- The ABS Elements further consider which kind of uses of GRFA could trigger the application of ABS measures. ABS measures usually require PIC for access to genetic resources “for their utilization”. “Utilization“, according to the Nagoya Protocol, means “to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology”.<sup>17</sup> While practices, such as acquiring semen from commercial providers to improve the genetic potential of a production herd, might not qualify as “research and development” and therefore not trigger the application of ABS measures, the use of that same semen for breeding and selection or novel technologies applied to this semen to estimate breeding values for the selection of breeding animals with a view to contribute to genetic improvement could be considered as “research and development”.

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<sup>15</sup> ABS Elements, paragraph 35; see also M. Schloen *et al.* 2011. *Access and benefit-sharing for genetic resources for food and agriculture – current use and exchange practices, commonalities, differences and user community needs*. [Background Study Paper No. 59](#).

<sup>16</sup> ABS Elements, paragraph 38.

<sup>17</sup> Nagoya Protocol, Article 2.

- The ABS Elements also address various options policy-makers may wish to consider in designing ABS authorization procedures, on the one hand, and benefit-sharing arrangements, on the other. They refer, for example, to the possibility of standardizing procedures and conditions for the granting of access to genetic resources and to the possibility of facilitating benefit-sharing through partnership agreements. Such agreements may cover a whole range of genetic resources and address the sharing of various benefits as part of a longstanding partnership.

16. While the ABS Elements thus address issues of particular relevance to GRFA, including AnGR, the Commission, at its last session, concluded that there is a need for more detailed explanatory notes describing, within the context of the ABS Elements, the distinctive features of GRFA.

### **III. DISTINCTIVE FEATURES OF ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE**

17. Starting in 2012, the Commission, in collaboration with its intergovernmental technical working groups on plant, animal and forest genetic resources, identified a list of distinctive features of genetic resources for food and agriculture, which is annexed to the ABS Elements. While these distinctive features aim to reflect an equilibrium between all subsectors of food and agriculture, not every feature is necessarily applicable to each and every GRFA. Moreover, the features are distinctive, but not necessarily unique to GRFA. Table 1 presents the distinctive features and highlights those features that are considered particularly relevant (marked in the table by plus signs [+]) or less (or not) relevant (marked in the table by minus signs [-]) to AnGR. Features marked in the table by grey shades are considered neutral or relevant only to parts of the sector. Table 1 provides a rating on the relevance of the distinctive features to AnGR, as contained in the ABS Elements (left-hand column) and changes proposed in the light of the outcomes of the Workshop, inputs received from Members and observers as well as comments received following the workshop (right-hand column).

18. Livestock play an important role for food security (A), especially in areas where crop production is not reliable. Likewise, human management (B.1) plays a crucial role in development of AnGR. In some cases, livestock species are fully dependent on humans for their survival and reproduction (e.g. heavy turkeys). With regard to the international exchange of AnGR and countries' interdependence in AnGR (C), it is important to note that the most intensive exchange with respect to AnGR occurs in only few selected breeds of a few livestock species that are key for food production. For instance, at least 50 percent of the global broiler market uses genetics from breeding companies based in the United States of America.<sup>18</sup> In 2016, the exports of dairy semen exceeded in value the dairy semen used domestically in the United States of America by seven times. Although international, exotic breeds and lines dominate global trade, the interdependence of countries with regard to regional breeds continues to exist and the exchange of regional breeds remains important.

19. With regard to the nature of the innovation process (feature D), it seems that technology development enabled substantial progress in this area, which should be reflected in D.4. Also, growing efforts in development of gene banking for AnGR (E4) might be better reflected in Table 1.

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<sup>18</sup> CGRFA/WG-AnGR-10/18/ Inf.10, page 24.

**TABLE 1: DISTINCTIVE FEATURES OF ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE**

		ABS Elements	2018
<b>A. Role of GRFA for food security</b>	A.1 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>B. Role of human management</b>	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.	+	+
<b>C. International exchange and interdependence</b>	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.	+	+
<b>D. Nature of the innovation process</b>	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.	-	
<b>E. Holders and users of GRFA</b>	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.	+	+
<b>F. GRFA exchange practices</b>	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.	+	+
<b>G. Benefits generated with the use of GRFA</b>	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.		

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

20. 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 AnGR.

##### ***Background information on animal genetic resources***

21. ABS policy-makers may find it useful to receive some background information on the use and exchange of AnGR.<sup>19</sup> Explanatory notes could 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. 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.

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 use optimal management (feeding, housing and health care) under environmentally-controlled conditions provided for within intensive production systems, which resulted in fast growth and high yields. 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. 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 have enabled a large-scale breeding industry to centralize genetic improvement and the supply of improved animals to producers. Similar structures are emerging in the pig sector, although to a lesser extent.

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.

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

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<sup>19</sup> See also [Background Study Paper No. 45](#).

Livestock Revolution,<sup>20</sup> 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%, respectively. The Livestock Revolution resulted in a significant shift of livestock production from temperate zones to the tropics and subtropics.

FAO estimates<sup>21</sup> 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.

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***

22. The ABS Elements recommend consulting government entities and non-governmental stakeholders holding, providing or using GRFA.<sup>22</sup> Explanatory notes could 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, breeding and herd book associations, breeding industry, pastoralists and their associations, breeding and research centres, conservation farms and facilities, 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. As most stakeholders of the livestock sector have limited knowledge of ABS and the implications of ABS for their sector, such consultations could also help raise the awareness on ABS-related issues within the sector.

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

23. The ABS Elements recommend considering ABS for GRFA in the wider context of sustainable agricultural development and food security.<sup>23</sup> Explanatory notes could 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. 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

<sup>20</sup> 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.

<sup>21</sup> 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](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)).

<sup>22</sup> ABS Elements, paragraph 15.II.

<sup>23</sup> ABS Elements, paragraph 15.III.

low-input production systems, for example, through provision of environmental services and further development of niche market products.

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 full understanding of the domestic livestock sector, current gene flows and potential implications of ABS measures on the domestic livestock production.

### ***Integration of implementation of ABS measures into the institutional landscape***

24. The ABS Elements recommend identifying existing institutional arrangements that may be used to address ABS.<sup>24</sup> Explanatory notes could 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 in 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***

25. The ABS Elements stress the importance of communicating ABS measures to potential providers, holders and users of GRFA.<sup>25</sup> Explanatory notes could 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 genetic and/or biochemical composition of AnGR. 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 full compliance with relevant national ABS measures.

Awareness-raising measures at national level should target breeders and researchers 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.

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

26. 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 could provide information on the status of “specialized instruments” under the Nagoya Protocol.<sup>26</sup> Explanatory notes could explain that:

In addition to these legally binding instruments, other instruments, such as the Global Plan of Action for Animal Genetic Resources (Global Plan of Action) are worthy of being considered

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<sup>24</sup> ABS Elements, paragraph 30.

<sup>25</sup> ABS Elements, 3.VI.

<sup>26</sup> ABS Elements, Chapter IV.

in the development and implementation of ABS measures for AnGR. The Global Plan of Action, 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”.<sup>27</sup> Among the main aims of the Global Plan of Action 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 Global Plan of Action 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”.<sup>28</sup>

The Global Plan of Action provides, as one of the actions of 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”.<sup>29</sup>

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 Global Plan of Action “appropriate conservation measures should ensure that farmers and researchers have access to a diverse gene pool for further breeding and research”.<sup>30</sup>

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”.<sup>31</sup>

With regard to international policies and regulatory frameworks relevant to AnGR, 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”.<sup>32</sup>

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 Global Plan of Action.

While not providing a “specialized instrument” for access and benefit-sharing for AnGR, the Global Plan of Action, 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.

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<sup>27</sup> Interlaken Declaration, paragraph 4.

<sup>28</sup> Global Plan of Action for Animal Genetic Resources, paragraph 15.

<sup>29</sup> Global Plan of Action for Animal Genetic Resources, Strategic Priority 3, Action 2.

<sup>30</sup> Global Plan of Action for Animal Genetic Resources, paragraph, paragraph 37.

<sup>31</sup> Global Plan of Action for Animal Genetic Resources, Strategic Priority 9, Action 3.

<sup>32</sup> Global Plan of Action for Animal Genetic Resources, Strategic Priority 21, Action 2.

Members reaffirmed their commitment to the implementation of the Global Plan of Action 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”.<sup>33</sup>

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

27. 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”.<sup>34</sup> Explanatory notes could explain that:

Continuous availability of AnGR research and development is indispensable to further enhance animal production output and efficiency and thereby contribute to food security and nutrition and rural development. Continued access to AnGR will also likely be important in increasing the resilience of production systems in light of climate change.

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

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

28. The ABS Elements recommend that in developing, adapting and implementing ABS measures, the relevance of germplasm flows should be considered.<sup>35</sup> Explanatory notes could explain that:

Historically, AnGR have been widely exchanged throughout the world and many of the most commonly used 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. 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 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 in the future, as many of the traits needed to respond to the effects of climate change may be found in locally adapted breeds. Climate change is not only likely to increase the exchange of AnGR overall, but could possibly in the future also lead to some flow of germplasm from developing to developed countries.

The need to adapt livestock production to the challenges of climate change also highlights the threat posed by the loss of genetic diversity and the importance of effectively conserving the full range of existing diversity. 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 use of a limited number of sires or parent animals.

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<sup>33</sup> C 2017/REP, *Appendix D*.

<sup>34</sup> ABS Elements, Chapter 5.

<sup>35</sup> ABS Elements. paragraph 15 I.e.

### *Categories of genetic resources use covered by ABS measures*

29. 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.<sup>36</sup> This consideration applies likewise to the temporal and the subject-matter scope of ABS measures. Explanatory notes could 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 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*

30. 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”.<sup>37</sup> The ABS Elements point out that it may be difficult in some cases to decide whether a GRFA is 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.<sup>38</sup> Explanatory notes could explain that:

There is a need to clearly identify activities related to AnGR that are considered “utilization” and those which are not. Activities based on or involving the identification of various phenotypic, genetic or biochemical characteristics of AnGR, are usually considered research and development. It is therefore generally acknowledged that “utilization” covers animal breeding and characterization (genomic, phenotypic), as well as basic research on the genetic background of traits.

On the other hand, trade in AnGR or their reproductive materials, performing or improving reproductive biotechnology in given species (AI, ET, 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 development of subsector standards building on current best practices, such as the breeders’ exemption, or putting in place multilateral solutions.<sup>39</sup>

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<sup>36</sup> ABS Elements, paragraph 36.

<sup>37</sup> Nagoya Protocol, Article 2.

<sup>38</sup> ABS Elements, paragraph 46–48.

<sup>39</sup> CGRFA/TTLE-ABS-3/16/Report 5, paragraph 20.

### ***Research and development for food and agriculture***

31. 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 could 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***

32. ABS measures sometimes distinguish between commercial and non-commercial utilization of genetic resources.<sup>40</sup> Explanatory notes could explain that:

In the livestock sector, non-commercial research aims to develop methods beneficial to farmers, thus providing societal benefits (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***

33. 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 could explain that:

The most common trade of AnGR is carried out between breeders and farmers, which in the past was based on bilateral agreements and the price usually reflected 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 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***

34. 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 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.<sup>41</sup> Explanatory notes could explain that:

Procedures for involving indigenous peoples and local communities (IPLC) in granting traditional knowledge (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

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<sup>40</sup> ABS Elements paragraph 50.

<sup>41</sup> ABS Elements, paragraph 63.

communities share TK associated with AnGR, and only one has granted PIC, a mechanism for benefit-sharing involving all relevant IPLCs might 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***

35. 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.<sup>42</sup> Explanatory notes could explain that:

AnGR have been widely exchanged throughout the world and many of the most commonly used 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***

36. 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.<sup>43</sup> Explanatory notes could 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***

37. The ABS Elements consider various benefit-sharing options to accommodate the incremental nature of the innovation process typical to many GRFA, including the pooling of benefits in a national benefit-sharing fund and multilateral solutions.<sup>44</sup> The feasibility of such benefit-sharing options may vary from subsector to subsector. Explanatory notes could 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 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 the Funding Strategy for the implementation of the Global Plan of Action for Animal Genetic Resources.

<sup>42</sup> ABS Elements, paragraph 66.

<sup>43</sup> ABS Elements, paragraph 68.

<sup>44</sup> ABS Elements, paragraph 69–71.

### ***Benefit-sharing through cooperation agreements***

38. 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.<sup>45</sup> 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.<sup>46</sup> Explanatory notes could 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 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***

39. 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.<sup>47</sup> Explanatory notes could explain that:

The unknown status of AnGR in older collections and gene banks, and on *in situ* farms, may make it difficult to determine the countries of origin.

## **V. GUIDANCE SOUGHT**

40. The Working Group is invited to:

- review and revise, as appropriate, the distinctive features of AnGR, as identified in Table 1 of this document; and
- review and revise, as appropriate, the explanatory notes contained in this document, and suggest additional explanatory notes, for submission to the Commission.

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<sup>45</sup> ABS Elements, paragraph 73.

<sup>46</sup> ABS Elements, paragraph 74.

<sup>47</sup> ABS Elements, paragraph 76.