Part 3

THE STATE OF CAPACITIES

Introduction

This part of the report presents an analysis of capacities in the management of animal genetic resources for food and agriculture (AnGR), based on the information provided in the country reports. In contrast to the country-reporting process for the first report on *The State of the World's Animal Genetic Resources for Food and Agriculture* (first SoW-AnGR), the country reports were prepared using a standard questionnaire. One hundred and twenty-eight reports were submitted using the questionnaire. Therefore, except where otherwise stated, the analysis is based on a self-selecting sample of 128 countries. The country coverage, including the possibility that non-reporting countries may have lower levels of capacity than those that reported, needs to be borne in mind when interpreting the findings. The regions and subregions used in the analysis are those that were defined for the purpose of the first SoW-AnGR. It should be noted that in some subregions the proportion of responding countries is relatively low and thus the above-noted potential for sampling bias to affect subregional-level statistics may be more marked.[1]

The analytical approach varies from section to section according to the nature of the information provided in the country reports. The first section presents an analysis of the state of human and institutional capacity in AnGR management. This is followed by sections describing the state of characterization, inventory and monitoring, breeding programmes, conservation programmes and the use of reproductive and molecular biotechnologies. The final section covers legal and policy frameworks affecting AnGR and their management. This section is divided into three major subsections, addressing frameworks at international, regional and national levels. The latter subsection draws on responses to a survey on policy and legal frameworks conducted by FAO in 2013.

Much of the analysis in Sections B, C, D and E is based on the breed concept. As discussed in the introduction to Part 1, there is no universally accepted means of determining whether a given livestock population should be considered a distinct breed. In the country-reporting process (as is the case with ongoing reporting of breed-related data to the Domestic Animal Diversity Information System [DAD-IS][2] – see Part 1 Section B) each country determined for itself how to interpret the breed concept. Thus it needs to be borne in mind that the unit of analysis upon which the reported figures are based may vary from country to country. It should also be noted that – as the objective is to assess national capacities – the unit of analysis for the breed-related data presented in this part of the report is the national breed population (i.e. a given breed within a given country), rather than the breed as a whole. So-called transboundary breeds (see Part 1 Section B) have national populations in more than one country. The country-report questionnaire requested respondents to indicate the number of breeds

[1] For further information on the country-reporting process and on the regional and subregional classifications, see "About this publication" in the preliminary pages.

[2] http://fao.org/dad-is

present in their respective countries and to indicate how many are considered "locally adapted" and how many "exotic" (see Part 1 Section B for definitions). Unless otherwise stated, figures indicating the proportion of national breed populations subject to various types of management activity are based on this sample.

Section A

Institutions and stakeholders

1 Introduction

The first report on *The State of the World's Animal Genetic Resources for Food and Agriculture* (first SoW-AnGR) (FAO, 2007a) concluded that in most parts of the world the institutional framework for animal genetic resources (AnGR) management was inadequate. Improvements in this field are targeted in Strategic Priority Area 4 of the Global Plan of Action for Animal Genetic Resources (FAO, 2007b) – Policies, Institutions and Capacity-building (see Box 3A1).

This section describes the state of human and institutional capacities in AnGR management at national, regional and international levels. The analysis is based largely on country reports, reports from regional focal points and networks for AnGR management and reports

Box 3A1
Strategic Priority Area 4 of the Global Plan of Action for Animal Genetic Resources

Strategic Priority Area 4: Policies, Institutions and Capacity-building

Implementation at national level

SP 12 Establish or strengthen national institutions, including national focal points, for planning and implementing animal genetic resources 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 animal genetic resources

SP 20 Review and develop national policies and legal frameworks for animal genetic resources

Implementation at regional level

SP 17 Establish Regional Focal Points and strengthen international networks

Implementation at international level

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 animal genetic resources

SP 21 Review and develop international policies and regulatory frameworks relevant to animal genetic resources

SP 22 Coordinate the Commission's efforts on animal genetic resources policy with other international forums

SP 23 Strengthen efforts to mobilize resources, including financial resources, for the conservation, sustainable use and development of animal genetic resources

Note: SP = Strategic Priority; "the Commission" = the Commission on Genetic Resources for Food and Agriculture.

from international organizations whose work is relevant to the implementation of the Global Plan of Action.[1]

2 Institutional capacities at country level

2.1 Basic recommended institutional framework for animal genetic resources management

In adopting the Global Plan of Action for Animal Genetic Resources countries affirmed the need for effective national institutions to support the sustainable management of AnGR. The Global Plan of Action specifically calls for the establishment or strengthening of National Focal Points for the Management of Animal Genetic Resources and for these bodies to be strongly linked to stakeholder networks. Recommendations for the development of institutional frameworks at national level were further elaborated in guidelines endorsed by the Commission on Genetic Resources for Food and Agriculture in 2011 (FAO, 2011a). The basic elements of this recommended framework are an officially nominated National Coordinator for the Management of Animal Genetic Resources, a National Focal Point (the National Coordinator and his or her support staff) and a multistakeholder National Advisory Committee (see Boxes 3A2 and 3A3). It is also recommended that each country develop a national strategy and action plan for AnGR as a vehicle for implementing the Global Plan of Action at national level (FAO, 2009).

As of July 2014, officially nominated National Coordinators were in place in 173 countries (Figure 3A1), up from 144 in 2006 (FAO, 2006). A majority of National Coordinators are based within ministries responsible for agriculture or rural development. However a number work for research institutions, universities or other relevant organizations (Figure 3A2). National Advisory Committees were in place in 78 countries (Figure 3A3).

Box 3A2
Elements of the recommended national institutional framework for the management of animal genetic resources

National Coordinator for the Management of Animal Genetic Resources: the government-nominated person who coordinates the national implementation of the Global Plan of Action for Animal Genetic Resources and leads the development and operation of a national network of stakeholders. He or she is the contact person for communication with FAO on matters relating to the implementation of the Global Plan of Action for Animal Genetic Resources and with global and regional animal genetic resources networks.
National Focal Point for the Management of Animal Genetic Resources: the National Coordinator for the Management of Animal Genetic Resources and his or her support staff within the institution responsible for coordinating activities concerning the management of animal genetic resources.
National Advisory Committee: a multistakeholder body, incorporating both scientific and policy expertise, that provides guidance on the development of the national animal genetic resources programme.

Source: FAO, 2011a.

2.2 Country-report analysis

The country-report questionnaire requested countries to provide a score (none, low, medium or high) for the state of their capacities and provisions in each of the following areas:

- education (the state of tertiary education in all areas of AnGR management);
- research (the state of research in all areas of AnGR management);
- awareness (the extent to which all stakeholders in agriculture, rural development and environmental management are aware of the roles and values of AnGR);

[1] See "About this publication" in the preliminary pages of the report for more information on the reporting process.

Box 3A3

The role of the National Coordinator for the Management of Animal Genetic Resources

The recommended activities of National Coordinators include the following:

Policy development

- Facilitating and supporting the development and revision of policy and legal frameworks in the field of animal genetic resources management, including national strategy and action plans for animal genetic resources.
- Contributing to the development and revision of other relevant policy and legal instruments such as national strategy and action plans on conservation and sustainable use of biological diversity and national livestock-development strategies.

Strengthening animal genetic resources management

- Coordinating the implementation of the National Strategy and Action Plan for Animal Genetic Resources.
- Coordinating and supporting the planning, implementation, monitoring and evaluation of conservation, surveying and monitoring and breed development strategies.
- Coordinating the identification of research priorities in animal genetic resources management.
- Coordinating the mobilization of financial and other resources to support implementation of the National Strategy and Action Plan for Animal Genetic Resources.

Communication and cooperation

- Facilitating communication on animal genetic resources management between the National Focal Point for the Management of Animal Genetic Resources and relevant ministries and other national bodies such as the National Focal Point for the Convention on Biological Diversity.[1]
- Developing and supporting national stakeholder networks in the animal genetic resources sector.
- Communicating with FAO and with Regional Focal Points and National Focal Points in other countries, and cooperating in activities organized at regional and international levels.

Education and public awareness

- Raising awareness of animal genetic resources issues via conferences, exhibitions, books, brochures, posters, the internet, television, radio, etc.

Global reporting

- Updating national data in the Domestic Animal Diversity Information System (DAD-IS) (or regional database if applicable) on a regular basis.
- Coordinating progress reporting on the implementation of the Global Plan of Action for Animal Genetic Resources.

Intergovernmental processes

- Participating in country delegations to the sessions of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture, the Commission on Genetic Resources for Food and Agriculture and other relevant intergovernmental bodies.
- Contributing to the development of country negotiating positions.
- Communicating with other National Coordinators to develop regional positions.
- Debriefing government officials following meetings and coordinating implementation of actions recommended by intergovernmental bodies.

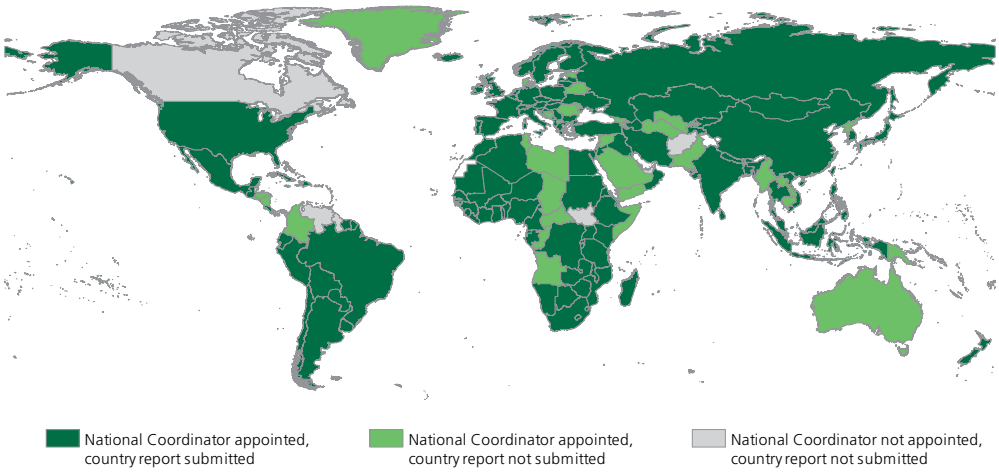
Source: FAO, 2011a.

[1] https://www.cbd.int/information/nfp.shtml

- infrastructure (the extent to which the organizational and physical infrastructure needed to deliver services related to AnGR management is in place);
- stakeholder participation (the extent to which individual stakeholders and stakeholder organizations, particularly livestock keepers and their organizations, are involved in and can influence collaborative AnGR

FIGURE 3A1

Submission of country reports and nomination of National Coordinators for the Management of Animal Genetic Resources



Note: Figure refers to National Coordinators appointed as of July 2014. The country report of Morocco was not prepared in the standardized format and thus could not be included in the quantitative analysis.

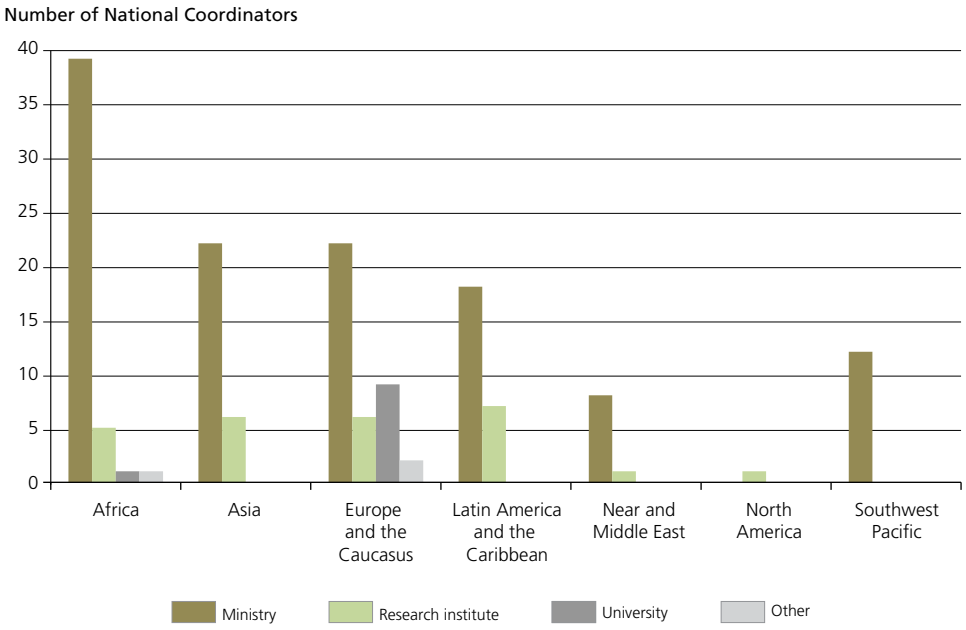
management activities at local and national levels);

- policies (the extent to which the country [i.e. national or regional government] has established policy initiatives, strategies, programmes or plans that promote the sustainable use, development and conservation of AnGR);
- policy implementation (the extent to which the country's policy initiatives, strategies, programmes or plans promoting the sustainable use, development and conservation of AnGR are being successfully implemented);
- laws (the extent to which the country has put in place a legal framework that is conducive to the sustainable use, development and conservation of AnGR and that protects livestock breeders/owners' rights to manage AnGR as they deem appropriate); and
- implementation of laws (the extent to which the country's laws conducive to the sustainable use, development and conservation of AnGR are being successfully implemented).

With regard to policies and laws, the questionnaire recognized that the type of framework required would vary from country to country, i.e. that elaborate frameworks are not necessarily required in all circumstances. In assigning their scores, countries were asked to focus on the extent to which their legal and policy measures are sufficient to ensure the sustainable use, development and conservation of AnGR in their particular national circumstances. The responses are summarized region by region in Figure 3A4. Differences at subregional level are shown in Figures 3A5, 3A6 and 3A7. Detailed findings within each thematic area are shown in Figures 3A9, 3A10 and 3A11.

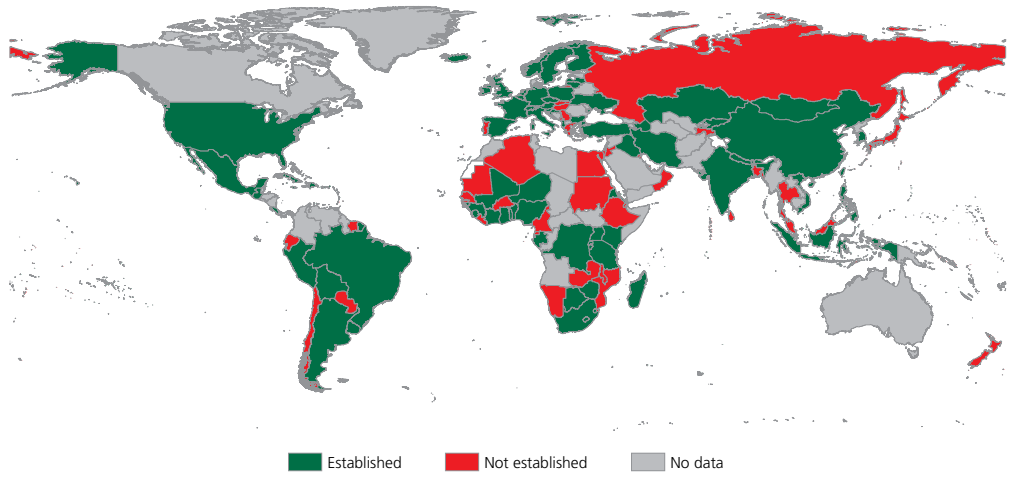
The scores shown in Figure 3A4 indicate that in almost all aspects of the institutional framework for AnGR management, North America and Europe and the Caucasus have higher levels of capacity than other regions. Asia has medium to low levels of capacity (average scores between 1 and 2) across all the elements of institutional

FIGURE 3A2
Employment affiliations of National Coordinators for the Management of Animal Genetic Resources



Source: DAD-IS (http://fao.org/DAD-IS) (accessed September 2014).

FIGURE 3A3
Status of National Advisory Committees for Animal Genetic Resources



Source: Country reports, 2014.

capacity covered. In other developing regions, at least some elements of institutional capacity are at very low levels (average scores between 0 and 1).

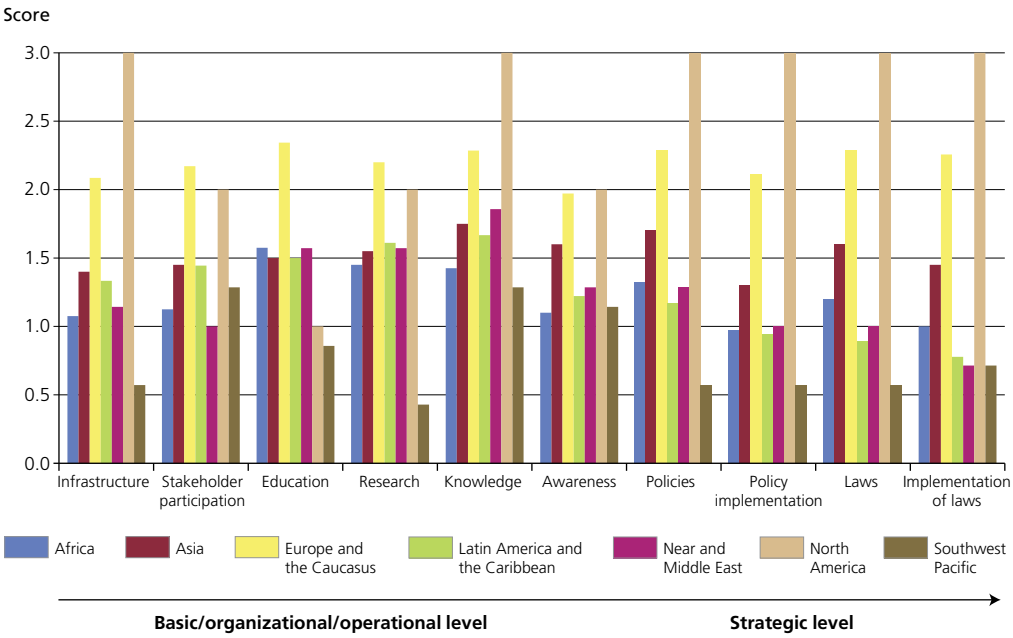
The country-report questionnaire also required responding countries to report on the progress they had made in implementing the various elements of the Global Plan of Action. These responses were used to calculate indicators for progress made at the level of strategic priority areas and at the level of individual strategic priorities (see Box 3A1 and Table 3F1 in Part 3 Section F) (FAO, 2014). National-level indicators for Strategic Priority Area 4 (Policies, Institutions and Capacity-building) are shown in Figure 3A8.

Infrastructure and stakeholder participation

Organized AnGR-management activities that involve action at farm (or holding) level (e.g. *in situ* conservation) are dependent on the active involvement of livestock keepers. They will often also require the participation of a range of other stakeholders (suppliers of livestock services, processers of livestock products, veterinary authorities, research institutions, local government authorities, nature conservation agencies, tourism operators and so on) (FAO, 2010; 2013). Other activities, such as surveying and monitoring of population sizes, may not require such a high level of commitment on the part of livestock keepers, but are nonetheless dependent on their participation. Again, they are also likely to require the cooperation of a range of different stakeholders (FAO, 2011b). While circumstances will

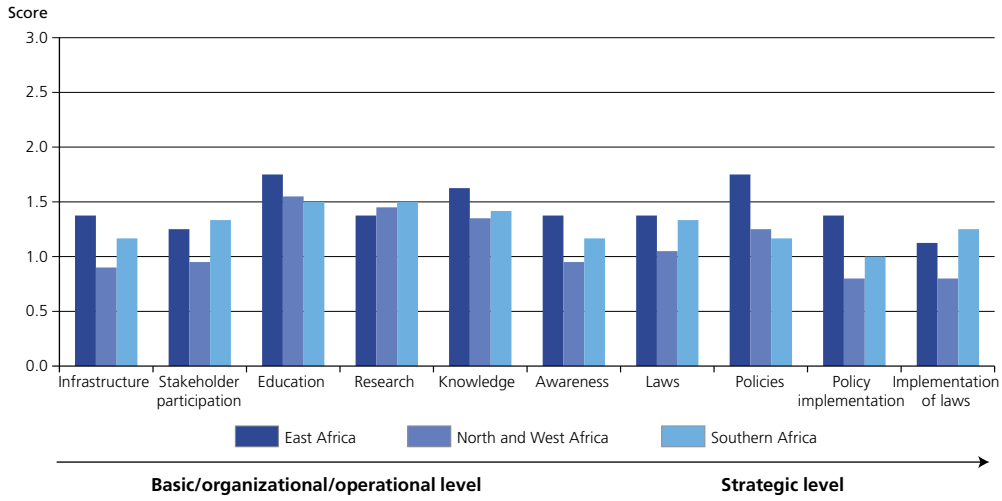
FIGURE 3A4

Overview of the state of institutions in animal genetic resources management



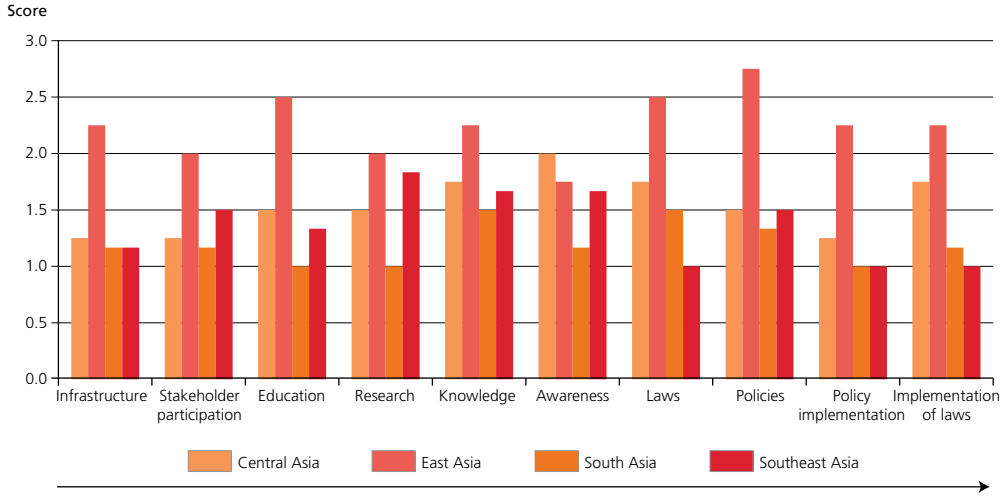
Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

FIGURE 3A5
State of institutions in animal genetic resources management – Africa



Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

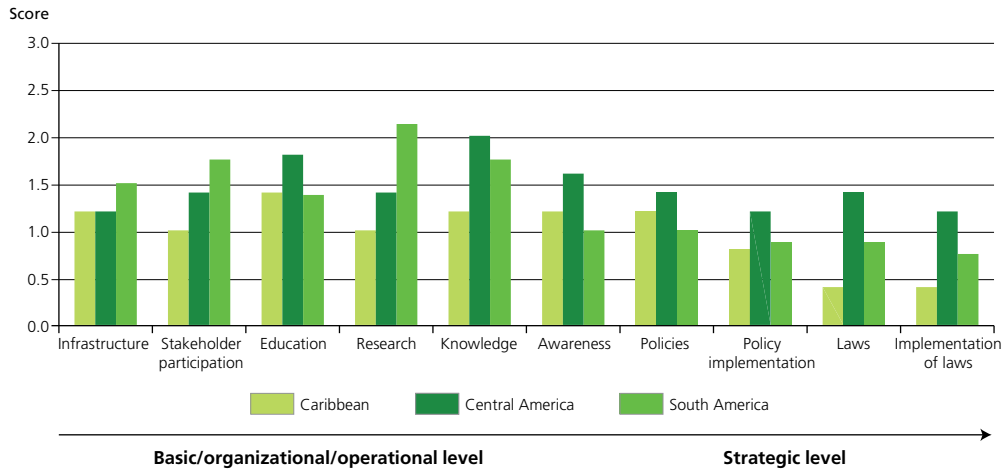
FIGURE 3A6
State of institutions in animal genetic resources management – Asia



Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

FIGURE 3A7

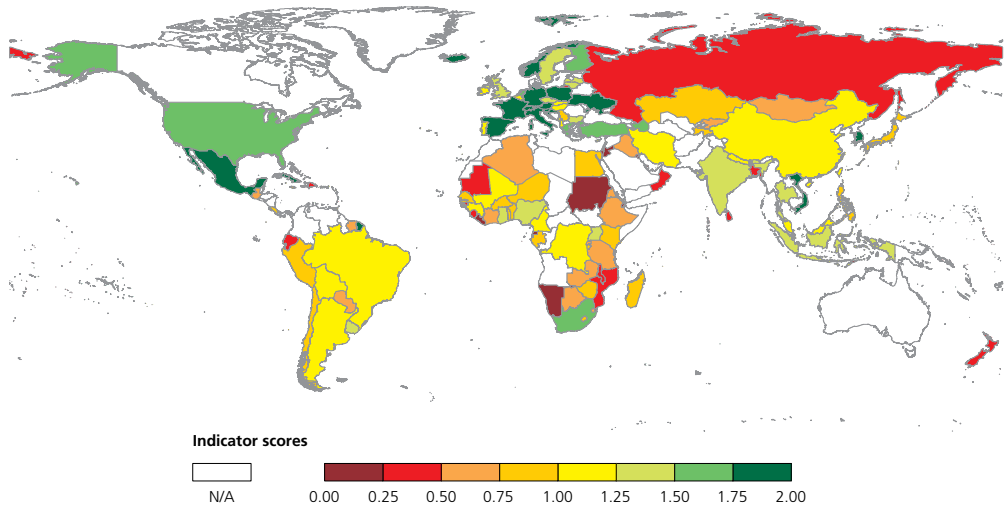
State of institutions in animal genetic resources management – Latin America and the Caribbean



Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

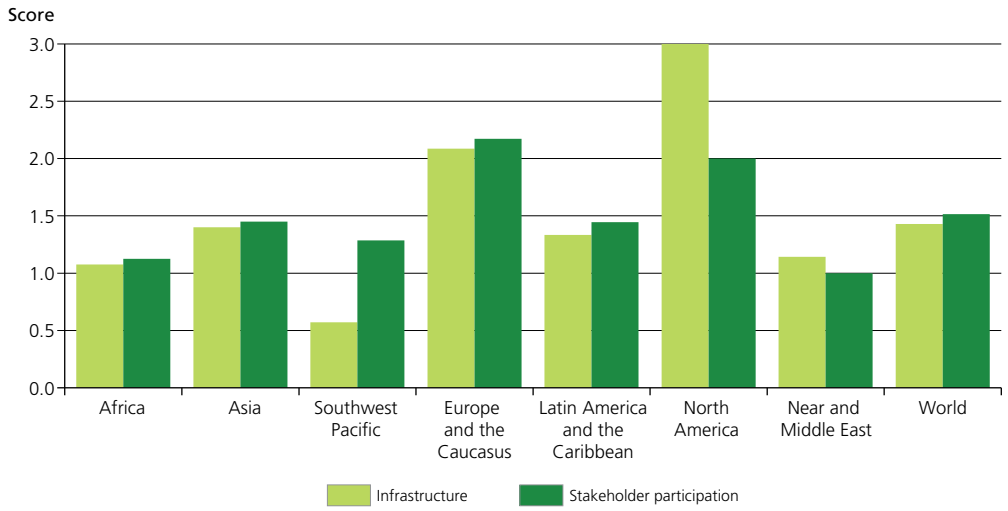
FIGURE 3A8

Indicators for the implementation of Strategic Priority Area 4 of the Global Plan of Action for Animal Genetic Resources



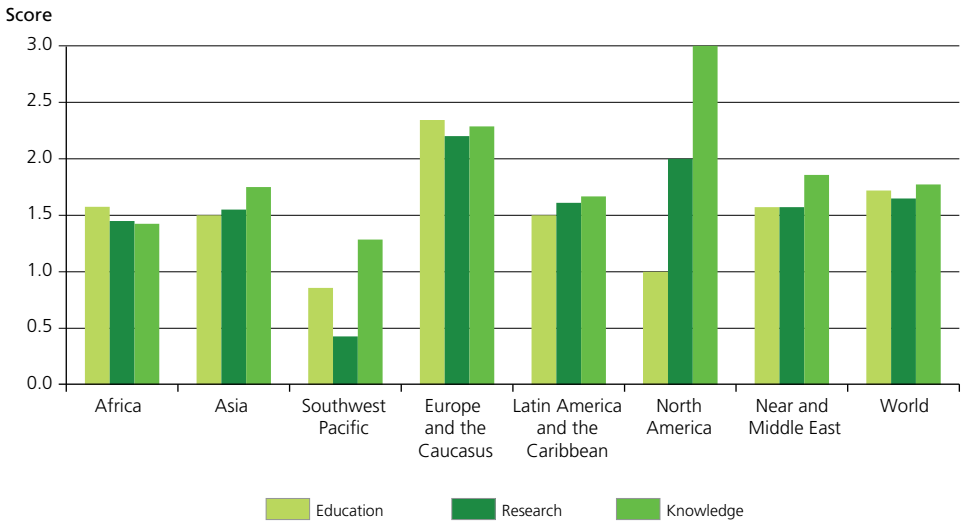
Note: Indicator scores are divided into eight evenly distributed classes between a minimum score of 0 and a maximum score of 2. A score of 2 means that all actions covered by the indicator have been implemented fully. A score of 0 means that no action has been taken.
Scores calculated based on self-assessments provided in country reports.
Strategic Priority Area 4 = Policies, Institutions and Capacity-building.
Source: Country reports, 2014.

FIGURE 3A9
State of infrastructure and stakeholder participation



Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

FIGURE 3A10
State of education, research and knowledge



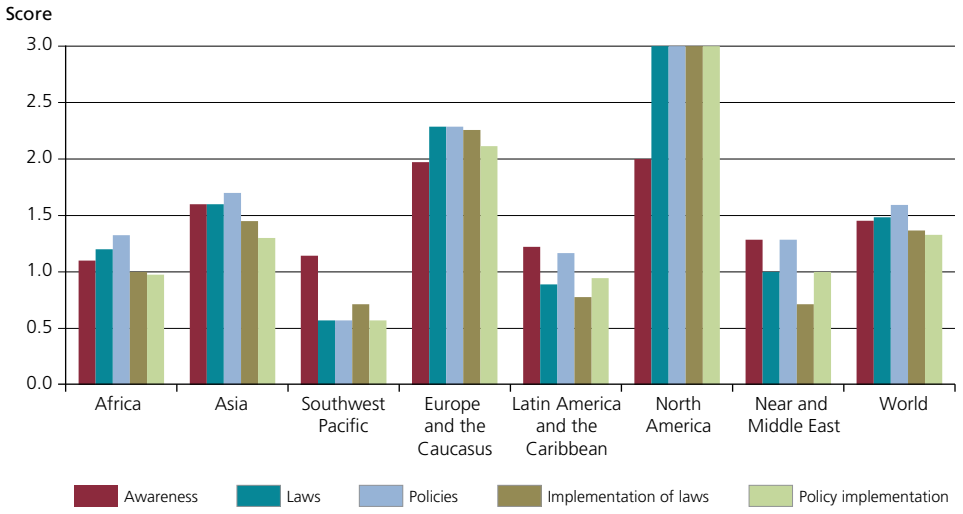
Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

vary from country to country, a top-down approach in which little attention is paid to stakeholders' objectives and concerns – particularly those of livestock keepers – is unlikely to be successful.

Effective stakeholder participation in AnGR management is likely to depend on the existence of a degree of organizational infrastructure, whether in the form of stakeholder groups such as breeders' associations or in the form of mechanisms that facilitate the involvement of individual stakeholders (consultative and participatory planning processes, etc.). Various elements of AnGR management are also dependent on the availability of a certain level of physical and technical infrastructure (e.g. laboratory facilities to enable cryoconservation and transport infrastructure to facilitate service delivery and marketing initiatives).

The country reports indicate that in all regions apart from North America and Europe and the Caucasus, both stakeholder involvement and physical and organizational infrastructure remain at low to medium levels of development (Figure 3A9). Even in developed regions, it appears that provisions in these fields still need to be strengthened. In North America, for example, infrastructure is very well developed, but the level of stakeholder participation is reported only to be medium. Many developing countries report that a lack of government support and funding constrains efforts to improve stakeholder participation. Some examples of initiatives in this field are nonetheless described in the country reports. For example, Uganda reports that livestock-keeper groups influence activities at local level and are gradually acquiring national recognition. The country is in the process of establishing a "Livestock Genetic Platform", via which stakeholders will be able to contribute to discussions on AnGR management.

FIGURE 3A11
State of policy development



Note: Each country provided a score for the state of institutions in each area. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3).
Source: Country reports, 2014.

Many countries, particularly in Africa, note that a lack of funding for infrastructure development is a problem. For example, the country report from the United Republic of Tanzania mentions poor road links to livestock-keeping areas. While European countries generally have well-developed infrastructure in place, some remote areas in this region remain poorly served by road networks. This can constrain surveying and monitoring activities, access to markets and the provision of veterinary services. The country report from Albania notes that in mountainous areas infrastructural developments associated with tourism have inadvertently helped AnGR conservation to flourish.

Education, research and knowledge

A lack of knowledge of AnGR and their management can be a serious constraint to the sustainable use, development and conservation of these resources. Some country reports note specific constraints or problems that have arisen because of a lack of knowledge. Swaziland's report, for example, mentions that indigenous knowledge related to livestock keeping and the maintenance of AnGR diversity has not been documented and that this is a constraint to the development of breeding programmes and other AnGR management strategies. In Sri Lanka, lack of knowledge is reported to lead to the slaughter of valuable breeding animals and to indiscriminate cross-breeding. Inability to distinguish between breeds has reportedly led to the near extinction of some of the country's breeds (e.g. the Kottukachchiya goat).

The state of education, research and knowledge, as reported in the country reports, is summarized in Figure 3A10. As in most areas of AnGR management, the highest levels of provision and capacity are reported from the developed regions of the world, although levels differ markedly between countries even in these regions. In most developing regions, education, research and knowledge are at medium to low levels, with the Southwest Pacific reporting the lowest levels across all categories.

While a number of countries report various educational courses and training activities related to livestock production, relatively little information is provided on the state of education more specifically related to AnGR management, i.e. breeding (genetic improvement), conservation, characterization, etc. Educational initiatives targeting AnGR management as a distinct topic appear to be restricted mainly to Europe and not to be very widespread. The livestock production study programme of University of Montenegro's Biotechnical Faculty is reported to include a course in "Animal genetic resources (sustainable use and conservation)". The country report from the Netherlands notes that in addition to university-level programmes, biodiversity and genetic resources are also included in the curriculum at primary and secondary school levels.

AnGR-related research activities are widely reported from all regions of the world. Nonetheless, many barriers to effective research efforts remain to be overcome, especially in developing countries. For example, the country report from Kyrgyzstan notes that a lack of funding and resources (laboratories and technical knowledge) and the absence of governmental support have reduced research capacity. A lack of young scientists entering the field is noted as constraint to research in some country reports (e.g. Barbados and Liberia).

State of awareness, policies and policy development, and laws and their degree of implementation

Awareness of the roles and values of AnGR among policy-makers is an important prerequisite for the development of appropriate institutions for their management. Awareness among the general public may also help to push the issue up the political agenda. Awareness among livestock keepers and development practitioners should lead to more sustainable approaches to AnGR management (providing such approaches are not constrained by other factors such as a lack of resources). Policies and laws can have a major influence on AnGR management. However, the

specific types of instruments and the levels of intervention required will depend on the specific circumstances in the respective country. Legal and policy frameworks are discussed in detail in Part 3 Section F. Country-report responses related to the state of awareness, laws, policies, implementation of laws and policy implementation are summarized in Figure 3A11.

The country reports indicate that in all regions there is a need to increase awareness of the roles and values of AnGR. Awareness of the significance of locally adapted breeds and the need to conserve those that are at risk of extinction may in fact be even lower than suggested by the data presented in Figure 3A11. For example, the country report from Germany notes that awareness is high only in relation to economically important breeds and that there is significantly less awareness of issues related to the management of breeds that are at risk of extinction. Despite such concerns, a certain basic awareness of the significance of sustainably managing AnGR is apparently widespread at governmental level, given the very large number of countries that have appointed National Coordinators for the Management of Animal Genetic Resources (see Subsection 2.1).

Legal and policy frameworks are well developed in North America and Europe and the Caucasus, but less so in other regions. It should be recalled (see above) that high scores do not necessarily indicate elaborate legal or policy measures in the field of AnGR management. They indicate that existing legal and policy frameworks are appropriate to the needs of the respective country. For example, the United States of America reports a relatively non-interventionist approach in many AnGR-related fields of policy and legislation (see Part 3 Section F), but indicates that this creates a conducive framework for effective AnGR management. The state of implementation of laws and policies is at a high level in North America and a medium to high level in Europe and the Caucasus. However, in other regions there seem to be major weaknesses in implementation. It is possible that the low scores in this field are in part accounted for by a lack of laws or policies to implement,[2] but in most regions the level of implementation appears to lag behind the level of "on-paper" provision.

A number of different awareness-raising activities (exhibitions at agricultural shows, television programmes on AnGR-related topics, etc.) are mentioned in the country reports. There are some indications that these have led to positive outcomes in terms of AnGR management. The country report from South Africa, for example, notes that intensified awareness-raising efforts targeting the "developing-farmer" and communal sectors have led to additional breeds, including the Zulu sheep, Tankwa goat and Afrikaner cattle, being characterized and conserved.

Integration of the management of animal genetic resources with the management of plant, forest and aquatic genetic resources

In view of growing interest in managing the various elements of biodiversity for food and agriculture in a more integrated way, the country-report questionnaire included a subsection devoted to this topic. Countries were requested to provide information on the extent to which AnGR management is integrated with the management of plant, forest and aquatic genetic resources for food and agriculture by providing a score (none, limited or extensive) for the extent of collaboration in various aspects of genetic-resources management. They were also requested to describe the nature of any collaboration reported and, if relevant, to describe any benefits obtained by pursuing a collaborative approach. The results of the scoring exercise are summarized in Table 3A1.

The average scores for the extent of collaboration between the subsectors of genetic resources management are rather low. However, there is a lot of variation between countries in terms of the levels of collaboration reported. While 20 percent of countries report no collaboration

[2] All reporting countries were included in the analysis of the level of implementation regardless of their reported level of "on-paper" provision.

in any of the areas of management considered, there are a number of reports of "extensive" integration. In the case of "joint national strategies or action plans" (some countries specified that they were referring to legal instruments), 16 percent of countries indicate an extensive level of integration. There are also some reports of integrated activities in fields such as marketing.

TABLE 3A1

Reported extent of collaboration in the management of the various subsectors of genetic resources for food and agriculture

Regions and subregions	Number of countries	Field of collaboration							
		Joint national strategies or action plans	Characterization	Genetic improvement	Product development and/or marketing	Conservation strategies, programmes or projects	Awareness-raising	Training activities and education	Mobilization of resources
Africa	**40**	**0.6**	**0.7**	**0.4**	**0.5**	**0.6**	**0.6**	**0.6**	**0.4**
East Africa	8	0.4	0.8	0.3	0.3	0.5	0.3	0.5	0.3
North and West Africa	20	0.6	0.7	0.4	0.5	0.6	0.6	0.6	0.4
Southern Africa	12	0.8	0.5	0.6	0.6	0.6	0.7	0.5	0.4
Asia	**20**	**1.0**	**0.6**	**0.5**	**0.4**	**0.5**	**0.6**	**0.5**	**0.5**
Central Asia	4	0.8	0.5	0.8	0.2	0.0	0.0	0.2	0.0
East Asia	4	1.0	0.6	0.6	0.6	1.0	1.5	0.4	0.8
South Asia	6	0.7	0.5	0.3	0.2	0.7	0.7	0.8	0.3
Southeast Asia	6	1.3	0.8	0.6	0.6	0.4	0.4	0.4	0.7
Southwest Pacific	**7**	**0.4**	**0.3**	**0.4**	**0.3**	**0.3**	**0.4**	**0.1**	**0.1**
Europe and the Caucasus	**35**	**1.0**	**0.5**	**0.3**	**0.5**	**0.7**	**0.9**	**0.7**	**0.7**
Latin America and the Caribbean	**18**	**0.8**	**0.3**	**0.4**	**0.3**	**0.6**	**0.9**	**0.7**	**0.6**
Caribbean	5	0.2	0.0	0.0	0.0	0.0	0.4	0.4	0.0
Central America	5	1.0	0.4	0.8	0.6	0.6	0.8	0.6	0.8
South America	8	1.0	0.5	0.4	0.4	0.9	1.3	0.9	0.9
North America	**1**	**0.0**	**0.0**	**0.0**	**0.0**	**1.0**	**1.0**	**1.0**	**0.0**
Near and Middle East	**7**	**0.4**	**0.1**	**0.3**	**0.0**	**0.1**	**0.3**	**0.1**	**0.1**
World	**128**	**0.8**	**0.5**	**0.4**	**0.4**	**0.6**	**0.7**	**0.6**	**0.5**

Note: Countries provided a score (none, limited or extensive) for the level of collaboration in each category of activity. The scores were converted into numerical values (none = 0; limited = 1; extensive = 2). The figures shown in the table are average scores for the respective categories.
Source: Country reports, 2014.

For example, the country report from Poland mentions the "Kurpie model", an NGO initiative to promote agricultural biodiversity, under which indigenous livestock breeds and plant varieties have been reintroduced and promoted for use in organic agriculture and sustainable development in the northeastern part of the country. Plant and animal products from the scheme are jointly marketed in shops in the capital city.

Most countries did not report specific institutions or stakeholder bodies that coordinate activities across the various subsectors of genetic resources. Some country reports note that the fact that different types of genetic resources are addressed by different ministries is a constraint to collaboration and coordination. Nonetheless, a number of coordinating structures or bodies of various types are mentioned in the country reports, including ministerial or interministerial committees (e.g. Finland and Gabon), foundations (e.g. France), genetic resources centres (e.g. Brazil, Norway and Sweden) and genetic resources networks (e.g. the Plurinational State of Bolivia). In other countries, particular stakeholders play an integrating role with regard to specific aspects of genetic resources management (e.g. gene banking or research).

In addition to the above-mentioned concern about lack of coordination between government ministries, the main constraints to integrated approaches to genetic resources management noted in the country reports are lack of funds, insufficient training of staff working in relevant institutions, lack of sensitization and education among stakeholders and the general public, lack of national-level strategies and legislation, and lack of coordination between administrative and field levels. Some country reports suggest that relatively small-scale initiatives, such as integrated projects and workshops, could be a means of fostering collaboration on a larger scale.

The main potential benefits of an integrated approach foreseen in the country reports are: in administrative terms, savings in time and costs; and, at field level, more efficient and sustainable use of natural resources and the reduction of conflicts related to resource use.

3 Institutional frameworks at subregional and regional levels

3.1 Regional focal points and networks for the management of animal genetic resources

Collaboration between countries at regional level can facilitate action in many areas of AnGR management. The Global Plan of Action for Animal Genetic Resources calls for the establishment of regional focal points for the management of AnGR and for the strengthening of international networks (see Box 3A1). Detailed advice on the establishment and operation of regional focal points is provided in FAO's guidelines on *The development of institutional frameworks for the management of animal genetic resources* (FAO, 2011a). As of mid-2014, the following focal points and networks were in operation:

- Asian Animal Genetic Resources Network;
- European Regional Focal Point for Animal Genetic Resources;
- Regional Focal Point for Latin America and the Caribbean;
- Sub-Regional Focal Point for West and Central Africa; and
- Animal Genetic Resources Network Southwest Pacific.

As part of the reporting process for the second SoW-AnGR, regional focal points and networks were invited to report on regional-level activities contributing to the implementation of the Global Plan of Action. Reports were received from Asia, Europe, Latin America and the Caribbean and the Southwest Pacific.[3] The reports can be accessed at http://www.fao.org/3/a-i4787e/i4787e03.htm. Regional focal points and networks also participated in the previous round of

[3] For information on the reporting process, see "About this publication" in the preliminary pages of this report.

reporting on the implementation of the Global Plan of Action (FAO, 2012).[4]

The European Regional Focal Point is the longest-established and most active network. During the period since the adoption of the Global Plan of Action (2007), it has been active in the implementation of all four of the Plan's strategic priority areas. In the field of characterization inventory and monitoring (Strategic Priority Area 1), actions have included work on the establishment of a regional information system for AnGR (the European Farm Animal Biodiversity Information System – EFABIS) and efforts to harmonize risk-status and endangerment criteria. In the field of sustainable use and development (Strategic Priority Area 2), actions have included contributing to discussions related to the European Union's legal framework on access and benefit-sharing. In the field of conservation (Strategic Priority Area 3), actions have included organizing training activities, providing support to a number of conservation projects and, in 2014, the establishment of the European Gene Bank Network for Animal Genetic Resources (EUGENA) (see Box 3D8 in Part 3 Section D). In the field of policies, institutions and capacity-building (Strategic Priority Area 4), actions have included contributing to discussions on the development of the European Union's legal and policy frameworks in areas relevant to AnGR management.

The Regional Focal Point for Latin American and the Caribbean was established in 2007. Its main activity has been the organization of a number of regional workshops for National Coordinators. Priorities for the future are reported to include seeking financial support for the organization of training courses and for collaborative activities at regional and/or bilateral levels. In the Southwest Pacific, an online network for discussion, dissemination of information and communication between National Coordinators has been established. Other activities have included characterization and conservation projects for locally adapted pigs and chickens, involving a number of countries. In 2012, the recently established Sub-Regional Focal Point for West and Central Africa reported a number of priorities for future action. However, it did not participate in the 2014 round of reporting. The Asian Animal Genetic Resources Network, established in late 2013, has agreed an organizational structure and intends to focus on information exchange, the provision of assistance and technical advice, and the mobilization of funds.

3.2 Other collaborative activities at regional and subregional levels

The focal points and networks discussed above exist specifically to strengthen the implementation of the Global Plan of Action at regional level. However, a range of other players also contribute to this goal. The roles of regional political and economic unions and communities (e.g. the European Union and the subregional economic communities of Africa) in the establishment of regional-level legal and policy instruments relevant to AnGR management are discussed in Part 3 Section F. Regional and subregional-level AnGR management activities can also be organized or supported by non-governmental organizations (NGOs), intergovernmental organizations (e.g. UN agencies) or research organizations (e.g. the centres of the Consultative Group on International Agricultural Research[5] – CGIAR). Countries can also enter directly into collaborative activities with their regional neighbours.

While the analysis presented in the *Synthesis progress report on the implementation of the Global Plan of Action* (FAO, 2014) indicates that international collaboration is one of the elements of the Global Plan of Action in which least progress has been made, a number of countries report that they have participated in collaborative activities at regional level. For example, in

[4] Reports were received from Europe, Latin America and the Caribbean, the Southwest Pacific, and West and Central Africa. The Asian Animal Genetic Resources Network was not in operation at the time. All regional progress reports are available on FAO's web site: http://www.fao.org/ag/againfo/programmes/en/genetics/Reporting_system_2007-11.html#secondo

[5] http://www.cgiar.org

response to a specific question about regional *in situ* conservation projects, more than 40 percent of countries indicate that they have contributed to the development and implementation of such programmes. A somewhat lower number (approximately 30 percent) report that they have contributed to "international cooperative inventory, characterization and monitoring activities involving countries sharing transboundary breeds and similar production systems", many of which are likely to have been at regional level. Collaboration in these fields is more advanced in developed regions than elsewhere in the world.

The level of international cooperation within Europe is greatly increased by the above-described work of the European Regional Focal Point. However, a number of examples of bilateral collaboration, or collaboration involving small groups of countries, are also reported. In the Americas, Brazil, Canada and the United States of America have cooperated in the development of an information system for the management of data related to conservation activities. The main other reported initiative involving countries from Latin America and the Caribbean is the REGENSUR Platform created by the Southern Cone Cooperative Program for Technological Development in Agri-Food and Agroindustry (PROCISUR) of the Inter-American Institute for Cooperation on Agriculture of the Organization of American States, which in 2010 expanded its mandate to include animals and micro-organisms in addition to plants. Collaborative work is envisaged in the fields of sustainable use, conservation, policies and capacity-building, the aim being to reinforce the implementation of national strategies and action plans for AnGR in the countries of the Southern Cone of South America. Regional-level initiatives in Africa have mostly been implemented under the auspices of the African Union Interafrican Bureau for Animal Resources (AU-IBAR).

AnGR-focused NGOs working at regional or subregional levels are reported mainly from Europe. Examples include Safeguard for Agricultural Varieties in Europe (SAVE Foundation) (see Box 3A4) and the Danubian Countries Alliance of Genes in Animal Species (DAGENE). Research organizations active at regional level include the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD) (mandate covering all Arab states), whose activities include inventory and characterization studies, breeding programmes, AnGR-related training activities and awareness-raising in the fields of conservation and sustainable use.

4 Institutional frameworks and stakeholders at international level

A range of different entities contribute to the institutional framework for the management of AnGR at international level (i.e. global or spanning more than one region). As at regional level, these include intergovernmental organizations, NGOs and research organizations. International policy and legal frameworks developed by global intergovernmental bodies such as the Convention on Biological Diversity (CBD), FAO and the World Intellectual Property Organization (WIPO) are discussed in Part 3 Section F.

The international instrument most directly focused on AnGR management is, clearly, the Global Plan of Action for Animal Genetic Resources, which was negotiated under the auspices of FAO's Commission on Genetic Resources for Food and Agriculture. The Commission is responsible for overseeing the implementation of the Global Plan of Action and FAO plays the leading role globally in terms of both supporting and monitoring implementation. FAO's activities are described in Boxes 3A5 and 3A6. The Commission provides an intergovernmental forum for ongoing discussion of issues relevant to the management of AnGR and other biodiversity for food and agriculture.

The ongoing work of both WIPO and the Secretariat of the CBD also supports the implementation of the Global Plan of Action in various ways. Both bodies submitted reports on their activities as part of the second SoW-AnGR reporting process. WIPO's report notes, in particular,

Box 3A4

Facilitating the establishment of institutional frameworks for animal genetic resources management – lessons from a project in Bulgaria

As part of the Swiss Agency for Cooperation-funded programme Linking Nature Protection and Sustainable Rural Development,[1] Safeguard for Agricultural Varieties in Europe (SAVE) Foundation was invited to help address the institutional framework for animal genetic resources management in Bulgaria.

In 2014, SAVE undertook two missions to Bulgaria: the first to meet stakeholders and gain an overview of the state of conservation measures for indigenous breeds at risk, both at policy level and on the ground; and the second to facilitate stakeholder meetings. These meetings addressed both technical matters related to the genotyping of livestock populations and matters related to the development of effective institutions and policies. Among the latter, the following topics received particular attention:

- the need to improve communication among stakeholders;
- the need to unify scattered animal genetic resources-related policy and regulatory provisions, so that the overall strategy is clarified and any contradictions can be addressed;
- the need for thematic workshops that help ensure that all stakeholders have the same level of knowledge; and
- the need to revise subsidy programmes on the basis of recommendations from the European Regional Focal Point for Animal Genetic Resources and the results of genotyping studies.

Stakeholders from all levels, government to farmers, attended the meetings and participated actively in the discussions. SAVE's role in this context was to make recommendations based on the discussions, with implementation then taking place at national level.

Experiences from this project and from SAVE's previous work in similar capacities show that the involvement of all stakeholders in discussions of institutional frameworks helps to create a transparent approach that allows everyone to participate in the planning of future activities and adds sustainability to the process.

Provided by Elli Broxham, SAVE Foundation.

[1] http://www.swiss-contribution.admin.ch/bulgaria/en/Home/Projects/Project_Detail?projectinfoID=214077

its *Patent landscape report on animal genetic resources* (WIPO, 2014) and ongoing negotiations taking place in the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore.[6] The report from the CBD Secretariat notes, *inter alia*, work taking place under the Global Taxonomy Initiative,[7] efforts to promote the ecosystem approach, work related to the Nagoya Protocol on Access and Benefit Sharing, work related to the Convention's Article 8(j) (Traditional Knowledge, Innovations and Practices) and the periodic publication of the *Global Biodiversity Outlook*.[8]

As discussed in Part 3 Section F, the Secretariats of the CBD and the Commission have agreed a joint work plan with the aim of promoting synergies in efforts to implement the CBD's Strategic Plan for Biodiversity 2011–2020 and the Commission's Multi-Year Progamme of Work.

Another UN body that contributes to the implementation of the Global Plan of Action, and submitted a report on its activities, is the International Atomic Energy Agency (IAEA), which assists countries through the transfer of nuclear-related technologies and complementary tools. AnGR-related technologies that feature in IAEA's work include molecular genetic testing, hormone monitoring and artificial insemination.

The main international research organizations with mandates relevant to the management

[6] http://www.wipo.int/tk/en/igc
[7] https://www.cbd.int/gti/
[8] https://www.cbd.int/gbo/

Box 3A5

FAO's role in the management of animal genetic resources

FAO's role in animal genetic resources (AnGR) management focuses on supporting countries in their implementation of the Global Plan of Action for Animal Genetic Resources, particularly by:

- raising awareness and promoting AnGR-related issues;
- collaborating with international bodies and organizations addressing sectoral and cross-sectoral issues of relevance to AnGR management;
- developing and maintaining a global information and communication structure for AnGR – the Domestic Animal Diversity Information System (DAD-IS) and the Domestic Animal Diversity Network (DAD-Net);
- supporting the establishment of National and Regional Focal Points;
- coordinating inter-regional activity;
- monitoring the implementation of the Global Plan of Action;
- overseeing the preparation of policy and technical guidelines;
- assisting countries with the development of national capacity in AnGR management;
- developing project and programme proposals; and
- mobilizing donor resources.

For further information see: http://www.fao.org/ag/angr.html

of AnGR are Bioversity International, the International Center for Agricultural Research in the Dry Areas (ICARDA) and the International Livestock Research Institute (ILRI). The latter two organizations undertake a range of activities relevant to the implementation of the Global Plan of Action, including characterization studies, work on the establishment of community-based breeding programmes and provision of support to policy development. Bioversity's AnGR-related work focuses mainly on economic valuation (see Part 4 Section E). All three organizations submitted reports on their activities as part of the second SoW-AnGR reporting process.

The number of international NGOs actively supporting the implementation of the Global Plan of Action is limited. Only a few organizations in this category submitted reports as part of the second Sow-AnGR reporting process: Heifer International; the International Committee for Animal Recording; the League for Pastoral Peoples; and Rare Breeds International. The missions of these organizations (along with those of other relevant international and regional organizations) are shown in Table 3A2.

A number of NGOS and civil society organizations have also taken on a campaigning role at international level. The emergence of the concept of "Livestock Keepers' Rights", for example, was discussed in the first SoW-AnGR[9] (recent developments are described in Box 3A7). Another issue that has become increasingly prominent in the work of civil society organizations in recent years is the development of so-called biocultural community protocols in livestock-keeping communities (see Part 4 Section D – particularly Box 4D3).

5 Changes since 2005

Table 3A3 compares the scores for the state of capacity and provision presented above in Subsection 2 to the equivalent figures from the first SoW-AnGR process,[10] taking into account the 109 countries that participated in both reporting processes. It is important to note that the figures are not directly comparable. Aside from the inevitable element of subjectivity involved in such scoring exercises, the scores used in the first SoW-AnGR were allocated on the basis of the textual descriptions presented in the country reports rather than being directly assigned by the

[9] FAO, 2007a, page 291.

[10] FAO, 2007a, Figures 44 to 46 and Table 58 (pages 205–213).

Box 3A6
The Domestic Animal Diversity Network (DAD-Net)

Established in 2005 by FAO's Animal Production and Health Division, DAD-Net is a moderated global electronic discussion forum where information and experiences on issues relevant to the management of animal genetic resources can be discussed informally. Membership is open to anybody interested in animal genetic resources management and is particularly relevant to National Coordinators for the Management of Animal Genetic Resources and their stakeholder networks, decision-makers, academics and non-governmental organizations. Topics discussed include training and education opportunities, research and technological developments and technology transfer. As of October 2014, the DAD-Net had 2 500 members, from 185 countries. Regional subgroups have been established for Asia and the Pacific, Latin America and Caribbean, East Africa, North Africa, West and Central Africa, and Eastern Europe and Central Asia.

For further information see https://dgroups.org/fao/dad-net\

countries themselves.[11] While the figures therefore have to be interpreted with some caution, the global trends over the 2005 to 2014 period have been positive (scores increased) or neutral (scores stayed the same) in all aspects of the institutional framework considered. The figures indicate declines in some areas of capacity in some regions, most commonly in Latin America and the Caribbean. These declines are clearly matters of some concern, but are perhaps accounted for by overly generous allocation of scores during the first SoW-AnGR process.

At international level, the major change since 2005 has been the adoption of the Global Plan of Action for Animal Genetic Resources. Implementation of most of the Global Plan of Action's strategic priorities takes place mainly at national level (see Table 3F1 in Part 3 Section F). As described above, activities related to the development of institutional frameworks fall mainly within Strategic Priority Area 4 of the Global Plan of Action (see Box 3A1). The *Synthesis progress report on the implementation of the Global Plan of Action* (FAO, 2014) includes an analysis of the progress made (as reported in the country reports) in the implementation of the various elements of the Global Plan of Action since its adoption in 2007.

[11] Countries had the opportunity to request amendments during the reviewing process.

Many examples of improvements to institutional frameworks are reported. However, relative to the amount of work that remains to be done in order to establish effective institutional frameworks in all countries, progress has been modest. On the positive side, the number of countries having a National Coordinator for the Management of Animal Genetic Resources in place is higher (in 2014) than ever before. The number of countries that have developed or are in the process of developing national strategies and action plans for AnGR (see Part 3 Section F) is also encouraging given that national plans targeting AnGR management in a holistic sense were rare prior to the adoption of the Global Plan of Action. Thirty-percent of country reports note an increase in national funding for AnGR management since 2007.

Given that at the time the first SoW-AnGR was prepared, only one regional focal point for AnGR (Europe) was in operation, the existence of four additional regional focal points and networks represents a significant step forward. However, there is clearly scope for further improvement, both in terms of the coverage of regional and subregional focal points and in terms of the level of activity of existing focal points.

The number of international organizations substantially involved in promoting the sustainable use, development and conservation of AnGR has not

TABLE 3A2

Organizations supporting animal genetic resources management at regional and international levels

Organization name and web link	Type	Description of mission
African Union Interafrican Bureau for Animal Resources (AU-IBAR) http://www.au-ibar.org/	IGO	To provide leadership in the development of animal resources for Africa through supporting and empowering African Union Member States and Regional Economic Communities.
Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD) http://www.acsad.org/	IGO	To develop plant varieties and animal breeds resistant to drought and integrated management of water resources, preserve the environment and biodiversity and combat desertification.
Bioversity International http://www.bioversityinternational.org/	CGIAR	To deliver scientific evidence, management practices and policy options to use and safeguard agricultural biodiversity to attain sustainable global food and nutrition security.
The Secretariat of the Convention of Biological Diversity (CBD) www.cbd.int/secretariat/	UN	To support the goals of the Convention: - the conservation of biological diversity - the sustainable use of its components - the fair and equitable sharing of benefits arising from the use of genetic resources.
Danubian Countries Alliance of Genes in Animal Species (DAGENE) http://www.dagene.eu/	NGO	To preserve genetics in the Danube river basin.
European Federation of Animal Science (EAAP) www.eaap.org/	NGO	To promote the improvement, organization and enlightened practice of animal production by scientific research, the application of science and cooperation between the national animal production organizations, scientists and practitioners of member countries.
Heifer International www.heifer.org/	NGO	To eradicate poverty and hunger through sustainable, values-based holistic community development through distributing animals, along with agricultural and values-based training, to families in need around the world as a means of providing self-sufficiency.
International Atomic Energy Agency (IAEA) – Joint FAO/IAEA Division www.iaea.org/	UN	To support Member States in the peaceful application of nuclear science and technology in a safe and effective manner to provide their communities with more, better and safer food and agricultural produce while sustaining natural resources.
International Centre for Agricultural Research in the Dry Areas (ICARDA) www.icarda.cgiar.org/	CGIAR	To improve the livelihoods of the resource-poor across the world's dry areas.
International Committee for Animal Recording (ICAR) www.icar.org/	NGO	To promote the development and improvement of the activities of performance recording and the evaluation of livestock.
International Livestock Research Institute (ILRI) http://www.ilri.org/	CGIAR	To improve food security and reduce poverty in developing countries through research for better and more sustainable use of livestock.
League for Pastoral Peoples and Endogenous Livestock Development (LPP) http://www.pastoralpeoples.org/	NGO	To support pastoral societies and other small-scale livestock keepers to pursue their own vision of development through research, technical support, advisory services and advocacy, including endogenous development built on local knowledge, institutions and resources.
NORDGEN - Nordic Genetic Resource http://www.nordgen.org/	IGO	To safeguard the sustainable use of plants, farm animals and forests, securing the broad diversity of genetic resources linked to food and agriculture through conservation and sustainable use, solid documentation and information work and international agreements.
Rare Breeds International http://www.rarebreedsinternational.org/	NGO	To prevent the loss of diversity in global farm animal genetic resources.
Safeguard for Agricultural Varieties in Europe (SAVE Foundation) http://www.save-foundation.net/	NGO	A European umbrella organization for the promotion and coordination of activities for the *in situ* conservation of at risk breeds of domestic animals and cultivated plant varieties.
World Intellectual Property Organization www.wipo.int/	UN	To lead the development of a balanced and effective international intellectual property system that enables innovation and creativity for the benefit of all.

Note: CGIAR = Consultative Group on International Agricultural Research; IGO = intergovernmental organization; NGO = non-governmental organization; UN = United Nations. For information on FAO's work in this field see Box 3A5.

Box 3A7
Livestock Keepers' Rights

"Livestock Keepers' Rights" is a concept developed by civil society (including non-governmental organizations and herders' associations) during the "Interlaken Process".* It is based on the rationale that many breeds in developing countries disintegrate because of the loss of the customary rights of livestock keepers to sustain their livestock on common property resources, as well as policies that are adverse to small-scale livestock keepers. Livestock Keepers' Rights are a set of principles that would support and encourage livestock keepers to continue making a living from their breeds and thereby achieve the combined effect of conserving diversity and improving rural livelihood opportunities.

The term Livestock Keepers' Rights was first coined during the 2002 World Food Summit, in allusion to the Farmers' Rights enshrined in the International Treaty on Plant Genetic Resources for Food and Agriculture. In a series of consultations and workshops held with hundreds of livestock keepers from more than 20 countries in Karen (Kenya) in 2003, Bellagio (Italy) in 2006, Yabello (Ethiopia) in 2006, Sadri (India) and Addis Ababa (Ethiopia) in 2007, Livestock Keepers' Rights were elaborated into a much more comprehensive concept than Farmers' Rights. Rather than representing legal rights, they correspond to development principles that would help livestock keepers continue to conserve biodiversity.

Principles and rights

During a workshop with legal experts held in Kalk Bay, South Africa, in December 2008, the rights were further refined and subdivided into principles and rights:

"Principle 1: Livestock Keepers are creators of breeds and custodians of animal genetic resources for food and agriculture ...

Principle 2: Livestock Keepers and the sustainable use of traditional breeds are dependent on the conservation of their respective ecosystems ...

Principle 3: Traditional breeds represent collective property, products of indigenous knowledge and cultural expression of Livestock Keepers ...

Based on these principles articulated and implicit in existing legal instruments and international agreements, Livestock Keepers from traditional livestock keeping communities and/or adhering to ecological principles of animal production, shall be given the following Livestock Keepers' Rights:

1. Livestock Keepers have the right to make breeding decisions and breed the breeds they maintain.
2. Livestock Keepers shall have the right to participate in policy formulation and implementation processes on animal genetic resources for food and agriculture.
3. Livestock Keepers shall have the right to appropriate training and capacity building and equal access to relevant services enabling and supporting them to raise livestock and to better process and market their products.
4. Livestock Keepers shall have the right to participate in the identification of research needs and research design with respect to their genetic resources, as is mandated by the principle of Prior Informed Consent.
5. Livestock Keepers shall have the right to effectively access information on issues related to their local breeds and livestock diversity."

The Declaration on Livestock Keepers' Rights that emerged from the Kalk Bay Workshop references these principles and rights to existing international agreements and legal frameworks such as the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, the Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration on Animal Genetic Resources, the Universal Declaration of Human Rights, the International Covenant on Economic, Social and Cultural Rights, the United Nations Declaration on the Rights of Indigenous Peoples, the Convention on the Protection and Promotion of the Diversity of Cultural Expressions, the Convention

(Cont.)

*"The Interlaken process" was the process that culminated in the adoption of the Global Plan of Action for Animal Genetic Resources in Interlaken, Switzerland in 2007.

Box 3A7 *(Cont.)*
Livestock Keepers' Rights

(No. 169) concerning Indigenous and Tribal Peoples in Independent Countries, the Declaration on the Rights of Persons belonging to National or Ethnic, Religious and Linguistic Minorities and other pertinent instruments.

The Declaration was signed by a large number of individuals and organizations. Subsequently, the participants of the International Technical Expert Workshop on Access and Benefit Sharing in Animal Genetic Resources for Food and Agriculture, held in Wageningen, the Netherlands, in December 2010, recommended that "Livestock Keepers' Rights should be addressed."

Livestock Keepers' Rights are frequently referred to as a potential tool for protecting the rights of livestock keepers in a context where scientists and industries are making increasing use of the intellectual property rights system to protect their advances in breeding and associated technologies. However, their scope is not restricted to the right to breed, save and exchange genetic material. It encompasses a broader approach that would strengthen small-scale livestock keepers and support them in making a living in their traditional agro-ecosystems.

The discussion about Livestock Keepers' Rights may be revived once The Nagoya Protocol on Access and Benefit-Sharing is ratified, as the Protocol requires its Contracting Parties to share monetary and non-monetary benefits arising from the utilization of traditional knowledge associated with genetic resources, and from the utilization of genetic resources held by indigenous and local communities, with these communities. As described above, non-monetary benefits, such as the participation of livestock keepers in policy formulation and implementation processes on animal genetic resources, training and capacity-building, access to services, marketing support, identification of research needs and access to information, are among the demands made in the Declaration on Livestock Keepers' Rights.

Provided by Ilse Köhler-Rollefson.
For further information see: Köhler-Rollefson and Wanyama, 2003; Köhler-Rollefson *et al.*, 2010a, Köhler-Rollefson *et al.*, 2010b; Köhler-Rollefson *et al.* 2012; FAO 2011c.

TABLE 3A3
Institutions and stakeholders – changes 2005 to 2014

	Africa			Asia			Southwest Pacific			Europe and the Caucasus			Latin America and the Caribbean			North America			Near and Middle East			World		
	n = 35			n = 18			n = 5			n = 29			n = 16			n = 1			n = 5			n = 109		
	2005	2014	Δ	2005	2014	Δ	2005	2014	Δ	2005	2014	Δ	2005	2014	Δ	2005	2014	Δ	2005	2014	Δ	2005	2014	Δ
Research	0.8	1.5	0.7	1.4	1.6	0.2	0.8	0.4	-0.4	2.1	2.3	0.2	1.6	1.8	0.2	3	2	-1	1.2	1.8	0.6	1.4	1.7	0.3
Knowledge	0.7	1.4	0.7	1.3	1.8	0.5	0.6	1.4	0.8	2.2	2.3	0.1	1.6	1.7	0.1	3	3	0	1	1.8	0.8	1.4	1.8	0.4
Awareness	0.9	1.1	0.2	1.5	1.7	0.2	0.4	1.2	0.8	2.2	2	-0.2	1.6	1.2	-0.4	2	2	0	1	1	0	1.5	1.5	0
Infrastructure	1	1.1	0.1	1.4	1.5	0.1	0.8	0.6	-0.2	2.1	2.2	0.1	1.8	1.4	-0.4	3	3	0	1.2	1	-0.2	1.5	1.5	0
Stakeholder participation	0.6	1.1	0.5	1	1.5	0.5	0.4	1.2	0.8	2	2.2	0.2	1.4	1.5	0.1	3	2	-1	0.4	0.8	0.4	1.2	1.5	0.3
Laws and policies	0.5	1.2	0.7	1.2	1.8	0.6	0.6	0.8	0.2	2	2.4	0.4	1.4	1.1	-0.3	3	3	0	0.8	1.2	0.4	1.2	1.6	0.4
Implementation of laws and policies	0.3	1	0.7	0.9	1.5	0.6	0.2	0.8	0.6	1.8	2.3	0.5	1	0.9	-0.1	3	3	0	0.6	0.9	0.3	0.9	1.4	0.5

Notes: This comparison is based on the country reports of 109 countries that reported for both the first and second SoWAnGRs. The date 2005 refers to the year in which the last country reports were submitted during the first reporting process (some reports were submitted as early as 2002). Scores: 0 = none; 1 = low; 2 = medium; 3 = high. In 2005, laws and policies were treated as a single category, while in 2014 they were scored separately. The 2014 scores for "laws and policies" and "implementation of laws and policies" shown in the table are averages of the scores for policies and the scores for laws. n= number of responding countries. Δ = difference in score between 2005 and 2014.

increased since 2005. However, four international organizations (AU-IBAR, IAEA, ILRI and the SAVE Foundation) report that their budgets for activities supporting AnGR-related activities have increased since the adoption of the Global Plan of Action.

6 Conclusions and priorities

In general, the conclusions drawn in the first SoW-AnGR remain valid. Without effective institutions, it is difficult to make progress in terms of strengthening AnGR management programmes. Major gaps and weaknesses in institutional frameworks still need to be addressed. The most positive development in recent years has probably been the more widespread establishment of specifically AnGR-focused structures and instruments, in particular National Focal Points (appointment of National Coordinators) and national strategies and action plans. These developments indicate that AnGR management has acquired at least a foothold on national political agendas. This is further illustrated by the large number of country reports submitted despite the short period of time available in which to prepare them. The development and strengthening of regional focal points and networks is another indicator of countries' interest in AnGR management.

While legal and policy frameworks are still reported to be far from adequate in many countries, they have been supplemented by a substantial number of new instruments over recent years (see Part 3 Section F for further discussion). However, effective implementation remains a problem for many countries. In many cases, the basic prerequisites for effective policy implementation – physical and organizational infrastructure, stakeholder participation, and knowledge and awareness of AnGR-related issues – remain weak or absent. The consequences of these weaknesses are evident in many of the areas of AnGR management discussed in the country reports. Aside from the ubiquitous lack of sufficient funding, lack of knowledge and technical skills, lack of stakeholder participation and inadequate or poorly implemented policies are among the main reported constraints to the establishment of effective AnGR management programmes in all fields from surveying and monitoring to conservation and genetic improvement.

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