Section F

Legal and policy frameworks

1 Introduction

This section is divided into three major subsections, respectively addressing international, regional and national (including where relevant subnational) legal and policy frameworks. As was the case in the first report on *The State of the World's Animal Genetic Resources for Food and Agriculture* (first SoW-AnGR) (FAO, 2007a), the first two subsections are based mainly on a review of relevant literature, while the subsection on national frameworks is based on country reporting – in this case comprising both the main country reports (see introduction to Part 3) and responses to a separate survey on legal and policy frameworks conducted by FAO in 2013.[1]

2 International frameworks

The first SoW-AnGR described a number of international legally binding and non-binding instruments relevant to the management of AnGR.[2] This subsection presents an overview of developments since the time the first report was prepared.

2.1 Management of biodiversity

Developments related to the work of the Convention on Biological Diversity

The Convention on Biological Diversity (CBD)[3] remains the main legally binding international framework for the management of biodiversity. From the perspective of AnGR management, significant developments in recent years have included an in-depth review of the CBD's Programme of Work on Agricultural Biodiversity, as a result of which, in 2008, the Conference of the Parties (COP) to the CBD invited

> *"Parties, other Governments, relevant international and regional organizations, local and indigenous communities, farmers, pastoralists and plant and animal breeders to promote, support and remove constraints to on-farm and* in situ *conservation of agricultural biodiversity through participatory decision-making processes in order to enhance the conservation of plant and animal genetic resources, related components of biodiversity in agricultural ecosystems, and related ecosystem functions" (Decision IX/1).*

Under the same decision, the COP welcomed the launch of the first SoW-AnGR and the adoption of the Global Plan of Action for Animal Genetic Resources (FAO, 2007b; see below for more details). It invited stakeholders to ensure the effective implementation of the Global Plan of Action.

In 2010, the COP adopted the Strategic Plan for Biodiversity 2011–2010, along with the Aichi Biodiversity Targets (Decision X/2). Of particular significance to AnGR management is Target 13:

> *"By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity."*

[1] For further information on the reporting process, see "About this publication" in the preliminary pages.
[2] FAO, 2007a, Part 3 Section E, pages 275–284.
[3] http://www.cbd.int

The COP invited FAO and its Commission on Genetic Resources for Food and Agriculture (CGRFA)

> *"to contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020 by refining targets for agricultural biodiversity, including at the ecosystem and genetic resources levels, and monitoring progress towards them using indicators" (Decision X/34).*

At the same meeting, the COP adopted 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 (CBD, 2011) (see Subsection 2.2 for further discussion).

In 2011, the second phase of the Joint Work Plan of the Secretariats of the CBD, FAO and the CGRFA, covering the period 2011 to 2020, was agreed upon. The key areas of work under this plan are assessments of biodiversity of relevance to food and agriculture, targets and indicators, best practices in the management of biodiversity, micro-organisms and invertebrates, access and benefit-sharing, enhancing implementation of the Strategic Plan for Biodiversity at national level, and climate change and genetic resources for food and agriculture (FAO, 2011a).

Developments related to the work of the Commission on Genetic Resources for Food and Agriculture

The CGRFA is the only permanent intergovernmental forum specifically addressing matters related to biodiversity for food and agriculture.[4] As far as AnGR management is concerned, the most significant development under the auspices of the CGRFA in recent years has been the adoption of the Global Plan of Action for Animal Genetic Resources. The process of preparing the first Sow-AnGR led to the development of draft strategic priorities for action for AnGR management (FAO, 2007c). This provided the basis for the negotiation of the Global Plan of Action by the CGRFA and its adoption by the International Technical Conference on Animal Genetic Resources for Food and Agriculture, held in Interlaken, Switzerland, in September 2007, along with the Interlaken Declaration on Animal Genetic Resources. Later in 2007, the Conference of FAO adopted a resolution endorsing the Global Plan of Action (FAO, 2007d).

The Global Plan of Action contains 23 strategic priorities for action, grouped into four strategic priority areas:

1. Characterization, Inventory and Monitoring of Trends and Associated Risks;
2. Sustainable Use and Development;
3. Conservation; and
4. Policies, Institutions and Capacity-building.

The strategic priorities, along with their main levels of implementation (national, regional or international) are shown in Table 3F1.

In 2009, the CGRFA agreed a timetable for monitoring the implementation of the Global Plan of Action, based on the preparation of periodical country progress reports (FAO, 2009a). The first round of reporting took place in 2012 (FAO, 2012). A further round of reporting followed as part of the reporting process for the preparation of the second SoW-AnGR. The outcomes are described in the various sections of Part 3, and in more detail in the *Synthesis progress report on the implementation of the Global Plan of Action for Animal Genetic Resources – 2014* (FAO, 2014a).

In 2013, the CGRFA agreed upon a set of targets and indicators to be used to monitor the implementation of the Global Plan of Action and another set to be used to monitor the status and trends of AnGR (FAO, 2013a; 2013b). The former set of indicators are referred to as "process indicators" and the latter as "resource indicators". The resource indicators are discussed in greater detail in Part 1 Section B.

The process-indicator framework includes indicators at the level of each strategic priority of the Global Plan of Action, as well as indicators at the level of the four strategic priority areas, with additional indicators for the overall state of collaboration and funding. The indicators can all be

[4] See FAO, 2007a, pages 276–277.

TABLE 3F1

Priority levels of implementation of the strategic priorities of the Global Plan of Action for Animal Genetic Resources

Implementation	Strategic Priority Area 1 Characterization, inventory and monitoring of trends and associated risks	Strategic Priority Area 2 Sustainable use and development	Strategic Priority Area 3 Conservation	Strategic Priority Area 4 Policies, institutions and capacity-building
National	**SP 1** Inventory and characterize AnGR, monitor trends and risks associated with them, and establish country-based early-warningand response systems	**SP 3** Establish and strengthen national sustainable use policies **SP 4** Establish national species and breed development strategies and programmes **SP 5** Promote agro-ecosystems approaches to the management of AnGR **SP 6** Support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of AnGR	**SP 7** Establish national conservation policies **SP 8** Establish or strengthen *in situ* conservation programmes **SP 9** Establish or strengthen *ex situ* conservation programmes	**SP 12** Establish or strengthen national institutions, including national focal points, for planning and implementing AnGR measures, for livestock sector development **SP 13** Establish or strengthen national educational and research facilities **SP 14** Strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation **SP 18** Raise national awareness of the roles and values of AnGR **SP 20** Review and develop national policies and legal frameworks for AnGR
Regional			**SP 10** Develop and implement regional and global long-term conservation strategies	**SP 17** Establish Regional Focal Points and strengthen international networks
International	**SP 2** Develop international technical standards and protocols for characterization, inventory, and monitoring of trends and associated risks		**SP 11** Develop approaches and technical standards for conservation	**SP 15** Establish or strengthen international information sharing, research and education **SP 16** Strengthen international cooperation to build capacities in developing countries and countries with economies in transition **SP 19** Raise regional and international awareness of the roles and values of AnGR **SP 21** Review and develop international policies and regulatory frameworks relevant to AnGR **SP 22** Coordinate the Commission's efforts on AnGR policy with other international forums **SP 23** Strengthen efforts to mobilize resources, including financial resources, for the conservation, sustainable use and development of AnGR

Note: SP = Strategic Priority; AnGR = animal genetic resources.

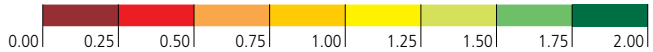
TABLE 3F2

Indicator scores for the implementation of the strategic priority areas of the Global Plan of Action for Animal Genetic Resources

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Africa	0.69	0.66	0.48	0.74	0.39	0.51
Asia	1.01	0.94	0.81	0.99	0.36	0.50
Europe and the Caucasus	1.48	1.31	1.29	1.43	1.03	0.54
Latin America and the Caribbean	0.89	0.90	0.77	0.91	0.33	0.65
Near and Middle East	0.57	0.33	0.22	0.35	0.25	0.38
North America	1.92	1.87	2.00	1.69	1.13	1.00
Southwest Pacific	0.57	0.37	0.25	0.23	0.11	0.38
World	**0.98**	**0.89**	**0.78**	**0.95**	**0.54**	**0.53**

Note: SPA = Strategic Priority Area (see Table 1F1). Indicator scores are divided into eight evenly distributed classes between a minimum score of 0 and a maximum score of 2. A score of 2 means that all actions covered by the indicator have been implemented fully. A score of 0 means that no action has been taken.

Indicator scores:



Source: FAO, 2014a.

calculated at national, regional and global levels. This was done for both the 2012 and the 2014 rounds of reporting (FAO, 2012; 2014a). Indicators for 2014 at strategic priority area level are summarized by region in Table 3F2 (country-level indicators for Strategic Priority Area 4 are shown in Figure 3A8 in Part 3 Section A). The figures show that implementation of the strategic priority areas is, on average, at a high level in North America and in Europe and the Caucasus, and at a medium or low level elsewhere. Implementation of Strategic Priority Area 4 (Conservation) is somewhat less advanced than that of the other strategic priority areas. The indicators for collaboration and funding are at a lower level than those for the strategic priority areas themselves.

Also in 2013, the CGRFA welcomed the idea of establishing a ten-year cycle for the preparation of state of the world reports for the various subsectors of genetic resources for food and agriculture. Following this cycle would mean that the next (third) SoW-AnGR would be published in 2025.

The Funding Strategy for the Implementation of the Global Plan of Action for Animal Genetic Resources was adopted by the CGRFA in 2009 (FAO, 2009a; 2009b). An FAO trust account was established for the receipt of voluntary contributions in support of the implementation of the Global Plan of Action. All trust account funds are dispersed to countries to support implementation activities at national or regional level. By 2011, US$1 million had been contributed to the trust account and the first call for proposals under the Funding Strategy was launched. In 2012, 13 projects, involving 30 countries, were chosen to receive funding.[5]

In addition to developments directly related to the implementation of the Global Plan of Action, the CGRFA has addressed a number of topics that are of relevance to AnGR management. For example, in 2013, the CGRFA adopted its Programme of Work on Climate Change and Genetic Resources for Food and Agriculture (FAO, 2013a). Also in 2013, it requested FAO to prepare *The State of the World's Biodiversity for Food and Agriculture*, which – it stressed – should focus on interactions between the

[5] For further details, see the Funding Strategy web site (http://www.fao.org/ag/againfo/programmes/en/genetics/first_call.html).

various sectors of genetic resources (animal, plant, forest, aquatic, micro-organism and invertebrate) and on cross-sectoral matters (ibid.).

Milestones and outputs for the CGRFA's work across all sectors of genetic resources and in cross-sectoral matters (access and benefit-sharing, climate change, biotechnology, biodiversity indicators and biodiversity and nutrition) are set out in its Multi-Year Programme of Work, which was adopted in 2007 and has been periodically revised (FAO, 2013a). In 2009, the CGRFA adopted a Strategic Plan in which it identified the processes and the partners that would be needed in order to achieve the milestones set out in the Multi-Year Programme of Work. A revised Strategic Plan, covering the period 2014 to 2023, was adopted in 2013 (ibid.).

2.2 Access and benefit-sharing

At the time the first Sow-AnGR was prepared, the main international instruments addressing access and benefit-sharing (ABS) issues were the CBD, the International Treaty on Plant Genetic Resources for Food and Agriculture (International Treaty) (FAO, 2009c) and, among "soft laws", the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization (CBD, 2002).[6] While AnGR fall within the scope of the CBD, the specific characteristics and requirements of the AnGR subsector had received little attention in the development of international instruments related to ABS. There was a degree of concern about the potential effects that ABS frameworks might, directly or indirectly, have on the use of AnGR and other genetic resources for food and agriculture. In 2004, the CGRFA had recommended

> *"that FAO and the Commission contribute to further work on access and benefit-sharing, in order to ensure that it move in a direction supportive of the special needs of the agricultural sector, in regard to all components of biological diversity of interest to food and agriculture" (FAO, 2004).*

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 entered into force on 12 October 2014. During the course of the negotiations on the Nagoya Protocol, the FAO Conference, at the recommendation of the CGRFA, invited the negotiators

> *"to explore and assess options … that allow for adequate flexibility to acknowledge and accommodate existing and future agreements relating to access and benefit-sharing" (FAO, 2009d).*

In 2011, the Commission decided to establish the Ad Hoc Technical Working Group on Access and Benefit-sharing for Genetic Resources for Food and Agriculture and mandated it to

> *"identify relevant distinctive features of the different sectors and sub-sectors of genetic resources for food and agriculture requiring distinctive solutions; taking into account the relevant distinctive features identified, develop options to guide and assist countries, upon their request, in developing legislative, administrative and policy measures that accommodate these features; and analyze, as appropriate, possible modalities for addressing access and benefit-sharing for genetic resources for food and agriculture, taking into account the full range of options, including those presented in the Nagoya Protocol" (FAO, 2011b).*

The Ad Hoc Working Group met in July 2012 in Longyearbyen (Svalbard), Norway (FAO, 2012).

Following the adoption of the Nagoya Protocol, the CGRFA launched a process aimed at the development of "Elements to Facilitate Domestic Implementation of Access and Benefit-Sharing for Different Subsectors of Genetic Resources for Food and Agriculture", intended as a voluntary tool to assist national governments with their work in this field (FAO, 2013a). The outcomes of the process were welcomed by the CGRFA at its Fifteenth Regular Session in 2015 (FAO, 2015).

[6] See FAO, 2007a, pages 277–278.

The Nagoya Protocol – scope and objectives

The Nagoya Protocol was adopted on 29 October 2010 by the Conference of the Parties (COP) to the CBD at its tenth meeting, held in Nagoya, Japan. The objective of the Nagoya Protocol is to further advance the third of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources.

In general, the assumption when selling genetic material in the form of breeding animals, semen, embryos, etc., is that its value as a genetic resource is already reflected in its price, and that the buyer will be free to use it for further research and breeding (FAO, 2009d). However, following the adoption of the Nagoya Protocol, things could change. The point of departure of the Nagoya Protocol is the sovereign right of states over their natural resources (Article 3 of the CBD), which implies that the authority to determine access to genetic resources rests with national governments and is subject to national legislation. The sovereign right of states to determine access to genetic resources should not be confused with other categories of entitlement, such as the private ownership of an animal or genetic material. ABS measures may require that, even though an animal may be the private property of a livestock keeper or the common property of a community, certain conditions (e.g. related to the need for "prior informed consent") have to be met before it can be provided to a third party for research and development. Governments can, however, defer to providers and users to work out arrangements for the exchange of privately held genetic resources, and can choose not to require prior informed consent.

The Nagoya Protocol, in its preamble, explicitly recognizes the importance of genetic resources to food security, as well as

> *"the special nature of agricultural biodiversity, its distinctive features and problems needing distinctive solutions"*

and

> *"the interdependence of all countries with regard to genetic resources for food and agriculture 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 ..."*

In this regard, the Nagoya Protocol also acknowledges the fundamental role of the CGRFA and of the International Treaty.[7] In its operational provisions, the Nagoya Protocol requires its Parties to consider, in the development and implementation of their access and benefit-sharing legislation or regulatory requirements, the importance of genetic resources for food and agriculture and their special role for food security.[8] However, the Nagoya Protocol does not specify how, in practice, ABS measures might take these matters into account.

It is important to note that the Nagoya Protocol does not prevent its Parties from developing and implementing other relevant international agreements, including other specialized ABS agreements, provided that they are supportive of and do not run counter to the objectives of the CBD and the Nagoya Protocol.[9] The Nagoya Protocol does not apply with respect to genetic resources covered by and for the purpose of such specialized instruments.[10] The Nagoya Protocol does not require its Parties to apply their ABS legislation or policies to any, or all, of their genetic resources.

Main provisions of the Nagoya Protocol and their relevance to animal genetic resources management

The Nagoya Protocol covers genetic resources, including AnGR, that are provided by Parties that are the countries of origin of the respective resources or by Parties that have acquired the resources in accordance with the CBD. The Nagoya Protocol sets out core obligations for its Parties to take measures in relation to access to genetic resources, benefit-sharing and compliance. It also addresses:

- access to traditional knowledge associated with genetic resources;

[7] CBD, 2011, Preamble.
[8] CBD, 2011, Article 8(c).
[9] CBD, 2011, Article 4.2.
[10] CBD, 2011, Article 4.4.

- the sharing of benefits derived from the utilization of genetic resources and of traditional knowledge associated with genetic resources; and
- the compliance of utilization of genetic resources and traditional knowledge with applicable requirements to obtain prior informed consent, where applicable, and to establish mutually agreed terms.

The Nagoya Protocol does not define "access to genetic resources". Instead it relies on the CBD definition of "genetic resources"[11] and introduces the concept of "utilization" of genetic resources, which 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 ..."[12] Thus, access to material that is not a genetic resource and access to a genetic resource for purposes other than research and development on its genetic and/or biochemical composition (e.g. access to milk for human consumption) are clearly outside the scope of the Nagoya Protocol. It remains to be seen whether, and to what extent, this definition of utilization proves to be useful in the AnGR subsector. Where, as in the case of AnGR, "research and development" and agricultural production occur in tandem, it may be difficult, in some situations, to distinguish "utilization" from activities related to production.

According to the Nagoya Protocol, access to a genetic resource for its utilization shall be subject to the prior informed consent of the Party that is the country of origin of the resource or has acquired the resource in accordance with the CBD, unless otherwise determined by that Party. Countries of origin of genetic resources, according to the CBD, are countries that possess them "in *in situ* conditions", which are defined as "conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, the surroundings where they have developed their distinctive properties".[13] The Nagoya Protocol further states that benefits arising from the utilization of genetic resources shall be shared with the providing Party in a fair and equitable way on the basis of mutually agreed terms.[14] A potential problem in this regard is that for animal breeds that are the result of dispersed contributions and that owe their development to a range of actors and environments in several different countries, it will often be difficult to identify the country in which they "developed their distinctive properties."

The Nagoya Protocol also requires its Parties to

> *"take measures, as appropriate, with the aim of ensuring that traditional knowledge associated with genetic resources that is held by indigenous and local communities is accessed with prior and informed consent or approval and involvement of these indigenous and local communities, and that mutually agreed terms have been established."*[15]

They are also required to ensure that

> *"the benefits arising from the utilization of traditional knowledge associated with genetic resources are shared in a fair and equitable way with the communities holding such knowledge, upon mutually agreed terms."*[16]

Also with regard to traditional knowledge associated with genetic resources, the Nagoya Protocol states that

> *"Parties shall endeavour to support, as appropriate, the development by indigenous and local communities, including women within these communities, of: (a) Community protocols in relation to access to traditional knowledge associated with genetic resources and the fair and*

[11] "Genetic resources" means "genetic material of actual or potential value." "Genetic material" means "any material of plant, animal, microbial or other origin containing functional units of heredity." "Biotechnology" means "any technological application that uses biological systems, living organisms, or derivatives therefore, to make or modify products or processes for specific use" (CBD, Article 2).

[12] CBD, 2011, Article 2.

[13] CBD, Article 2.

[14] CBD, 2011, Article 5.1.

[15] CBD, 2011, Article 7.

[16] CBD, 2011, Article 5.5.

equitable sharing of benefits arising out of the utilization of such knowledge ..."[17]

The potential role of so-called biocultural community protocols in AnGR management is discussed in Part 4 Section D.

The key components of the Nagoya Protocol include the compliance measures: appropriate, effective and proportionate measures to provide that genetic resources utilized within a Party's jurisdiction are of good legal status, i.e. have been accessed with prior informed consent, and that mutually agreed terms have been established, as required by the relevant domestic ABS measures.[18] The rationale for these compliance measures is to discourage illegal access to, or acquisition of, genetic resources. To support compliance, countries have to monitor, and enhance the transparency of, the utilization of genetic resources and associated traditional knowledge, including designating one or more so-called checkpoints.[19] While the Nagoya Protocol's "user-country" measures may well have a deterrent effect in countries that implement and effectively enforce them, they may pose substantial administrative and logistical challenges in many countries. Similarly, Parties will need to consider the potential costs (transaction costs, administrative costs, etc.) of measures they are considering introducing in order to implement the Nagoya Protocol with respect to AnGR. The Nagoya Protocol does not distinguish between user and provider countries. All Parties will have to adopt user-country compliance measures.

2.3 Intellectual property rights

As discussed in the first SoW-AnGR,[20] rapid developments in the field of biotechnology have focused attention on the issue of intellectual property rights in relation to AnGR. Since 2007, the debate on these matters has continued in various international fora. While these debates continue, the World Trade Organization's (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) remains the main international legal framework in this field. While the TRIPS Agreement, under its Article 27, states that patents shall be available for any invention, whether product or process, in all fields of technology, it allows for some exemptions to patentability. Of particular relevance in the context of AnGR management is the following wording from paragraph 3(b) of Article 27:

"Members may also exclude from patentability ... plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes."

At the same time, the TRIPS Agreement does not prescribe a specific notion of invention and does not explicitly bind WTO Member States either to allow or to forbid the patentability of substances existing in nature. For further information on the question of the patentability of substances existing in nature, see WIPO (2011).

Article 27.3(b) states that a review of provisions on optional exceptions to patentability should take place four years after the entry into force of the WTO Agreement, i.e. in 1999. This review took place, but did not reach a definitive conclusion. After the Doha Declaration of 2001 (WTO, 2001), the discussion on the review of Article 27.3(b) was broadened to include the relationship between the TRIPS Agreement and the CBD, as well as the protection of traditional knowledge and folklore. Debate on this issue is still ongoing.

In addition to the developments in WTO fora, discussions on this topic are also taking place elsewhere. In 2000, members of the World Intellectual Property Organization (WIPO) established an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore. In 2009, WIPO members agreed to develop an international legal instrument (or instruments) that would give genetic resources, traditional knowledge and traditional cultural expressions effective protection. This process is also ongoing. In particular, WIPO

[17] CBD, 2011, Article 12.3.
[18] CBD, 2011, Article 15.1.
[19] CBD, 2011, Article 17.1.
[20] See FAO, 2007a, Part 3 Section E Subsection 1.5 (pages 279–280) and Part 3 Section E Subsection 2.1 (pages 285–290).

members are considering whether, and to what extent, the intellectual property system should be used to ensure and track compliance with ABS systems in national laws established pursuant to the CBD, its Nagoya Protocol and the International Treaty.

One of the options under discussion is to develop mandatory disclosure requirements that would require patent applicants to show the source or origin of genetic resources, and also possibly evidence of prior informed consent and a benefit-sharing agreement. Another key issue is that of defensive protection of genetic resources, i.e. the implementation of measures aimed at preventing patents that do not fulfil the patentability requirements of novelty and inventiveness from being granted over genetic resources and associated traditional knowledge. Defensive protection measures could include, for example, the creation of databases on genetic resources and traditional knowledge to help patent examiners find relevant prior art and avoid the granting of erroneous patents. Over the years, WIPO has developed a number of tools in the area of intellectual property and genetic resources, including a database of Biodiversity-related Access and Benefit-sharing Agreements[21] and Intellectual Property Guidelines for Access to Genetic Resources and Equitable Sharing of the Benefits arising from their Utilization (WIPO, 2013).

Additional developments have taken place in the forum organized by WIPO's Standing Committee on the Law of Patents (SCP), established in 1998. The work of the Standing Committee led, in 2000, to the adoption of the Patent Law Treaty, which aims to harmonize certain formal aspects of the patent grant procedure. The scope of the Patent Law Treaty, however, does not cover substantive aspects of patent law. In order to harmonize the latter, the Standing Committee began, in 2001, to discuss a draft substantive patent law treaty. In 2006, the draft was put aside because no consensus had been reached on it. Although the draft treaty has been abandoned for the time being, the importance of conducting an international debate on substantive patent law has been recognized and the Standing Committee has been maintained. Currently, five topics related to substantive patent law are under debate within the Standing Committee, namely: exceptions and limitations to patent rights; technology transfer; quality of patents, including opposition systems; confidentiality of communications between patent advisors and their clients; and patents and health.

The first SoW-AnGR included a subsection on the role of patenting as an "emerging issue" in AnGR management.[22] Trends in the use of patents in the AnGR subsector were recently subject to a more in-depth analysis as the basis for the preparation of a WIPO patent landscape report (WIPO, 2014). Findings are summarized in Box 3F1.

Another aspect of the TRIPS Agreement that has some relevance for AnGR management is regulation of the use of geographical indications. Article 22 of the TRIPS Agreement defines geographical indications as "indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin." Member countries are obliged to provide legal means by which the "use of any means in the designation or presentation of a good that indicates or suggests that the good in question originates in a geographical area other than the true place of origin in a manner which misleads the public as to the geographical origin of the good" can be prevented. Article 23 provides additional protection for geographical indications for wines and spirits.

Articles 22 and 23 have been subject to negotiations under the Doha Round.[23] A special session of the Council for TRIPS[24] has been negotiating the establishment of a multilateral register for wines and spirits, which would register geographical

[21] http://www.wipo.int/tk/en/databases/contracts/

[22] FAO, 2007a, Part 3 Section E Subsection 2.1 (pages 285–290).

[23] The Doha Round is the round of trade negotiations that began in 2001.

[24] http://www.wto.org/english/tratop_e/trips_e/gi1_docs_e.htm

Box 3F1

Findings of a patent landscape report on animal genetic resources

Patenting activity for animal genetic resources for food and agriculture (AnGR) has received little attention so far in policy discussions. A World Intellectual Property Organization (WIPO) patent landscape report prepared in collaboration with FAO establishes that patenting activity involving livestock occurs in the fields of biotechnology, pharmaceuticals, immunology and gene therapy, stem cells and transgenic animals. It shows that animals are important experimental models, sources of material for medical products and bioreactors for recombinant proteins. The report identifies six broad categories of AnGR-related technology development: artificial insemination; sex selection and control of oestrus; marker-assisted breeding; transgenic animals; animal cloning; xenotransplantation; and animal models. To assist in future policy deliberations on access to AnGR and benefit-sharing, a flexible and updatable indicator has been developed to monitor trends in patent activity in the AnGR subsector.

Key reproductive technologies in animal breeding, such as artificial insemination, embryo transfer, *in vitro* fertilization and superovulation, have a long history. The creation of a transgenic mouse using DNA microinjection in 1980 (the "oncomouse", see Patent US4736866A) marked the emergence of genetically engineered animals. This was followed by somatic cell nuclear transfer and animal cloning in the 1990s. Patenting activity in these areas focuses on methods rather than specific genetic sequences. In parallel, from the early 2000s onwards, phenotypic selection for breeding using Best Linear Unbiased Prediction (BLUP) approaches was increasingly complemented, and in some cases replaced, by DNA marker-assisted breeding and genomic selection indexes. The completion of genome mapping projects for pigs (2012), zebu cattle (2012) and water buffalo (2014) are likely to accelerate trends towards the use of genomic selection indexes.

Patenting activity involving AnGR increased markedly in the late 1990s, focusing on expressed sequence tags (ESTs) and single nucleotide polymorphisms (SNPs). SNPs are important in marker-assisted breeding for the identification of traits such as meat or milk quality. At the same time, patenting activity involving transgenic livestock also increased. However, activity involving AnGR declined sharply from 2001, caused by a combination of factors including an increasingly restrictive approach to the patentability of DNA sequences by patent offices and a lack of markets for food products from transgenic animals.

The majority of activity focuses on mainstream breeds and there is no substantive evidence of activity that might be considered to involve misappropriation or biopiracy of genetic resources and associated traditional knowledge in the patent data. Nevertheless, patent claims involving livestock are commonly constructed to include large groupings of animals (e.g. bovine, porcine or ruminant). Where granted and in force, such patents could affect the ability of livestock keepers to utilize AnGR or specific technologies in breeding. Furthermore, trends towards genetic selection on economic traits, such as milk or meat quality or disease resistance, reflected in patent documents could have negative implications for the conservation of the global livestock gene pool. Genome mapping projects and the rise of commercial genomic selection indexes suggest the convergence of genomic information with software and business methods that may be eligible for patent protection. Trends in activity arising from genome sequencing projects merit careful attention with regard to their implications (positive or negative) for AnGR management. Finally, research disclosed in patents on disease control and climate change technologies could have wider applicability to livestock keepers in developing countries, something that merits further research.

Provided by Eirini Kitsara, WIPO.
For further information, see WIPO, 2014.

indications for wines and spirits and provide notification of the registries for those Members using the system. Linked to the negotiations of the multilateral register, are discussions on the extension of the higher level of protection, as provided for in Article 23, beyond wines and spirits. Members remain deeply divided on this issue. Those in favour of expanding the register have argued that a higher level of protection for more goods is a better way to defend and market locally based products (e.g. WTO, 2005). Those in opposition have argued that the existing level of protection is adequate and that expanding protection would create unnecessary burdens that would disrupt legitimate marketing practices (Taubman *et al*., 2012). As part of the ongoing review pursuant to Article 24.2 of the TRIPS Agreement, negotiations on other matters related to geographical indications continue under the auspices of the Council for TRIPS. These include a stock-taking exercise of national practices in this field (WTO, 1998; 2010). Given the role of product marketing in the "valorization" of livestock breeds (see Part 3 Section D and Part 4 Section D), these developments are potentially relevant to AnGR management. However, their significance is difficult to assess.

The issue of patenting in the AnGR subsector has always been controversial. While some stakeholders argue that the possibility of obtaining a patent helps to stimulate innovation, others express a range of ethical and socio-economic concerns.[25] The trend towards greater use of the intellectual property rights system to incentivize and protect advances in breeding and associated technologies has been one of the factors motivating various civil society organizations to advocate the establishment of so-called livestock keepers' rights (see Part 3 Section A) and biocultural community protocols (see Part 4 Section D).

2.4 Regulation of international trade, including sanitary issues

The main international legal framework regulating trade livestock and livestock products is provided by the WTO's Agreement on Agriculture (adopted in 1994).[26] Trade in animals and animal products is greatly affected by sanitary rules, i.e. many countries' ability to trade is limited as a result of their having a poorer disease status than potential trading partners. This can have a knock-on effect on AnGR management. For example, access to breeding animals or genetic material may be constrained and restrictions on access to export markets may affect demand for livestock products and hence the profitability of using particular types of AnGR.

The WTO's Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) aims to ensure that trade restrictions are minimized by requiring that members ensure "that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence ..." (Article 2, paragraph 2). Measures that "conform to international standards, guidelines or recommendations" are "deemed to be necessary to protect human, animal or plant life or health, and presumed to be consistent with the relevant provisions [of the agreement]" (Article 3, paragraph 2). In the case of animals and animal products, the relevant international standards are those of the World Organisation for Animal Health (OIE)[27] and the Codex Alimentarius Commission.[28] Countries can implement more restrictive standards if there is scientific justification or if determined to be appropriate based on the risk assessment procedures set out in the agreement (Article 3, paragraph 3).

The legal framework for trade and sanitary matters that was in place in 2005/2006 remains largely unchanged in 2014. One issue that has become increasingly prominent in recent years is the question of private-sector standards, such as those set by supermarket chains. Standards of this type have the potential to affect demand for animal

[25] See FAO, 2007a, pages 285–89 for an overview of these issues.

[26] FAO, 2007a, Part 3 Section E Subsections 1.4 and 1.6 (pages 278–283).

[27] http://www.oie.int/

[28] http://www.codexalimentarius.org/

products and hence the use and development of AnGR. In 2011, the WTO's Committee on Sanitary and Phytosanitary Measures agreed to take some actions aimed at reducing the potential negative effects of private-sector standards on countries' abilities to trade internationally (WTO, 2011). Discussions on this topic have continued, but at the time of writing remain unresolved.

2.5 Conclusions

As far as legally binding instruments relevant to the management of AnGR are concerned, the most significant development of recent years has been the adoption and entry into force of the Nagoya Protocol. Implications for the AnGR subsector are not yet clear. Efforts to ensure appropriate provisions for the various subsectors of food and agriculture are ongoing, *inter alia* under the auspices of the CGRFA. Negotiations on various international legal frameworks that may directly or indirectly affect the management of AnGR, most notably on issues related to international trade and intellectual property rights, are also ongoing. The Global Plan of Action for Animal Genetic Resources notes the need to ensure that the various international instruments that affect countries' capacities to exchange, use and conserve AnGR, and to trade animal products, are mutually supportive. It calls for a review of such frameworks

> *"with a view to ensuring that [they] ... take into account the special importance of animal genetic resources for food and agriculture for food security, the distinctive features of these resources needing distinctive solutions, the importance of science and innovation, and the need to balance the goals and objectives of the various agreements, as well as the interests of regions, countries and stakeholders, including livestock keepers."*[29]

Whether or not AnGR-related concerns are successfully mainstreamed into negotiations related to the ongoing development of international legal frameworks, these frameworks will continue to influence the development of the livestock sector internationally and hence affect the use of AnGR. It is therefore important that stakeholders involved in AnGR management pay attention to developments in the international legal arena and have the capacity to follow them and interpret their implications for the subsector. There may be some need for capacity-development and awareness-raising in this field.

In terms of international policy, the major development since the time the first SoW-AnGR was prepared has been the adoption of the Global Plan of Action. Countries' ongoing commitment to the process has been demonstrated by developments such as the adoption of the Funding Strategy for the Global Plan of Action and the establishment of a mechanism for monitoring implementation, as well as by the large number of countries that reported on their implementation activities in 2012 and 2014. The Global Plan of Action was envisaged as a rolling plan, with an initial time horizon of ten years. The outputs of the second SoW-AnGR process will provide a basis for reviewing and potentially revising the Global Plan of Action (FAO, 2014b; 2015).

The adoption of the CBD's Strategic Plan for Biodiversity and the Aichi Targets, including Target 13 on the maintenance of genetic diversity, was another major development. Updated national biodiversity strategy and action plans, the main instruments for the implementation of the CBD at country level, are increasingly including references to AnGR and actions related to their management (see Subsection 4 for further discussion).

3 Regional frameworks

This subsection discusses the effects of legal and policy frameworks at regional level (i.e. applying to a group of countries) on the management of AnGR, focusing particularly on developments since the first SoW-AnGR was drafted in 2005/2006. The equivalent subsection in the first

[29] FAO, 2007b, Strategic Priority 21, Action 1.

SoW-AnGR focused largely on the legal and policy framework in place in the European Union (EU),[30] because of its comprehensive nature and many AnGR-relevant provisions. EU frameworks are, similarly, the main focus of this updated analysis (particularly given that the frameworks in most of the fields discussed in the first AnGR have been updated during the intervening period). Regional-level policy frameworks, and in particular regional-level legally binding instruments, in fields directly relevant to AnGR management are rare in other regions. The discussion of instruments outside the EU is therefore, inevitably, relatively brief in comparison. Initiatives at regional level not specifically related to legal and policy frameworks, particularly the activities of regional focal points for the management of AnGR, are discussed in Part 3 Section A.

3.1 The European Union

EU legislation relevant to AnGR management addresses a range of different topics, including conservation, zootechnics (animal breeding), animal health, trade in animals and animal products, organic agriculture, food and feed safety, the use of genetically modified organisms (GMOs) and access and benefit-sharing. The EU utilizes several different types of legal instrument, some of which are binding and some of which are not. Binding instruments fall into three main categories: regulations, directives and decisions. A regulation is a legislative act that must be applied in its entirety across the whole EU. A directive sets out goals that member countries must achieve, but leaves it up to countries to decide how they wish to achieve the these goals. A decision is binding on those (e.g. an EU country or an individual company) to whom it is addressed and is directly applicable (EU, 2014a).

[30] Member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

General frameworks addressing agriculture, rural development and biodiversity

The EU's Common Agricultural Policy (CAP) comprises a set of rules and mechanisms regulating the production, trade and processing of agricultural products in the EU. It has a major influence on the agricultural sector in EU member countries and has major implications for the management of all resources used in agriculture, including AnGR. The first SoW-AnGR emphasized the significance for AnGR management of the reforms to the CAP that had occurred over the preceding decade and a half, particularly the introduction of agri-environmental schemes, first under Council Regulation (EEC) No 2078/92 and then under Council Regulation (EC) No 1257/99. At the time the first SoW-AnGR was drafted, Council Regulation (EC) No 1698/2005, a new act providing a framework for support for rural development, financed by the European Agricultural Fund for Rural Development, had recently been passed. The objective of the fund, whose first funding period ended in 2013, is to improve the competitiveness of agriculture and forestry, the state of the environment and the countryside, and the quality of life and economic activity in rural areas (EU, 2012). On the basis of strategic guidelines (Council Decision 2006/144/EC), EU member countries developed national rural development strategy plans (RDP) for the 2007 to 2013 period. These plans constituted the reference framework for rural development programmes featuring measures grouped around four "axes": 1. improving the competitiveness of the agricultural and forestry sector; 2. improving the environment and the countryside; 3. quality of life in rural areas and diversification of the rural economy; and 4. "LEADER" (related to local development strategies involving public–private partnerships).

Council Regulation (EC) No 1698/2005 states specifically (Article 39) that, under Axis 2, agri-environment payments can be provided for the conservation of genetic resources in agriculture. The actions under the other axes do not directly target AnGR. However, they potentially influence demand for different types of AnGR via demand for

the various products and services that they provide. Measures that promote the diversification of the rural economy and the economic sustainability of rural livelihoods, particularly those of smaller-scale producers in harsh or remote production systems, have at least some potential to provide indirect support to the maintenance of diverse AnGR.

The background to the establishment of these instruments was the CAP reform of 2003, which involved the decoupling of farm support payments from production and the introduction of so-called single farm payments (Council Regulation (EC) No 1782/2003; Council Regulation (EC) No 73/2009). It was noted at the time that these developments, at least in theory, had the potential to reduce the profitability of keeping at-risk breeds and bring about a fall in their population sizes unless alternative economic incentives emerged (Canali and the Econogene Consortium, 2006). Concerns were also expressed about an increase in the minimum area eligible for single farm payments, because of the significant role played in breed conservation by part-time farmers and hobby breeders operating on small areas of land (RBST, 2009). Zjalic (2008) noted that the expected decline in the overall number of sheep and goats in the EU as a result of decoupling could prove to be a threat to some breeds, but also that agri-environmental schemes providing payments for raising at-risk breeds might become increasingly attractive as an alternative source of income. Such reflections about future trends are, however, inevitably rather speculative. A review undertaken in 2010, based on consultations with National Coordinators for the Management of Animal Genetic Resources from EU countries (Zjalic, 2010), suggested that the effects of the reforms on the status of at-risk breeds had generally not been large.

In 2010, the European Commission launched a public debate on the future of the CAP, which attracted 5 700 submissions from stakeholders, think tanks and research organizations, and the general public. The report summarizing the outcome of the process concluded there was considerable consensus among EU citizens that the objectives of agriculture in the EU should be "provision of a safe, healthy choice of food, at transparent and affordable prices; ensuring sustainable use of the land; activities that sustain rural communities and the countryside; and security of food supply (European Commission, 2010). The specific "directions to be followed" identified via the consultation process included efforts to "protect the environment and biodiversity, conserve the countryside, sustain the rural economy and preserve/create rural jobs, and mitigate climate change" (ibid.).

In 2011, the European Commission presented a set of legal proposals for the future of the CAP (EU, 2014b) and an "impact assessment" of various policy options (European Commission, 2011). In June 2013, political agreement on CAP reform was reached. In December of the same year, four basic regulations were adopted – Regulation (EU) No 1305/2013 on rural development, Regulation (EU) No 1306/2013 on "horizontal" issues such as funding and controls, Regulation (EU) No 1307/2013 on direct payments to farmers and Regulation (EU) No 1308/2013 on market measures – along with transitional rules for the year 2014. Under the regulation on rural development, "agri-environment-climate" support payments can be made "for the conservation and for the sustainable use and development of genetic resources in agriculture." Under the same regulation, the European Commission is also empowered to adopt delegated acts[31] related to "the conditions applicable to commitments to rear local breeds that are in danger of being lost to farming or to preserve plant genetic resources that are under threat of genetic erosion." In this regard, Commission Delegated Regulation (EU) No 807/2014, adopted in March 2014, sets out rules for determining whether a breed is "in danger of being lost to farming." In contrast

[31] The European Commission may be delegated "power to adopt non-legislative acts of general application to supplement or amend certain non-essential elements of the legislative act" (Article 290 of the Treaty on the Functioning of the European Union – available at http://tinyurl.com/pmkex58).

to previous arrangements, the new framework does not include a set of population thresholds. Member states are required to determine for themselves whether breeds fall into this category. The following conditions must be met:

"(a) the number of breeding females at national level concerned is stated;
(b) that number and the endangered status of the listed breeds is certified by a duly recognised relevant scientific body;
(c) a duly recognised relevant technical body registers and keeps up-to-date the herd or flock book for the breed;
(d) the bodies concerned possess the necessary skills and knowledge to identify animals of the breeds in danger."

The effects that the other aspects of the 2014 CAP reform will have on AnGR management are difficult to predict. Developments such as the provision of support for young people entering the agricultural sector and a range of measures to support the economic and social vitality of rural areas, along with the above-mentioned agri-environmental measures, are broadly compatible with efforts to support livestock-keeping livelihoods that involve the use of breeds that are at risk, or potentially at risk, of extinction (SAVE Foundation, 2013). With regard to the abolition of milk quotas, the country report from Poland notes that this is likely to have a significant effect on the utilization of AnGR, although precise outcomes are difficult to predict. The report notes that Poland has high potential to increase dairy production and that concentration of the sector might be very rapid and lead to substantial breed replacement.

In 2012, the European Commission launched the European Innovation Partnership "Agricultural Productivity and Sustainability" (EIP-AGRI) (European Commission, 2012a). European Innovation Partnerships are intended to "address weaknesses, bottlenecks and obstacles in the European research and innovation system that prevent or slow down good ideas being developed and brought to market" (European Commission, 2012b). The communication that launched EIP-AGRI heavily emphasized the important role of agricultural genetic resources, noting that "making use of European genetic diversity unlocks a vast potential for development." Roles are foreseen across most of the "areas of innovative actions" described in the document, which range from "increased agricultural productivity, output, and resource efficiency" to "biodiversity, ecosystem services, and soil functionality" and "innovative products and services for the integrated supply chain." A focus group on "genetic resources – cooperation models" has been established and held its first meeting in early 2014 (European Commission, 2014a).[32]

In the general field of biodiversity conservation and management, significant policy developments in recent years have included the adoption by the European Parliament (EU, 2007) of the 2006 Biodiversity Communication and Action Plan: "Halting the loss of biodiversity by 2010 – and beyond" (European Commission, 2006a; 2006b; 2006c). The plan included a set of objectives, targets and actions. Most relevant to AnGR were Objective 2: "To Conserve and Restore Biodiversity and Ecosystem Services in the Wider EU Countryside", which under the heading "Agricultural and rural development policy" included the target "Member States have optimised use of opportunities under agricultural, rural development and forest policy to benefit biodiversity 2007–2013" and the action "Strengthen measures to ensure conservation, and availability for use, of genetic diversity of crop varieties, livestock breeds and races, and of commercial tree species in the EU, and promote in particular their *in situ* conservation."

In 2011, the European Commission adopted the EU Biodiversity Strategy to 2020, which includes the headline target of "Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss" (EU, 2011).

[32] Further information can be found on the European Commission website: http://tinyurl.com/opxf7qt (EIP-AGRI); http://tinyurl.com/pycgx8w (focus group on genetic resources).

Genetic resources for food and agriculture are targeted under several actions, including via references to facilitating "collaboration among farmers and foresters to achieve continuity of landscape features, protection of genetic resources and other cooperation mechanisms to protect biodiversity" (Action 9), encouraging "the uptake of agri-environmental measures to support genetic diversity in agriculture and explore the scope for developing a strategy for the conservation of genetic diversity" (Action 10) and regulating "access to genetic resources and the fair and equitable sharing of benefits arising from their use" (Action 20). In 2012, the European Parliament adopted a resolution[33] on the biodiversity strategy. Of particular relevance to AnGR management are paragraphs 71 and 72 of the resolution, which call for

> *"appropriate legislation and incentives for the maintenance and further development of diversity in farm genetic resources, e.g. locally adapted breeds and varieties"*

and stress

> *"the need for more effective cooperation at European level in the field of scientific and applied research regarding the diversity of animal and plant genetic resources in order to ensure their conservation, improve their ability to adapt to climate change, and promote their effective take-up in genetic improvement programmes."*

Animal genetic resources management

This subsection discusses instruments that specifically target the management of AnGR. These instruments fall roughly into two categories: those targeting animal breeding or "zootechnics" and those targeting the broader sustainable management of AnGR, with particular emphasis on breeds that are at risk of extinction.

EU zootechnical legislation addresses a range of issues related to animal breeding. The legal framework described in the first SoW-AnGR[34] was largely still in place at the time of writing (July 2014). Separate sets of legal instruments are in place for each of the main mammalian livestock species or species groups raised in the EU (bovine, porcine, ovine and caprine, and equine) addressing a range of different aspects of the breeding process and trade in breeding animals (recognition of breeding organizations, entering in herdbooks, pedigree certificates and acceptance for breeding). For "other breeding animals" a basic directive is in place, but no implementing measures providing rules for the various above-listed elements. Another set of instruments regulates the import of breeding animals and genetic material from outside the EU and a further Council Decision regulates the operation of INTERBULL as the official reference centre for pure-bred breeding animals of bovine species. The main objectives of this body of legislation are to promote public health and food safety (rules on identification and registration), ensure the quality of traded breeding stock (rules requiring uniform breeding methods) and promote equity among breeders (rules ensuring that all breeders and breeding organizations are subject to the same requirements).

At the time of writing, a review of these measures was underway with a view to their consolidation under a single regulation and directive, the aim being (*inter alia*) to address concerns about inconsistencies in the interpretation of the existing provisions by the authorities in different countries and hence potential obstacles to trade and the operation of the EU single market (European Commission, 2014b; 2014c). It is expected that this review will be completed by the end of 2015.

As described above, Council Regulation (EC) No 1698/2005 allowed for the provision of agri-environment payments for the conservation of genetic resources in agriculture, and similar provisions are now in place under Regulation (EU) No 1305/2013. These payments are the mainstays of support for *in situ* conservation measures in the EU. However, support for a range of activities related to the conservation and sustainable use of AnGR is also addressed within the framework of Council Regulation (EC) No 870/2004, which established a second Community Programme on

[33] P7_TA(2012)0146.

[34] FAO, 2007a, pages 295–296.

the "conservation, characterization, collection and utilization of genetic resources in agriculture." Actions that can potentially receive support under the programme include those related to establishing inventories of conservation measures and the exchange of scientific and technical information, as well as those more directly related to conservation (*in situ* and *ex situ*), characterization, etc. Seventeen co-funded actions under the programme commenced in 2007, with a maximum duration of four years (European Commission, 2013a).[35] Five of these projects targeted AnGR: Towards self-sustainable European Regional Cattle Breeds;[36] An Integrated Network of Decentralized Country Biodiversity and Genebank Databases;[37] Heritage Sheep;[38] European Livestock Breeds Ark and Rescue Net;[39] and A Global View of Livestock Biodiversity and Conservation.[40]

An independent expert evaluation of the Community Programme published in 2013 (European Commission, 2013b) noted a number of positive outcomes and recommended that the programme should be continued. It concluded that the programme had:

"a. stimulated considerable interest among various groups of stakeholders within the European Union and beyond;
b. promoted collaboration among diverse groups of stakeholders in different countries;
c. led to the establishment of useful links and partnerships across Europe;
d. advanced the understanding of some local practices and needs;
e. led to useful results and guidelines for the conservation of valuable genetic resources;
f. established well characterised and evaluated core collections and cryo-banks of various plant and animal species; and
g. improved the scientific knowledge on the nature, management and potential of genetic resources of some species of farm animals, crops and forest trees in Europe."

However, the assessment noted that the utilization component of the programme had not been addressed to the same extent as the other components. To address this gap, it recommended that "the primary objective of selected Actions be the delivery of appropriate utilisation of agricultural genetic resources in practice" and that "increased involvement of end-users and small and medium enterprises in the funded actions, to ensure the immediate transfer and implementation of project results." With regard to AnGR management specifically, the submission provided by the European Regional Focal Point on Animal Genetic Resources to the expert evaluation emphasized the opportunity that the programme provided to link "on-farm" conservation activities to research activities (ERFP, 2012). It also noted that applied research under the five AnGR-related co-funded actions had contributed enormously to the sustainable management of AnGR. The weak points of the programme were considered to be the limited amount of funding available overall and the lack of continuity associated with project-based activities (ibid.).

With the aim of implementing the recommendations of the evaluation of the second Community Programme, the European Parliament, in 2013, allocated 1.5 million euros for a "preparatory action on EU plant and animal genetic resources"[41] that would review the state of genetic resources-related activities in the EU and make practical recommendations for future improvements (European Commission, 2013c).

[35] See web site: http://ec.europa.eu/agriculture/genetic-resources/actions/index_en.htm
[36] See web site: http://ec.europa.eu/agriculture/genetic-resources/actions/f-012/index_en.htm
[37] See web site: http://ec.europa.eu/agriculture/genetic-resources/actions/f-020/index_en.htm
[38] See web site: http://ec.europa.eu/agriculture/genetic-resources/actions/f-040/index_en.htm
[39] See web site: http://ec.europa.eu/agriculture/genetic-resources/actions/f-066/index_en.htm
[40] See web site: http://ec.europa.eu/agriculture/genetic-resources/actions/f-067/index_en.htm
[41] See website: http://ec.europa.eu/agriculture/calls-for-tender/2013-271472_en.htm

The following themes were identified for inclusion in the review:

"improvement of the communication between Member States concerning best practice and the harmonisation of efforts in the conservation and sustainable use of genetic resources";
"enhancing networking among key stakeholders and end-users in view of exploring marketing (and other cooperation) opportunities, such as provided by quality schemes and short supply chains";
"improvement of the exchange of knowledge and research on genetic diversity in agricultural systems";
"adaptation of breeding methods and legislation to the need of conservation and sustainable use of genetic diversity";
"contribution to the successful implementation of rural development measures concerning genetic diversity in agriculture";
"explore bottlenecks and enabling conditions for the sustainable use of genetic resources in agriculture"; and
"reduction of the unnecessary administrative burden so as to provide better access to actions."

Access and benefit-sharing

Following the adoption of the Nagoya Protocol (see Subsection 2), the EU was faced with the task of establishing dedicated legislation that would enable it to proceed with ratification and implementation. A draft regulation was developed by the European Commission (European Commission, 2012c), based on an extensive impact assessment study covering all relevant economic sectors and involving broad stakeholder consultation (European Commission, 2012d). The draft regulation covered the elements of the Nagoya Protocol that required harmonization and were better addressed at EU level – namely user measures and compliance – leaving access requirements to be considered by the individual EU Member States.

The draft regulation, together with the proposal for the ratification of the Nagoya Protocol, was presented to the European Parliament and the Council of Ministers in October 2012. The submission of the draft regulation was followed by an intensive period of discussions and negotiations between the different EU institutions involved in the legislative process. Political compromise between the co-legislators – the Council and the European Parliament – on the text of a draft regulation was achieved at the end of 2013. The vote in the Plenary of the European Parliament took place in March 2014 and the Council of Ministers adopted the regulation the following month. Successful completion of the process enabled ratification of the Nagoya Protocol by the EU on 16 May 2014 and publication of Regulation (EU) No 511/2014 on 20 May. The remaining step at EU level was to develop and agree on implementing acts. An ABS Committee established by the European Commission completed this task in July 2015. The ratification of the Nagoya Protocol by individual Member States is proceeding in accordance with their internal procedures.

The regulation sets out rules governing compliance with the Nagoya Protocol's provisions on access and benefit-sharing for genetic resources and traditional knowledge associated with genetic resources. It is based on the principle that users of genetic resources should exercise "due diligence" in ascertaining that applicable rules on access and benefit-sharing have been and are followed (Article 4). The due diligence concept, which is elaborated in the EU timber regulation (Regulation (EU) No 995/2010), contains three elements: provision of information; risk assessment; and risk mitigation. The benefit-sharing requirements of the Nagoya Protocol are to be dealt with on the basis of "mutually agreed terms" between the provider and the user.

Regulation (EU) No 511/2014 also covers compliance measures, such as checkpoints (Article 7) and risk-based monitoring of users (Article 9), as well as the establishment of competent authorities and national focal points, and reporting and submission of information to the Access Benefit

Sharing Clearing House.[42] It requires Member States to establish penalties that are effective, proportionate and dissuasive. It also establishes important compliance-facilitation tools, such as EU-registered collections (Article 5) and recognized best practices (Article 8).

The influence that the Nagoya Protocol will have on the management of AnGR in the EU is difficult to predict. Effects will depend heavily on the access legislation adopted by individual Member States and other Parties to the Nagoya Protocol. However, it is possible that the new arrangements will help to promote gene banking and the development of AnGR held in the public domain.

Animal health

The first SoW-AnGR provided an overview of the EU framework for animal health – a large body of instruments addressing various individual species, health problems and livestock-sector activities – and noted a number of potential effects on AnGR and their management. Given that animal health problems can pose a direct threat to the survival of at-risk breed populations and can undermine the economic sustainability of livestock-keeping livelihoods, a well-regulated animal-health system is an important component of AnGR management in the broad sense. Potentially negative consequences include the effects of compulsory culling campaigns on at-risk breed populations and various restrictions and requirements that may constrain conservation activities or the keeping of certain breeds in their traditional production systems. The report noted both that some problems of this type had arisen at EU level and that some steps had been taken to address them (e.g. allowing for potential derogations for at-risk breeds in the event of a culling campaign and adjusting animal identification requirements to account for problems encountered in certain extensive production systems).

In 2008, the European Commission adopted a communication on an action plan for the implementation of a new animal health strategy for the EU for the six years to 2013 (European Commission, 2008). The strategy document, subtitled "Prevention is better than cure", noted the challenges posed by new and re-emerging diseases and by the increased volume of trade in animal products, both within the EU and with third countries. The strategy was based on four main pillars: "1. Prioritisation of EU intervention; 2. The EU animal health framework; 3. Prevention, surveillance and preparedness; and 4. Science, innovation and research" (European Commission, 2007).

With regard to regulation, the objective was to develop a "single clear regulatory framework" converging as far as possible with the standards and guidelines of the World Organisation for Animal Health (OIE)[43] and the Codex Alimentarius Commission.[44] After extensive consultations a proposal for a new regulation on animal health was published in 2013 (European Commission, 2013d), the intention being to streamline the large number of existing instruments in this field into a single law. In April 2014, the European Parliament adopted a legislative resolution containing a number of amendments to the draft act (EU, 2014c). These amendments featured a number of references to AnGR management, including statements that:

- competent authorities should consider effects on diversity and the need to conserve AnGR when deciding upon what actions to take in the event of a disease outbreak;
- the European Commission should take breed-level diversity into account when adopting delegated acts related to the approval of establishments[45] of various kinds; and
- breed should be included as a data item in traceability systems for genetic material.

[42] The Access and Benefit-sharing Clearing-House was established under Article 14 of the Nagoya Protocol.

[43] http://www.oie.int

[44] http://www.codexalimentarius.org/

[45] An "establishment" in this context refers to "any premises, structure, or any environment, in which animals or germinal products are kept, except for: (a) households keeping pet animals; (b) non-commercial aquaria keeping aquatic animals; (c) veterinary practices or clinics."

Organic products and other specialized food products

Supplying products to niche markets is recognized as a potential means of keeping breeds in profitable production and thereby reducing the likelihood that they will fall out of use and face the risk of extinction (see Part 4 Section D). Niche marketing can be facilitated by the existence of a legal framework that regulates the designation and labelling of particular classes of products that have characteristics that make them attractive to particular groups of consumers.

The first SoW-AnGR noted the existence of a number of EU quality schemes covering animal products, and briefly described the legal framework established during the 1990s to regulate the operation of these schemes.[46] A new framework was put in place in 2006: Council Regulation (EC) No 510/2006 on protected geographical indications (PDI) and protected designations of origin (PDO); and Council Regulation (EC) No 509/2006 on traditional specialties guaranteed (TSG). In the case of PDIs and PDOs, the rules stated that a name could not be registered if it conflicted "with the name of a plant variety or an animal breed and as a result is likely to mislead the consumer as to the true origin of the product." The regulation on TSGs, however, stated that the "name of a plant variety or breed of animal may form part of the name of a traditional speciality guaranteed, provided that it is not misleading as regards the nature of the product." Rules related to product specification (i.e. the description of the product for the purposes of its registration under one of the quality schemes) included no references to breed-related information. Many PDIs, PDOs and TGIs for animal products involve no requirement that the product comes from a specific breed.

2012 saw the adoption of a new unified instrument, Regulation (EU) No 1151/2012. The main innovative feature of this instrument is the establishment of a scheme for the use of "optional quality terms", the objective being "to facilitate the communication within the internal market of the value-adding characteristics or attributes of agricultural products by the producers thereof." The regulation establishes the term "mountain product" as an optional quality term and requires the European Commission to investigate the case for a new term "product of island farming". A report setting out the pros and cons of introducing this term was published late in 2013 (European Commission, 2013f). Conditions of use for the "mountain product" quality term are further elaborated under Commission Delegated Regulation (EU) No 665/2014. The European Commission has also investigated the possibility of establishing a labelling scheme for "local farming and direct sales" (European Commission, 2013f).

The EU legal framework for organic agriculture has also been revised since the time the first SoW-AnGR was drafted (2005/2006). The main instrument in the current framework is Council Regulation (EC) No 834/2007, which addresses both crop and livestock production. Detailed rules for the implementation of this regulation are set out in Commission Regulation (EC) No 889/2008. Under this new framework, provisions related to the choice of breeds for organic livestock production are similar to those previously in place,[47] i.e. account must be taken of animals' capacity to adapt to local conditions. Likewise, both the 1999 and the 2007 regulations refer to the use of well-adapted breeds being a fundamental element of organic disease-control strategies. The 2007 regulation also refers to the use of well-adapted breeds as a means of avoiding the use of welfare-unfriendly practices. The provisions of the 2007 regulation that address the use of "non-organic" animals for breeding purposes, allow some additional flexibility in the use of such animals in the case of breeds that are at risk of extinction.

On the policy front, the European Action Plan for Organic Food and Farming, launched by the European Commission in 2004 (European Commission 2004a; 2004b), was replaced in 2014 by the Action Plan for the Future of Organic Production in the

[46] See FAO, 2007a, pages 296–297.

[47] Regulation (EC) 1804/1999 (see FAO, 2007a, page 297 for further information).

European Union (European Commission, 2014d). The new plan aims to ensure, *inter alia*, that consumer trust and the integrity of organic production are maintained in the face of rising demand and changing societal expectations, while also avoiding overcomplicated rules that exclude small operators and maintaining the innovative role of the organic sector. It contains no specific references to the role of AnGR diversity in organic agriculture.

A legislative proposal for a new regulation (replacing that of 2007) was published by the European Commission in March 2014 (European Commission, 2014e; 2014f). The roles of well-adapted breeds are again highlighted and the above-mentioned provision related to the use of non-organic breeding animals from at-risk breeds is maintained (in other respects, the rules regarding the origin of breeding animals for use in organic agriculture become less flexible).

The precise implications of these developments for AnGR management remain unclear. While the growth of organic production probably contributes to some degree to increasing demand for locally adapted animals – and thus keeping relevant laws and policies updated is likely to be conducive to sustainable AnGR management – in many cases, organic production is based on "mainstream" breeds widely used in conventional agriculture. Effects on the use of AnGR at national level in some EU countries are discussed below in Subsection 4.4. Some criticism has been directed at the current EU framework on the grounds that allowing the widespread use of mainstream animals in organic agriculture creates welfare problems because of these animals' lack of adaptedness to more "natural" production environments (Compassion in World Farming, 2013; Eurogroup for Animals, 2013).

Animal welfare

The main EU legal instrument on the welfare of animals kept for farming purposes is Council Directive 98/58/EC. This directive includes rules on the use of breeding procedures and others related to the need to ensure that "on the basis of their genotype or phenotype" animals "can be kept without detrimental effect on their health and welfare." Specific instruments addressing the welfare of laying hens, calves, pigs and broiler chickens are also in place. The main developments since the time the first SoW-AnGR was drafted (2005/2006) have been the adoption of Council Directive 2007/43/EC on broiler welfare and Council Directive 2008/119/EC and Council Regulation (EC) No 1099/2009, updating, respectively, rules on calf welfare and welfare at the time of slaughter. The main policy instrument in this field is the EU Strategy for the Protection and Welfare of Animals 2012–2015 (European Commission, 2012e). The various new laws and policies do not include any provisions specifically related to the use of breeding technologies or to the circumstances in which particular genotypes can be raised. However, the broiler Directive does request a report on genetic parameters and their influence on broiler welfare.

The extent to which welfare-related instruments affect the management of AnGR is difficult to estimate. As production systems are adapted to meet welfare rules, demand for various types of AnGR is likely to change to some degree. More direct effects may potentially arise in connection with the use of breeds that have specific phenotypes that may affect their welfare. An interesting example of a cattle breed whose use has been the subject to legal challenges is the Belgian White Blue, which because of its double muscling phenotype has a high rate of caesarean sections (Lips *et al*., 2001). During the 1990s, the European Court of Justice ruled that under European zootechnical legislation (Directive 87/328/EEC) Sweden could not forbid, because of welfare concerns, the use of imported semen from this breed, on the grounds that "national authorities are not entitled to reject the use of semen of that breed … since the genetic peculiarities and defects of an animal may be defined only in the Member State in which the breed of cattle has been accepted for artificial insemination" (Case C-162/97).[48] In other

[48] Judgment of 19.11.1998 — Case C-162/97 Judgment of the Court (Fifth Chamber) 19 November 1998 (available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:61997CJ0162&from=EN).

words, as the Belgian authorities had approved the breed for artificial insemination, no restrictions on the use of its semen could be imposed by any EU member state.

Food and feed safety

In the field of food and feed safety, the main instruments noted in the first SoW-AnGR – Regulation (EC) No 178/2002 and Regulation (EC) No 882/2004 – continue to form the backbone of the EU legal framework. A new regulation on the traceability of food of animal origin, Regulation (EU) No 931/2011, has been put in place. These instruments do not include any provisions specifically related to breeding or AnGR management. Effective frameworks addressing these matters are, in general, likely to benefit livestock-keeping livelihoods by promoting animal health and consumer confidence in animal products and hence in some circumstances may indirectly benefit AnGR diversity. However, such legislation can potentially prove onerous for small-scale producers and may also create problems for the marketing of some speciality products (see Subsection 4 for further discussion).

3.2 Other regional frameworks

Many parts of the world have regional or subregional intergovernmental bodies that promote economic or political cooperation among their member countries. In some cases, these bodies have the authority to adopt legally binding instruments. Whether or not this is the case, they normally have some policies and strategies that aim to coordinate the actions of their member countries within particular areas of activity. Outside the EU, regional legal frameworks, where they exist, are relatively undeveloped and include few instruments specifically targeting the livestock sector, with the partial exception of animal health-related matters. It is beyond the scope of this report to review the legal and policy frameworks of all the world's regional and subregional bodies and their potential effects on AnGR management. However, a number of examples of livestock-related and AnGR-related instruments (mostly policy instruments) are discussed below.

Several of the subregional economic communities of Africa have developed policies that directly target AnGR management, as well as various provisions addressing the livestock sector in a broader sense. For example, in 2005, the Heads of State and Government of the Economic Community of West African States (ECOWAS)[49] adopted a regional agricultural policy referred to as ECOWAP (Decision A/Dec. 11/01/05). Livestock-related elements of the policy include plans to harmonize sanitary norms and standards and to establish a regional programme on transhumance. A decision on the use of "transhumance certificates" to regulate the cross-border movements of pastoralists had previously been adopted (Decision A/Dec. 5/10/98).[50] 2010 saw the publication of the Strategic Action Plan for the Development and Transformation of Livestock Sector in the ECOWAS Region (2011–2020) (ECOWAS Commission, 2010). The plan's objectives include:

> *"Improvement of the performance of local breeds through emphasis on the following: (i) Evaluation and harmonisation of the management of genetic resources; (ii) Facilitation of the development of regional centres of excellence and genetic value addition to local breeds as well as capacity building."*

The Regional Indicative Strategic Development Plan of the Southern African Development Community (SADC)[51] for the period 2005 to 2020 includes the "sustainable management and utilization of farm animal genetic resources" among its strategies for increasing production, productivity and profitability in the livestock sector (SADC, 2003). Other relevant elements of the plan include promoting diversification and intensification of crop and livestock systems and strengthening and

[49] Member states: Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

[50] See FAO 2007a, Box 65 (page 328).

[51] Member states: Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia, Zimbabwe.

broadening early warning systems for livestock diseases. None of SADC's legally binding instruments target AnGR management specifically. However, the Protocol on Trade (1996) has an annex on sanitary and phyosanitary matters (approved in 2008). The organization has taken several initiatives of relevance to AnGR management in the region, including the Promotion of Regional Integration initiative, which operated between 2005 and 2009 with the aim of improving productivity and trade flows in the livestock sector, the Trans-boundary Animal Diseases Project and the Foot and Mouth Disease Programme.[52]

The African Union, as part of its efforts to foster agricultural development across the continent, has taken steps to promote the sustainable use and development of AnGR. For example, its framework for mainstreaming livestock into the Comprehensive Africa Agriculture Programme[53] calls for a number of actions targeting the characterization and conservation of AnGR, as well dissemination of information, technology transfer and harmonization of regulatory frameworks (AU-IBAR, 2010). The Strategic Plan 2014 to 2017 of the African Union – Interafrican Bureau for Animal Resources (AU-IBAR) addresses the implementation of the Global Plan of Action for Animal Genetic Resources in Africa (AU-IBAR, 2013).

As described in the first SoW-AnGR,[54] the African Union's predecessor, the Organization of African Unity, developed a model law on the protection of the rights of farmers and the regulation of access to biological resources, to assist countries in the development of national policies and legislation in this field (OAU, 2000). In the wake of the adoption of the Nagoya Protocol, the African Union Commission developed draft African Union Strategic Guidelines for the Coordinated Implementation of the Nagoya Protocol on Access and Benefit Sharing, which were adopted by the African Ministerial Conference on the Environment in March 2015 (Decision 15/3).

In Latin America, the Andean Community of Nations[55] has put in place a number of instruments relevant to AnGR management. For example, Decision 523 of 2002 approves the Regional Biodiversity Strategy for the Countries of the Tropical Andes. While this strategy does not include any provisions specifically addressing AnGR management, it includes a "line of action" on the conservation and sustainable use of native and locally adapted agrobiodiversity, which focuses, *inter alia*, on characterization, identifying means of stimulating the marketing and use of products and services to support *in situ* conservation, strengthening scientific and technical capacities, and addressing access and benefit-sharing issues. Decision 391 of 1996 establishes a common subregional regime for access to genetic resources. It targets all genetic resources, with no particular provisions for AnGR or for genetic resources for food and agriculture in general. Other relevant instruments in this subregion include Decision 328 on agricultural and animal health.

Elsewhere in the world, regional bodies have put in place few legal instruments or major policy instruments that target AnGR management or explicitly include it within broader fields of action such as livestock development or biodiversity conservation. One example of an instrument that acknowledges the significance of AnGR is the Cooperation Council of the Arab States of the Gulf's[56] General Regulations of Environment in the GCC States (1997), which states that responsibilities of agencies responsible for environmental protection and conservation should include issuing and implementing rules and regulations related to, *inter alia*, "conservation of biological resources of local domesticated animals and local plants of economic value and improving them."

[52] For further information see the SADC Livestock Production website (http://tinyurl.com/op3rupo)

[53] The Comprehensive Africa Agriculture Development Programme was endorsed by African Heads of State in 2004. For further information see the programme website: http://www.nepad-caadp.net/

[54] FAO, 2007a, Box 45 (page 292).

[55] Member states: Bolivia (Plurinational State of), Colombia, Ecuador, Peru.

[56] Member states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates.

3.3 Conclusions

As recognized in the Global Plan of Action for Animal Genetic Resources, many aspects of AnGR management potentially benefit from coordination and cooperation at regional level. Regional collaboration does not necessarily depend on the existence of regional-level legal and policy frameworks. However, a lack of consistency and coordination at policy and legislative levels has the potential to inhibit both trade in genetic resources and non-commercial collaboration in conservation, research and so on. In this respect, a regional approach that facilitates harmonization may be useful. There may also be benefits in terms of cost effectiveness if countries are spared the need to develop their own frameworks from scratch. On the other hand, as with laws and policies at any level (e.g. national or global), regional frameworks have the potential to overburden stakeholders with costs and bureaucratic procedures or to fail because of a lack of capacity to implement them or because of poor design. Clearly, any plans to establish regional frameworks need to be well adapted to the needs and capacities of the respective regions. Experiences from the EU appear to indicate (see various examples above) that in some fields of activity legal and policy frameworks need to be overhauled quite frequently if they are to remain relevant – a point that may need to be borne in mind when considering the feasibility of regional approaches elsewhere. Another notable characteristic of developments in the EU are the wide-ranging stakeholder consultations that take place before any legal instruments are put in place.

Outside Europe, as was the case at the time of the first SoW-AnGR, regional policy and, particularly, legal instruments addressing AnGR management are few and far between. The topic appears not to have entered in any substantial way onto the agendas of many regional bodies. It is, of course, difficult without an in-depth analysis of circumstances in the respective regions to know what the potential benefits and costs of attempting to establish instruments of this kind might be.

Assessing the effects of existing frameworks is also difficult. In the EU, assessments of the impact of AnGR-related instruments have been published and indicate various positive outcomes. However, there is some concern about a lack of involvement of the "end-users" of genetic resources and a lack of focus on utilization relative to conservation. Little has been published on the effects of regional AnGR-related policies elsewhere in the world.

Changes since the time of the first SoW-AnGR have been quite substantial in Europe. Several areas of AnGR-relevant legislation have seen major revisions, often with the aim of consolidating and clarifying frameworks that had developed into elaborate sets of species- and topic-specific instruments. In many cases, the updated frameworks have been established only recently or are still in the process of development.[57] Their practical effects on AnGR management are therefore not yet evident. Outside Europe, the most prominent developments have been in policy rather than legal frameworks and mainly in Africa, both at continental (African Union) and at subregional levels.

List of legal instruments cited

Andean Community of Nations

Decision 328 Andean agricultural and livestock health (1992) (available at http://www.sice.oas.org/trade/junac/decisiones/Dec328e.asp).

Decision 391 Common regime on access to genetic resources (1996) (available at http://www.sice.oas.org/trade/junac/decisiones/dec391e.asp).

Decisión 523 Estrategia regional de biodiversidad para los países del trópico andino (2002) (available in Spanish at http://tinyurl.com/ppshlvb).

Cooperation Council for the Arab States of the Gulf

General Regulations of Environment in the GCC States, 1997 (available at http://tinyurl.com/q7fjny3).

[57] At the time of writing, July 2014.

Economic Community of West African States

Décision A/DEC. 5/10/98 relative à la réglementation de la transhumance entre les états membres del la CEDEAO. Vingt-et-unième session ordinaire de la Conférence des chefs d'état et de gouvernement. Abuja 30–31 Octobre 1998 (available in French at http://tinyurl.com/nsobh9e).

Decision A/DEC. 11/01/05 adopting an agricultural policy for the Economic Community of West African States (ECOWAP). Twenty-eighth session of the Authority of Heads of State and Government, Accra, 19th January 2005 (available at http://tinyurl.com/pz32kpy).

European Union

Commission Delegated Regulation (EU) No 665/2014 of 11 March 2014 supplementing Regulation (EU) No 1151/2012 of the European Parliament and of the Council with regard to conditions of use of the optional quality term 'mountain product' (available at http://tinyurl.com/o2kjac7).

Commission Delegated Regulation (EU) No 807/2014 of 11 March 2014 supplementing Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and introducing transitional provisions (available at http://tinyurl.com/nnbknfb).

Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control (available at http://tinyurl.com/b59rog).

Council Decision 2006/144/EC of 20 February 2006 on Community strategic guidelines for rural development (programming period 2007 to 2013) (available at http://tinyurl.com/nunb3v5).

Council Directive 87/328/EEC of 18 June 1987 on the acceptance for breeding purposes of pure-bred breeding animals of the bovine species (http://tinyurl.com/oclnhr2).

Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes (available at http://tinyurl.com/nel556k).

Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production (available at http://tinyurl.com/mo4o444).

Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves (available at http://tinyurl.com/oaxgrqn).

Council Regulation (EEC) No 2078/92 of 30 June 1992 on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside (available at http://tinyurl.com/prfsuo9).

Council Regulation (EC) No 1257/99 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain Regulations (available at http://tinyurl.com/ntz6qow).

Council Regulation (EC) No 1782/2003 of 29 September 2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers and amending Regulations (EEC) No 2019/93, (EC) No 1452/2001, (EC) No 1453/2001, (EC) No 1454/2001, (EC) 1868/94, (EC) No 1251/1999, (EC) No 1254/1999, (EC) No 1673/2000, (EEC) No 2358/71 and (EC) No 2529/2001 (available at http://tinyurl.com/p8hovps).

Council Regulation (EC) No 870/2004 of 24 April 2004 establishing a Community programme on the conservation, characterisation, collection and utilization of genetic resources in agriculture and repealing Regulation (EC) No 1467/94 (available at http://tinyurl.com/pxxjay7).

Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (available at http://tinyurl.com/al7gs2).

Council Regulation (EC) No 509/2006 of 20 March 2006 on agricultural products and

foodstuffs as traditional specialities guaranteed (available at http://tinyurl.com/o3rfwaf).

Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs (available at http://tinyurl.com/o6qkovr).

Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91 (available at http://tinyurl.com/4dcvy8).

Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003 (available at http://tinyurl.com/nrtkyus).

Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing (available at http://tinyurl.com/q96hydm).

Regulation (EC) No 178/2002 of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety (available at http://tinyurl.com/np2pbzm).

Regulation (EC) No 882/2004 of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules (available at http://tinyurl.com/p23uvu5).

Regulation (EU) No 995/2010 of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market (available at http://tinyurl.com/c5lwg58).

Regulation (EU) No 931/2011 of 19 September 2011 on the traceability requirements set by Regulation (EC) No 178/2002 of the European Parliament and of the Council for food of animal origin (available at http://tinyurl.com/6o55jls).

Regulation (EU) No 1151/2012 of 21 November 2012 on quality schemes for agricultural products and foodstuffs (available at http://tinyurl.com/ojjz743).

Regulation (EU) No 1305/2013 of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005 (available at http://tinyurl.com/qesmnxd).

Regulation (EU) No 1306/2013 of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008 (available at http://tinyurl.com/p28qeor).

Regulation (EU) No 1307/2013 of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009 (available at http://tinyurl.com/qjz6j7v).

Regulation (EU) No 1308/2013 of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007 (available at http://tinyurl.com/p6o3enl).

Regulation (EU) No 511/2014 of 16 April 2014 on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union (available at http://tinyurl.com/px94vur).

Southern African Development Community

Protocol on trade in the Southern African Development Community (1996) (available at http://tinyurl.com/pboj7eq).

Sanitary and phytosanitary (SPS) annex to the SADC Protocol on Trade approved by the SADC Committee of Ministers of Trade on 12 July 2008, Lusaka, Zambia (available at http://tinyurl.com/qeqnyhj).

4 National frameworks

4.1 Roles of national laws and policies in animal genetic resources management

"A range of policies and legal instruments have direct or indirect effects on the use, development and conservation of animal genetic resources. These instruments often pursue different objectives, such as economic development, environmental protection, animal health, food safety, consumer protection, intellectual property rights, genetic resources conservation, and access to and equitable sharing of benefits arising from the use of animal genetic resources." (FAO, 2007a)

As the quotation shows, the Global Plan of Action on Animal Genetic Resources[58] recognizes both the significant role of legal and policy frameworks in AnGR management, and the potentially complex nature of the effects involved. Laws and policies can serve as tools in AnGR management, but they also form part of the context within which AnGR management takes place. As discussed in Part 2 of this report, legal and policy frameworks are often among the factors shaping the development of a country's livestock sector.

There is no "blueprint" for an effective legal and policy framework for AnGR management. As well as having its own particular set of objectives, problems and opportunities, each country will have its own legal system and its own approach to the development and implementation of policy instruments. The Global Plan of Action does not attempt to prescribe solutions or even to provide a checklist of topics that need to be addressed. However, it does call on countries to

"periodically review existing national policies and regulatory frameworks, with a view to identifying any possible effects they may have on the use, development and conservation of animal genetic resources ..."

and to

"consider measures to address any effects identified in [the] reviews of policy and legal frameworks."[59]

Countries wishing to improve the effectiveness of their legal and policy frameworks as tools to promote the sustainable management of AnGR potentially have a number of different strategies at their disposal. For example, the Global Plan of Action notes that countries may wish to respond to any identified weaknesses in their existing provisions either via policy and legislative changes or by improving the implementation of existing measures.[60] With regard to the types of instruments required, the first SoW-AnGR tentatively concluded that, in some circumstances, attempting to develop elaborate legal frameworks may not be the best way forward. It noted the potential contribution of "sound policy decisions and strategies, complemented by a clear legal definition of the competences and duties of institutions, and a well-organized monitoring and evaluation system ..."[61] However, it also noted that some countries had reported the need to improve their legal frameworks in order to put their existing policies into operation. It also noted that some countries were increasingly relying on market mechanisms and private institutions to provide for various aspects of AnGR management and that in these circumstances close attention needed to be paid to the potential need for regulatory measures to ensure that public-goods aspects of AnGR management were adequately accounted for.

Whatever approach countries choose to take in terms of promoting or enabling effective AnGR management (i.e. whatever balance between legislation, policy measures and reliance on the market and private initiatives), it is likely that some aspects of livestock development (and other activities that affect livestock development) will be regulated by law and that

[58] FAO, 2007a, Rationale to Strategic Priority 20.

[59] FAO, 2007a, Strategic Priority 20, Actions 1 and 2.

[60] FAO, 2007a, Strategic Priority 20, Action 2.

[61] FAO, 2007a, page 333.

this will affect the management of AnGR. The field of animal health and sanitary protection – which the first SoW-AnGR concluded was the most heavily regulated aspect of the livestock management – is perhaps the most obvious example. Moreover, given increasing concerns about a number of public goods-related issues in the livestock sector (e.g. environmental protection and human public health), across ever wider areas of the world, it is possible that, in a number of countries, the range of livestock-sector activities subject to legal regulation may expand. Developments of this kind can present both challenges (e.g. additional regulatory burdens or restrictions on livestock keepers' activities) and opportunities (e.g. better protection from disease and environmental threat or potential new niche markets) for the management of AnGR. In some circumstances, it may be feasible to build "AnGR-friendly" provisions into legal instruments in these various fields. In others, it may be necessary to focus on policy measures that help livestock keepers and other managers of AnGR adapt to the circumstances created by the introduction of the new legislation.

4.2 Context, information sources and methodology

The broad range of potentially relevant legislation and policies, and the fact that the concrete effects of legislation and policies on AnGR management cannot necessarily be inferred simply from the wording of the respective instruments, have meant that it has been difficult to obtain a global overview of the state of national provisions in this field and their implications for AnGR. In 2003, FAO conducted a survey on the legal framework for AnGR management, in which questionnaires were sent to all National Coordinators for the Management of AnGR and the Chairs and Technical Secretaries of National Consultative Committees[62] on AnGR. Combined with information obtained from all the country reports[63] that had been submitted to FAO by September 2003 and from an extensive internet search, the results of the survey were used to prepare an FAO Legal Study entitled *The legal framework for the management of animal genetic resources* (FAO, 2006). The material assembled for this study was later combined with information obtained from additional country reports, from FAO's FAOLEX database[64] and via direct e-mail contact with National Coordinators to prepare a chapter on national legislation and policy for the first SoW-AnGR.[65] Both the legal study and the first SoW-AnGR stressed that the material presented should not be regarded as a comprehensive global inventory of relevant legal and policy instruments. The other main limitation of these studies was that, as noted above, an inventory of instruments does not necessarily provide a good indication of their effects on AnGR management – or of what needs to be done to supplement or improve them.

In 2013, as part of the preparation process for the second SoW-AnGR, FAO organized another global survey of national legal and policy frameworks (referred to below as the "legal survey"). All National Coordinators were invited to complete a questionnaire[66] in which they were asked to indicate the presence or absence of legal and policy instruments at national level in a number of fields directly or indirectly relevant to the management of AnGR, to describe these instruments, to indicate the effect they (or the absence of relevant laws and/or polices) were having on AnGR management, and to describe the country's needs with respect to the future development of its legal and policy framework. Forty-six fully completed questionnaires were

[62] These bodies were established for the preparation of country reports for the first SoW-AnGR process.

[63] Reports submitted as part of the first SoW-AnGR process (ftp://ftp.fao.org/docrep/fao/010/a1250e/annexes/CountryReports/CountryReports.pdf).

[64] http://faolex.fao.org/faolex/

[65] FAO 2007a, Part 3 Section E Subsection 4 (pages 307-333).

[66] http://www.fao.org/ag/againfo/programmes/documents/genetics/global/SoWAnGR_leg_policies_invitation_E.pdf

submitted.[67] This provided a smaller, but more in-depth, dataset than had been available for the previous studies. The objective of obtaining detailed information on how existing instruments affect AnGR management and on countries' future priorities was only partially met (answers were often worded in a very general way or referred to general improvements in AnGR management rather than specifically to improvements to legal and policy frameworks). The main country-report questionnaire for the second SoW-AnGR provided countries with additional opportunities to report on their legal and policy frameworks, particularly in the section on institutions and stakeholders (see Part 3 Section A) and the section on progress in implementing Strategic Priority Area 4 of the Global Plan of Action.

For the purposes of the legal survey, a "policy" was defined as follows:

> *"a set of planned actions adopted by government with the aim of meeting a specific objective or objectives – a policy may be approved by parliament, but is not as by intent or nature legally binding. Instruments of this type may be given a range of different names including 'strategy', 'programme' or 'plan'."*[68]

One of the objectives was to identify whether, how and to what extent formal instruments of this kind contribute to improving the management of AnGR relative to situations in which management actions (if any) are taken on a more ad hoc basis. The discussion that follows below focuses on formal policy instruments of this kind. It should, however, be recognized that "policy", in a broader sense, can include the unwritten "level of commitment" shown by a government to a given field of activity, whether or not it is targeted by a specific policy instrument. It may also refer to the "stance" or attitude of a government with respect to a particular question, influencing the type of action that is taken, but not part of a conscious and coherent effort to pursue a particular outcome. The legal survey did not address the effects of policies in these more informal senses. However, the country-report questionnaire provided countries with opportunities to comment on the state of policy implementation, the state of awareness of policy-makers and constraints (of any kind, including political) to the implementation of various AnGR management activities.

For the purpose of the survey, "legislation" was taken to include "both primary legislation (e.g. laws, acts)[69] and secondary legislation (e.g. regulations)[70]". Countries were also given the opportunity to report on "relevant court cases (especially in common law systems)[71] and on trends in customary law.[72]" Little or no information on the significance for AnGR management of customary law or legal precedent in common-law systems

[67] 17 OECD countries: Australia, Austria, Czech Republic, Finland, France, Germany, Hungary, Italy, Luxembourg, Netherlands, Norway, Republic of Korea, Slovenia, Spain, Sweden, Switzerland, United States of America. 29 non-OECD countries: Bhutan, Brazil, Bulgaria, Burundi, Costa Rica, Croatia, Cyprus, Democratic Republic of the Congo, Ecuador, Ethiopia, Ghana, Guatemala, Iraq, Jordan, Latvia, Malaysia, Mauritius, Montenegro, Namibia, Nepal, Serbia, Sri Lanka, Sudan, Suriname, Thailand, United Republic of Tanzania, Uruguay, Viet Nam, Zimbabwe.

[68] The phrase "planned actions" was used in recognition of the fact that the mere existence of a policy does not necessarily always translate into concrete activity.

[69] Primary legislation is normally enacted by a legislative body (e.g. parliament). [Foot note is part of the original quoted text.]

[70] Secondary or implementing legislation (regulations) is subsidiary to primary legislation; it provides more detail and is issued by an authority of the executive that has been specifically authorized in a parliamentary-level law to issue regulations on the respective matter. [Foot note is part of the original quoted text.]

[71] Common law, also known as case law or precedent, is law developed by judges through decisions of courts and similar tribunals. [Foot note is part of the original quoted text.]

[72] Customary law refers to the laws, practices and customs of indigenous and local communities which are an intrinsic and central part of the way of life of these communities. Customary laws are embedded in the culture and values of a community or society; they govern acceptable standards of behaviour and are actively enforced by members of the community (http://www.wipo.int/wipo_magazine/en/2010/04/article_0007.html). [Foot note is part of the original quoted text. Full reference = WIPO. 2010. What place for customary law in protecting traditional knowledge? *WIPO Magazine*, 4 (2010): 18–20.]

was submitted in the survey responses and the topics were not pursued further.

The discussion presented below is based largely on an analysis of the results of the legal survey, supplemented with material from the country reports. In the case of instruments specifically targeting the sustainable use, development and conservation of AnGR, examples drawn from FAO's FAOLEX database are also included. In a few cases, material from other sources is used to illustrate particular points that were not well covered in the survey responses. The discussion is divided into four main subsections:

- instruments specifically addressing AnGR management (characterization, surveying and monitoring, genetic improvement, conservation, etc., i.e. approximately the subject matter of the Global Plan of Action);
- instruments addressing various aspects of the marketing of livestock products (these instruments are not primarily concerned with AnGR management, but are highly relevant to efforts to promote sustainable use);
- instruments addressing animal health (again not specifically focused on AnGR, but a highly regulated field with substantial potential to affect AnGR management); and
- instruments addressing various general aspects of agricultural and rural development (not specifically focused on AnGR, but possibly including some AnGR-related provisions and possibly affecting AnGR management indirectly in various ways).

The discussion of each specific aspect of the legal and policy framework for AnGR management aims to provide an overview of the state of provision in the respective field (whether instruments are present, in development or non-existent), to present some examples of existing provisions, to draw attention to any gaps and weaknesses that countries report in existing frameworks and to summarize available information on countries' priorities for future developments. Where necessary, a short introduction to the topic and the main types of instrument that are likely to be relevant is included. In the case of instruments directly targeting the management of AnGR (Subsection 4.3) an attempt is made to present a quantitative analysis of the state of provision. It should be borne in mind that the figures presented are based purely on countries' responses to the legal survey and are therefore likely to be affected by differences in how the questionnaire was interpreted (e.g. in terms of precisely what kind of instrument qualifies for inclusion in which field of AnGR management). Moreover, it should also be recalled that, given the complexity of many aspects of AnGR management, the presence of an instrument addressing a given field does not necessarily indicate that there are no significant gaps in existing provisions.

Because of the relatively small number of survey responses received, the quantitative results presented below are not broken down by region as was done for the equivalent chapter in the first SoW-AnGR. However, to give an indication of differences between developed and developing countries, results for OECD (Organisation for Economic Co-operation and Development) and non-OECD countries are presented separately. The sample includes 17 OECD countries (50 percent of all OECD countries) and 29 non-OECD countries (20 percent of all non-OECD members of the CGRFA). Given that member countries of the EU are subject to regional-level legal and policy frameworks in many relevant fields (see Subsection 3 above), these countries are treated as a distinct subgroup in some of the textual descriptions. However, separate quantitative analyses are not presented for this group of countries.

The legal survey respondents were a self-selecting group that included approximately 35 percent of all the countries that submitted country reports.[73] The country-report questionnaire did not include detailed questions about legal policy frameworks. However, it required countries to provide a score (none, low, medium or high) for the state of their legal and policy frameworks for AnGR management (see Part 3

[73] Only one country (Australia) submitted a response to the legal survey but provided no country report.

Section A). Comparing the average scores of the survey respondents to those of the full set of countries that submitted country reports provided an opportunity to roughly evaluate how representative the subsample was with respect to the state of policies and legislation. As might have been expected, the survey respondents scored, on average, higher than did the full set of countries. In the case of OECD countries, the survey respondents scored on average 17 percent higher than the full sample for both legislation and policies.[74] The equivalent figures for non-OECD countries were 6 percent higher in the case of legislation and 15 percent higher in the case of policies.[75]

The choice of examples presented below, both in the main text and in boxes, is influenced to a large extent by the availability of information. However, the aim is to provide some geographical diversity, at least in terms of developing vs. developed countries. The focus is also, as far as possible, on instruments that include a substantial body of AnGR-focused provisions or have some clearly identifiable effect on AnGR management. It must, however, be emphasized that the examples presented are intended as illustrative instances of the kinds of instruments that countries have put in place. They are not necessarily typical of instruments in the respective field. They are also not intended as examples of "best practice", and the mention of an instrument is not intended to imply that it is superior to equivalent provisions in other countries.

[74] Out of a possible maximum score of 3, OECD legal survey respondents scored 2.69 on average for the state of their legislation (90 percent of the potential maximum) compared to an average score of 2.30 (77 percent) for all OECD countries in the full country report dataset. The equivalent figures for policies were, by coincidence, exactly the same.

[75] Out of a possible maximum score of 3, non-OECD legal survey respondents scored on average 1.31 (44 percent of the potential maximum) compared to 1.23 (41 percent) for all non-OECD countries in the full country report dataset. The equivalent scores for polices were 1.59 (53 percent) and 1.38 (46 percent).

4.3 Instruments targeting the management of animal genetic resources

Overall management of animal genetic resources

As awareness of the importance of AnGR has increased at policy level in recent years – particularly since the adoption of the Global Plan of Action in 2007 – a growing number of countries have recognized the need for a more coherent national approach to the management of their livestock biodiversity. In some cases, this was an explicit conclusion of the country report prepared for the first SoW-AnGR. For example, the country report of the United Kingdom states that "The creation of a National Action Plan, facilitated through the National Co-ordinator, for the conservation and utilisation of AnGR in the UK based on the recommendations in this Report is strongly recommended." The recommendation was followed up in 2006 with the publication of the *UK National Action Plan on Farm Animal Genetic Resources*.[76]

The Global Plan of Action itself recognizes the importance of adopting a "strategic planning approach to conservation and utilization strategies" that identifies priorities at (*inter alia*) national level.[77] In 2009, the CGRFA endorsed guidelines on the preparation of national strategies and action plans for AnGR (FAO, 2009e) and encouraged countries to make full use of them (FAO, 2009a). The guidelines emphasize the importance of obtaining government endorsement for national strategies and action plans, i.e. that these instruments should become formal national "policies" in the sense described above (Subsection 4.2) (although the guidelines also recognize that the most appropriate approach to obtaining governmental commitment will vary from country to country).

Twenty-six percent of the countries that submitted country reports indicated that they have government-endorsed national strategy and

[76] Available at http://tinyurl.com/or5t9ez

[77] FAO, 2007b, Paragraph 16.

action plans (NSAPs) in place. A further 4 percent reported that their NSAPS have been prepared, but are not yet government endorsed, and 24 percent reported that they are in the process of preparing NSAPs (see Figure 3F1).

As part of the legal survey, countries were asked about legislation and policy instruments targeting the "overall management of AnGR".[78] A large majority of responding OECD countries (76 percent) indicated that they have developed policies in this category. The figures for non-OECD countries were substantially lower (34 percent). However, a further 55 percent of non-OECD countries reported that they are in the process of developing policies of this type.[79] While many countries have chosen to develop AnGR-specific national strategies and action plans, some survey responses indicate that AnGR-related issues are addressed via national biodiversity strategies and action plans (i.e. instruments covering all types of biodiversity) (e.g. France),[80] via strategies for agricultural biodiversity as a whole (e.g. Italy)[81] or as part of a broad livestock-development policy or strategy (e.g. the United Republic of Tanzania).[82] The potential

[78] The intention was to obtain information on national strategies and action plans (which were specifically highlighted as an example in the footnote to the question) or equivalent policy instruments and on legal instruments of a similar broad scope.

[79] The equivalent figure for OECD countries is 6 percent, i.e. one additional country.

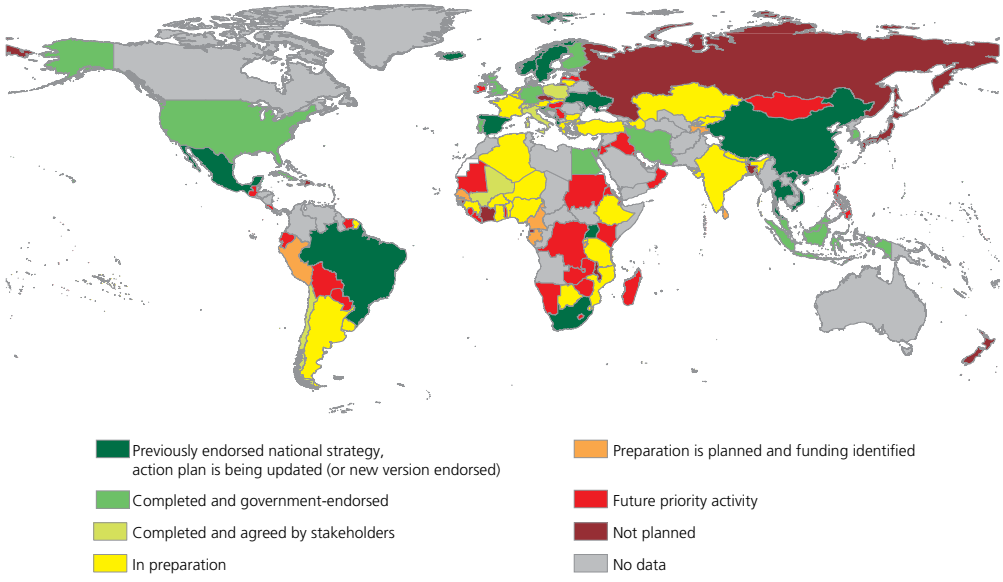
[80] National Biodiversity Strategy 2011–2020 (available in English at http://www.cbd.int/doc/world/fr/fr-nbsap-v2-en.pdf).

[81] Piano Nazionale sulla Biodiversità di Interesse Agricolo (available in Italian at http://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/1225).

[82] National Livestock Policy 2006 (available at http://tinyurl.com/oggwcag).

FIGURE 3F1

The status of national strategy and action plans for animal genetic resources



Source: Country Reports, 2014.

advantage of such an approach is that AnGR management may be better integrated into broader development strategies. The potential disadvantage is a lack of sufficiently detailed attention to AnGR and possibly a lack of sufficient "visibility" for AnGR-specific issues among policy-makers and the general public. The question of how AnGR management is addressed in legal and policy instruments addressing broader issues in rural development and environmental protection is discussed in more detail below (Subsection 4.6).

In cases where the survey responses highlight problems associated with the lack of an overarching national policy for AnGR management, the main concern is a lack of coordination among different policy initiatives. In the words of the response from Iraq, for example, AnGR-related work "is scattered and not organized." Similarly, the response from Bhutan states that

> *"since there are no overall policy directives, different agencies are promoting their own mandates. For example, Agency A promotes exotic high-yielding breed X in an area with traditional breed Y to increase production, while Agency B says breed Y has to be conserved ... [C]onservation and management of ... traditional breeds are less effective under such circumstances."*

Where legislation is concerned, 76 percent of OECD countries and 48 percent of non-OECD countries reported ed that they have legislation targeting "overall" management of AnGR (Figure 3F2).[83] Again, a substantial proportion of non-OECD countries reported that they have instruments under development. While it is possible to speculate that a single broad-scope instrument might help to promote a more cohesive approach, few if any survey responses mention any specific problems associated with the lack of an instrument of this kind. Evidence from the country reports suggests, on the other hand, that some countries regard the development of a more comprehensive legal instrument as an important priority. Hungary's country report, for example, makes several references to the objective of developing a new "Animal Breeding Act" that would address a wide range of different aspects of AnGR management.[84] Slovakia's country report, in describing the main constraints to improving the sustainable use and development of its AnGR, states that "the priority is to adopt legislation ... that will treat farm animal genetic resources comprehensively" – adding that this would require amendment of the existing Animal Breeding Act[85] and the introduction of relevant regulatory decrees.

Among the instruments described in the responses to the legal survey, one of the more comprehensive in its scope is Spain's Royal Decree 2129/2008,[86] which established the country's National Program for the Conservation, Improvement and Promotion of Livestock Breeds. A policy document, the Development Plan of the National Program for the Conservation, Development and Improvement of Livestock Breeds, followed in 2009.[87] The principles underlying the "joined-up"

[83] Some of the responses refer to a number of different instruments addressing different aspects of AnGR management rather than strictly to single instruments that aim to create a legal framework for multiple aspects of AnGR management.

[84] The country's current legal framework is based on the Law on Animal Breeding (1993/CXIV) (available in Hungarian at http://njt.hu/cgi_bin/njt_doc.cgi?docid=19614.243848).

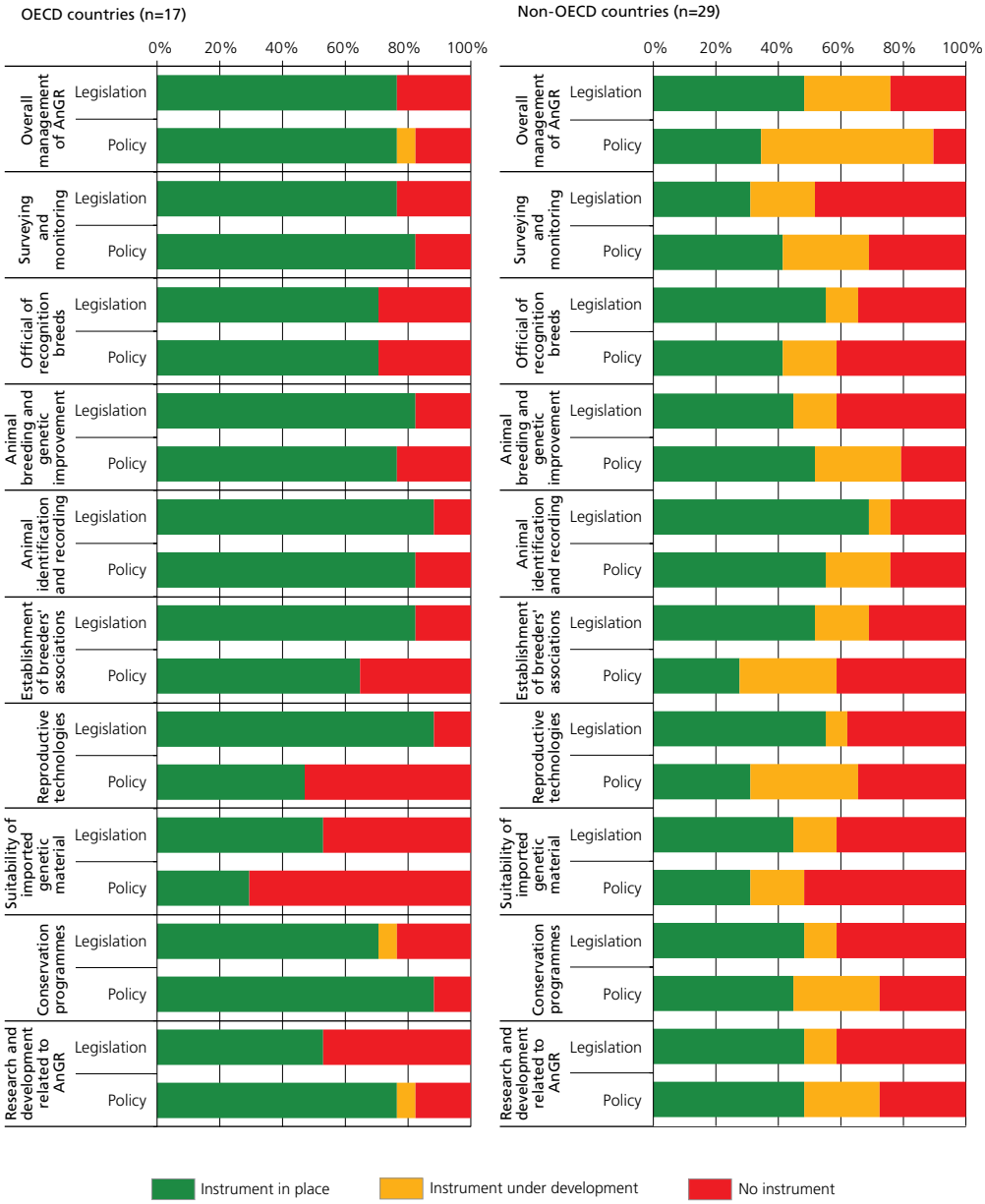
[85] ZÁKON z 13. mája 1998 o šľachtení a plemenitbe hospodárskych zvierat a o zmene a doplnení zákona č. 455/1991 Zb. o živnostenskom podnikaní (živnostenský zákon) v znení neskorších predpisov (available in Slovak at http://faolex.fao.org/docs/pdf/slo94705.pdf) amended by ZÁKON z 11. septembra 2009, ktorým sa mení a dopĺňa zákon č. 194/1998 Z. z. o šľachtení a plemenitbe hospodárskych zvierat a o zmene a doplnení zákona č. 455/1991 Zb. o živnostenskom podnikaní (živnostenský zákon) v znení neskorších predpisov v znení neskorších predpisov (available in Slovak at http://faolex.fao.org/docs/pdf/slo94706.pdf).

[86] Real Decreto 2129/2008, de 26 de diciembre, por el que se establece el Programa nacional de conservación, mejora y fomento de las razas ganaderas. Boletín oficial del Estado, Núm. 23 Martes 27 de enero de 2009 Sec. I. Pág. 9211 (available in Spanish at http://www.boe.es/boe/dias/2009/01/27/pdfs/BOE-A-2009-1312.pdf and in English at http://tinyurl.com/pwwdzw6).

[87] Plan de desarollo del Programa nacional de conservación mejora y fomento de las razas ganaderas (available in Spanish at http://tinyurl.com/osocu62).

FIGURE 3F2

State of development of legal and policy instruments



Source: Legal survey responses, 2013.

approach to national AnGR management taken in this decree are set out as follows in its preamble:

> *"While the need to characterize and conserve animal genetic resources has become a priority, this conservation must be linked to the selection of breeds that start from a better situation in terms of their census population size and productivity, and, in whatever case, to their sustainable use",*

which further states that it is the

> *"competency and responsibility of the public administration to implement effective regulation and planning of the [management of the country's] genetic heritage ..."*

Other reported instruments targeting multiple aspects of AnGR management include France's Law on Agricultural Orientation (2006)[88] and Germany's Animal Breeding Act (2006).[89] The survey responses did not include many examples of broad-scope legal instruments from outside Europe. However, a search of FAO's FAOLEX legal database[90] revealed a number of instruments, from various parts of the world, that target genetic improvement programmes but also include measures related to conservation (and to varying degrees other aspects of AnGR management). Examples (including additional examples from Europe) include Decree No. 2010-106 Regulating the Improvement of Domestic and Domesticated Animals in Madagascar,[91] Kyrgyzstan's Law on Pedigree Stockbreeding (2009),[92] Hungary's Decree No. 93 of (VII. 24.) concerning the Genetic Resources Conservation System of Protected Autochthonous Animal Species (2008),[93] Viet Nam's Decision No. 10/2008/QD-TTg approving the Strategy on Animal Breeding Development up to 2020 (2008)[94] (see Box 3F2) and Order No. 04/2004/L-CTN promulgating the Ordinance on Livestock Breeds (2004),[95] Poland's Act on Livestock Breeding (2007) (see Box 3F10),[96] Albania's Law on Livestock Breeding (2005) (see Box 3F3),[97] the Stock-breeding Law of the People's Republic of China (2005),[98] Uganda's Animal Breeding Act (2001),[99] Kazakhstan's Law No. 278-1 on Pedigree Stockbreeding (1998),[100] Uzbekistan's Law No. 165-I on Pedigree Stockbreeding (1995),[101] the Russian Federation's Federal Law No. 123-FZ on Pedigree Stockbreeding[102] and Ukraine's Law No. 3691-XII on Pedigree Stockbreeding (1993).[103] Another recent example is the Punjab Breeding Act of 2014 (Pakistan) (see Box 3F4).

A related category of legal instruments are those that address the establishment (or designation) of institutions responsible for overseeing or coordinating AnGR management at national

[88] Loi n° 2006-11 d'orientation agricole (available in French at http://faolex.fao.org/docs/texts/fra67797.doc).

[89] Tierzuchtgesetz. *Bundesgesetzblatt,* Part I, No. 64, 27 December 2006, pp. 3294–3315 (available in German with an English abstract at http://tinyurl.com/ogcuq4e).

[90] http://faolex.fao.org/faolex/

[91] Décret N°2010-106 du 2010/03/02 réglementant l'amélioration génétique des animaux domestiques et domestiqués à Madagascar (available in French at http://faolex.fao.org/docs/pdf/mad131582.pdf).

[92] Закон Кыргызской Республики о племенном деле в животноводстве Кыргызской Республики (available in Russian with an English abstract at http://tinyurl.com/o25spes).

[93] 93/2008. (VII. 24.) FVM rendeleta védett őshonos állatfajták genetikai fenntartásának rendjéről (available in Hungarian with an abstract in English at http://tinyurl.com/nelj9jl).

[94] *Công Báo* Nos. 75-76, 27 January 2008, pp. 26–33 (available in English at http://faolex.fao.org/docs/pdf/vie79311.pdf).

[95] *Công Báo* No. 16, 24 April 2004, pp. 20–30 (available in English at http://faolex.fao.org/docs/pdf/vie45179.pdf).

[96] Ustawa o organizacji hodowli i rozrodzie zwierząt gospodarskich (available in Polish with an English abstract at http://tinyurl.com/oqs6slp).

[97] Ligj Nr.9426, datë 6.10.2005 për mbarështimin e blegtorisë (available in Albanian with an English abstract at http://tinyurl.com/p7rossj).

[98] Available in English at http://faolex.fao.org/docs/texts/chn61879.doc

[99] Available in English at http://faolex.fao.org/docs/pdf/uga119210.pdf

[100] Закон Республики Казахстан от 09.07.1998 N 278-1 "О племенном животноводстве" (available in Russian with an English abstract at http://tinyurl.com/nbu5r4q).

[101] Закон Республики Узбекистан «О племенном животноводстве» 21 декабря 1995 г. N 165-I (available in Russian with an English abstract at http://tinyurl.com/pl2ajnq).

[102] Федеральный Закон Российской Федерации о племенном животноводстве (available in Russian with an English abstract at http://tinyurl.com/nd98uxb).

[103] Закон України про племінну справу у тваринництві (available in Ukrainian with an English abstract at http://tinyurl.com/nslbjh7).

Box 3F2

Viet Nam's legal framework for animal genetic resources management

Close to 70 percent of the Vietnamese population live in rural areas, and 80 percent of this group practise animal husbandry. In total, animal husbandry accounts for 18 to 25 percent of the country's agricultural gross domestic product. The current challenges facing animal husbandry in Viet Nam include unplanned, unsustainable growth in small-scale and sporadic production; low productivity, low quality and low production yields, resulting in uncompetitive products at high prices; lack of land zoned for agricultural purposes by the government; lack of investment; and lack of systematic organization of livestock services and management.

Legal instruments have been introduced in order to orient and develop goals for the livestock industry. These instruments facilitate specific plans for the provision of personnel, facilities, investment, zoning and general development, in order to combat the aforementioned challenges. The current strategy for the livestock sector encourages the development of commercial, industrial and commodity farms in which production and processing are better controlled. Food sanitation and security at national level are priorities.

The Ordinance on Livestock Breeds,[1] passed in April 2004 to take effect in July 2004, was originally drafted and approved with foreign, imported breeds in mind. The genetic improvement objectives addressed in this instrument are chiefly to create advantageous cross-breeds of exotic and indigenous breeds (Article 5.1) through characterization and selective research (Article 11), while conserving local breeds (Article 12). The first two objectives are manifested in a number of breeding programmes: for example, Sindhi crossed with local yellow cattle; and Landrace and Yorkshire crossed with local pig breeds. However, it was not until 2008 that more attention was paid to the objective of conserving indigenous breeds.

Decision No. 10/2008/QD-TTg[2] approving the Strategy on Animal Breeding Development up to 2020 was first drafted by the Ministry of Agriculture and Rural Development. A survey was sent to authorities in all 64 provinces, as well to as to livestock specialists and experts. Amendments were then made and passed at interdepartmental and interministerial conferences. The Decision was finally completed and presented to the government for approval.

Since its inception in 2008, the Decision has improved awareness of the role of livestock at national and local levels. Most provinces have put forth development plans for livestock production. Output of livestock products has increased by 25 to 30 percent thanks to higher breed productivity, better disease control and more environmentally sustainable practices.

Through the creation and implementation of this Decision, we have learned that in order for a legal instrument to be relevant to farmers' lives, strategy building must begin from real demands and needs. Goals and targets must have realistic timelines. Collaboration between stakeholders, government officials and NGOs is essential.

Areas that need improvement include more exhaustive and better-reinforced policies regarding the inclusion of indigenous breeds in breeding programmes. Awareness training for key stakeholders, especially policy-makers and governmental agencies, would help prevent near-sighted execution of relevant ordinances and potential oversights in regional policy-making. Collaboration and consultation with researchers and breed experts should also be instrumental in future policies.

Provided by Le Thi Thuy, National Coordinator for the Management of Animal Genetic Resources, Viet Nam.

[1] *Công Báo* No. 16, 24 April 2004, pp. 20–30 (available in English at http://faolex.fao.org/docs/pdf/vie45179.pdf).

[2] *Công Báo* Nos. 75-76, 27 January 2008, pp. 26–33 (available in English at http://faolex.fao.org/docs/pdf/vie79311.pdf).

Box 3F3
Albania's Law No. 9426 on Livestock Breeding

Albania is a country where the agricultural sector, and livestock production in particular, contributes significantly to the economy (18 percent of gross domestic product). The experience of the past 24 years of development under free-market conditions (1990 to 2014) has shown that the lack of an adequate legal framework is among the main factors constraining the effective management of biodiversity and that this has negative consequences for rural development.

The main legal instrument addressing animal genetic resources (AnGR) is Act No. 9426 of 20 January 2008 on Livestock Breeding,[1] which provides a framework for the conservation, evaluation and sustainable use of AnGR and of associated knowledge and technologies. In particular, it addresses methods and technologies for animal breeding and feeding, conservation and sustainable use of AnGR (including specific provisions for autochthonous/native/local breeds), criteria for the preparation and approval of breeding programmes, the provision of professional services related to livestock production, the establishment and administration of gene banks, the operation of breeders' associations and trade in breeding materials.

Although this law is considered an important step towards meeting international standards in the conservation and sustainable economic use of AnGR, its implementation is difficult because of a lack of human and infrastructural capacities. The objective for the medium term should be to complete the legislative framework for AnGR management in accordance with obligations deriving from the international conventions and agreements that Albania has ratified and to bring national legislation into line with international and European Union law. In particular, there is a need to elaborate the secondary legislation needed to implement *in situ* and *ex situ* conservation programmes, establish a national gene bank and a national agency for AnGR, and address property rights in light of the Nagoya Protocol on Access and Benefit-Sharing.

Provided by Kristaq Kume, National Coordinator for the Management of Animal Genetic Resources, Albania.

[1] Available in Albanian with an abstract in English at http://tinyurl.com/p9kaulb

level. Examples detected via search of FAOLEX include Poland's 2008 regulation[104] designating responsibility for the coordination of activities related to AnGR management and Argentina's Resolution No. 693/2004 Creating the National Advisory Commission for Genetic Resources for Food and Agriculture.[105] The legal basis for Turkey's institutional framework is described in Box 3F5. An interesting comment on the link between legal and institutional frameworks is provided in the country report from Cameroon, which states that

> *"the major impediment to implementation of [AnGR-related legislation] lies in the conflicts that arise due to their dispersal in different ministries, namely Livestock, Agriculture, Environment and Forestry. Harnessing these laws and attributing their implementation and monitoring to a single National Competent Authority will greatly improve the situation."*

Having considered a number of examples from countries that have chosen to develop broad-based instruments in this field, it is important to note that others have deliberately adopted a light touch with respect national legal and policy measures addressing AnGR management. In the United States of America, for example, breed development

[104] Rozporzadzenie w sprawie podmiotu upowaznionego do realizacji dzialan w zakresie ochrony zasobow genetycznych zwierzat gospodarskich. *Journal of Laws*, 2008 No. 108 Pos. 691 (available in Polish with an English abstract at http://faolex.fao.org/faolex).

[105] Resolución Nº 693/2004 – Créase la Comisión Nacional Asesora en Recursos Genéticos para la Alimentación y la Agricultura (CONARGEN) (available in Spanish at http://faolex.fao.org/docs/texts/arg121919.doc).

Box 3F4
The Punjab Livestock Breeding Act 2014 (Pakistan)

Pakistan has rich diversity of indigenous animal genetic resources (AnGR). Of the major livestock species, there are five breeds of buffaloes, 15 of cattle, 25 each of sheep and goats, 20 of camels and five of indigenous chickens. Documentation of breeds and production systems is weak. Attempts are being made to create awareness regarding the importance of AnGR and the need to improve their utilization.

Pakistan is home to world famous *Bos indicus* breeds of cattle, namely Sahiwal and Red Sindhi. Cross-breeding with exotic Holsteins and Jerseys is threatening these breeds. Establishing the Research Centre for Conservation of Sahiwal Cattle has helped to conserve the Sahiwal breed. Attempts to import Saanen and Boer goats can harm the locally adapted goat breeds. Prior to 2014, there was no legislation in place to stop unabated production (and import) of semen for artificial insemination. No certification/approval was required to produce semen locally. Semen from Sahiwal cattle and Nili-Ravi buffalo was produced in millions of doses without any attention to quality and genetic potential. It was felt that legislation was needed in order to improve the unique locally adapted breeds and to stop indiscriminate cross-breeding. A breeding policy, formulated in 2003 had not been adopted and legislation was needed to implement it. It took almost a decade, and a lot of consultation among different stakeholders, to reach the stage at which legislation could be drafted.

The Punjab Livestock Breeding Act 2014[1] was published on 29 May 2014. The objective of this act is to regulate livestock breeding services in the province of Punjab. It necessitates the formulation of an authority to regulate the provision of breeding services and to raise awareness regarding the need to conserve and improve the genetic potential of livestock breeds. It will encourage pedigree and performance recording and the development of herdbooks by breed societies. Semen production and distribution, artificial insemination services and the import of semen will operate under set regulations. Breed societies and promotional activities for the conservation of breeds will be supported. Awareness of the Punjab Livestock Breeding Act 2014 is likely to stimulate the creation of new breed societies. Other provinces are likely to follow the example of Punjab province, as they also have unique genetic resources to conserve and develop. If properly implemented, this will bring about a paradigm shift in the utilization of indigenous AnGR in the country. Periodic review of the implementation mechanism will be required, so that any adjustments needed to ensure the conservation and development of indigenous breeds can be made.

Provided by M. Sajjad Khan.
[1] Available at http://punjablaws.gov.pk/laws/2567.html

strategies are left in the hands of the private sector. Government involvement in AnGR management is focused largely on cryoconservation and assessing the status of genetic diversity (the country's response to the legal survey notes that the establishment of its National Animal Germplasm Program was enabled by legislation[106] passed in 1990). As another example, Australia's response to the legal survey reports no legislation within the category "overall management of AnGR." It notes that

> *"Australian Government policy on management of genetic resources is to create the enabling environment to allow both owners and users of animal genetic resources to establish breeding and conservation programs for their respective industries."*

The main mechanisms involved are reported to be

> *"industry-government partnerships [that] collaborate through R&D [(research and*

[106] Food, Agriculture, Conservation, and Trade Act of 1990. Provisions related to the National Genetic Resources Progam were amended by the Agriculture Act of 2014 (available at http://tinyurl.com/kpggybj).

Box 3F5

The legal basis for Turkey's animal genetic resources management programme

Turkey's National Consultative Committee on Conservation of Animal Genetic Resources and Animal Breed Registration Committee were established on the basis of its Regulation on the Conservation of Animal Genetic Resources and Regulation on Animal Breed Registration (both based on the Veterinary Services, Plant Health, Food and Feed Act of 2009).[1] The two Committees are charged, *inter alia*, with identifying objectives and drawing up policies related to the conservation, sustainable utilization and characterization of animal genetic resources and import and export of genetic material.

The primary legislation (the 2009 Act) addresses a wide range of topics spanning crop and animal agriculture and consumer protection, and is implemented by a large number of regulations in addition to those specifically related to animal genetic resources. The Act itself includes an article on "zootechnics", which in its detailed provisions focuses largely on the operation of herdbooks and the registration of breeding animals, but which also states that "The Ministry [of Food, Agriculture and Livestock] shall take measures to conserve animal genetic resources, and implement these measures or ensure that they are implemented."

2012 saw the introduction of a further legal instrument, the Regulation on Utilization and Export of Native Domestic Animal Genetic Resources[2] (also based on the 2009 Act), which regulates the use of animal genetic resources and includes a material transfer agreement for research-related purposes.

Sources: Government of Turkey, 2011; FAOLEX.

[1] Law on Veterinary Services, Plant Health, Food and Feed; Law No: 996; Adoption Date: 13/6/2010 (available in English at http://faolex.fao.org/docs/pdf/tur106155E.pdf). Similar provisions had been established under the Animal Improvement Act (No. 4631) of 2001 (available in Turkish at http://faolex.fao.org/docs/texts/tur24242.doc).

[2] Official Gazette of Turkey, No. 28418, 21 September 2012 (available in Turkish at http://www.resmigazete.gov.tr/eskiler/2012/09/20120921-3.htm).

development)] activities to determine future priorities for these industries and through these, the appropriate conservation, use and development of animal genetic resources."

With regard to the significance of legal measures relative to policy measures, it is interesting to note the following statement from Ireland's country report:

"Traditionally, laws were enacted in this area, but over the last 20 years policies developed by the sector have been the main drivers."

Integration of animal genetic resources management with other sectors of genetic resources for food and agriculture

As part of the legal survey, countries where asked whether they had any legal or policy instruments in place that specifically address the integration of AnGR management with the management of other genetic resources for food and agriculture. Such measures might, for example, aim to promote efficiency in the operation of genetic resources management programmes across sectors or to promote greater attention to ecological interactions between livestock and crop plants, forest trees, micro-organisms, aquatic species, etc.

Among OECD countries, in the case of both policies and legislation, 65 percent of respondents reported that they have instruments of this type in place. In the case of non-OECD countries, the figures were substantially lower (14 percent and 41 percent, respectively, for legislation and policy instruments). However, a number of countries reported that they have instruments under development (13 percent for legislation and 24 percent for policy instruments).

While the practical effects on AnGR management are not always clear, a number of countries provide examples of policies, strategies or institutions that, in one way or another, span several sectors of genetic resources. Austria, for example, describes several policy instruments, including the

Austrian Agri-Environmental Programme (ÖPUL) and Initiative Agriculture 2020,[107] that target all aspects of agriculture (including management of AnGR) in an integrated way, taking ecological and social factors into consideration. The aim – as described in the survey response – is to strengthen "a sustainable farm-based agriculture and forestry", within which sustainable management of AnGR is integrated. Other reported examples from Europe include Norway's National Strategic Plan of the Norwegian Genetic Resources Centre, which addresses livestock, crops and forest trees. The response from Germany notes that AnGR are considered in the country's National Agro-Biodiversity Strategy and National Rural Development Policy, and also mentions the importance of integrating the management of livestock with grassland management.

Reported examples from developing countries include Malaysia's National Strategies and Action Plans for Agricultural Biodiversity Conservation and Sustainable Utilization (strategies for plant, livestock, arthropod and microbial genetic resources published together in one document), which "strive for coordinated and holistic ways to identify, conserve and optimize the use of agricultural biodiversity in Malaysia".[108] The survey response from Brazil mentions that over the last decade the country's Ministry of Agriculture has been promoting integrated crop–livestock–forestry systems, which have reportedly contributed to reducing the amount of deforestation and greenhouse gas emissions associated with livestock production. It further notes that there is no specific legislation related to this activity, but that it has taken place within the framework of the country's Forestry Code,[109] which was revised in 2010.[110] Nepal (which is in the process of developing instruments in this field) highlights links to the management of pastures and forests:

> *"programs on conservation and promotion of farm animal genetic resources are tied up with the fodder, pasture and leasehold forestry programs …From the fiscal year 2013/14, the Government of Nepal has launched the forage pasture mission which also focuses [on] programs to conserve native animals as well as to increase the production and productivity of farm animals."*

Surveying and monitoring

As discussed in Part 4 Section A, establishing a national breed inventory and monitoring changes in the size and structure of breed populations are important elements of national AnGR management. Countries vary greatly in their capacities to implement surveying and monitoring activities (see Part 3 Section B) and in terms of their specific objectives for data collection. The tasks that need to be addressed by policy and legal frameworks in this field will thus vary from country to country. Nonetheless, given the need to assemble, store and report national-scale data in a consistent way over an extended period of time, some degree of leadership and coordination at national level is likely to be essential.

FAO's guidelines on *Surveying and monitoring of animal genetic resources* (FAO, 2011c) recommend that countries should review their requirements for data and information on AnGR and draw up strategies for meeting these requirements. The guidelines also note the importance of a "mandate" for national surveying and monitoring activities, i.e. that these activities should have "official status and backing from the relevant authorities." They further recommend that the key elements of such a mandate should include a definition of the objectives and scope of the activities (species and geographical

[107] http://www.lebensministerium.at/en/initiatives/Agriculture2020.html

[108] The quotation is taken from the preface of the document (which is available at http://www.fao.org/Ag/AGAInfo/programmes/documents/genetics/country_reports/Malaysia_NSAP_Oct2013.pdf).

[109] Lei n. 4.771, de 15 de setembro de 1965. Institui o novo Código Florestal (available in Portuguese at http://faolex.fao.org/docs/texts/bra12382.doc).

[110] Lei nº 12.651, de 25 de maio de 2012. Dispõe sobre a proteção da vegetação native (available in Portuguese at http://faolex.fao.org/docs/pdf/bra113357.pdf).

coverage, time frame), allocation of responsibilities to organizations and individuals (including responsibility for coordinating and overseeing the strategy), provisions related to stakeholder involvement, and provisions related to accessing and using the data collected.

Among responses to the legal survey, 76 percent of OECD countries reported that they have policy instruments in place in this field and 82 percent that they have legislation (Figure 3F2). The figures for non-OECD countries were 41 percent for policies and 31 percent for legislation. A substantial number non-OECD countries reported that they are in the process of developing legislation (21 percent) and/or policies (28 percent) in this field. Several other countries mentioned that they regard the development of legislation and/or policies in this field as an important objective.

Survey responses from a number of European countries (e.g. Austria and the Netherlands) note that national implementation of EU regulations on animal registration facilitate the monitoring of breed population sizes. The usual pattern in EU countries is for monitoring programmes to be based on the involvement of breed societies. The societies keep track of demographic trends in their respective breeds and provide data to a central authority that operates a database of some kind. The legal and policy frameworks for such programmes vary from country to country, but in all EU countries they are underpinned by legislation on animal registration and on the operation of breed societies. Some countries have legislation in place that explicitly allocates the task of operating a monitoring programme to a particular national body. In other cases, monitoring programmes have been established or strengthened through policy measures without recourse to specific legislation. While most survey responses from EU member countries do not mention any future needs in terms of improving legal or policy frameworks in this field, there are some indications that further strengthening is required. For example, Germany mentions the need to establish a specific regulation on monitoring. The country report from Slovakia lists a lack of "legislation concerning the responsibility of individual institutions" as one of the main obstacles to the implementation of surveying and monitoring programmes. Among countries from other parts of Europe, the survey response from Norway notes the need to establish monitoring systems for species that currently lack adequate recording systems at breed level, but states that this needs to be addressed more at policy than at legislative level.

Survey responses from developing countries provide little detailed information on the nature of their existing or planned legislation and policies in this field, on the impacts of existing measures or on steps that need to be taken to improve them. However, several countries note the practical difficulties involved in implementing their existing instruments. One objective mentioned by several countries (e.g. Brazil, Costa Rica and Sri Lanka) is to have breed-level data collection included in national livestock censuses. A search of the FAOLEX database did not reveal many examples of legal instruments from non-OECD countries that specifically address surveying and monitoring. Where instruments are in place, the main objective appears to be the establishment of institutional responsibilities. For example, China's above-mentioned Stock-breeding Law of 2005 allocates responsibility "for organizing the investigation of livestock and poultry genetic resources, releasing national reports about the status of livestock and poultry genetic resources and publishing the list of livestock and poultry genetic resources approved by the State Council" to the stockbreeding and veterinary administrative department of the State Council. Cameroon's Decree No. 2012/382 of 2012 on the organization of the Ministry of Livestock, Fisheries and Animal Industries[111] charges the Insemination and Animal Genetic Resources Service with inventory of AnGR and the identification of breeds that are at risk of extinction.

[111] Décret nº 2012/382 du 14 septembre 2012 portant organisation du Ministère de l'Elevage, des Pêches et des Industries Animales (available in French at http://faolex.fao.org/docs/pdf/cmr126963.pdf).

Official recognition of breeds

Given that the breed is generally the main unit of management in national AnGR management programmes, many countries are likely to see the need for some kind of procedure (formal or informal) whereby a livestock population can be officially recognized as a breed by the national authorities, if only for matters such as international reporting on the state of AnGR diversity. Countries may also wish to establish procedures for the allocation of breeds to categories such as "native", "locally adapted" and "exotic." While formal mechanisms and strict criteria are not necessarily required, if recognition as a breed (or as belonging to a particular category of breed) affects how a livestock population is treated under national laws and policies (e.g. eligibility for support payments under conservation schemes), clear legal definitions of the criteria and processes involved may be important.

Seventy-one percent of the OECD countries that responded to the legal survey reported that they have legislation in place addressing the question of the official recognition of breeds (Figure 3F2). The same proportion reported that they have policies. The figures for non-OECD countries were 55 percent and 41 percent, respectively. It should, however, be noted that the reported legal instruments are quite diverse in terms of how prescriptive they are and the extent to which they grant a role to the national authorities. For example, the response from Australia refers to the country's Competition and Consumer Act (2010)[112] rather than to any AnGR-specific legislation and notes that the recognition of breeds is the responsibility of breed societies.

Several survey responses from European countries indicate that clearly defined criteria and/or procedures for the recognition of breeds are set out in laws or regulations. The response from Slovenia, for example, notes that a new breed or line can be recognized by the minister competent for animal husbandry on the basis of advice from the country's Animal Husbandry Council. Detailed rules on the criteria and procedures for the recognition of breeds (along with specific rules for the recognition of breeds as "indigenous" or "traditional") are set out in the Regulation on Conservation of Farm Animal Genetic Resources (2011).[113] Bulgaria, in its survey response, notes that the country's Law on the Protection of New Plant Varieties and Animal Breeds of 1998 (as amended in 2010)[114] includes a list of autochthonous breeds and breeds developed in Bulgaria that are considered the property of the state, as well as provisions related to the recognition of other breeds (whether newly developed or brought in from outside the country) by the State Breed Commission. In this particular case, the law creates the basis for a *sui generis* intellectual property rights (IPR) system for livestock breeds: a breeder who has "created or discovered and developed" a breed can be issued with an "animal breed certificate" valid for 30 years. Another example is provided in the response from Latvia, which notes that its Agricultural Data Centre established a commission for approval of breeds in accordance with Cabinet Regulation No. 475 (21.06.2011) Approval and Registration of Farm Animal Breeds.[115] The commission includes representatives from the country's Agricultural Data Centre and from scientific and educational institutions. The approval process takes into account the "number of female and male animals, characteristic traits, productivity and genetic structure of [the] population." Some countries, in contrast, have adopted a more flexible approach based on ongoing advice to government from officially recognized expert bodies. For example, the United Kingdom's National Action Plan on Farm Animal

[112] Available at http://www.comlaw.gov.au/Details/C2011C00003/Download

[113] Pravilnik o ohranjanju biotske raznovrstnosti v živinoreji (Regulation on Conservation of Farm Animal Genetic Resources) (available in Slovenian at http://tinyurl.com/nm8l28a and in English http://tinyurl.com/ntyb4qw)

[114] Закон за закрила на новите сортове растения и породи животни (available in Bulgarian at http://tinyurl.com/pxlo9uh – the original act from 1998 is available in English at http://tinyurl.com/qb2pr6t).

[115] Lauksaimniecības dzīvnieku šķirnes apstiprināšanas un reģistrācijas kārtība (available in Latvian at http://likumi.lv/doc.php?id=232283).

Box 3F6

Official recognition of livestock breeds in Brazil

In Brazil, official recognition of livestock breeds is regulated by Law No. 4.716/1965,[1] Decree No. 58.984/1966[2] and Technical Guidance SNAP 47/1987.[3] The procedure requires the respective breeders' association (at this point in the process regarded as a "promotional association") to submit an application to the Ministry of Agriculture. The application is then assessed by Ministry technicians and experts recruited on an ad hoc basis, taking into consideration, *inter alia*, the uniqueness of the animals, the proposed descriptors and whether or not the breed has already been registered under another name. If the conclusion is that the candidate population qualifies as a separate breed, the Ministry of Agriculture will recognize it and will allow the association to start issuing registration documents for the animals – including pedigrees, and so on. Copies of these documents have to be sent to the Ministry of Agriculture so that they can be checked.

Every time a new breed is recognized, there is an increase in the number of herds and breeders, and consequently in the number of animals. Recently, two locally adapted cattle breeds have been recognized by the Ministry of Agriculture: the Curraleiro Pe-Duro and the Criollo Lageano. In the case of the Criollo Lageano, there were only two herds remaining before the recognition of the breed in 2008. Since then, the number of herds has increased to 27. There are still many locally adapted breeds that have not been recognized by the Ministry of Agriculture. One of them, the Pantaneiro cattle breed, has just (late 2013) started the process, with the creation of a promotional breeders' association.

Source: Adapted from Brazil's response to the 2013 legal survey.

[1] Lei No 4.716, de 29 de junho de 1965. Dispõe sôbre a organização, funcionamento e execução dos registros genealógicos de animais domésticos no País (available in Portuguese at http://tinyurl.com/oqfwrt5).

[2] Decreto Nº 58.984, de 3 de agosto de 1966. Aprova o Regulamento da Lei número 4.716, de 29.6.65, que dispõe sôbre o registro genealógico de animais domésticos no País.

[3] Portaria Nº 47, de 15 de outubro de 1987.

Genetic Resources (2006) recommended that this role be given to the country's National Standing Committee on Farm Animal Genetic Resources.[116] This body later developed a set of definitions[117] for use in the country's breed inventory and guidance on the evidence needed to prove that a breed should be included in the inventory.[118]

Some countries report that legal frameworks for breed recognition are still in the process of being developed. Montenegro's survey response, for example, notes that the country's Law on Livestock Farming (2010)[119] lays down rules for the recognition of new breeds and lines of domestic animals developed in Montenegro "in accordance with the scientific methods", but also notes that secondary legislation laying down more detailed conditions and procedures needs to be developed. It further notes that developing a regulation for the recognition of already-known autochthonous breeds is an important objective with respect to the genetic assessment and conservation of these breeds.

Non-European countries that report legal instruments in this field include Brazil, where the recognition of a breed goes hand in hand with the recognition of a breeders' association (see Box 3F6) and Viet Nam. In the latter country, the Ordinance on Livestock Breeds (2004)[120] sets out rules under which "new livestock breeds shall be recognized and put on the lists of livestock breeds permitted for production and business promulgated by [the relevant ministry]." The procedure involves determining "the difference, stability, uniformity of yield, quality [and] disease resistance of new breeds", as well as any potential "harmful effects." The registration process in Indonesia is described in Box 3F7.

[116] Currently the Farm Animal Genetic Resources Committee (web site: http://www.defra.gov.uk/fangr/).

[117] *Definition of a breed for the purpose of the UK National Inventory* (available at http://www.defra.gov.uk/fangr/2011/03/17/national-inventory/).

[118] *Eligibility of a UK breed for inclusion in the UK National Breed Inventory* (available at http://tinyurl.com/o57cvrk).

[119] Закон о сточарству (available in Montenegrin at http://tinyurl.com/ozn4jas).

[120] Ordinance on Livestock Breeds (No. 16/2004/PL-UBTVQH11) (available in English at http://tinyurl.com/o8b8lqs).

Box 3F7
Registration of livestock breeds in Indonesia

Indonesia is home to many diverse plant, animal and microbial genetic resources. Not all have been managed properly or characterized to identify their valuable traits. There is great potential to enhance the use of the country's animal genetic resources in the production of meat, milk and eggs as sources of protein for human consumption. To protect these valuable resources, the Government of Indonesia, through the Minister of Agriculture, released Decree No. 19/Permentan/OT.140/2/2008 on the registration of livestock breeds. To operationalize the decree, a commission has been set up to evaluate proposals for breed registration submitted by the local governments in the breeds' home areas. The commission consists of around 20 people, including scientists from national research institutes and universities, as well as officials from the General Livestock Services. Each proposal consists of:

1. a justification for the proposed registration;
2. a description of the breed's specific traits;
3. a description of the breed's geographical distribution; and
4. information on the superiority of the breed's traits.

The operationalization of the commission was initiated in 2010 through several meetings. As of March 2013, the commission had registered the following 27 breeds: Aceh cattle (Aceh); Alabio duck (South Kalimantan); Bali cattle (Bali); Batur sheep (Central Java); Gaga chicken (South Sulawesi); Garut sheep (West Java); Gembrong goat (Bali); Kaligesing goat (Central Java); Kisar sheep (Maluku); Kokok-balenggek chicken (West Sumatera); Lakor buffalo (Maluku); Madura cattle (East Java); Magelang duck (Central Java); Moa buffalo (Maluku); Palu sheep (Central Sulawesi); Pampangan buffalo (South Sumatera); Pegagan duck (South Sumatera); Pelung chicken (West Java); Pesisir cattle (West Sumatera); Pitalah duck (West Sumatera); Rambon goat (Central Java); Sentul chicken (West Java); Sumbawa buffalo (West Nusa Tenggara); Sumbawa cattle (West Nusa Tenggara); Sumbawa horse (West Nusa Tenggara); Tegal duck (Central Java); and Wonosobo sheep (Central Java). Each registration is established via a ministerial decree.

After the release of a ministerial decree for the registration of a breed, the local government releases local regulations related to the management of the breed. The rules specify that the local government should take care of the breed by:

1. allocating budget for maintaining the breed;
2. maintaining the breed's diversity;
3. improving income generation from the breed; and
4. involving many farmers in conservation activities.

Provided by Bess Tiesnamurti.

The survey responses provide relatively little information on the effects that legislation (or lack of legislation) in this field has on AnGR management. Neither do they provide much information on countries' future needs in terms of developing legislation or policies in this field. Some responses note positive effects. Cyprus, for example, comments that legislation has "major implications for PDO [protected designation of origin] applications for specific products." The descriptions of arrangements in Brazil and Indonesia presented in Boxes 3F6 and 3F7 provide further examples of how sustainable AnGR management has benefited from the process of breed recognition.

Some countries mention that a lack of legislation on breed recognition creates problems or report that the introduction of legislation is a future priority. For example, the response from Bhutan mentions that its lack of legislation in this field hampers the conservation and sustainable use of its traditional breeds. Likewise, Nepal's response notes that official recognition of breeds would help in promoting conservation and sustainable use activities. Other responses,

however, state that the absence of legislation has little effect. For example, the United States of America (as noted above, a country that relies largely on the private sector to manage its AnGR) reports that it has no legislation or policies in this field, but that this has "no negative impact on animal genetic resources management." Mauritius (a country with a small number of breeds and that, to date, has given little emphasis[121] to *in situ* conservation or policies promoting sustainable use of locally adapted breeds) notes that, although it has no legislation in place, all stakeholders accept the breed inventory used by the government in, for example, its National Biodiversity Strategic and Action Plan.[122]

Genetic improvement programmes

Genetic improvement programmes can have major implications for the livelihoods of individual livestock keepers and breeders, for the profits of commercial organizations and for national objectives such as food security and the maintenance of diverse portfolios of AnGR. However, they are complex undertakings (see Part 4 Section C), and establishing and sustaining effective breeding programmes has proven to be a challenge in many countries (see Part 3 Section C). The roles of different stakeholder groups, including those of public-sector bodies, in the planning and implementation of genetic improvement programmes (or the extent to which their participation is regarded as an objective) varies greatly from country to county (see Part 3 Section C). Along with major differences between countries in terms of technical and organizational capacity to implement the various elements of breeding programmes, this means that the challenges involved in establishing appropriate legal and policy frameworks for genetic improvement programmes are very diverse.

Policies supporting or influencing the objectives of breeding programmes – or promoting changes in breed utilization (e.g. substitution of one breed by another) – are discussed in Part 3 Section C, based on the material provided in the country reports. The emphasis below in this subsection is therefore on legal frameworks.

Eighty-two percent of the OECD countries that responded to the legal survey indicated that they have legislation addressing animal breeding and genetic improvement in place (Figure 3F2). Slightly fewer (76 percent) indicated that they have policies in place. Among non-OECD respondents, the equivalent figures were 45 and 52 percent, respectively, with a further 14 percent reporting that they have legislation in preparation and 28 percent that they have policies in preparation.

One factor that facilitates the establishment of breeding programmes is the existence of a national animal identification system. Because of the multiple benefits that can be obtained from having such a scheme, compulsory animal identification systems are widespread in developed countries. Eighty-eight percent of OECD countries that responded to the legal survey reported that they have legislation in place in the field of "animal identification and recording" (Figure 3F2). The figure rises to 100 percent if countries reporting animal identification laws related to animal health (see Subsection 4.5 below) are included. There is also growing interest in the establishment of animal identification schemes in developing countries. Sixty-nine percent of non-OECD survey respondents indicated that they have legislation related to animal identification in place and a further 7 percent that they are developing legislation. The main motivation for the development of animal identification systems is to improve animal health and the traceability of animal products (see Subsections 4.4 and 4.5 for further discussion). However, once systems exist they can also serve other purposes such as the identification of animals for breeding purposes.

In many countries, particularly in the developed regions of the world, the main stakeholders involved in implementing breeding programmes are breeders' associations. These associations are usually non-governmental bodies

[121] According to its country report.

[122] Available in English at https://www.cbd.int/doc/world/mu/mu-nbsap-01-en.pdf

operated by their members. National authorities may, however, choose to introduce legal and policy measures to promote the establishment of such organizations or to regulate their operation, with the aim of promoting the sustainable development of national AnGR, as well as improving rural livelihoods, food security, etc. Defined standards and procedures for the various elements of breeding programmes can also help ensure effective implementation and create conditions in which breeding animals can be traded with confidence.

As discussed above in Subsection 3, EU member countries are obliged to comply with EU-level legal instruments related to animal identification, the recognition of breeders' associations, the keeping of herdbooks, the contents of pedigree certificates, performance testing and genetic evaluation and the acceptance of animals for breeding. Countries vary in the extent to which they go beyond establishing the basic EU-prescribed legal framework and seek more actively to influence the objectives and implementation of breeding programmes. For example, the survey response from the Netherlands states that genetic improvement is completely in the hands of the private sector and that the only remaining involvement of the government in breeding is through pre-competitive public–private research programmes and other specific research projects. The response from Germany mentions that its Animal Breeding Act (see above) regulates the process of recognizing breeding programmes and makes performance recording and the estimation of breeding values mandatory, but contains no rules directly addressing breeding goals. It notes that in the case of breeds that are at risk of extinction, conservation breeding programmes that do not involve performance evaluation are permitted. It further notes that, if necessary, breeders' associations can be required to cooperate in the implementation of conservation measures (although this is reported not to have happened to date).

Slovenia, in its country report, mentions that in order (*inter alia*) to ensure the maintenance of genetic diversity and the overall progress of the livestock sector, it has established a "basic common breeding programme" for all livestock species, the implementation of which – by breeding organizations in collaboration with research institutions – is financed by the government. Rules related to the establishment and implementation of the common programme are set out in the country's Livestock Breeding Act.[123] The implementation of this programme, and of other approved breeding programmes, forms the basis of Slovenia's conservation programme – in accordance with the requirements of its Regulation on Conservation of Farm Animal Genetic Resources (see above). Further information on legislation related to conservation breeding programmes is provided below in the subsection on conservation.

Among countries elsewhere in the world, instruments addressing the establishment or operation of breeders' associations are the most commonly reported type of legislation related to breeding programmes. Fifty-two percent of non-OECD respondents to the legal survey indicated that they have legislation of this type in place. Costa Rica's response, for example, mentions its Executive Decree No. 19400 (1989),[124] which transfers responsibility for the management of genealogical registers to breeders' associations and prescribes minimum standards for the operation of these associations. Zimbabwe's response mentions the Zimbabwe Herd Book, a registering body for breeders' associations that was established by act of parliament in 1981.[125] Namibia mentions its Livestock Improvement Act (1977), which – as well as containing provisions related to the recognition of breeders' associations – grants exclusive rights to the Namibian Stud Book Association to

[123] Zakon o Živinoreji (ZŽiv) (available in Slovenian at http://tinyurl.com/o6o4pbw and in English at http://tinyurl.com/n2thv8c). In the English version, the programme is referred to as the "Joint basic breed programme".

[124] Traspasa Registro Genealógico de Ganado a Asociación de Productores y Criadores de Ganado N° 19400-MAG (available in Spanish at http://www.mag.go.cr/legislacion/1990/de-19400.pdf).

[125] Registration of Pedigree Farm Livestock Act, Act 21/1981 (available at http://faolex.fao.org/docs/pdf/zim60476.pdf).

issue pedigree certificates. Responses from several countries (e.g. Ghana, Sri Lanka, Suriname and the United Republic of Tanzania) indicate that they are in the process of developing legislation in this field.

Few of the survey responses provide any information on legal instruments related to the establishment of breeding programmes by the public sector. Viet Nam's Ordinance on Livestock Breeds (2004)[126] sets out basic objectives for state policies on livestock breeding, which include ensuring "the development of livestock breeds along the direction of industrialization and modernization on the basis of livestock breed development strategy, planning and plans", supporting "organizations and individuals tasked to multiply or raise purebred livestock breeds, prototypal, grandparental and nucleus breed stocks" and encouraging "organizations and individuals to produce and use new livestock breeds." The above-mentioned Namibian Livestock Improvement Act allows for the establishment "by the Minister"[127] of schemes to evaluate and certificate the performance of particular kinds and breeds of animals with the object of improving their genetic production potential. The Livestock Act of Bhutan (2001)[128] is described in Box 3F8.

Several of the AnGR-related laws listed above in the subsection on "general instruments" include provisions related to the role of the state in coordinating and/or implementing genetic improvement programmes, the operation of state-run breeding establishments and/or the provision of breeding services by the public sector. Madagascar's Decree N°2010-106,[129] for example, establishes the country's National Council for Genetic Improvement, which is allocated the task (*inter alia*) of developing national genetic improvement programmes. The "genetic improvement service" of the Livestock Ministry is charged with coordinating and monitoring the implementation of the council's recommendations. Regional "Breed Offices" are given the task of supporting and overseeing the operation of herd books by livestock-keepers' associations. As another example, Kyrgyzstan's Law on Pedigree Livestock Breeding[130] includes provisions related to the organization of a state herd book and to the supply of state support to breeding organizations. It assigns a role in coordinating the activities of breeding organizations to an "Authorized State Body for Pedigree Stockbreeding" and also includes provisions related to the operation of state breeding farms.

In so far as they provide any information on the effects that legislation related to breeding programmes is having on AnGR management, the survey responses generally indicate that the reported instruments are having a positive effect. France, for example (referring to both legal and policy measures), states that

> *"the collective organization of the measures allows different organizations to carry out their missions ... [in] animal breeding, management of genetic diversity and the sustainable conservation of genetic resources."*

Likewise, the response from Austria states that

> *"the regulations guarantee that a breeders' organisation is competent and works according to approved good practice methods."*

The responses from countries where there is no legislation in place generally provide little detailed information on their future priorities. The country report from Rwanda, however, notes that the main weakness of the national legal framework is the lack of an "animal breeding law" that would (*inter alia*)[131] regulate

[126] *Công Báo* No. 16, 24 April 2004, pp. 20–30 (available in English at http://faolex.fao.org/docs/pdf/vie45179.pdf).

[127] The Minister of Agriculture, Water and Rural Development.

[128] Available in English at http://faolex.fao.org/docs/pdf/vie45179.pdf

[129] Décret N°2010-106 du 2010/03/02 réglementant l'amélioration génétique des animaux domestiques et domestiqués à Madagascar (available in French at http://faolex.fao.org/docs/pdf/mad131582.pdf).

[130] Закон Кыргызской Республики о племенном деле в животноводстве Кыргызской Республики (available in Russian with an English abstract at http://tinyurl.com/o25spes).

[131] The other objective mentioned is to regulate the entry of new genetic material into the country.

"who is entitled to collect and sell semen and from what animals, who can do inseminations and [under] what ... minimum standards/requirements, pedigree registration[,] ... the recognition of breed associations and their herd books, the right to issue pedigree certificates and ... [the implementation of] performance testing and genetic evaluation".

Few countries report specific gaps in their existing provisions (although some note that implementation needs to be strengthened) or any problems caused by existing instruments. One exception is provided in the United Kingdom's country report, which lists "zootechnical legislation requirements being unachievable for numerically small breeds" among the obstacles to enhancing AnGR conservation measures. As is the case in several other areas of AnGR management, the survey response from the United States of America notes that the absence of legislation on breeding programmes (other than on animal identification) does not cause any problems with regard to AnGR management.

Reproductive biotechnologies

Legal and policy frameworks related to the use of reproductive technologies such as artificial insemination and embryo transfer have the potential to affect both breeding and conservation programmes. More broadly, they may influence the types of AnGR used by livestock keepers (e.g. if programmes only provide genetic material from certain breeds) and hence potentially affect both livestock-keeping livelihoods and the diversity of national livestock populations. The extent to which these technologies are in use in livestock production at country level is discussed in Part 3 Section E.

Relevant policies in this field can include instruments that aim to promote the use of reproductive technologies via the provision of subsidized services or via extension activities. In the case of legal instruments, the main objectives are generally to ensure the quality of the germplasm used in sanitary and genetic terms. Provisions typically relate to the licensing and inspection of artificial insemination centres and other facilities, quality controls on donor animals, and inspection and certification of imported or exported materials. Bhutan's Livestock Act of 2001 (see Box 3F8) can

Box 3F8

The legal and policy framework for breeding programmes in Bhutan

The legal and policy framework for animal breeding in Bhutan is based on the Livestock Act of Bhutan (2001)[1] and the Livestock Breeding Policy of 2007.

According to Chapter III of the Livestock Act, which addresses "designated farms", the Ministry of Agriculture may establish its own farms for genetic improvement and conservation and may also "help private farms in breeding." The Act also includes rules related to the supply of breeding animals to farms and the use of artificial insemination and embryo transfer.

The Breeding Policy sets out strategies for the development of breeding programmes and practices for large ruminants and – in less detail – for the country's other main livestock species. In the case of cattle, separate strategies are in place for peri-urban areas (based on cross-breeding) and for remote rural areas (based on promotion of the locally adapted Siri cattle and Mithun crosses, and – in the longer term – establishment of community-based breeding programmes). All the species- or breed-level strategies are based on a situational analysis of the current state of breeding practices and knowledge. Despite the systematic approach, the Bhutan's response to the 2013 legal survey reports that breeding policies for species other than cattle remain unclear and that this has contributed to an increase in the use of exotic breeds and cross-breeds and a decline in the populations of locally adapted breeds. In the case of cattle, Bhutan's country report states that the existing policy will favour effective management of locally adapted multipurpose cattle, but that little has yet been done in terms of the implementation of measures to improve their performance.

Sources: Country report of Bhutan; Bhutan's response to the 2013 legal survey.

[1] Available in English at http://www.nab.gov.bt/assets/uploads/docs/acts/2014/Livestock_Act_2001_Eng.pdf

Box 3F9

The legal framework for the use of reproductive biotechnologies in Brazil

Companies that produce, collect, process or market the semen and embryos of cattle, buffaloes, goats, sheep, horses, pigs or poultry in Brazil must be registered with the Ministry of Agriculture. Such companies are responsible for sending information on the animals from which material is collected, as well as on the number of semen samples or embryos collected, to the Inspection Division of Animal Genetic Material. The regulatory basis for the use of animal genetic material in Brazil is Law No. 6.446/1977,[1] which provides for the mandatory inspection and surveillance of semen used for artificial insemination. This law is regulated by Decree No. 187/1991,[2] which defines the role of the Ministry of Agriculture in the registration of sires, as well as in the registration of industrial and commercial companies and in the surveillance of genetic material imported or exported via airports, ports and border stations.

Any owner sending an animal as a donor to an artificial insemination centre must present performance certification indicating that the genetic material from the animal will be able to improve the production records of the respective breed.

Source: Adapted from Brazil's response to the 2013 legal survey.

[1] Lei nº 6.446, de 5 de outubro de 1977. Dispõe sobre a inspeção e a fiscalização obrigatórias do sêmen destinado à inseminação artificial em animais domésticos, e dá outras providências (available in Portuguese at http://tinyurl.com/q7rxo82).

[2] Decreto No. 187 de 9 de agosto de 1991. Regulamenta a Lei nº 6.446, de 5 de outubro de 1977, que dispõe sobre a inspeção e fiscalização obrigatórias do sêmem destinado à inseminação artificial em animais domésticos (available in Portuguese at https://www.planalto.gov.br/ccivil_03/decreto/1990-1994/D0187.htm).

serve as an example: this law contains a subchapter on artificial insemination and embryo transfer, which provides for the establishment of artificial insemination units (laboratories and housing facilities for donor animals) according to prescribed standards, forbids the use of semen from unlicensed premises, requires that donors of semen or embryos be certificated for genetic merit and disease status, requires that consignments of semen and embryos entering the country have a valid import licence and provides for inspection of artificial insemination units and laboratories used for semen processing and embryo storage. Further provisions are included in the country's Livestock Rules and Regulations of 2008 and the Livestock Breeding Policy of 2007. Brazil's legal framework in this field is described in Box 3F9.

A large majority (88 percent) of the OECD countries that responded to the legal survey indicated that they have legislation in place related to the use of reproductive biotechnologies (Figure 3F2). The figure for policies was lower (47 percent). This may be because developed countries where the service provision is largely in the hands of the private sector do not feel the need for policies in this field. In the case of non-OECD countries, the figures were 55 percent for legislation and 31 percent for policies.

Survey responses from countries that have legislation in place generally indicate that it serves its purpose of promoting the safe and efficient use of reproductive biotechnologies. A problem is, however, noted in the country report from Cyprus, which states that legal constraints affecting the use of fresh semen create difficulties for the use of artificial insemination in locally adapted ruminant breeds. The survey responses also mention few specific gaps in existing legislation. The response from Burundi notes the need to expand the species coverage of its legislation, while the responses from both Austria and Spain note the potential need to develop legislation to regulate the use of cloning. The only response that mentions any provisions specifically addressing potential problems that legal restrictions on the use of reproductive technologies might cause in AnGR management is that from Spain, which states that in the case of Royal Decree 841/2011[132] exemptions to the requirements

[132] Real Decreto 841/2011, de 17 de junio, por el que se establecen las condiciones básicas de recogida, almacenamiento, distribución y comercialización de material genético de las especies bovina, ovina, caprina y porcina, y de los équidos (available in Spanish at http://www.boe.es/boe/dias/2011/07/14/pdfs/BOE-A-2011-12107.pdf).

of the law are possible in the case of breeds that are at risk of extinction or difficult to manage, or for the establishment of a gene bank. It further states that future requirements include a system for determining with more precision the situations in which exemptions from sanitary rules should be allowed. With regard to problems caused by the absence of legislation, Malawi's country report notes that the

> *"lack of a breeding protocol and regulation has led to use of non-evaluated bulls for AI [(artificial insemination)] and potential inbreeding due to few bulls being used."*

Conservation

As the state of conservation programmes and policies is discussed in Part 3 Section D, the focus in this subsection is on legal instruments. Legislation in the field of AnGR conservation may address a range of different issues, including institutional responsibilities for implementing or coordinating national conservation programmes, the establishment of conservation facilities such as gene banks, the provision of support payments to the keepers of at-risk breeds, and the definition of the responsibilities of particular stakeholder groups such as breeders' associations.

Among the respondents to the legal survey, 71 percent of OECD countries reported that they have legislation in place targeting AnGR conservation and 88 percent that they have policies (Figure 3F2). The figures for non-OECD countries were 48 percent for legislation and 44 percent for policies. Countries were also asked specifically about measures targeting *in vivo* conservation and cryoconservation (Figure 3F3).[133] In the case of OECD countries, in both the legal and the policy categories, more respondents reported that their instruments target cryoconservation than *in vivo* conservation (71 percent vs. 65 percent for legislation and 76 percent vs. 65 percent for polices). In contrast, among non-OECD countries, more respondents reported instruments targeting *in vivo* conservation than cryoconservation (41 percent vs. 31 percent for both legislation and policies). However, a substantial proportion of non-OECD countries (34 percent) reported that they have a policy instrument under development in this category, suggesting a growing interest in cryoconservation in developing countries.

As noted above in the subsection on instruments targeting the general management of AnGR, a number of countries have legal instruments in place that assign responsibility for implementing conservation programmes to specific bodies as part of their overall mandates to implement or support national AnGR management programmes. A few other countries report legislation related specifically to the establishment of gene banks. One example is the Kenya Animal Genetic Resources Centre Order (2011),[134] which, *inter alia*, establishes the centre as a state corporation, defines its functions and the composition and competencies of its governing board, and establishes arrangements related to its funding.[135]

At a more fundamental level, legislation may serve to establish the implementation of (and/or provision of support to) AnGR conservation activities as one of the responsibilities of the national government. For example, France's Agricultural Orientation Law (2006)[136] states that the government is authorized to take (by ordinance) the measures necessary to conserve of AnGR diversity, making specific efforts to conserve local breeds, particularly

[133] Answering these subquestions was optional. Countries that reported instruments targeting conservation were asked to indicate whether these include measures specifically related to the two categories of conservation. In fact, almost all countries provided answers to both the subquestions. The few gaps that remained could be filled based on the assumption that if no conservation instruments were reported there could be no provisions targeting the individual categories of conservation. It was thus possible to calculate figures base on the full dataset of 46 countries.

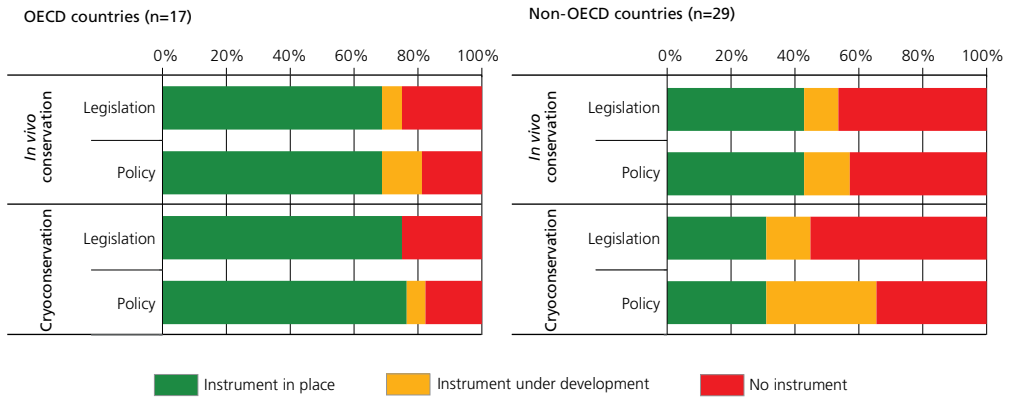
[134] Available in English at http://faolex.fao.org/docs/pdf/ken106282.pdf (the order is mentioned in Kenya's country report in connection with the country's plans to establish an *in vitro* gene bank).

[135] The above-mentioned legislation establishing the National Animal Germplasm Program in the United States of America is another example.

[136] Loi n° 2006-11 du 5 janvier 2006 d'orientation agricole (available in French at http://tinyurl.com/ppfcl5n).

FIGURE 3F3

Types of conservation targeted by legal and policy instruments



Source: Legal survey responses, 2013

those from mountain areas. The same country's Rural and Sea Fishing Code[137] states that the state shall ensure the conservation of AnGR diversity in collaboration with all relevant stakeholders. As another example, Viet Nam's Ordinance on Livestock Breeds (2004)[138] prescribes that the state

> *"shall invest in and render support for the collection and conservation of precious and rare livestock gene sources; build establishments for keeping precious and rare livestock gene sources; and preserve precious and rare livestock gene sources in localities."*

The extent to which the activities of bodies mandated to manage national conservation programmes are prescribed in legal instruments varies greatly from country to country. Slovenia's above-mentioned Regulation on Conservation of Farm Animal Genetic Resources, for example, includes quite detailed provisions related both to the elements of the national conservation programme and to associated activities such as the official recognition of breeds (see above). The conservation programmes prescribed in this regulation are based on breeding programmes certified in accordance with the legislation described above in the subsection on genetic improvement, but also include risk-status monitoring and conservation-related research, education, training and public-awareness raising, as well as proposals for *ex situ in vivo* conservation measures and for activities related to the ethnological, cultural, historical and environmental roles of the respective breeds.

As noted above, in a number of countries, legislation addressing the operation of breeding programmes includes explicit references to conservation or the need to maintain genetic diversity. Spain's Royal Decree 2129/2008, for example, classifies "[breed] improvement programmes" either as "selection programmes" or as "conservation programmes." A conservation programme is defined as an

> *"improvement programme which has as its objective the maintenance of genetic diversity to guarantee the conservation of*

[137] Code rural et de la pêche maritime. Article D653-9 Créé par Décret n°2006-1662 du 21 décembre 2006 - art. 3 JORF 23 décembre 2006 (available in French at http://tinyurl.com/ppfcl5n).

[138] Available at http://faolex.fao.org/docs/pdf/vie45179.pdf

a breed, cross-bred population,[139] *bloodline or variety and to prevent its extinction or to increase its population."*

Improvement programmes of whatever category have to be submitted to the competent authority as part of the process through which the respective breeders' association acquires official recognition. The obligations of breeders' associations under the decree include implementing the officially approved improvement programme (whether "conservation" or "selection") for their respective breed. If a conservation programme has been approved, participation "in the form that the competent authorities stipulate" is obligatory for all livestock breeders who belong to the respective breeders' association. The contents of a conservation programme (i.e. the elements that have to be included in the plans submitted for approval by the competent authority) are listed in an annex to the decree. The decree further states that the decision as to whether or not a conservation programme is required is to be based on the "degree of development, population size, zootechnical value and productive capacity" of the breed.

As noted above in Subsection 3, EU legislation includes provisions related to support payments for the keepers of breeds considered to be at risk of extinction. Several survey responses from EU member countries mention conservation programmes that include payments made in accordance with this legislation. Examples include the Austrian Agri-Environmental Programme 2007–2013,[140] which allowed for payments to be made to the keepers of 31 "acknowledged endangered breeds" provided that they were members of the respective breeding organization, followed the breeding programme for the breed and – if the breed was classified as "highly endangered" – followed the mating recommendations drawn up by the breeding organization.

The survey responses do not generally provide detailed information on how the reported legal and policy instruments contribute to the implementation of concrete conservation activities. In some cases, countries report that conservation activities underpinned by legislation have been associated with improvements in the status of at-risk breeds. Taking Austria again as an example, the country's survey response notes that since its Agri-Environmental Programme was established in 1995,[141] the populations of all at-risk breeds in the country have grown significantly and none have been lost. It should, of course, be borne in mind that, while appropriate legal frameworks may contribute to such successes they are also likely to depend on a wide range of other factors, including the availability of resources, capacity to plan and implement appropriate activities and "political will" to support them on the part of the national authorities and other stakeholders. The relative significance of legal and other factors – and chains of cause and effect among them – are difficult to identify and are likely to vary from country to country.

In some cases, the existence of legislation may help promote the provision of financial resources for conservation: some legal instruments (e.g. China's Stock-breeding Law of 2005[142] and Montenegro's Law on Livestock Farming – 2010)[143] make specific references to the inclusion of AnGR-related funding in state budgets. Alternatively, a lack of funding may inhibit the development of legislation. For example, the survey response from Latvia notes that developing laws and regulations that allocate institutional responsibilities for implementing conservation programmes is an important objective, but that this has not been done because regular funding to support the work has not been secured.

The survey responses generally do not report any specific problems associated with current legal or policy frameworks or any specific gaps

[139] "encaste" in the original Spanish.

[140] For details of AnGR conservation measures implemented under this scheme, see the Austrian Programme for the Conservation of Acknowledged Endangered Breeds (available in English at http://tinyurl.com/nkl9bdt).

[141] The predecessor of the programme mentioned in the preceding paragraph.

[142] Available in English at http://faolex.fao.org/docs/texts/chn61879.doc

[143] Закон о сточарству (available in Montenegrin at http://tinyurl.com/ozn4jas).

Box 3F10

The legal basis for animal genetic resources conservation in Poland

Poland's Animal Breeding Law of 20 August 1997,[1] brought in after the introduction of the market economy into the country, set out provisions for fundamental changes in the organization of breeding and reproduction in farm animals. The law enabled the transfer of responsibilities over animal breeding from the state (the Central Animal Breeding Office) to breeders' organizations, and created the legal and institutional conditions for this change.

The 1997 law did not contain any provisions specifically targeting the conservation of animal genetic resources (AnGR); the only reference appeared in Article 1, which indicated that the scope of the law encompassed the regulation of issues related to animal breeding and the management of AnGR.

The designation of Poland's National Focal Point for Animal Genetic Resources, and particularly the process of preparing the country report for the first report on *The State of the World's Animal Genetic Resources*, contributed to awareness raising and to an informed discussion on the further development of animal breeding legislation. The National Focal Point played an active role in this development and lobbied for the inclusion of an acknowledgment of the state's obligation to conserve AnGR in the legislation.

Amendments introduced to the 1997 law in 2004 included, for the first time, an article setting out provisions for the conservation of breeds, varieties and lines of farm animals threatened with extinction due to small or decreasing population size (Article 21a). This was a major development that was fundamental to the establishment of a legal and institutional framework for AnGR conservation. The article also included provision for an implementing act, through which the Minister of Agriculture would identify an entity to be given responsibility for implementing and coordinating conservation programmes and for the collection and storage of biological material for cryoconservation. While efforts to conserve native breeds had been underway in Poland since the 1980s, the amended law established a legal basis for comprehensive conservation activities and resulted in the coordination of these activities being entrusted to the National Research Institute of Animal Production.

In 2007, the further development and transformation of animal breeding and reproduction in Poland, including implementation of European Union legislation, led to the adoption of a new Animal Breeding Law.[2] Provisions for the conservation of endangered breeds were further enhanced (Article 28). The law sets out the elements of conservation programmes and defines the responsibilities of the entity entrusted by the Minister of Agriculture with coordination of conservation activities. The law coheres with the Rural Development Programme (currently 2014–2020, earlier phases 2004–2006 and 2007–2013), which provides support to farmers who keep endangered local breeds.

Issues for consideration in the further development of the legal framework for conservation include formal recognition of the National Bank of Animal Genetic Resources Biological Material and amendments to the list of species eligible for inclusion in conservation programmes.

Provided by Elżbieta Martyniuk, National Coordinator for the Management of Animal Genetic Resources, Poland.

[1] Dz.U. 1997 Nr 123 poz. 774 Ustawa z dnia 20 sierpnia 1997 r. o organizacji hodowli i rozrodzie zwierząt gospodarskich (available in Polish at http://isap.sejm.gov.pl/DetailsServlet?id=WDU19971230774).

[2] Dz.U.07.133.921 Ustawa z dnia 29 czerwca 2007 r. o organizacji hodowli i rozrodzie zwierząt gospodarskich (available in Polish at http://faolex.fao.org/docs/pdf/pol87292.pdf).

or weaknesses in them. Some responses do, however, indicate problems associated with the absence of legislation. The response from Bhutan, for example, states that the

> *"lack of legislation on conservation programs hampers execution of conservation, especially* in-situ *conservation. The Biodiversity Act of Bhutan 2001 needs to be updated and AnGR conservation and management [needs to be] ... included."*

Similarly, the country report from Italy mentions that the country's ability to make appropriate plans for AnGR conservation is constrained by the lack of a national law, although the problem is partially mitigated by the existence of several regional laws.[144]

Importation of genetic material

As discussed in Section C of Part 1, there are considerable international flows of AnGR. While it is generally accepted that enabling livestock keepers and breeders to access a wide range of genetic material, whether from inside or outside their home countries, is an important objective, countries may for various reasons wish to control the flow of genetic resources across their borders.

The most common reason for placing legal restrictions on the import of genetic material is to prevent the entry of transboundary animal diseases. Controls of this type, which have to comply with international regulations related to trade barriers (see Subsection 2), are discussed below in Subsection 4.5. Countries may also choose to put in place rules related to the characteristics of the genetic material itself. Rules of this type potentially relate to the genetic quality of specific consignments of genetic material (e.g. requiring that it comes from animals that have been subject to genetic evaluation) or to categories of genetic material (e.g. to the breed from which it comes). It has sometimes been proposed that countries should require compulsory assessments of potential impacts on AnGR diversity, livelihoods and the environment before allowing a new breed to be imported. Counter arguments are that such measures can constitute a barrier to trade and that ensuring that breeders and livestock keepers are sufficiently well informed to make appropriate decisions about the type of animals they wish to use is a more appropriate approach (for discussion see Tvedt *et al*., 2007; Pilling, 2007).

The legal survey requested countries to report on instruments aimed at ensuring the suitability of imported genetic material for use in local production environments. Among reporting OECD countries, 52 percent stated that they have legislation of this type in place. The equivalent figure for non-OECD countries was 45 percent (Figure 3F2). In the case of policies, the figures were 29 percent and 31 percent, respectively.

There appears to have been some diversity in how this question was interpreted. Where the responses provide details, they generally refer to legislation targeting the quality of imported genetic material, rather than measures specifically related to matching imported material to production systems in the importing country. As discussed above in Subsection 3, imports of genetic material into EU member countries from "third countries" (i.e. non-member countries) have to comply with rules set out in the relevant EU directive.[145] A number of responses from European countries refer to this requirement (although, as indicated by the above-cited figures for OECD countries, not all EU respondents considered that their instruments fall into the category targeted by this question).

The responses from developing countries, where they provide details, also for the most part refer to general legislation targeting the quality of imported genetic material. The response from Brazil, for example, states that imported material must be accompanied by a pedigree record of at

[144] For example: Legge regionale 14 ottobre 2008, n. 26 Tutela delle risorse genetiche autoctone vegetali ed animali di interesse agrario. B.U. Regione Basilicata N. 50 del 16 ottobre 2008 (available in Italian at http://tinyurl.com/q28dn8e).

[145] Council Directive 94/28/EC of 23 June 1994 laying down the principles relating to the zootechnical and genealogical conditions applicable to imports from third countries of animals, their semen, ova and embryos, and amending Directive 77/504/EEC on pure-bred breeding animals of the bovine species (available at http://tinyurl.com/o8fq6kr).

least three generations and by performance certification attesting to the potential of the material to improve the production levels of the respective breed. Likewise, the survey response from Ecuador notes that, in order to guarantee the development of the national livestock sector, the introduction of animals of low zootechnical quality for the purpose of breeding is prohibited, even in the case of international donations, and that import documents for breeding animals or other genetic material must include pedigrees. Namibia's response notes that the relevant instrument in this field is the above-mentioned Livestock Improvement Act of 1977. This law requires that anyone wishing to import animals, semen, ova or eggs into Namibia must obtain written permission from the Registrar of Livestock Improvement. If a breeders' society exists for the respective breed, the application must be lodged with the society, which will then make a recommendation to the Livestock Improvement Board.

None of the survey responses describe any instruments requiring compulsory impact assessments prior to the introduction of new breeds. However, South Africa's country report notes that its Animal Improvement Policy (2006)[146] calls for the implementation of "biological impact studies" before new breeds are imported so that their potential impact on locally adapted AnGR can be assessed (see Part 1 Section C). A few survey responses express some concern about the absence of such measures. The response from Cyprus, for example, notes that the

> *"import of exotic genetic material that cannot cope with [the] local production environment, results in financial losses for the farmers and, sometimes, [leads] to genetic dilution of local animal genetic resources"*

and the need for

> *"tighter control, policies and infrastructure to allow for genetic assessment before introduction of genetic material for the purpose of animal husbandry."*

[146] Animal Improvement Policy for South Africa. Notice 165 of 2007. *Government Gazette*, No. 30459 (16 November 2007): 41–66.

Some survey responses advocate an approach based on awareness-raising rather than on legal measures. The response from the Czech Republic, for example, states that future needs include carrying out an assessment of the suitability of imported material from different breeds and publishing its results "to improve the general awareness on this issue and facilitate farmers' decisions."

Animal genetic resources-related research

A lack of sufficient information about the characteristics of AnGR, particularly the characteristics of locally adapted breeds, is often noted as a constraint to their effective management (FAO, 2007), as is a lack of appropriate tools for their characterization, conservation, use and development. Strengthening AnGR-related research is therefore an important objective. Relevant legal instruments include those that prescribe the inclusion of AnGR-related research in national research activities and/or establish the institutional framework for such research activities (e.g. establishing research organizations or prescribing their mandates). Research activities may also be affected by legislation in fields such as animal welfare, sanitary protection and ABS.

While several survey responses note that research on AnGR is neglected, a number of relevant legal and policy instruments are reported. Most OECD respondents (76 percent) indicated that they have relevant policies in place (Figure 3F2). Fewer (53 percent) reported legislation. The equivalent figures for non-OECD countries were 48 percent for both policies and legislation. Among legal instruments, reported examples include Slovenia's Regulation on the Conservation of Farm Animal Genetic Resources (2011),[147] under which the activities to be covered by the country's Programme for Conservation of Farm Animal Genetic Resources include "research, education, training, and raising public awareness and promotion in the field of conservation of livestock biodiversity." Under the

[147] Pravilnik o ohranjanju biotske raznovrstnosti v živinoreji (Regulation on Conservation of Farm Animal Genetic Resources) (available in Slovenian at http://tinyurl.com/nm8l28a and in English at http://tinyurl.com/ntyb4qw).

same instrument, the organization "appointed as a public-service gene-bank for animal husbandry" is charged with research into the zootechnical and molecular characteristics of indigenous breeds. Most of the reported legal instruments in this category do not include such detailed AnGR-specific provisions, but outcomes in terms of promoting research on the topic are generally reported to be positive. The precise mechanisms involved are not always clear. However, the response from Latvia (which reports "no specific regulations regarding research related to AnGR") links the need for legislation to the need for regular funding for AnGR-related research.

Reported national policies that target AnGR-related research include the Renewable Natural Resources Research Policy of Bhutan (2011),[148] whose section on veterinary and livestock health includes the objective of enhancing "sustainable livestock production and health through participatory selective breeding, identification of promising indigenous animals and animal products"; Costa Rica's State Policy for the Food and Agriculture Sector and Rural Development,[149] which includes a strategy for improving the infrastructure for research into genetic improvement (focusing particularly on the creation of gene banks and the establishment of public–private partnerships for the management of genetic resources); and Malaysia's National Strategies and Action Plans on Agricultural Biodiversity Conservation and Sustainable Utilization,[150] which include a subsection on "monitoring and research" of AnGR. The survey response from Germany notes that "research on conservation and sustainable use of AnGR is part of the research agenda of public research conducted by the Ministry of Agriculture and other institutions." It also notes that a number of research programmes not specifically focused on AnGR (e.g. on organic farming and various aspects of biodiversity management) can, in principle, include projects in this field. The response from Spain, likewise, notes that several National Research Plans implemented by the National Institute for Agricultural and Food Research and Technology (INIA)[151] have included activities related to AnGR.

Transgenic animals and the use of transgenic products

Given the number of genetically modified crop varieties available for use in agriculture and the various controversies that surround their use, many countries have put in place regulatory frameworks of one kind or another addressing the use of genetically modified organisms (GMOs) in agriculture and the use of products derived from GMOs. These frameworks generally establish mechanisms via which specific GMOs or products derived from GMOs can be assessed and (if deemed appropriate) certified for use (see Box 3F11 for an example), prohibit or restrict the use of particular categories of GMOs or GMO-derived products and/or set out rules aimed at ensuring the safe use of GMOs. To date, the most prominent GMO-related issue in the livestock sector has been the use of GMOs in animal feed. Any future moves to expand the use of transgenic animals in agriculture and food production will inevitably bring regulatory issues to the fore.

As part of the legal survey, countries were asked to report on legislation related to the use of transgenic livestock and whether current legal frameworks have any effect on AnGR and their management. A majority of responding OECD countries (76 percent) reported that they have relevant legislation in place, while 47 percent reported policies. The equivalent figures for non-OECD countries were 41 percent and 27 percent respectively.

The survey responses do not highlight many AnGR-specific issues. Some countries report that they are in the process of developing legislation related to the use of GMOs in general. Some responses note that current frameworks do not specifically address livestock. However, no specific problems related to gaps in existing legislation are mentioned. Some countries report that they

[148] Available in English at http://tinyurl.com/pq7za53

[149] Política de Estado para el Sector Agroalimentario y el Desarrollo Rural Costarricense 2010–2021 (available in Spanish at http://www.mag.go.cr/bibliotecavirtual/a00289.pdf).

[150] Available in English at http://tinyurl.com/owjbqr7

[151] http://www.inia.es/IniaPortal/verPresentacion.action

Box 3F11

The regulatory framework for the use of genetically modified organisms in Australia

All dealings with genetically modified (GM) organisms in Australia are regulated by the Gene Technology Regulator under the Gene Technology Act 2000. The Regulator will only grant a licence for the commercial release of a GM crop if it has been assessed as safe for human health and the environment. Every potential licensee must provide the Regulator with an application, which is subject to public consultation and a transparent risk assessment process, involving a comprehensive risk assessment and risk management plan. The principals underpinning the risk assessment process are based on international standards originally developed by bodies such as the World Health Organization, the Codex Alimentarius Commission and the Organisation for Economic Cooperation and Development.

Similarly, GM foods are not approved for sale unless they have been assessed as safe for human consumption, and those foods that are approved must be labelled to allow consumers to make an informed choice. GM foods are only approved for sale once assessed as safe by Food Standards Australia New Zealand (FSANZ). To enable consumers to make informed choices GM foods are required to be labelled in accordance with the Australia New Zealand Food Standards Code, administered by FSANZ. The exemptions to the GM labelling requirements relate to food products that do not contain GM material of any type and are therefore indistinguishable from conventionally produced foods, including animals fed on GM feed.

There are no GM animals or animal products currently approved for commercial release in Australia.

Source: Australia's response to the 2013 legal survey.

have established institutional responsibilities for dealing with the regulation of the use of GMOs in the livestock sector. Costa Rica, for example, notes that the National Animal Health Service has been assigned the task of developing and implementing provisions related to the use, release or commercialization of genetically modified animals – or their products or subproducts – that could present any kind of risk to the environment or to human or animal health.[152] Countries report varying levels of legal restriction on the use of GMOs. The survey response from Austria, for example, states that

> *"the use of genetically modified animals and their products is forbidden in agricultural production in Austria. Imported products containing GMO may be used for feedstuff but must be labelled accordingly."*[153]

With regard to the effects of these measures, the response notes that

> *"organic farming plays an important role in Austrian agriculture. To further protect the organic sector, use of GMOs in agriculture is not desirable."*

The response from Norway notes that the country's legal prohibition of the use of GMOs in all food and feed creates problems with regard to the sourcing of feed products, particularly soybeans. However, there is no indication that this has any particular effect on the management of AnGR.

Access and benefit-sharing

International developments in the field of access and benefit-sharing are described above in Subsection 2. As part of the legal survey, countries were asked about the state of ABS-related legislation and policies at national level and about whether existing or planned instruments include any specific provisions related to AnGR or genetic resources for food and agriculture in general. Previous assessments of use and exchange practices in the AnGR sector (e.g. FAO, 2009c) have generally concluded that few ABS-related prob-

[152] Ley N° 8.495. Ley general del Servicio Nacional de Salud Animal. *La Gaceta* N° 93, 16 de mayo de 2006 (available in Spanish at http://faolex.fao.org/docs/pdf/cos78033.pdf).

[153] Verordnung der Bundesministerin für Gesundheit und Frauen über die Kennzeichnung von Erzeugnissen, die aus gentechnisch veränderten Organismen bestehen oder solche enthalten (Gentechnik-Kennzeichnungsverordnung) Bundesgesetzblatt Nr. BGBl. II Nr. 5/2006 (available in German at http://tinyurl.com/pf6ec8e).

lems have arisen, either in terms of potential users being unable to access AnGR or in terms of AnGR being acquired without adequate consent being obtained from the providers or without appropriate sharing of benefits. However, they also suggest that some stakeholders have concerns about potential future developments: on the one hand that additional regulations may inhibit or add to the transaction costs of exchanging AnGR and on the other that greater interest in utilizing locally adapted AnGR outside their areas of origin (e.g. as part of climate change adaptation efforts) may lead to inequitable exploitation of these resources.

The survey responses largely reflect the low profile of ABS issues in the AnGR subsector. The proportion of countries reporting that they have ABS-related legislation currently in place was low: 18 percent in OECD countries and 28 percent in non-OECD countries. The figures for policies were 35 percent and 28 percent, respectively. A number of countries, however, reported that national ABS-related instruments are being introduced or updated in order to enable them to meet their commitments under the Nagoya Protocol. In the case of OECD countries, of all the topics covered in the survey, ABS was the one for which the largest number of respondents reported that instruments are "in development": 47 percent in the case of legislation and 29 percent in the case of policies. The equivalent figures for non-OECD countries were substantially lower (particularly in the case of legislation) at 10 percent and 21 percent, respectively. Fifty-nine percent of OECD respondents and 31 percent of non-OECD respondents reported that their existing or planned instruments feature at least some provisions specifically targeting AnGR (including exemptions, or potential exemptions, for AnGR from general ABS rules). However, few responses highlight any concrete AnGR-related ABS issues that need, or have needed, to be addressed at legislative or policy level. A few note the need to develop measures addressing access to genetic material for research purposes or for storage in gene banks (and subsequent extraction of the material for use). Again, however, no specific problems (current or foreseen) are described.

Some survey responses indicate that AnGR are included under ABS-related provisions set out in general instruments on biodiversity. Domesticated animals are, for example, explicitly included within the scope of the Biodiversity Act of Bhutan (2003)[154] and hence within the scope of the ABS-related rules set out in this law. In this case, the provisions allow for the possibility of exemptions for AnGR (and plant genetic resources for food and agriculture) under "special rules and regulations or conditions" where the competent authority deems appropriate.

Reported legal instruments that include provisions specifically related to the export of AnGR include Montenegro's above-mentioned Law on Livestock Farming (2010),[155] which states that

> *"indigenous and endangered indigenous breeds can be exported only if exports do not threaten their numerical strength and their protection, based on authorization from the Ministry."*

Similarly, Viet Nam's Ordinance on Livestock Breeds (2004)[156] states that "international exchange of precious and rare livestock gene sources" requires permission from the Ministry of Agriculture. Another example is provided in Turkey's country report: a regulation adopted in 2012 – the Regulation on Utilization and Export of Native Domestic Animal Genetic Resources[157] (see also Box 3F5) – prohibits the export of AnGR without permission from the Ministry of Food, Agriculture and Livestock. It also requires foreign researchers to obtain permission to use AnGR for research purposes in Turkey and Turkish researchers to obtain permission to use AnGR for research abroad. Export of at-risk AnGR for commercial purposes is forbidden and requests for genetic material from gene banks are not to be accepted

[154] Available in English at http://www.icimod.org/resource/2216

[155] Закон о сточарству (available in Montenegrin at http://tinyurl.com/ozn4jas).

[156] *Công Báo* No. 16, 24 April 2004, pp. 20–30 (available in English at http://faolex.fao.org/docs/pdf/vie45179.pdf).

[157] *Official Gazette of Turkey*, No. 28418, 21 September 2012 (available in Turkish at http://tinyurl.com/naaagwp).

if stocks are limited. Export is prohibited unless the prescribed application procedures are followed and a material transfer agreement prepared.

China's Stock-Breeding Law (2005)[158] includes the following specific reference to benefit-sharing arrangements:

> *"Where any livestock or poultry genetic resource included in the protection list is to be exported from China or is to be researched and utilized within China in cooperation with any foreign institution or individual, the applicant shall file an application with the stockbreeding and veterinary administrative department of the provincial people's government and shall simultaneously put forward a plan on sharing the benefits with the state."*

No survey responses or country reports describe any specific effects that provisions of this kind have had, to date, on the use and exchange of AnGR.

Patenting

International developments with regard to legal frameworks addressing intellectual property rights in the field of AnGR management are discussed above in Subsection 2. National-level measures were addressed as part of the legal survey. Countries were asked to provide information on their patent laws, particularly whether they include any provisions specifically related to AnGR or to living organisms in general. Because the questions were clearly interpreted differently by different countries, it is difficult to provide an overview of the findings in quantitative terms. However – whatever the legal framework in the respective country – the survey responses generally suggest that patent law has had little impact on AnGR management. No specific concerns are raised about existing frameworks. However, some responses note the need for adaptation or clarification of existing provisions or called for a more homogeneous approach globally.

The responses from several EU member countries refer to the exclusion of "animal varieties" from patentability under the EU directive on the legal protection of biological inventions.[159] Similar exclusions are reported in the responses from a few other countries (e.g. Malaysia and Switzerland). Little information is provided on the effects of these exclusions. In the case of Switzerland, the effects of the existing framework are described as follows:

> *"Respect is given to safety of breeds and genetic diversity, privilege of farmers and breeders is respected, benefit sharing is respected, fundamental research can be done."*

The response from Austria notes that a change in the law "would have powerful effects on the management of Animal Genetic Resources in EU/Austria" and the need for "decisions in the EU about the legality of future patenting praxis." The response from Bulgaria mentions that under the country's *sui generis* system for livestock breeds (see above), autochthonous breeds are excluded from "authorship claims", which it is stated "can be harmful for the conservation and development of the breed."

4.4 Instruments related to marketing

In most production systems, the management of AnGR is influenced – at least to some degree – by the need to produce goods or services that can be sold at a profit. If a breed's products are difficult to market, it will often become less popular with livestock keepers and, in extreme cases, may fall completely out of use and become extinct. While the basic driving forces of markets for livestock products are consumer demands and competition among producers, they are also generally regulated, at least to some extent, by legislation and may be influenced by public policies. The main objectives of these instruments are normally to protect the interests of consumers and/or to promote the development of a flourishing livestock

[158] Available in English at http://faolex.fao.org/docs/texts/chn61879.doc

[159] Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions (available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31998L0044).

sector (or the economy more broadly). However, because they may differentially affect the profitability of different types of livestock production, they have the potential to influence the types of AnGR that are kept by livestock keepers.

Consumer protection

Most if not all countries have some kind of legislation in place that aims to protect consumers by prohibiting the sale of dangerous or defective goods, goods marketed under misleading descriptions and so on. While legislation of this type has no obvious differential effects on the marketing of products from different types of AnGR, it may underpin more specific regulations or initiatives that do have such effects.

Where animal products are concerned, one of the most significant aspects of consumer protection is food safety. While effective regulation in this field is, clearly, extremely important from the perspective of public health and in terms of consumer confidence in livestock products, food safety laws can create challenges for the producers of certain types of food (including traditional products such as cheeses made from raw milk) or for producers that operate in conditions that make it difficult to comply fully with the relevant rules (e.g. some small-scale livestock keepers). The possibility that effects of this kind might create problems for the marketing of products from at-risk breeds was acknowledged in the first SoW-AnGR. However, there was little to indicate that this was a widespread issue. A small number of responses to the legal survey mention problems of this kind. The response from the Czech Republic, for example, states that

> *"the impact appears to be in some respect negative. Compliance with legal measures brings a number of inspections [and] additional administrative burden. It requires technical measures which might be capital intensive. For that reason some farms retreat from keeping animals and ... [AnGR diversity] decreases."*

Likewise, the response from Norway notes that

> *"due to high hygienic standards requiring expensive production equipments, these regulations challenge the profit for small-scale entities."*

Product traceability

An issue closely related to consumer protection is that of the traceability of food products of animal origin through all stages of production, processing and distribution, i.e. from the birth of the animal to the sale of the product to the consumer. As noted above in Subsection 4.3, traceability is one of the multiple benefits potentially associated with an effective animal identification system. Traceability is important from the perspective of improving food safety. It can also help to increase consumers' confidence in claims made about the origin of products as part of marketing campaigns. It can, however, create substantial transaction costs. A compulsory traceability system normally requires legal backing to ensure compliance.

Traceability systems and related legal frameworks are widespread in developed countries. EU regulations, for example, are noted above in Subsection 3. There is also increasing interest in establishing traceability systems in developing countries. Examples of relevant legislation reported in the responses to the legal survey include the United Republic of Tanzania's Act on Animal Identification and Traceability (2010),[160] Ecuador's Ministerial Accord establishing the Animal Identification and Traceability System (2011),[161] Namibia's Animal Identification Regulations (2009)[162] and Uruguay's Resolution on the Animal Identification and Registration System (2011).[163]

[160] Available in English at http://tinyurl.com/oum2t2h

[161] Acuerdo N° 41 – Crea el Sistema de Identificación y Trazabilidad Animal (SITA) (available in Spanish at http://faolex.fao.org/docs/pdf/ecu120083.pdf).

[162] Animal Identification Regulations (GN No. 29 of 2009) *Government Gazette of the Republic of Namibia,* No. 4217 of 5 March 2009 (available in English at http://faolex.fao.org/docs/pdf/nam126791.pdf).

[163] Resolución N° 11/011 – Sistema de Identificación y Registro Animal (SIRA) (available in Spanish at http://faolex.fao.org/docs/pdf/uru110739.pdf).

The survey responses do not highlight any particular problems with regard to the effectiveness of existing legislation as a basis for establishing effective traceability systems. However, the response from the United Republic of Tanzania notes that the country's system is new and that more efforts are needed to ensure that it functions properly and is sustainable over the longer term. The indirect effects that the existence of a traceability system has on AnGR management are likely to vary from country to country depending on how it affects market access and demand for various kinds of animal product. The livestock sector in general is likely to benefit from greater consumer confidence and possible opportunities to enter new markets. The survey response from Slovenia, for example, notes that traceability increases buyers' awareness of the origin of food products and increases demand for food from local sources. On the negative side, the response from the Czech Republic notes that, as in the case of food-safety regulations, complying with traceability legislation can sometimes be a burden for small-scale producers.

Marketing schemes – mainstream and niche products

Several countries indicate in their survey responses that they have policy measures in place supporting marketing schemes for livestock products. In some cases, these measures have been established on the basis of specific legislation. Some of these policies and laws target mainstream livestock products. Others focus on (or include provisions related to) the marketing of niche products, i.e. products with specific characteristics that appeal to a particular subset of consumers. A few survey responses note that "general" laws or policies on marketing do not adequately address the marketing of products from a diverse range of AnGR, either because of a lack of provisions specifically addressing this area or because the types of products promoted tend to come from a narrow range of "mainstream" breeds. The response from Nepal, for example, notes that a

> *"lack of clear policy for the marketing of animal products specially from the native breeds and of niche products hinders the conservation of animal genetic resources".*

The response from Luxembourg notes that

> *"animal products are ... [promoted] under the national meat quality labels (beef, pork, direct farm sales, etc.) or private initiatives. Mostly, conventional intensive beef breeds and pig hybrids are valued under these labels."*

Reported examples of marketing laws that address the promotion of niche products include Slovenia's Act on the Promotion of Agricultural and Food Products (2011).[164] Marketing activities within the framework of this law reportedly contribute to increasing product diversity and awareness of "autochthonous and other breeds of AnGR", which in turn helps to keep the breeds in use.

There are a number of specific niche markets that are recognized as having at least some potential as outlets for the sale of products from breeds that are not competitive in mainstream markets. These include the market for organic products, the market for products sold under protected designations of origin (or similar labels that indicate the geographical source of a product or the methods used in its production) and the market for products produced under labels that indicate high standards of animal welfare. The legal survey specifically asked countries to report on laws or policies related to markets of this type. Responses are discussed in the following paragraphs.

Organic production. In the case of organic production, all the responding OECD countries and more than 60 percent of responding non-OECD countries reported that they have legislation in place. The sample of countries that responded to the survey appears to be a little more advanced in this respect than the world as a whole. UNEP (2013) reports that 86 countries

[164] Zakon o promociji kmetijskih in živilskih proizvodov (available in Slovenian at http://tinyurl.com/o4d7lcd).

have legislation on organic agriculture in place, while another 26 countries are in the process of drafting legislation.

A legal framework for organic production normally consists of a set of standards that producers have to follow in order to be permitted to describe their products as organic, arrangements for the certification of organic products and rules related to the use of logos and labels indicating that products are organic. By increasing consumer confidence in organic products and providing protection against fraudulent competition, an effective legal framework increases the likelihood that producers who follow organic standards will be able to make a profit and continue operating. If organic products are produced for export, they normally have to be certified by a certification body that is recognized by the relevant authorities in the importing country (UNEP, 2013). In addition to legislative measures, countries may choose to introduce various kinds of policy measure to encourage or support the development of organic production (support payments, provision of information to producers and consumers, etc.).

Organic standards for livestock production typically include some reference to the types of breed that are appropriate for use in organic systems. The Codex Alimentarius Commission's Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods (FAO/WHO, 2007), for example, state that

> *"the choice of breeds, strains and breeding methods shall be consistent with the principles of organic farming, taking into account in particular:*
> *a) their adaptation to the local conditions;*
> *b) their vitality and resistance to disease;*
> *c) the absence of specific diseases or health problems associated with some breeds and strains (porcine stress syndrome, spontaneous abortion etc.)."*

As noted above in Subsection 3, the EU regulation on organic production refers to the need to choose breeds that are appropriate to the production conditions. Examples at national level include Canada's General Principles and Management Standards,[165] which serve as organic standards within the framework of the Organic Products Regulations (2009)[166] and state that

> *"the operator shall ... select breeds and types of livestock that are suitable for site-specific conditions within the local environment and production system and that are resistant to prevalent diseases and parasites ..."*

While rules related to the use of well-adapted animals in organic production clearly have some potential to influence AnGR management, in many cases the breeds used in organic production are the same as those used in conventional production in the same geographical area (FAO, 2007a). A further point to note is that a well-developed legal framework will not, in and of itself, create a thriving organic sector if consumers have little interest in organic products or are unable to pay the higher prices usually associated with them. Any potential benefits in terms of promoting the sustainable use of AnGR are likely to depend on a number of factors in addition to legal and policy frameworks.

Among respondents to the legal survey, several European countries indicated that the presence of a legal framework for organic livestock production has some positive effect on the maintenance of breeds that might otherwise be at risk of abandonment. The response from Austria, for example, notes that

> *"one of the major principles of organic livestock farming is to use animal breeds that are adapted to climatic and other local conditions. The organic farming sector in Austria contributes to diversity of farm animals by following [this] principle and by supporting the use of rare animal breeds."*

Other examples of countries reporting positive effects include Croatia, the Czech Republic and Germany. Some countries, however, report that

[165] Organic Production Systems General Principles and Management Standards. CAN/CGSB-32.310-2006 (available at http://tinyurl.com/nubfg9m).

[166] Available at http://laws-lois.justice.gc.ca/PDF/SOR-2009-176.pdf

effects of this kind are limited (e.g. Cyprus and Norway).

Most survey responses from developing countries, even if they indicate that some legal or policy measures are in place, do not mention any particular effects on AnGR management. An exception is the response from Thailand, which notes that its provisions in this field help to promote the conservation of AnGR. The Thai Agricultural Standard for Organic Agriculture (2005) states that

> *"the choice of breeds, strains and breeding technique shall be consistent with the principles of organic agriculture taking into account in particular: their adaptability to the local conditions; the capacity of vitality and resistance to diseases by selection of breeds which are resistant to diseases such as tick-borne disease, etc."*[167]

On the policy side, the response from Nepal notes that its Agriculture Policy of 2004 and Poultry Policy of 2011 include provisions related to the marketing of organic products and that some guidelines have also been formulated for the promotion of organic products. While several other developing countries indicate that strengthening the organic sector is regarded as an important objective, little information is provided on the specific legal and policy measures required or on potential effects on the management of AnGR.

Geographical indications. As in the case of organic labelling schemes, the objective of geographical indications and similar designations is to prevent false claims about product origin and thereby ensure that the consumer is not deceived and that genuine producers of the sought-after products can take advantage of price premiums. The significance of niche markets in efforts to promote the sustainable use and conservation of AnGR is discussed in Part 3 Section D and Part 4 Section D. The following discussion focuses on legal and policy instruments.

As described above in the Subsection 3, several geographical indication schemes have been established under EU legislation. Many EU member countries mention this in their survey responses. The responses suggest that the extent to which the schemes have contributed to keeping potentially threatened breeds in use varies considerably from country to country. However, in most countries such schemes are clearly regarded as valuable, or potentially valuable, tools for promoting sustainable use and conservation. Some responses mention national schemes (e.g. France's Label rouge)[168] in addition to the EU-level schemes. No particular weakness in existing provisions are highlighted in the survey responses, but several note that the link to specific breeds is usually indirect, i.e. breeds usually benefit because they are associated with the location or production system associated with the indication rather than because their use is mandatory for inclusion in the scheme. Some countries, however, have gone a step further and established breed-specific labelling schemes. Examples of legislation addressing schemes of this type include Spain's Royal Decree 505/2013 Regulating the Use of the Logo "Autochthonous Breed" in Products of Animal Origin (2013),[169] under which breeders' associations for officially recognized autochthonous breeds are able to establish specifications for the use of the logo for their respective breeds. The specifications (minimum contents for which are set out in an annex to the decree) have to be submitted to the competent authorities for approval.

Provisions related to geographical indications are reported by some non-EU European countries,

[167] Thai Agricultural Standard TAS 9000-2005. Organic Agriculture Part 2: Organic Livestock. National Bureau of Agricultural Commodity and Food Standards Ministry of Agriculture and Cooperatives (available in English at http://www.acfs.go.th/standard/download/eng/Organic_Agriculture2.pdf).

[168] Code rural et de la pêche maritime. Article L641-1 (available in French at http://tinyurl.com/o4l5yep).

[169] Real Decreto 505/2013, de 28 de junio, por el que se regula el uso del logotipo «raza autóctona» en los productos de origen animal (available in Spanish at http://www.boe.es/boe/dias/2013/07/24/pdfs/BOE-A-2013-8048.pdf).

such as Montenegro[170] and Serbia,[171] but appear to be uncommon in other regions of the world. One exception is Brazil,[172] where products that have a distinct reputation associated with their place of origin and unique qualities associated with local production conditions or know-how can be assigned a registration of geographical indication. Brazil's survey response indicates that by the end of 2013 geographical indications had been granted to two types of cheese (Canatra and Serro) and one type of beef (Pampa Gaúcho).

In some circumstances, a label for a class of products sourced from a particular geographical area and/or produced using specific methods can be established under trademark law. The survey response from Nepal, for example, mentions labels established for pashminas and for carpets made from the wool of native sheep breeds.

Animal welfare-related labelling. If consumers are willing to pay premium prices for animal products derived from high-welfare production systems, it may be necessary to regulate product labelling in order to ensure that they are provided with accurate information that allows them to make informed choices about their purchases. For example, EU legislation includes provisions related to the labelling of eggs as "free range."[173] Potential effects on the management of AnGR arise because the type of animals suitable for keeping in different types of production system may vary (e.g. more "robust" animals for outdoor production systems). Legislation that facilitates the marketing of products from higher-welfare (often higher-cost) production systems may help to keep breeds of this type in use. Most instruments in this category reported in the responses to the legal survey focus on organic production rather than on other high-welfare production methods. Several responses recognize that there is some potential for at-risk breeds to benefit from the existence of marketing schemes for high-welfare products, but no specific cases are highlighted. Likewise, few specific gaps in existing legislation are mentioned, although the response from Germany notes the possibility that EU-level legislation regulating the use of voluntary animal welfare labels might be required in the future.

Few responses from developing countries report any legislation in this field or mention it as a priority for the future. Interest appears to be higher in countries that target export markets. Brazil's survey response, for example, while stating that there is no legislation in this field, mentions its Permanent Technical Committee on Animal Welfare, created in 2008, whose duties include legislative alignment of domestic standards with the scientific criteria established by international agreements to which the country is a signatory, as well as preparing and stimulating the Brazilian agricultural sector to comply with the requirements of its export markets. The response from Namibia mentions the Farm Assured Namibian Meat Scheme,[174] which combines animal welfare standards with rules on environmental protection, animal identification and traceability and various other aspects of animal husbandry and record keeping.

4.5 Instruments related to animal health and welfare

The first SoW-AnGR concluded that animal health was the most highly regulated aspect of livestock management globally. Most, if not all, countries have put in place legislation that aims to control

[170] Ukaz o proglašenju Zakona o oznakama porijekla, geografskim oznakama i oznakama garantovano tradicionalnih specijaliteta poljoprivrednih i prehrambenih proizvoda / Law on Designations of Origin, Geographical Indications and Indications of Traditional Specialities Guaranteed for Agricultural and Food Products. *Official Gazette of Montenegro,* No. 18/11 (available in English at http://www.wipo.int/wipolex/en/text.jsp?file_id=287272 and in the original at http://www.wipo.int/wipolex/en/text.jsp?file_id=249273).

[171] Law on Indications of Geographical Origin. *Official Gazette of the Republic of Serbia*, No. 18/2010 (available in English at http://www.wipo.int/wipolex/en/text.jsp?file_id=186618).

[172] Instrução Normativa Nº 25/2013 Estabelece as condições para o Registro das Indicações Geográficas (available in Portuguese at http://revistas.inpi.gov.br/pdf/PATENTES2230.pdf).

[173] Commission Regulation (EC) No 589/2008 of 23 June 2008 laying down detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards marketing standards for eggs (available at http://tinyurl.com/66ewtgq).

[174] http://www.nammic.com.na/jdownloads/Manuals/fanmeatmanual.pdf

the spread of livestock diseases within national borders and to prevent the introduction of diseases from outside. Many countries have also established policies or programmes of various kinds that aim to improve the health of their livestock populations. In addition to provisions related to the establishment of relevant institutions (veterinary services and so on), legal frameworks in this field can include provisions that place various kinds of restriction on the activities of livestock keepers and other stakeholders (prohibiting practices that contribute to the spread of diseases) and may also make compulsory certain activities that contribute to disease control (e.g. slaughter and safe disposal of infected animals).

The impacts that policies and legislation in the animal-health field have on AnGR and their management are generally indirect. Control of animal health problems helps to support livestock-keeping livelihoods, to protect animal populations (including at-risk breeds) from the effects of disease epidemics and to facilitate the exchange of breeding animals and genetic material both at national level and internationally. Effective policy and legal instruments that promote animal health can therefore contribute in many ways to the sustainable management of AnGR. Having noted these benefits, it has to be acknowledged that it in some circumstances an improved animal-health situation may facilitate the replacement of locally adapted breeds by disease-susceptible exotic breeds, with potentially negative consequences for diversity. Clearly, this does not mean that animal health-related policies and legislation should be neglected in order to help keep resistant breeds in use. It may, however, be a factor to bear in mind when assessing the effects of livestock-sector policies on AnGR management (see Part 2).

Another potentially problematic effect of animal health-related legislation is that it may prescribe the compulsory culling of animal populations affected by (or that have come into contact with) particular infectious diseases. Culling campaigns against disease such as foot-and-mouth disease, classical swine fever and African swine fever have led to the extinction of an (apparently) small number of breeds and substantially reduced the population sizes of several others (for further discussion of this threat, see Part 1 Section F). Less dramatically, legal requirements or restrictions imposed in order to improve disease control may make it difficult or costly to continue keeping livestock in certain production systems, with potentially negative consequences for the associated AnGR. A further set of potential problems relate to restrictions on access to breeding material. Such problems are most likely to arise because of sanitary controls on imports, but may also occur because of rules related to the movement of animals within the country or to the use of genetic material in the form of semen, embryos, etc. (potentially including material cryoconserved at an earlier time when sanitary rules were less strict).

As part of the legal survey, countries were asked to report on a range of animal health-related laws and policies, including those related to animal identification, the import and export of animals and breeding material, the movement of livestock within the country, the use of reproductive biotechnologies[175] and the control of epidemics through culling.

As discussed above (Subsection 4.3), animal identification systems serve a number of purposes and can contribute in several ways to the management of AnGR. The main initial motivation is often to improve disease control, but systems developed for this purpose can serve other objectives such as facilitating genetic improvement programmes and programmes for monitoring of population trends. Several survey responses note the multiple benefits that can be obtained from having legislation on animal identification in place. All OECD respondents to the survey reported that they have legislation related to animal identification in place, as did more than 50 percent of non-OECD countries, with a further 10 percent reporting that they are

[175] The focus in this subsection is on sanitary issues in the use of reproductive biotechnologies. Other issues related to the use of these technologies are discussed above in Subsection 4.3.

developing legislation in this field. Effects on AnGR diversity are generally regarded either as neutral or as positive, the latter because the systems help to reduce the threat posed by epidemics.

The survey responses do not highlight any particular AnGR-related problems associated with animal identification laws. It is, nonetheless, interesting to note that some issues have arisen in the past. The first SoW-AnGR, for example, noted that some amendments to EU legislation on animal identification had to be introduced to account for the difficulty of attaching ear tags to animals kept in certain extensive production systems within the required time limits after birth.[176] More recently, the survival of certain types of semi-feral pony in the United Kingdom was reportedly threatened by the high costs of compulsory "horse passport" identification documents and microchipping. Derogations, allowable under the relevant EU regulation,[177] were incorporated into national legislation to address the problem.[178]

Many survey responses note that national legislation prescribes compulsory culling in certain circumstances and that this poses a potential threat to AnGR. While some countries' legislation allows for possible derogations to protect at-risk breed populations (reported examples include Finland and Germany), the survey results suggest that provisions of this kind are not widespread. Several countries note the need to review legislation in this field.

A few survey responses mention problems, or potential problems, arising because of sanitary restrictions on the import of breeding animals or genetic material. Brazil's response, for example, notes that for many years Brazilian breeders of various zebu cattle breeds were unable to import semen or embryos from India. Spain's response notes that legislation of this kind might hamper the exchange of genetic material and that in the case of transboundary breeds at risk of extinction, simplified mechanisms that facilitate the implementation of conservation programmes need to be developed.

With regard to animal movements at country level, the survey response from Brazil notes that when a disease outbreak occurs, restrictions on the movement of breeding animals across state boundaries cause some problems for breeders, but also notes that these restrictions are accepted because breeders recognize the benefits in terms of disease control. The response from Norway reports that

> *"movement of live AnGR within Norway is highly regulated and restricted by law, especially [in the case of] sheep and goats. This makes sustainable breeding a big challenge since it is almost impossible to get 'new' breeding animals to the herd."*

It further notes that

> *"exemptions based on [the needs of] national AnGR should be accepted within this legislation."*

Another problem is mentioned in the response from Latvia, which notes that restrictions on marketing imposed in order to control diseases can have a significant effect on livestock keepers' incomes.

A small number of survey responses indicate that legislation related to the use of reproductive technologies and frozen genetic material can have implications for cryoconservation programmes. The response from Spain, for example, reports that specific provisions for at-risk breeds are included in its Royal Decree 841/2011 Establishing Basic Conditions for Collection, Distribution and Marketing of Genetic Material from Bovine, Ovine, Caprine and Equine Species.[179]

[176] For example, Commission Decision 2004/764/EC of 22 October 2004 concerning an extension of the maximum period laid down for the application of eartags to certain bovine animals kept in nature reserves in the Netherlands (available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32004D0764). See FAO, 2007a, page 300 for further discussion of regulations of this type.

[177] Commission Regulation (EC) No 504/2008 of 6 June 2008 implementing Council Directives 90/426/EEC and 90/427/EEC as regards methods for the identification of equidae (available at http://tinyurl.com/qgnyzjn).

[178] For example: The Equine Identification (Wales) Regulations 2009 (available at http://www.legislation.gov.uk/wsi/2009/2470/made).

[179] Real Decreto 841/2011, de 17 de junio, por el que se establecen las condiciones básicas de recogida, almacenamiento, distribución y comercialización de material genético de las especies bovina, ovina, caprina y porcina, y de los équidos (available in Spanish at http://www.boe.es/boe/dias/2011/07/14/pdfs/BOE-A-2011-12107.pdf).

The legal survey also sought information on instruments related to animal welfare (instruments related specifically to labelling are discussed above in Subsection 4.4). Potential effects of such instruments on AnGR management might arise, for example, because of rules affecting the use of particular reproductive technologies. Indirect effects might arise if production systems have to be adapted in order to account for welfare rules and this in turn leads to changes in the types of AnGR kept. It is also possible that activities (e.g. sports) that create demand for particular types of animal might be banned or restricted under welfare legislation.

The survey responses suggest that while many countries have animal welfare legislation and policies in place, impacts on AnGR management are limited (or at least unrecognized). Some responses note that because locally adapted breeds tend to be associated with extensive systems – often regarded as high-welfare systems – the keepers of these breeds may be less likely than the keepers of other breeds to be affected by any financially burdensome welfare-related rules that might be introduced.

4.6 General instruments related to agriculture, land use, rural development and natural-resources management

The final section of the legal survey was devoted to legislation and policies that address "agriculture, land use and natural resources management", i.e. that address the overall management of the production systems, ecosystems and environments within which AnGR are used and developed. The topics covered included very broad fields of action such as agricultural and livestock development, the use of natural resources, environmental protection and management of biodiversity (including wild biodiversity), as well as some more specific topics such as the management of natural and human-induced disasters.[180] In this context, influences on AnGR and their management may be direct or indirect. One the one hand, a law or policy may have an impact because of specific provisions related to AnGR; in other words AnGR may (to some degree) have been "mainstreamed" within the respective field. On the other, a policy or law that does not include a specific reference to AnGR may have an inadvertent effect (positive or negative) on AnGR (e.g. by promoting or constraining the operation of different types of livestock production that tend to use different types of AnGR).

The various topics addressed in this part of the survey (and below in this subsection) are closely inter-related. The "architecture" of legal and policy frameworks addressing them (e.g. whether topics are addressed separately or under broad all-encompassing instruments) inevitably varies from country to country. The absence of a specific instrument does not necessarily mean the topic is being neglected. For some categories, it is therefore not particularly informative to present quantitative figures for the proportion of countries having instruments in place. The survey questionnaire was, however, arranged topic by topic (proceeding roughly from the broader to the narrower), with the aim of eliciting as much information as possible. The description presented below is structured in a similar way.

Agriculture and rural development

The management of AnGR is closely entwined with the management of a range of other natural resources and with many aspects of agricultural and rural development. These resource-use and developmental issues are likely to be major themes of interest for national governments and therefore targeted by legal and policy measures of one kind or another. Growing concerns about the harmful effects that agriculture can have on the environment and growing awareness of the importance of ecosystem services used in agriculture and produced in agricultural systems have contributed to a growing interest in a more integrated approach to these issues at policy level.

As described above in Subsection 3, measures that address interactions between agriculture

[180] For a discussion on policy and legal instruments in the latter field, see Part 1 Section F (Threats to AnGR).

and the environment are a significant feature of policies and legislation at EU-level. All EU member countries developed national rural development strategy plans for the 2007 to 2013 period. Most of the policies of this type reported in the survey responses were from European countries (including both members and non-members of the EU). Examples include the New Hungary Rural Development Programme,[181] which included an action on "Preservation of native and endangered farm animal genetic resources through breeding" under which livestock keepers who raise a "protected native or endangered farm animal breed" and adhere to rules regarding herd book registrations and the mating plans prescribed in the respective breeding programme are eligible to receive support payments in line with the rules set out in the relevant EU legislation.[182]

In some circumstances, the recognition of AnGR issues in a broad rural development programme may provide a framework for the development of a national strategy and action plan specifically for AnGR. For example, Montenegro's Action Plan for the Conservation of Genetic Resources in Agriculture[183] (published in 2008) was foreseen in the country's Agriculture and Rural Development Strategy (2006).[184]

The extent to which agri-environmental schemes affect the management of AnGR indirectly by influencing trends in livestock-sector development is not easy to assess. However, the inclusion of measures aimed at supporting livelihoods in more remote and "marginal" areas, the diversification of the rural economy and the use of grazing livestock to provide various ecosystem services implies some potential for positive outcomes in terms of promoting the use of more diverse livestock populations. An example of an indirect effect of this kind is provided in the survey response from Luxembourg, which states that although the country's rural development programmes are "not particularly aimed at conserving farm animal genetic resources", they include measures aimed at protecting forest soils against compaction, including support for the use of horses for work in the forests – a task for which the rare Ardennes horse is reportedly well suited.

Legal instruments in this field reported in survey responses from non-European countries tend to be less focused on the multiple functions of agriculture and its multiple impacts on ecosystem function. They generally do not include specific provisions related to the sustainable use or conservation of AnGR. The focus is often on the sustainable use of specific natural resources that underpin agriculture (water, soil, etc.), access to these resources, land-use planning and/or establishing the institutional framework for the management and development of the agricultural sector. Reported examples include Uruguay's Law on Land Management and Sustainable Development (2008)[185] and Sri Lanka's Agrarian Development Act (2000).[186] Ecuador's Organic Law on Food Sovereignty[187] explicitly refers to the multiple social and environmental considerations that have to be accounted for in land use and to the importance of maintaining ecological functions. It also refers explicitly to the conservation of agrobiodiversity, although the focus is largely on plants. Any effects on AnGR management reported

[181] New Hungary Rural Development Programme NHRDP Version 9, amended according to EC comments Ares (2012)796680_02072012 – February 2013 (available in English at www.mvh.gov.hu/MVHPortal/files/1039501_NHRDP_version_9pdf).

[182] Council Regulation 1974/2006/EC, of 15 December 2006 laying down detailed rules for the application of Council Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (available at http://faolex.fao.org/docs/pdf/eur68184.pdf).

[183] Akcioni plan očuvanja genetičkih resursa u poljoprivredi (2009–2013) (available in Montenegrin at http://tinyurl.com/pwe2j8q).

[184] Montenegro's agriculture and European Union. Agriculture and rural development strategy. Final report of the EU funded project (available in English at http://tinyurl.com/oljz327).

[185] Ley N° 18.308 Ordenamiento territorial y desarrollo sostenible (available in Spanish at http://www.parlamento.gub.uy/leyes/AccesoTextoLey.asp?Ley=18308&Anchor).

[186] Agrarian Development Act, No. 46 of 2000 (available in English at http://faolex.fao.org/docs/pdf/srl43285.pdf).

[187] Ley Orgánica del Régimen de la Soberanía Alimentaria 2009 (available in Spanish at http://www.soberaniaalimentaria.gob.ec/?page_id=132#sthash.MC9aPFkS.dpuf).

in the survey responses are indirect: sustainable management of AnGR can only occur in sustainable production systems. For example, the response from Burundi mentions (*inter alia*) laws on the management of soil[188] and water[189] and notes that "land and water are key issues in the management of genetic resources."

Among reported policy instruments, Costa Rica's State Policy for the Food and Agriculture Sector and Rural Development 2010–2020[190] includes (in addition to the above-mentioned provisions on AnGR-related research – see Subsection 4.3) a section on agrobiodiversity, which – interestingly from the perspective of this chapter – calls for an exhaustive analysis of the country's legislation on genetic resources and intellectual property and the establishment of a national plan for its application. It also calls for efforts to strengthen the conservation and use of plant and animal genetic resources, emphasizing collaborative and interdisciplinary approaches within the frameworks of national programmes for the two subsectors and the respective global plans of action. A section on climate change adaptation emphasizes the importance of *in situ* and *ex situ* conservation of crop, livestock and fish genetic resources.

Livestock sector development

The legal survey also asked countries about instruments specifically focusing on the overall development of the livestock sector. These would typically be national livestock-development strategies or plans, or legal instruments of similar scope. Few of the survey responses indicate that broad livestock-sector policies include any provisions related to promoting the sustainable use, development or conservation of AnGR. The picture provided by the country reports is, however, rather more positive. Sixty-five percent of countries report that they have livestock development strategies or plans that address AnGR management and a further 12 percent that the topic will be addressed in a forthcoming plan. The region with the highest proportion of countries (83 percent) reporting such policies is Africa. In many cases, little information is provided on the content or state of implementation of these policies. It cannot be assumed that all are having a positive effect on AnGR management. Nonetheless, a number of the policy documents referred to in the reports include substantial provisions related to the sustainable use, development and conservation of AnGR and of locally adapted breeds in particular.

Kenya's National Livestock Policy (2008)[191] includes a section on AnGR that contains plans, *inter alia*, for the implementation of demographic surveys of AnGR, the development of guidelines on appropriate matching of breeds and production environments, the strengthening of various aspects of the organizational infrastructure for breeding programmes (e.g. animal registration and recording schemes, breeders' associations and the delivery of breeding services, such as artificial insemination) and the establishment of breeding programmes for locally adapted breeds (see Box 3F12 for further information). As another example, India's National Livestock Policy (2013)[192] sets out breeding policies for all the main species of (mammalian) livestock present in the country, with varying degrees of emphasis given to the development of locally adapted breeds. Other elements of the policy include promoting the use of reproductive biotechnologies and the implementation of conservation measures including the provision of support to migratory pastoralist communities that manage breeds of "buffaloes, sheep, goats, yaks, etc."

Several countries report that although policies exist their implementation is weak or that general

[188] Décret du 26 novembre 1958 sur la conservation et utilisation des sols (available in French at http://faolex.fao.org/docs/pdf/bur39375.pdf).

[189] Loi n°1/02 du 26 mars 2012 portant code de l'eau au Burundi (available in French at http://faolex.fao.org/docs/pdf/bur129952.pdf).

[190] Política de Estado para el Sector Agroalimentario y el Desarrollo Rural Costarricense 2010–2021 (available in Spanish at http://www.mag.go.cr/bibliotecavirtual/a00289.pdf).

[191] Available at http://tinyurl.com/obuqbuq

[192] Available at http://dahd.nic.in/dahd/WriteReadData/NLP%202013%20Final11.pdf

Box 3F12

Animal genetic resources management in Kenya's National Livestock Policy

The Kenya National Livestock Policy (2008) was formulated with an aim of addressing the challenges facing the livestock subsector in the fields of breeding, nutrition and feeding, disease control, value addition and marketing, and research and extension. Specific objectives include establishing appropriate management systems for the sustainable development of the livestock industry, effectively improving and conserving available animal genetic resources (AnGR), achieving effective control of animal diseases and pests, ensuring the safety of foods of animal origin and focusing research efforts in the livestock subsector on resolving current and emerging problems.

With regard to the management of AnGR, the policy addresses, or intends to address, characterization, inventory and documentation, and sustainable use and conservation of indigenous AnGR. Specific achievements attributable to the National Livestock Policy include:

1. the establishment, through a legal notice, of the Kenya Animal Genetic Resources Centre, which is tasked with establishment, under the guidance of the National Animal Genetic Resources Advisory Committee, of a gene bank that will take custody of tissues, DNA, semen and embryos from all important livestock and emerging livestock species in Kenya – the material will be conserved for posterity and made available for research and breeding as deemed appropriate;
2. conversion of livestock farms and sheep and goat stations into conservation farms for breeds that are considered vulnerable, especially those threatened by cross-breeding and natural disasters;
3. collection of livestock data as part of the 2009 human population census, which provided livestock populations by species – an agriculture census is planned for 2015, and if it takes place, will provide information about the AnGR in Kenya;
4. regulation of all breeding-service providers and the establishment of farmer groups, cooperatives and other community-based structures to provide artificial insemination services;
5. increasing financial support from the government for livestock registration and performance recording;
6. allocation of additional funds by the government for the commercialization of indigenous chickens and for upgrading the Rabbit Multiplication Centre; and
7. establishment of a livestock insurance scheme.

Implementation has enhanced awareness among the public and among government officials regarding the need to manage AnGR sustainably. Pastoralists have become more involved in conservation efforts for breeds such as the Red Maasai sheep. This came about when some of them realized that if they cross-breed all their flocks they lose them all whenever there is the severe drought, while the Red Maasai animals survive. The policy is also intended to contribute to the development of breeding programmes for indigenous AnGR.

The policy was developed with the participation of key livestock sector stakeholders. Their views were gathered via workshops arranged in various parts of the country and later via a national forum. The draft policy was presented to the Cabinet and finally passed by the Kenyan Parliament.

Provided by Cleopas Okore, National Coordinator for the Management of Animal Genetic Resources, Kenya.

provisions related to AnGR management need to be elaborated in more detail. South Africa mentions that both its National Livestock Development Strategy and its Animal Improvement Policy (2006)[193] promote the sustainable use of AnGR and are linked to the country's Animal Improvement Act (1998).[194] Both policies were reportedly undergoing revision in parallel to the second SoW-AnGR reporting process, with the aim of ensuring consistency among the instruments and their relevance under changing circumstances, "including climate change and climate smart animal agriculture."

As far as indirect effects on AnGR management are concerned, there are indications in the responses to the legal survey that livestock development policies can have both positive and negative effects on diversity. The response from Mauritius, for example, notes that the country's livestock policy aims to increase its

> *"self-sufficiency in certain commodities ... through the provision of imported animals with better production potential as well as infrastructure and equipment."*

The consequence of this for AnGR is that

> *"exotic animals with higher production potential are being favoured at the expense of local animals and their crosses."*

The response from Suriname, however, notes the existence of breeding, livestock-management and livestock-extension policies that target small-scale farmers in low external input production systems, and that within these policies "local genetics are sometimes the choice."

Management of biodiversity

The next topic explored in the legal survey was legislation and policies addressing the management of biodiversity (i.e. biodiversity as a whole rather than agricultural biodiversity or AnGR in particular). From the AnGR management perspective, the main questions of interest with regard to these instruments are:

- whether they include any provisions directly related to promoting the conservation and sustainable use of AnGR;
- whether they include any provisions that may indirectly affect AnGR management (e.g. by restricting the use of grazing animals in protected areas); and
- whether they include any provisions that affect access to AnGR or the sharing of benefits derived from their use (this issue is discussed above – see Subsection 4.3).

National policies on biodiversity are very widespread (Figure 3F4). As of April 2014, National Biodiversity Strategies and Action Plans (NBSAPs) (the principal instruments for implementing the CBD at national level) had been developed by 179 countries.[195] To assess the extent to which these plans address the management of AnGR, the 174 NBSAP documents available on the CBD website in April 2014 were searched using relevant keywords. Based on the results of this search and the information provided in the country reports, the plans could be roughly grouped into the following three categories: no mention of AnGR (18 percent); AnGR explicitly included in the scope of the plan, but no AnGR-focused activities mentioned (13 percent); and AnGR-focused actions mentioned (69 percent). The practical impact of these AnGR-related provisions is difficult to assess, but is not necessarily very large. For example, Austria's response to the legal survey states that "the Austrian National Biodiversity Strategy has little impact on the management of animal genetic resources."

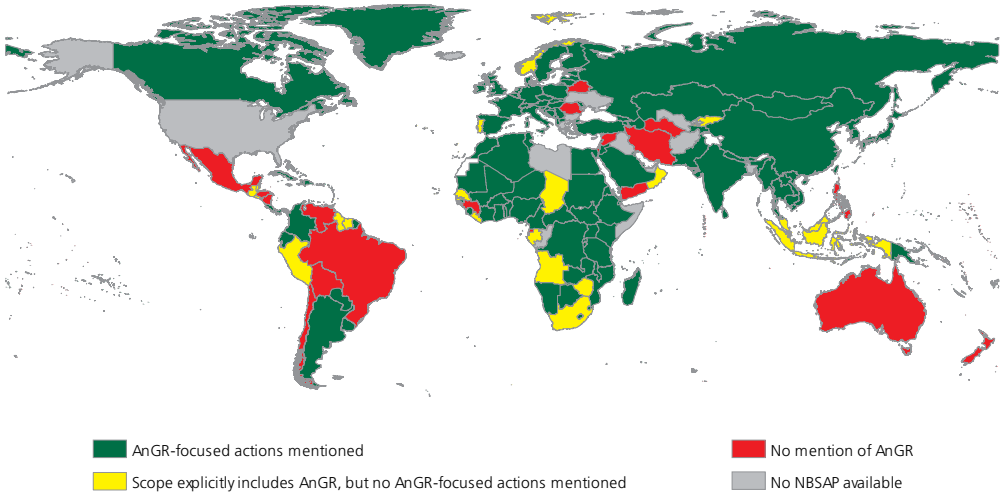
The survey responses indicate that legislation targeting the management of biodiversity is also widespread. More than 80 percent of OECD countries and almost 70 percent of non-OECD countries reported that they have legislation in place (Figure 3F2). Several responses indicate that the conservation of AnGR is explicitly included within the scope of

[193] Animal Improvement Policy for South Africa. Notice 165 of 2007. *Government Gazette,* No. 30459 (16 November 2007: 41–66) (available at http://www.gov.za/documents/animal-improvement-policy-south-africa).

[194] Animal Improvement Act 62 of 1998 (available at http://faolex.fao.org/docs/pdf/saf17623.pdf).

[195] http://www.cbd.int/nbsap/

FIGURE 3F4
Inclusion of animal genetic resources issues in national biodiversity strategies and action plans



Note: Analysis based on national biodiversity strategies and action plans (NBSAPs) available on the website of the Convention on Biological Diversity (www.cbd.int/nbsap) (accessed in April 2014).

national biodiversity legislation. For example, the Biodiversity Act of Bhutan (2003)[196] states that

> *"This Act shall apply to all the genetic and biochemical resources including wild, domesticated and cultivated species of flora and fauna, both* in-situ *and* ex-situ *conditions found within the territory of [the] Kingdom of Bhutan."*

Norway's Nature Diversity Act (2009)[197] states that "The genetic diversity of domesticated species shall be managed in such a way that it helps to secure the future resource base" and further that "The King may make regulations regarding special conservation measures for domesticated species ..." Other reported examples in which AnGR are explicitly mentioned as targets for conservation measures are the biodiversity laws of Viet Nam (2008)[198] and Costa Rica (1999).[199]

The survey responses provide little information on practical effects that instruments of this type have on AnGR management. Likewise, little information is provided on any priority requirements in terms of developing new instruments or improving existing ones. A few of the reported legal instruments include provisions allowing for restrictions to be imposed on the use of grazing animals in circumstances where they are regarded as a potential threat to biodiversity. None of the

[196] The Biodiversity Act of Bhutan, Water Sheep Year 2003 (available in English at http://tinyurl.com/oo6ovrm).

[197] Act of 19 June 2009 No. 100 Relating to the Management of Biological, Geological and Landscape Diversity (Nature Diversity Act) (available in English at http://www.regjeringen.no/en/doc/laws/Acts/nature-diversity-act.html?id=570549).

[198] Luật số 20/2008/QH12 của Quốc hội: LUẬT ĐA DẠNG SINH HỌC (Law No. 20/2008/QH12. Biodiversity Law) (available in Vietnamese at http://tinyurl.com/pn947rv and in English at http://tinyurl.com/newysn5).

[199] Ley de Biodiversidad (available in Spanish at http://tinyurl.com/obvn7cz).

survey responses indicated that such instruments have caused any problems for AnGR management (see, however, Box 1F3 in Part 1 Section F).

Environmental protection and planning

Another field of legislation and policy that can affect the development of livestock production systems and hence indirectly affect the management of AnGR is environmental protection. As described above, instruments focusing on biodiversity were treated as a separate category in the legal survey. The category "environmental protection" was therefore intended to catch instruments related to other environmental issues such as the pollution of land, air and water. While a large majority of responding countries reported that they have legislation and policies relating to environmental protection in place, few mentioned any impacts on AnGR management. However, there were some exceptions. The survey response from France, for example, notes that its National Plan on Climate Change Adaptation[200] and its legislation on water management have affected the availability of animal feed (e.g. in some areas a reduction in the availability of forage maize and an increase in the proportion of grass in the diet). These changes, in turn, are reported to affect AnGR management, as they may favour the use of breeds that make good use of grass-based diets. Similarly, France's "Écoantibio" plan (National Action Plan for the Reduction of Risks of Antibiotic Resistance in Veterinary Medicine)[201] is reported to have led breeders to pay greater attention to "rusticity" and disease resistance.

Rules related to the establishment of livestock farms and holdings – another category of instrument addressed in the legal survey – can target a range of concerns including environmental, animal health and animal welfare-related matters. Where regulations are in place, farmers and livestock keepers typically have to register their holdings and comply with certain minimum standards. The survey responses indicate that legislation of this type is widespread. Some mention that regulations can constrain the establishment, operation or expansion of livestock holdings. However, no examples of significant effects on AnGR management are reported. Several responses note that small-scale holdings where locally adapted breeds tend to be kept are less strictly regulated than larger holdings. The country report from Norway notes that the

> *"production of pork and poultry has since 1975 been legally regulated by a concession act. This act aims to avoid the development of industrial-type animal production in the most concentrate-intensive production systems. The accepted upper limit of herd sizes [was] ... increased in 1992, 1995, 2003 and 2013."*

Rangeland management

Another area in which environmental concerns interact with livestock development is rangeland management. Access to grazing land is vital to many livestock-keeping livelihoods – and by extension to the maintenance of many breeds. This is one of the few fields of action in which the results of the legal survey suggest that legislation is more prevalent in non-OECD than in OECD countries. This is probably because land-ownership systems other than straightforward private ownership (under which management and access is largely a matter for the individual owner) are more widespread in non-OECD countries.

While livestock-keeping communities often have – or used to have – traditional mechanisms for regulating access to grazing land, in recent decades (in some cases over a longer period) legislation has come to play an increasing role in rangeland management. Several examples of national legislation in this field were discussed in the first SoW-AnGR.[202] Because they directly

[200] Plan national d'adaptation de la France aux effets du changement climatique 2011 – 2015 (available in French at http://tinyurl.com/o28vmx7).

[201] Plan national de reduction des risques d'antibiorésistance en médecine vétérinaire (available in French at http://tinyurl.com/q3crwm4 and in English at http://tinyurl.com/pvnwwjs).

[202] FAO 2007a, pages 310–311.

affect access to productive resources, laws and policies in this field are potentially more controversial than some of the other types of legislation discussed in this section. While stated objectives, such as promoting the sustainable use of grazing land, typically appear to favour the sustainable use of AnGR, detailed provisions – or details of implementation – may or may not favour the continuation of livestock-keeping livelihoods and practices that support the maintenance of locally adapted breeds.

In so far as the legal survey responses provide any information on the consequences of legislation in this field for AnGR management, they note positive outcomes. The responses from several European countries (e.g. France, Hungary and Latvia) note that increased interest, at policy level, in the protection of permanent meadows and other grassland habitats has created opportunities for keeping locally adapted breeds in use.

It should, however, be noted that some criticism has been levelled at existing legislation in this field. Hesse and Thebaud (2006), for example, argue that while the pastoral laws adopted in several West African countries during the 1990s and early 2000s include a number of positive features, their complicated bureaucratic mechanisms, and sectoral approaches that artificially divide local livelihood systems, have the potential to disempower pastoralist communities and undermine their grazing-based livelihood strategies. Legal frameworks and policies in West Africa have, nonetheless, been described as "more favourable" to pastoralism than those in East Africa, which reportedly tend to favour sedentarization (Inter-Résaux, 2012). The African Union's Policy Framework for Pastoralism in Africa (African Union, 2013) notes positive trends in pro-pastoral policies and legislation in Africa, but recognizes that major challenges remain. Appropriate legislation – accompanied by institutional and operational measures – is recognized as an essential component of efforts to improve pastoral policies. Specifically, it is recognized that there is a need to secure

> *"access to rangelands for pastoralists through supportive land tenure policies and legislation, and further development of regional policies to enable regional movements and livestock trade" (ibid.).*

Stakeholder participation

A further issue addressed in the legal survey was the question of stakeholder participation. Countries were also asked to provide information on legal and policy frameworks promoting the participation of livestock keepers in decision-making related to livestock-sector development. Instruments of this type are reported to be widespread. In some cases, the survey responses indicate that even though there is no legislation or formal policy in place, frequent consultations with a range of stakeholders take place. The effects on AnGR management are generally reported to be positive, although as discussed in Part 3 Section A, many countries acknowledge that much remains to be done to improve stakeholder participation in this field.

The legislation reported in this category includes general instruments related to the participation of citizens in the development of national laws and policies (e.g. Slovenia's Resolution on Legislative Regulation of 2009),[203] instruments related to the organization of research and development programmes (e.g. Australia's Primary Industries and Energy Research and Development Act of 1989),[204] instruments addressing the development of the agricultural sector (e.g. Spain's Royal Decree 822/2010)[205] and instruments specifically focusing on livestock breeding (e.g. Bulgaria's Animal Breeding Law of 2000, as amended in 2010).[206]

[203] Resolucija o normativni dejavnosti (ReNDej) (available in Slovenian at http://tinyurl.com/oyfsuyr).

[204] Available at http://www.comlaw.gov.au/Series/C2004A03948

[205] Real Decreto 822/2010, de 25 de junio, por el que se aprueba el Reglamento de desarrollo de la Ley 10/2009, de 20 de octubre, de creación de órganos consultivos del Estado en el ámbito agroalimentario y de determinación de las bases de representación de las organizaciones profesionales agrarias (available in Spanish at http://tinyurl.com/pdy97x7).

[206] Закон за животновъдството в сила от 09/09/2000 г. (available in Bulgarian at http://tinyurl.com/qejpg4a).

Several survey responses describe institutional frameworks for the participation of livestock keepers and other stakeholders in decision-making processes without providing details of the legal and policy instruments (if any) that underpin them. A number of responses from countries where there are no instruments in place report the need to strengthen participation, although not necessarily through the development of a formal instrument. The general topic of stakeholder participation is discussed in more detail in Part 3 Section A.

In this context, it is important to note that the link between legal and policy frameworks and stakeholder participation is often a two-way relationship: not only may laws and policies help to promote participation, but appropriate stakeholder participation may help to create more appropriate laws and policies and facilitate their implementation. For example, the country report from Botswana, commenting on AnGR-related laws, notes that

"farmers feel that they are more recipients of these laws, as they are seldom consulted ... [or enabled to have an] input in the law-making process."

5 Changes since 2005

Because of differences in the approaches to data collection and the number of countries that participated, it is not possible to compare the figures presented above directly to those presented in the equivalent chapter of the first SoW-AnGR. It is also not possible, based on the survey results, to provide a detailed analysis of how many countries have developed legal and policy instruments in specific fields during the period between 2005 and 2013. Indicators of change include the substantial proportion of countries (particularly non-OECD countries) that report that they are in the process of developing legal or policy instruments and (less quantifiably) the numerous post-2005 instruments presented as examples above.

In response to a question in the country-report questionnaire about the development of legal and policy frameworks since the adoption of the Global Plan of Action, 20 percent of countries reported that progress had been made in this field (in addition to 23 percent that stated that they already had comprehensive legislation and policies in place before 2007) (Table 3F3). In addition, as part of the assessment of institutions and stakeholders (see Part 3 Section A), countries were asked to score (none, low, medium or high) the current state of their legal and policy frameworks and the state of implementation of these frameworks. For the first SoW-AnGR, countries were assigned scores based on the information provided in their country reports.[207] Clearly, the two sets of scores are not directly comparable. As well as being affected by differences in methodology, the differences between the two sets of scores may reflect changes in countries' objectives and "ambitions" over the years. While these caveats should be borne in mind, the findings appear to indicate positive developments overall. Out of 110 countries that were included in both scoring exercises, far more increased their scores (between 45 percent and 48 percent depending on the category) than decreased their scores (between 13 percent and 16 percent) between 2005 and 2013.[208]

While it appears that progress has been made, the country reports indicate that a large proportion of countries still consider their legal and policy frameworks – and the state of implementation of these frameworks – to be inadequate. There is some indication that mainstreaming of AnGR into wider legal and policy frameworks (e.g. livestock-sector development strategies and national biodiversity strategies and action plans)

[207] FAO, 2007a, Table 58 (pages 207–213). In this case, scores were allocated jointly for laws and policies.

[208] For state of legislation: 45 percent with an increased score vs. 16 percent with a decrease. For state of policies: 46 percent with an increased score vs. 13 percent with a decrease. For implementation of legislation: 48 percent with an increased score vs. 15 percent with a decrease. For implementation of policies: 48 percent with an increased score vs. 14 percent with a decrease.

TABLE 3F3
Progress in the development of legal and policy frameworks

Region	Number of country reports	Comprehensive framework before GPA adoption	Progress since GPA adoption	No progress since GPA adoption
	%			
Africa	40	10	18	72
Asia	20	10	40	50
Europe and the Caucasus	35	54	26	20
Latin America and the Caribbean	18	11	6	83
Near and Middle East	7	0	14	86
North America	1	100	0	0
Southwest Pacific	7	14	0	86
World	**128**	**23**	**20**	**57**

Note: GPA = Global Plan of Action for Animal Genetic Resources.
Source: Country reports, 2014

has become more widespread, but the practical consequences of this are as yet unclear. The number of national strategies and action plans for AnGR developed in recent years also indicates that additional attention is being paid to AnGR management at policy level. However, the implementation of most of these instruments is still at an early stage.

Interest in the development of AnGR-related legal measures is apparently widespread. However, the question raised in the first SoW-AnGR about whether elaborate legal frameworks are always necessary or appropriate remains to be resolved. It is not clear, based on the country reports and responses to the legal survey, that all countries have adequately assessed the impact of their current legislation (or lack of legislation) on AnGR management or developed a clear vision of their future needs in this field. Where this is the case, the Global Plan of Action's recommendation regarding the need to conduct "periodic reviews" of legal and policy frameworks to identify effects on AnGR management – and, if necessary, steps that can be taken to improve the situation – remains relevant.

6 Gaps and needs

The results of the legal survey give an indication (based on a limited sample of countries) of which areas of AnGR management are well covered by laws and policies and which are not. However, the extent to which specific gaps in this coverage represent significant constraints to AnGR management on a global scale is difficult to estimate. Priorities for improving national legal and policy frameworks have to be developed at country level based on careful assessments of national needs and circumstances. Some country reports suggest that weaknesses in policy- and law-making processes constitute a bottleneck that inhibits progress towards better AnGR management. Perhaps the most significant of these weaknesses is a lack of stakeholder participation, but a lack of expertise in the formulation of legal instruments is also an issue for some countries.

The country reports note a number of different factors that contribute to problems in the implementation of policy and legal frameworks. These include a lack of human and financial resources, logistical problems, lack of coordination between

different departments, excessive bureaucracy, lack of awareness on the part of stakeholders, lack of clarity in the formulation of legal and policy texts, and lack of harmony between the procedures envisaged in such texts and the administrative arrangements through which they are meant to be implemented. Addressing some of these constraints may be relatively straightforward given the necessary political will, but others may be difficult to overcome, at least in the short to medium term. A realistic assessment of what is feasible and what policy and legal tools are appropriate in national circumstances is likely to be important. The process of developing, or where relevant reviewing and updating, national strategies and action plans for AnGR (FAO, 2009e) may provide countries with the opportunity to assess the state of their existing policy and legal frameworks, in consultation with a range of stakeholders, and identify any changes that may be required.

References

African Union. 2013. *Policy framework for pastoralism in Africa securing, protecting and improving the lives, livelihoods and rights of pastoralist communities*. Addis Ababa (available at http://tinyurl.com/phmxofn).

AU-IBAR. 2010. *Framework for mainstreaming livestock in the CAADP pillars*. Nairobi, African Union – Interafrican Bureau for Animal Resources (available at http://www.nepad-caadp.net/pdf/Action%20plan%20for%20development%20of%20livestock.pdf).

AU-IBAR. 2013. *Strategic Plan 2014–2017.* Nairobi, African Union – Interafrican Bureau of Animal Resources (available at http://www.au-ibar.org/component/jdownloads/finish/77/1931).

Canali, G. & the Econogene Consortium. 2006. Common agricultural policy reform and its effects on sheep and goat market and rare breeds conservation. *Small Ruminant Research*, 62: 207–213.

Country reports. 2014. The reports can be accessed at http://www.fao.org/3/a-i4787e/i4787e03.htm.

CBD. 2002. *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*. Montreal, Canada, Convention on Biological Diversity (available at https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf).

CBD. 2011. *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*. Text and annex. Montreal, Canada, Convention on Biological Diversity (available at https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf).

Compassion in World Farming. 2013. *Contribution to the consultation on the review of the EU policy on organic agriculture* (available at http://ec.europa.eu/agriculture/consultations/organic/contributions/1-ciwf_en.pdf).

ECOWAS Commission. 2010. *Strategic Action Plan for the Development and Transformation of Livestock Sector in the ECOWAS Region (2011-2020).* Abuja (available at http://tinyurl.com/ps77fft).

ERFP. 2102. *Questionnaire for the consultation of stakeholders on the community programme on genetic resources in agriculture – Council Regulation (EC) No 870/2004. Response from the European Regional Focal Point for Animal Genetic Resources* (available at http://tinyurl.com/ojqt2ga).

EU. 2007. *European Parliament resolution of 22 May 2007 on halting the loss of biodiversity by 2010* (available at http://tinyurl.com/ppqcafd).

EU. 2011. *The EU Biodiversity Strategy to 2020*. Brussels (available at http://tinyurl.com/plpojgs).

EU. 2012. *European Agricultural Fund for Rural Development (EAFRD).* European Union website (available at http://tinyurl.com/6ft3kel) (accessed 12 June 2014).

EU. 2014a. *Regulations, directives and other acts*. European Union website (available at http://europa.eu/eu-law/decision-making/legal-acts/index_en.htm) (accessed 11 June 2014).

EU. 2014b. *Legal proposals for the CAP after 2013.* European Union website (available at http://ec.europa.eu/agriculture/cap-post-2013/legal-proposals/index_en.htm) (accessed 17 June, 2014).

EU. 2014c. *European Parliament legislative resolution of 15 April 2014 on the proposal for a regulation of the European Parliament and of the Council on Animal Health (COM(2013)0260 – C7-0124/2013 – 2013/0136(COD)) (Ordinary legislative procedure: first reading*). Strasbourg, France (available at http://tinyurl.com/nf27ghe).

Eurogroup for Animals. 2013. *Contribution to the consultation on the review of the EU policy on organic agriculture* (available at http://tinyurl.com/nety8c7).

European Commission. 2004a. *Action Plan for the Future of Organic Production in the European Union*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels (available at http://tinyurl.com/puom5aa).

European Commission. 2004b. *European Action Plan for Organic Food and Farming.* Commission Staff Working Document. Annex to the Communication from the Commission. Brussels (available at http://tinyurl.com/nnvb24w).

European Commission. 2006a. *Halting the loss of biodiversity by 2010 – and beyond – Sustaining ecosystem services for human well-being.* Communication from the Commission. Brussels (available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52006DC0216I).

European Commission. 2006b. *Sustaining ecosystem services for human well-being. {COM(2006)216 final. Impact assessment.* Annex to the Communication from the Commission – Halting the loss of biodiversity by 2010 – and beyond. Commission Staff Working Document. Brussels (available at http://tinyurl.com/ogedqfz).

European Commission. 2006c. *Technical annex.* Annexes to the Communication from the Commission – Halting the loss of biodiversity by 2010 – and beyond – Sustaining ecosystem services for human well-being. Commission Staff Working Document. Brussels (available at http://tinyurl.com/qgqt2j8).

European Commission. 2007. *A new animal health strategy for the European Union (2007-2013) where "Prevention is better than cure"*. Brussels (available at http://tinyurl.com/5z5d25).

European Commission. 2008. *Action plan for the implementation of the EU Animal Health Strategy*. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Brussels (available at http://tinyurl.com/66c799).

European Commission. 2010. *The Common Agricultural Policy 2013. Your ideas matter. The Common Agricultural Policy 2013. Public debate. Summary report.* Brussels (available at http://tinyurl.com/q6qlyxe).

European Commission. 2011. *Impact assessment. Common Agricultural Policy towards 2020*. Commission Staff Working Paper. Brussels (available at http://tinyurl.com/pl9lu4g).

European Commission. 2012a. *Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee on the European Innovation Partnership 'Agricultural Productivity and Sustainability'*. COM/2012/079 final. Brussels (available at http://tinyurl.com/qykwl7j)

European Commission. 2012b. *Innovation Partnerships: new proposals on raw materials, agriculture and healthy ageing to boost European competitiveness.* European Commission press release IP/12/196 29/02/2012. Brussels (available at http://tinyurl.com/o4hgoqf).

European Commission. 2012c. *Proposal for a regulation of the European Parliament and of the Council on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization in the Union*. Brussels (available at http://tinyurl.com/org8ene).

European Commission. 2012d. *Impact assessment accompanying the document Proposal for a regulation of the European Parliament and of the Council on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization in the Union /* SWD/2012/0292 final */.* Commission Staff Working Document. Brussels (available at http://tinyurl.com/pfwtlv5).

European Commission. 2012e. *Communication from the Commission to the European Parliament, the Council and the European Economic and Social*

Committee on the European Union Strategy for the Protection and Welfare of Animals 2012-2015. Brussels (available at http://tinyurl.com/p9yth3a).

European Commission. 2013a. *Preserving genetic resources in agriculture. Achievements of the 17 projects of the Community Programme 2006-2011*. Brussels (available at http://tinyurl.com/npb2y4s).

European Commission. 2013b. *Independent Expert Evaluation of Council Regulation (EC) No. 870/2004 Conservation, Characterisation, Collection and Utilisation of Genetic Resources in Agriculture*. Annex to Commission Staff Working Document Accompanying the document Report from the Commission to the European Parliament, the Council and the Economic and Social Committee Agricultural Genetic Resources – from conservation to sustainable use. Brussels (available at http://tinyurl.com/ndnz3xe).

European Commission. 2013c. *Call for tenders N°AGRI-2013-EVAL-07. Preparatory action – EU plant and animal genetic resources in agriculture. Tender specifications*. Brussels (available at http://tinyurl.com/qbw4sbe).

European Commission. 2013d. *Proposal for a regulation of the European Parliament and of the Council on animal health.* Brussels (available at http://tinyurl.com/potm3nw).

European Commission. 2013e. *Report from the Commission to the European Parliament and the Council on the case for an optional quality term 'product of island farming'*. Brussels (http://tinyurl.com/q3um3nj).

European Commission. 2013f. *Report from the Commission to the European Parliament and the Council on the case for a local farming and direct sales labelling scheme*. Brussels (available at http://tinyurl.com/ngqtfb6).

European Commission. 2014a. *EIP-AGRI Focus Group 4: Genetic Resources – Cooperation Models Report of the first meeting 6-7 February 2014, Rome, Italy*. Brussels (available at http://tinyurl.com/oz4w9mh).

European Commission. 2014b. *Proposal for a regulation of the European Parliament and of the Council on the zootechnical and genealogical conditions for trade in and imports into the Union of breeding animals and their germinal products*. Brussels (http://tinyurl.com/q2xesqu).

European Commission. 2014c. *Proposal for a directive of the European Parliament and of the Council amending Directives 89/608/EEC, 90/425/EEC and 91/496/EEC as regards references to zootechnical legislation*. Brussels (available at http://tinyurl.com/oddfow5).

European Commission. 2014d. *Action Plan for the Future of Organic Production in the European Union*. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Brussels (available at http://tinyurl.com/puom5aa).

European Commission. 2014e. *Proposal for a regulation of the European Parliament and of the Council on organic production and labelling of organic products, amending Regulation (EU) No XXX/XXX of the European Parliament and of the Council [Official controls Regulation] and repealing Council Regulation (EC) No 834/2007*. Brussels (http://tinyurl.com/oas99k6).

European Commission. 2014f. *Annexes to the proposal for a regulation of the European Parliament and of the Council on organic production and labelling of organic products, amending Regulation (EU) No XXX/XXX of the European Parliament and of the Council [Official controls Regulation] and repealing Council Regulation (EC) No 834/2007. COM(2014) 180 final. Annexes 1 to 5.* Brussels (available at http://tinyurl.com/pfhhmux).

FAO. 2004. *Report of the Tenth Regular Session of the Commission on Genetic Resources for Food and Agriculture, Rome, Italy, 8–12 November 2004*. CGRFA-10/2004/REP. Rome (available at ftp://ftp.fao.org/docrep/fao/meeting/014/j3951e.pdf).

FAO. 2006. *The legal framework for the management of animal genetic resources*, by A. Ingrassia, D. Manzella & E. Martynuik for the Development Law Service FAO Legal Office. FAO Legislative Study 89. Rome (available at http://www.fao.org/ag/magazine/LegalStudy89.pdf).

FAO. 2007a. *The State of the World's Animal Genetic Resources for Food and Agriculture*, edited by B. Rischkowsky & D. Pilling. Rome (available at http://www.fao.org/docrep/010/a1250e/a1250e00.htm).

FAO. 2007b. *Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration.* Rome (available at http://www.fao.org/docrep/010/a1404e/a1404e00.htm).

FAO. 2007c. *Draft strategic priorities for action for the sustainable use, development and conservation of animal genetic resources for food and agriculture*. Working Document. Commission on Genetic Resources for Food and Agriculture, Eleventh Regular Session, Rome, 11-15 June 2007. CGRFA-11/07/6. Rome (available at ftp://ftp.fao.org/docrep/fao/meeting/014/j9572e.pdf).

FAO. 2007d. *Report of the Conference of FAO. Thirty-fourth Session, Rome, 17–24 November 2007*. C 2007/REP. Rome (available at ftp://ftp.fao.org/docrep/fao/meeting/012/k0669e01.pdf).

FAO. 2009a. *Report of the Twelfth Regular Session of the Commission on Genetic Resources for Food and Agriculture, Rome, 19-23 October 2009*. CGRFA-12/09/REPORT. Rome (available at ftp://ftp.fao.org/docrep/fao/meeting/017/k6536e.pdf).

FAO. 2009b. *Funding Strategy for the implementation of the Global Plan of Action for Animal Genetic Resources*. Rome (available at http://www.fao.org/docrep/012/i1674e/i1674e00.pdf).

FAO. 2009c. *The use and exchange of animal genetic resources for food and agriculture*. CGRFA Background Study Paper No. 43. Rome (available at ftp://ftp.fao.org/docrep/fao/meeting/017/ak222e.pdf).

FAO. 2009d. *Report of the Conference of FAO Thirty-sixth Session, Rome 18–23 November, 2009*. C 2009/REP. Rome (available at http://www.fao.org/docrep/meeting/019/k6302e.pdf).

FAO. 2009e. *Preparation of national strategies and action plans for animal genetic resources*. FAO Animal Production and Health Guidelines. No. 2. Rome (available at http://www.fao.org/docrep/012/i0770e/i0770e00.htm).

FAO. 2011a. *Joint Work Plan with the Convention on Biological Diversity*. Information Document. Commission on Genetic Resources for Food and Agriculture, Thirteenth Regular Session Rome, 18–22 July 2011. CGFRFA-13/11/Inf.11. Rome (available at http://www.fao.org/docrep/meeting/023/mb707e.pdf).

FAO. 2011b. *Report of the Thirteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture Rome, Italy, 18 – 22 July 2011*. CGRFA-13/11/Report. Rome (available at http://www.fao.org/docrep/meeting/024/mc192e.pdf).

FAO. 2011c. *Surveying and monitoring of animal genetic resources*. Animal Production and Health Guidelines. No. 7. Rome (available at http://www.fao.org/docrep/014/ba0055e/ba0055e00.htm).

FAO. 2012. *Report of the First Session of the Ad Hoc Technical Working Group on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture, Longyearbyen (Svalbard), Norway, 11–13 September 2012*. CGRFA/WG-ABS-1/12/Report. Rome (available at http://www.fao.org/docrep/meeting/026/me840e.pdf).

FAO. 2013a. *Report of the Fourteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture Rome, Italy, 15–19 April 2013*. CGRFA-14/13/Report. Rome (available at http://www.fao.org/docrep/meeting/028/mg538e.pdf).

FAO. 2013b. *Targets and indicators for animal genetic resources for food and agriculture*. Working Document. Fourteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture Rome, Italy, 15–19 April 2013. CGRFA-14/13/4.2. Rome (available at http://www.fao.org/docrep/meeting/027/mf582e.pdf).

FAO. 2014a. *Synthesis progress report on the implementation of the Global Plan of Action for Animal Genetic Resources – 2014*. Information Document. Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture, Rome, 19–23 January, 2015. CGRFA-15/15/Inf.18. Rome (available at http://www.fao.org/3/a-mm278e.pdf).

FAO. 2014b. *Implementation and updating of the Global Plan of Action for Animal Genetic Resources*. Working Document. Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture, Rome, 19–23 January 2015. CGRFA-15/15/11. Rome (available at http://www.fao.org/3/a-mm522e.pdf).

FAO. 2015. *Report of the Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture, Rome, 19 – 23 January 2015*. CGRFA-15/15/Report. Rome (available at http://www.fao.org/3/a-mm660e.pdf).

FAO/WHO. 2007. *Organically produced foods.* Third edition. Rome, Geneva (available at ftp://ftp.fao.org/docrep/fao/010/a1385e/a1385e00.pdf).

Government of Turkey. 2011. *Domestic animal genetic resources in Turkey*. Ankara, Republic of Turkey, Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Research and Policy (available at http://tinyurl.com/pypnwtn).

Hesse, C. & Thebaud, B. 2006. Will pastoral legislation disempower pastoralists in the Sahel? Indigenous Affairs, 1/06: 14–23 (available at http://tinyurl.com/om658ef).

Inter-Résaux. 2012. *Pastoralism in sub-Saharan Africa: know its advantages, understand its challenges, act for its sustainability*. Food Sovereignty Brief No. 5, May 2012. Inter-Résaux Développement Rural/SOS Faim (available at http://tinyurl.com/qgbjrrx).

Legal survey responses. 2013. Responses to a questionnaire survey conducted by FAO (available at http://www.fao.org/3/a-i4787e/i4787e02.htm).

Lips, D., De Tavernier, J., Decuypere, E. & Van Outryve, J. 2001. Ethical objections to caesareans: implications on the future of the Belgian White Blue. In *Preprints of EurSafe. "Food Safety, Food Quality and Food Ethics" The Third Congress of the European Society for Agricultural and Food Ethics, 35 October 2001 Florence, Italy*, pp. 291–294. Milan, Italy, University of Milan (available at http://tinyurl.com/ojqtwj9).

OAU. 2000. *African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources*. Addis Ababa, Organization of African Unity (available at http://www.wipo.int/wipolex/en/text.jsp?file_id=252153).

Pilling, D. 2007. Genetic impact assessments – summary of a debate. *Animal Genetic Resources Information*, 41: 101–107 (available at ftp://ftp.fao.org/docrep/fao/010/a1206t/a1206t00.pdf),

RBST. 2009. *Consultation on the implementation of the CAP Health Check reforms relating to the Single Farm Payment Scheme and other direct payments. Response of the RBST*. Warwickshire, UK, Rare Breeds Survival Trust (available at http://tinyurl.com/pozoy2w).

SADC. 2003. *Southern African Development Community. Regional Indicative Strategic Development Plan*. Gaborone (available at http://tinyurl.com/nt5b4bb).

SAVE Foundation. 2013. Agrobiodiversity within the CAP: a chance for rural and social development. *SAVE eNews*, 4/2013: 1–2.

Taubman, A., Wager, H. & Watal, J. 2012. *A handbook on the WTO TRIPS Agreement*. Cambridge UK, Cambridge University Press.

Tvedt, M.V., Hiemstra, S.J., Drucker, A.G., Louwaars, N. & Oldenbroek, K. 2007. *Legal aspects of exchange, use and conservation of animal genetic resources*. FNI Report 1/2007. Lysaker, Norway, Fridtjof Nansen Institute (available at http://www.fni.no/doc&pdf/fni-r0107.pdf).

UNEP. 2013. *Green economy and trade. Trends, challenges and opportunities*. Nairobi, United Nations Environment Programme (available at http://tinyurl.com/c3xnhbt).

WIPO. 2011. *Patent-related flexibilities in the multilateral legal framework and their legislative implementation at the national and regional levels – PART II. Committee on Development and Intellectual Property (CDIP) Seventh Session Geneva, May 2 to 6, 2011*. Geneva, Switzerland, World Intellectual Property Organization (available http://tinyurl.com/py5yvhe).

WIPO. 2013. *Draft intellectual property guidelines for access to genetic resources and equitable sharing of the benefits arising from their utilization*. Consultation Draft, February 4, 2013. Geneva, Switzerland, World Intellectual Property Organization (available at http://tinyurl.com/nl9rb4v).

WIPO. 2014. *Patent landscape report on animal genetic resources*, by P. Oldham, S. Hall & C. Barnes. Geneva, Switzerland, World Intellectual Property Organization (available at http://www.wipo.int/edocs/pubdocs/en/wipo_pub_947_3.pdf).

WTO. 1998. *Review under Article 24.2 of the application of the provisions of the section of the TRIPS Agreement on Geographical Indications. Checklist of questions*. Council for Trade-Related Aspects of Intellectual Property Rights. IP/C/13. Geneva, Switzerland, World Trade Organization (available at http://www.wto.org/english/tratop_e/trips_e/ta_docs_e/5_3_ipc13_e.pdf).

WTO. 2001. *Declaration on the TRIPS Agreement and Public Health*. Ministerial Conference, Fourth Session, Doha, 9–14 November 2001. Geneva (available at http://tinyurl.com/qgj9arj).

WTO. 2005. *Geographical indications. Communication from the European Communities.* General Council, Trade Negotiations Committee, Council for Trade-Related Aspects of Intellectual Property Rights, Special Session. WT/GC/W/547 TN/C/W/26 TN/IP/W/11. Geneva, Switzerland, World Trade Organization (available at http://tinyurl.com/ox5h8sc).

WTO. 2010. *Annual report of the Council for TRIPS.* IP/C/56. Geneva, Switzerland, World Trade Organization (available at http://tinyurl.com/p52e2ug).

WTO. 2011. *Actions regarding SPS-related private standards. Decision of the Committee.* G/SPS/55. Committee on Sanitary and Phytosanitary Standards. Geneva, Switzerland, World Trade Organization (available at http://docsonline.wto.org/imrd/directdoc.asp?DDFDocuments/t/G/SPS/55.doc).

Zjalic, M. 2008. *Farm animal production systems and threats to biodiversity in Europe*. Paper presented at the Globaldiv Summer School, 8–12 September 2008, Piacenza, Italy. GlobalDiv (available at http://www.globaldiv.eu/SummerSchool/docs/Zjalic/ZjalicHandout.pdf).

Zjalic, M. 2010. *Technical report on review of impact of changes in CAP on farm animal biodiversity in the European Union*. GlobalDiv WP 4. Rome, European Federation of Animal Science (available at http://tinyurl.com/maaodgj).