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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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SYNTHESIS PROGRESS REPORT ON THE IMPLEMENTATION OF THE *GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES* - 2012

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I.   EXECUTIVE SUMMARY

This report presents an analysis of the progress made in the implementation of the *Global Plan of Action for Animal Genetic Resources* since its adoption in 2007.

The report is based on data collected via a reporting process agreed by the Commission on Genetic Resources for Food and Agriculture at its Twelfth Regular Session in 2009. To facilitate reporting at country level, the Commission endorsed the flexible use of a questionnaire prepared by FAO and requested that countries be enabled to report electronically. The details of the questionnaire were subsequently revised in consultation with a regionally balanced group of countries. In November 2012 an electronic version of the questionnaire was published on the "*Global Plan of Action* reporting system" page of the web site of FAO's Animal Production and Health Division, and countries were invited to use it to prepare Country Progress Reports. Countries were requested to submit their reports (completed questionnaires) by 29 February 2012. Information on activities at regional level was obtained by inviting Regional Focal Points and networks for animal genetic resources to complete a questionnaire on activities in their respective regions. Information on the activities of international organizations was obtained by inviting relevant organizations also to complete questionnaires.

To describe the state of implementation of the *Global Plan of Action* by countries, FAO developed a set of indicators based on the Country Progress Report questionnaire. Indicator scores were calculated for individual countries and at subregional, regional and global levels. In addition to the assessment of the state of implementation of the various elements of the *Global Plan of Action*, the impact of the *Global Plan of Action* was also assessed in terms of the extent of progress made since its adoption in 2007.

Eighty-four countries submitted Country Progress Reports on their implementation of the *Global Plan of Action*, 80 of which were submitted on time and in the correct format for inclusion in the global analysis. Reports were received from four regional focal points or networks and from eleven international organizations. All reports are available on the above mentioned web site.

Analysis of the impact of the *Global Plan of Action* at country level reveals that substantial improvements have been made since 2007. In addition, the Country Progress Reports also show that many countries had, even before the adoption of the *Global Plan of Action,* taken important steps to improve the management of their animal genetic resources. This can in part be attributed to the effects of the awareness raised during the process that led to the adoption of the *Global Plan of Action*. Many countries are in the process of preparing or endorsing national strategies and action plans for animal genetic resources. Many others regard this as a priority for the future. Once these strategies and plans start to be implemented, it can be expected that national management activities will be further strengthened. The need to intensify efforts to implement the *Global Plan of Action* is clearly indicated by the fact that in many cases where improvement to a particular aspect of animal genetic resources management at country level is required (as judged by the reporting countries themselves), no action is reported to have been taken since 2007.

The Country Progress Reports indicate that the state of implementation of the various elements of the *Global Plan of Action*, and the extent to which progress has been made since 2007, vary substantially among countries and regions, although some caution is needed in interpreting the regional figures because of the uneven coverage of the reporting. Implementation is generally at a high level in Europe and the Caucasus and North America, at a medium level in Asia, and at a low level in other regions. However, individual countries from all developing regions have reached high levels of implementation in some aspects of the *Global Plan of Action*. Likewise, some countries from developed regions have reached only low levels of implementation in some aspects. For the world as a whole, the indicator for Strategic Priority Area 4 (Policies, institutions and capacity building) shows a lower level of implementation than the indicators for the other three strategic priority areas. However, for several developing regions, it is Strategic Priority Area 3 (Conservation) that has the lowest indicator scores.

In all regions, the indicators for the state of collaboration and for the state of funding show a lower level of implementation than those for the strategic priority areas themselves. Financial constraints are also the most frequently mentioned obstacles to the implementation of the *Global Plan of Action*.

Regional Progress Reports on the state of implementation of the *Global Plan of Action* present a mixed picture. Several regions of the world do not yet have a Regional Focal Point or regional network. Activities are most advanced in Europe, the region with the longest-established Regional Focal Point, where a range of activities are reported across all the strategic priority areas of the *Global Plan of Action*. A more limited range of activities is reported by the Regional Focal Point for Latin America and the Caribbean and the Animal Genetic Resources Network – Southwest Pacific. The Sub-Regional Focal Point for West and Central Africa, launched only in June 2011, has established regional priorities for action in the various strategic priority areas of the *Global Plan of Action*.

A small number of international organizations continue to make an important contribution to the implementation of the *Global Plan of Action*, often via innovative, efficient and participatory programmes and projects. The activities of these organizations span the four strategic priority areas of the *Global Plan of Action*.

Overall, despite the significant impact of the *Global Plan of Action,* the task of improving the management of the world's animal genetic resources management remains far from complete. The reason for this lies mainly in a lack of sufficient financial resources, but also in low levels of collaboration between countries, a lack of established policies and legal frameworks, and a lack of strong institutional and human capacity for planning in the livestock sector. Decision-makers are encouraged to use the country-level indicators presented in this report as a means of identifying strategic priority areas and strategic priorities where action is particularly required.

II.   INTRODUCTION

In September 2007, the International Technical Conference on Animal Genetic Resources for Food and Agriculture, held in Interlaken, Switzerland, adopted the *Global Plan of Action for Animal Genetic Resources* and the *Interlaken Declaration on Animal Genetic Resources*[1] (*Global Plan of Action*). The *Global Plan of Action* and the *Interlaken Declaration* were subsequently endorsed by the Thirty-fourth Session of the FAO Conference.[2]

The Commission on Genetic Resources for Food and Agriculture (Commission), at its Eleventh Regular Session, agreed that follow-up to the International Technical Conference should be placed within the Commission's Multi-Year Programme of Work and that the Commission should oversee the implementation of the *Global Plan of Action*.[3] The Commission requested the development of modalities for evaluating progress in the implementation of the *Global Plan of Action.*[4]

At its Twelfth Regular Session in 2009, the Commission adopted a schedule for reporting on the implementation of the *Global Plan of Action*, which involves the preparation of Country Progress Reports by individual countries. The Commission encouraged its Members to prepare their first Country Progress Reports by 2011, and requested FAO to prepare a Synthesis Progress Report for the Commission's Fourteenth Regular Session based on the Country Progress Reports and any available Regional Progress Reports. The Commission endorsed the flexible use of a questionnaire[5] prepared by FAO to assist countries in the preparation of their Country Progress Reports, and requested FAO to enable countries to report electronically.[6] The reporting schedule also calls for the preparation of reports on the activities of international organizations in implementing the *Global Plan of Action*. The latest information received from international organizations is incorporated in this Synthesis Progress Report.

The *Global Plan of Action* includes 23 strategic priorities 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 main responsibility for implementing the *Global Plan of Action* lies with national governments.[7] However, some strategic priorities are particularly relevant to implementation at regional or international level. Table 1 illustrates the main levels at which each strategic priority is to be implemented.

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[1] ITC-AnGR/07/REP; http://www.fao.org/ag/againfo/programmes/en/genetics/ITC_docs.html
[2] CGRFA/WG-AnGR-5/09/Inf. 9; http://www.fao.org/docrep/meeting/021/am222e.pdf
[3] CGRFA-11/07/Report, paragraph 17; ftp://ftp.fao.org/docrep/fao/meeting/014/k0385e.pdf
[4] CGRFA-11/07/Report, paragraph 23; ftp://ftp.fao.org/docrep/fao/meeting/014/k0385e.pdf
[5] CGRFA-12/09/Inf.9.; ftp://ftp.fao.org/docrep/fao/meeting/017/ak225e.pdf
[6] CGRFA-12/09/Report, paragraph 38; ftp://ftp.fao.org/docrep/fao/meeting/017/k6536e.pdf
[7] *Global Plan of Action for Animal Genetic Resources*, paragraph 56.

Table 1. Priority levels of implementation of the strategic priorities[8] of the *Global Plan of Action*

GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES	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-warning and 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 & 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

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[8] SPs.

III.   PROGRESS IN THE IMPLEMENTATION OF THE GLOBAL PLAN OF ACTION AT COUNTRY LEVEL

DATA COLLECTION

As described above, the Commission, at its Twelfth Regular Session, endorsed the flexible use of a questionnaire prepared by FAO to assist countries in the preparation of Country Progress Reports, and requested FAO to enable countries also to report electronically[9]. Subsequently, the Sixth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture (Working Group) recommended that countries from various regions participate in testing the questionnaire in order to identify questions requiring clarification prior to its use by all countries.[10] In view of the Working Group's request, FAO prepared a revised version of the questionnaire in an electronic format. In October 2011, a regionally balanced group of 17 countries[11] invited were invited to review the questionnaire in terms of whether the instructions, overall structure, and individual questions were clear, unambiguous and sufficiently complete, and whether the electronic format was easy to use. The test was conducted in English, French and Spanish, and participants were invited to comment on the quality of the translations from English to French and Spanish. Ten countries provided feedback.[12] Based on the contributions received, the questionnaire and instructions were finalized.

The scope of the revised questionnaire remained largely the same as that of the template agreed by the Commission, the objective being to elicit information on the state of animal genetic resources management at national level and on countries' involvement in collaborative activities at supranational levels, with particular focus on identifying progress made since the adoption of the *Global Plan of Action* in 2007. A small number of questions (such as whether or not countries have established National Focal Points) were removed as the relevant information is already available to FAO from other sources. The finalized version consisted of 66 questions, grouped according to the strategic priority areas of the *Global Plan of Action*. Fifty-eight were multiple-choice questions, 34 of which were supplemented by text boxes that provided countries with the opportunity to enter additional information. A further eight questions allowed only for textual answers. The multiple-choice elements of the questionnaire were compulsory (except for a few questions that were not applicable to all countries). The questionnaire involved a degree of subjectivity in the sense that for many questions countries had to determine for themselves what constitutes a "sufficient", "comprehensive" or "adequate" level of implementation given their particular needs and circumstances.

In November 2011, FAO invited all countries to prepare their Country Progress Reports using the electronic questionnaire, which was made available on the "*Global Plan of Action* reporting system" page[13] of the web site of FAO's Animal Production and Health Division. Countries were requested to submit their reports by 29 February 2012. The Country Progress Reports (completed questionnaires) had to be submitted electronically, which enabled FAO to transfer the data to a database for analysis.

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[9]CGRFA-12/09/Report, paragraph 38; ftp://ftp.fao.org/docrep/fao/meeting/017/k6536e.pdf

[10]CGRFA/WG-AnGR-6/10/Report, paragraph 17; http://www.fao.org/docrep/meeting/021/k9966e.pdf

[11]Africa: South Africa, Senegal, Togo; Asia: China, Indonesia; Europe: Germany, Poland; Latin America and the Caribbean: Brazil, Colombia, Peru; Near East: Jordan, Morocco, Tunisia; North America: United Stated of America; Southwest Pacific: Australia, Papua New Guinea.

[12]Brazil, China, Germany, Norway, Peru, Poland, South Africa, Senegal, Togo, United States of America.

[13]The questionnaire was prepared using Adobe LiveCycle. This provided respondents with full control over the electronic file. Respondents required Adobe Reader to open and complete the questionnaire. Respondents were advised to save the questionnaire locally on their own computers, before completing it and submitting it to FAO. The invitation, questionnaire, instructions and reports received are published at http://www.fao.org/ag/againfo/programmes/en/genetics/Reporting_system.html

DATA ANALYSIS

Status of implementation of the *Global Plan of Action*

Based on the Country Progress Report questionnaire, indicators were developed for each of the four strategic priority areas along with one for the state of collaboration and one for the state of funding (the latter two relating to Part 3 of the *Global Plan of Action* "Implementation and financing …"). In addition to these six indicators at strategic priority area (or equivalent) level, indicators for each of the 13 strategic priorities that are to be implemented at national level (see Table 1) were also developed. In the case of Strategic Priority 1, two indicators were developed (and named SP1a and SP1b). This resulted in a total of 14 indicators at strategic priority level. A target was formulated for each indicator. The results of the current round of reporting will provide a baseline against which future progress towards the targets can be measured.

Each indicator is based on one or more of the multiple-choice questions in the Country Progress Report questionnaire. Each of these questions contributes to an indicator at strategic priority area level. However, they do not all contribute to an indicator at strategic priority level. The number of questions contributing to the various indicators is quite variable. Moreover, because of the condensed nature of the Country Progress Report questionnaire, in some cases the set of questions associated with a given indicator does not fully cover all aspects of the respective strategic priority or strategic priority area. This should be borne in mind when interpreting the indicators. An overview of the relationships between questions and indicators at strategic priority area and strategic priority levels, along with the respective targets is provided in Annex 1.

In order to calculate indicator scores, the answers to the multiple-choice questions were classified according to whether they indicate a low level of implementation (no action undertaken yet), a medium level of implementation (some action undertaken, but more required) or a high level of implementation (action completed either prior to the adoption of the *Global Plan of Action* or after). Each of these levels of implementation was assigned a score (0 for a low level of implementation, 1 for a medium level of implementation and 2 for a high level of implementation). An overall score for each indicator was obtained by calculating the arithmetic mean of the scores for all the questions assigned to the respective indicator. Scores were calculated at national, subregional, regional and global levels. Classification of countries into regions and subregions was based on the classification system used in *The State of the World's Animal Genetic Resources for Food and Agriculture*[14]. Country Progress Reports were not checked for internal consistency or for consistency with information available from other sources, but analysed as received.

For presentation purposes, indicator scores were divided into eight evenly distributed classes between the minimum score of 0 and the maximum score of 2. The eight classes are represented by eight colours – three shades of red (representing high levels of implementation), two of yellow (representing medium levels of implementation) and three of green (representing low levels of implementation). Indicator colours were chosen so as to correspond to traffic-light colours. The colours and their respective scores and levels are shown in Table 2.

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[14] http://www.fao.org/docrep/010/a1250e/a1250e00.htm;
South Sudan became an independent country after the publication of *The State of the World's Animal Genetic Resources for Food and Agriculture* in 2007. At the time, Sudan was assigned to the Near and Middle East Region. For the purposes of the present report, South Sudan is considered to be part of the Africa Region and Sudan to be part of the Near and Middle East Region.

Table 2. Colour scale used to express the indicators

Scores for colour class*	Indicator colour	Indicator level
0.00 – 0.25		Low
0.25 – 0.50		Low
0.50 – 0.75		Low
0.75 – 1.00		Medium
1.00 – 1.25		Medium
1.25 – 1.50		High
1.50 – 1.75		High
1.75 – 2.00		High

*Border values included in lower category.

Impact of the *Global Plan of Action*

In addition to the current status of implementation, the extent to which the implementation[15] of the *Global Plan of Action* has led to changes in the targeted fields of activity was also analysed. Many of the multiple-choice questions in the Country Progress Report questionnaire allowed countries to indicate whether they had implemented the respective action fully prior to the adoption of the *Global Plan of Action* 2007 (such answers were classified as "completed before"); whether they have made progress since the adoption of the *Global Plan of Action*, with the action now either fully or partially completed (such answers were classified as "progress"); or whether action has not been taken or remains in the planning stage (such answers were classified as "no progress"). For each strategic priority area, the total number of responses falling into each of the three categories was counted and the results presented as relative frequencies (percentages).

Relating process and resource indicators

A graphical method to relate resource indicators to process indicators was developed for Strategic Priority Area 1 (results are presented in Annex 4). For each subregion, the percentage of local breeds (excluding extinct breeds) with unknown risk status was plotted against the subregional process indicator score for Strategic Priority Area 1 Relationships between process and resource indicators in other strategic priority areas were not explored because the data for the relevant resource indicators is insufficiently complete.

RESULTS

Of the 85 Country Progress Reports received, 80 were analysed. The Country Progress Report from Lebanon did not follow the questionnaire template. Reports from Azerbaijan, Italy, Jamaica and Viet Nam were received after the results had been analysed. The reports from Albania, Luxembourg, Portugal, Suriname and Thailand did not respond to some of the compulsory questions. The latter reports were included in the analysis, but this means that for some questions fewer than eighty responses were available for analysis. Fifty-nine reports were received in English, 13 in French and 12 in Spanish.

FAO's records indicate that as of May 2012, 160 countries had an officially nominated National Coordinator for the Management of Animal Genetic Resources.[16]

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[15]For the purpose of the analysis, any activity undertaken after the adoption of the *Global Plan of Action* was considered to constitute implementation of the *Global Plan of Action*. No attempt was made to distinguish activities that might have occurred even if there had been no *Global Plan of Action*.

[16]http://dad.fao.org/cgi-bin/EfabisWeb.cgi?sid=-1,contacts

The geographic coverage of countries with National Coordinators appointed is almost complete. Some bigger gaps remain in Latin America and the Caribbean (e.g. Guyana, Peru and the Bolivarian Republic of Venezuela), Africa (e.g. Madagascar and South Sudan), the Near and Middle East (e.g. Afghanistan and Sudan). Madagascar and Kuwait are the only countries that submitted Country Progress Reports despite having no National Coordinator currently appointed. The relatively high level of Country Progress Report coverage in Europe and the Caucasus and Latin America and the Caribbean (particularly South America) may be attributable to the presence in these regions of well-established Regional Focal Points for Animal Genetic Resources.

Table 3 provides an overview of the regional distribution of the Country Progress Reports used in the analysis. Overall, 41 percent of countries submitted a report on time and in accordance with the agreed format. More than 60 percent of countries in Europe and the Caucasus provided such a report. Less than 30 percent of the countries of the Southwest Pacific, Asia and the Near and Middle East did so. Coverage within regions must be taken into account when interpreting the results of analyses presented below, particularly references to "a majority or a minority of countries" within a given region, and generally with regard to the Southwest Pacific and Near and Middle East regions. In the case of Asia, the country coverage is low, but a large part of the region is covered because reports were received from some big countries. Country Progress Reports are published on the "*Global Plan of Action* Reporting system" page of the FAO web site.[17]

Table 3. Overview of the regional distribution of the analysed Country Progress Reports

Regions	Number of countries that reported	Number of countries in the region	Coverage (%)
Africa	20	51	39
Asia	8	31	26
Europe and the Caucasus	30	49	61
Latin America and the Caribbean	13	33	39
Near and Middle East	4	14	29
North America	2	2	100
Southwest Pacific	3	15	20
World	80	195	41

The following paragraphs present an analysis of the answers to the individual questions in the Country Progress Report questionnaire. Results are presented graphically in Figures 1 to 66.

The questions are discussed in order of strategic priority area. Within each strategic priority area, the questions are grouped according to the strategic priority level indicator to which they contribute. Questions that contribute to the respective strategic priority area level indicator but not to a specific strategic priority indicator follow at the end each subsection. The questions from the questionnaire are used as the figure titles, and for ease of reference, the question numbers used in the questionnaire are also shown. The multiple-choice answers from the questionnaire are shortened in the figures for ease of presentation. Responses to each question are broken down by region. The number of reporting countries in each region is presented on the left side of each figure (n).

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[17]http://www.fao.org/ag/againfo/programmes/en/genetics/Reporting_system.html

Strategic priority areas, collaboration and funding

Strategic Priority Area 1: Characterization, inventory and monitoring of trends and associated risks

Long-term goal: Improved understanding of the status, trends and associated risks, and characteristics of all aspects and components of animal genetic resources, to facilitate and enable decision-making for their sustainable use, development and conservation.

SP1: Inventory and characterize animal genetic resources, monitor trends and risks associated with them, and establish country-based early-warning and response systems

Indicator SP1a: The completeness of characterization.

Figure 1. Q2 – Which of the following options best describes your country's progress in implementing phenotypic characterization studies covering morphology, performance, location, production environments and specific features in all livestock species of economic importance?
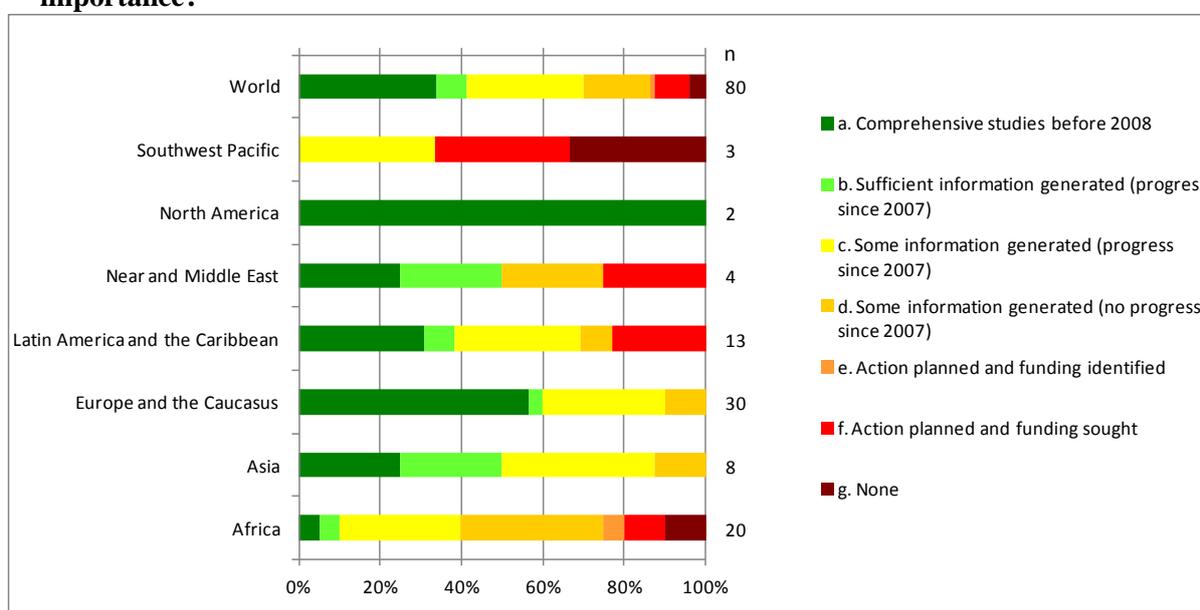
About 40 percent of reporting countries have undertaken phenotypic characterization studies covering morphology, performance, location, production environments and specific features in all livestock species of economic importance. Almost 90 percent have undertaken at least some such studies. Additional studies are, however, required in the majority of countries, particularly in Africa and the Southwest Pacific. It should also be recalled that (as noted in the report from Mongolia) even where comprehensive studies have been conducted in the past, major changes to production environments may mean that further studies are required or will be required in the future. Some countries report that phenotypic characterization work is undertaken by breeding organizations and non-governmental organizations (NGOs) for the particular breeds for which they take responsibility or by individual research organizations. Almost 40 percent of countries have made further progress in phenotypic characterization studies since the adoption of the *Global Plan of Action* (additional to the approximately 35 percent of countries that report comprehensive studies completed before 2008).

Figure 2. Q3 – Which of the following options best describes your country's progress in molecular characterization of its animal genetic resources covering all livestock species of economic importance?
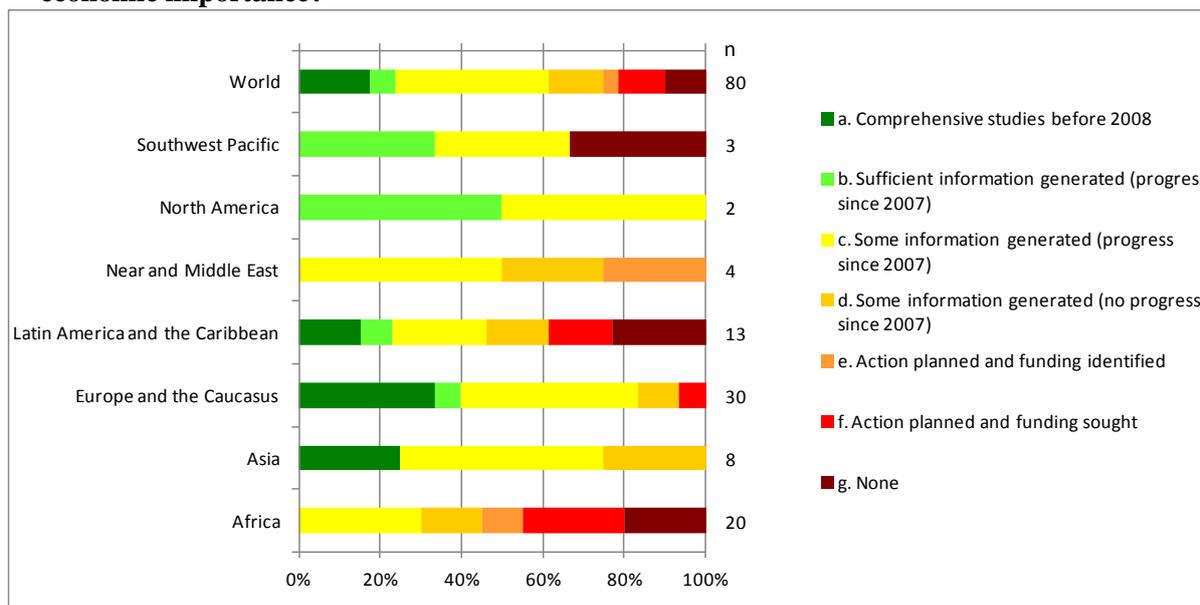
More than 20 percent of reporting countries have undertaken comprehensive molecular characterization of their animal genetic resources covering all livestock species of economic importance. More than 70 percent have undertaken some molecular studies. Molecular characterization is less well advanced in Africa than elsewhere. No countries from the region report comprehensive studies and more than 50 percent report that no molecular characterization has yet been undertaken. Almost 40 percent of countries in Latin America and the Caribbean also report no molecular characterization studies to date, although some countries from the region report comprehensive coverage. Overall, almost 50 percent of countries have generated some information from molecular studies since 2007.

Figure 3. Q10 – Is your country conducting research to develop methods, technical standards or protocols for phenotypic or molecular characterization, or breed evaluation, valuation or comparison?
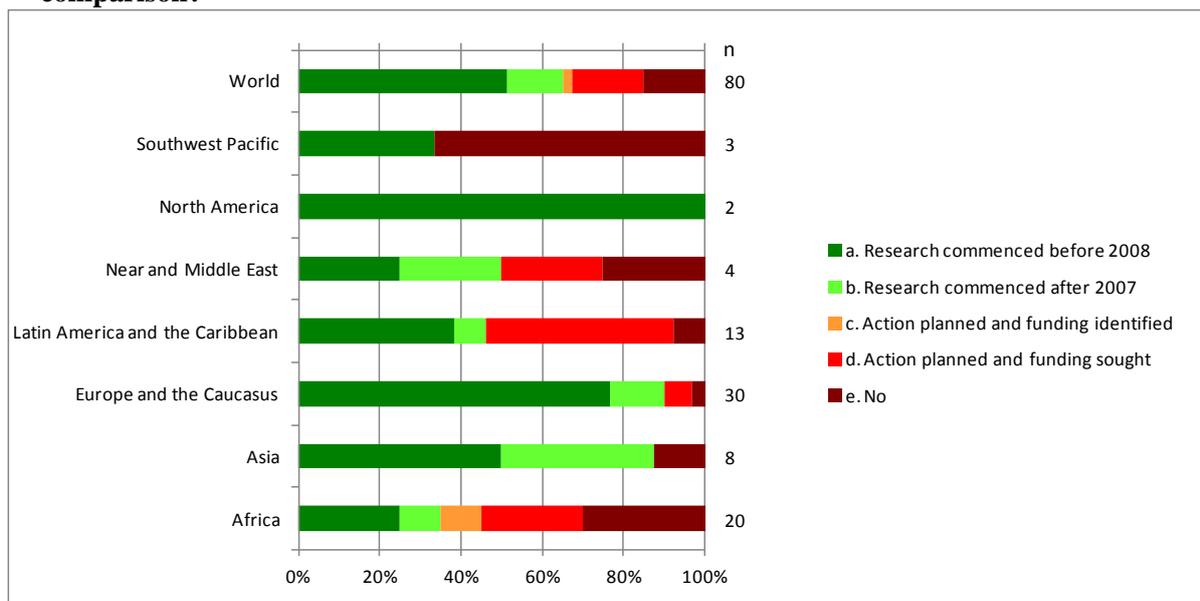
More than 60 percent of reporting countries indicate that they undertake research to develop methods, technical standards or protocols for phenotypic or molecular characterization, or breed evaluation, valuation or comparison. About 50 percent had commenced these studies before the adoption of the *Global Plan of Action*, while about 15 percent commenced their studies after 2007. Research activities in this field are most widespread in North America, Europe and the Caucasus and Asia.

Indicator SP1b: The completeness of inventory and the regularity of monitoring of trends and associated risks

Figure 4. Q1 – Which of the following options best describes your country's progress in building an inventory of its animal genetic resources covering all livestock species of economic importance?
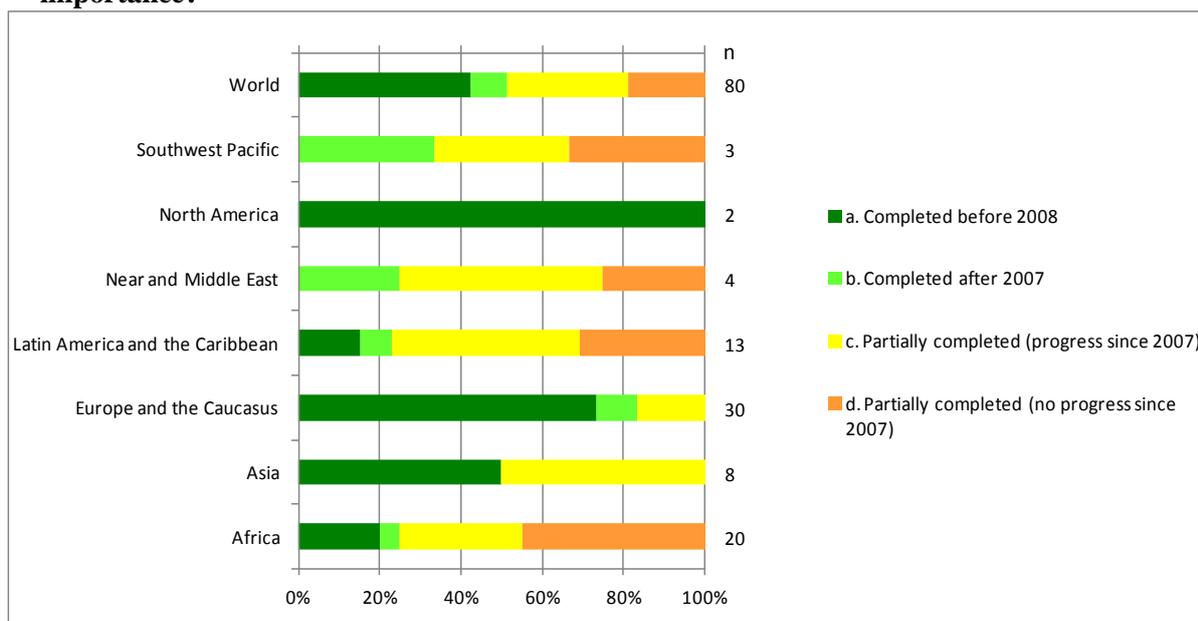
More than 40 percent of reporting countries had built an inventory of their animal genetic resources covering all livestock species of economic importance before the adoption of the *Global Plan of Action*. Among the remaining countries, a majority have either completed or made progress towards completing their inventories since 2007. However, more than 40 percent of the reporting countries from Africa and 30 percent from the Southwest Pacific and from Latin America and the Caribbean have not yet completed their inventories and have made no further progress since 2007. A number of countries report that they prepared inventories many years ago or as part of the preparation of country reports submitted during the reporting process for *The State of the World's Animal Genetic Resources for Food and Agriculture*. In some cases, countries note that existing inventories are occasionally updated, or require updating, because new breeds are imported or because new information on breed identities becomes available.

Figure 5. Q4 – Has your country conducted a baseline survey of the population status of its animal genetic resources for all livestock species of economic importance?
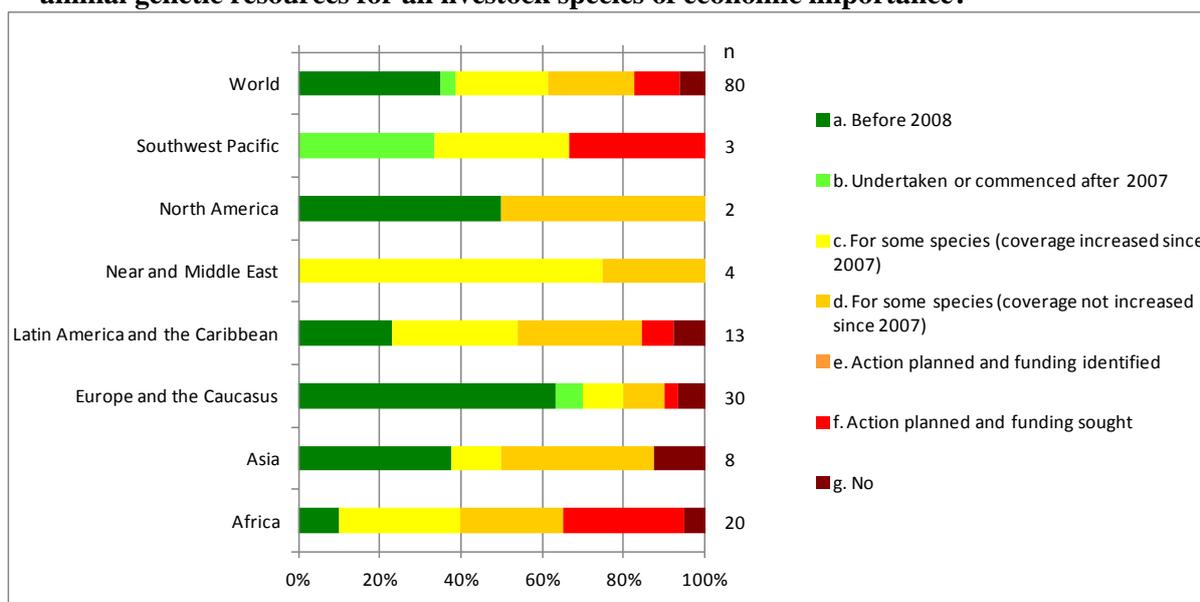
Note: Answer "e" was not selected by any country.

Close to 40 percent of responding countries have conducted a baseline survey of the population status of their animal genetic resources for all livestock species of economic importance. With the exception of the Southwest Pacific Region, very few countries have undertaken or commenced baseline surveys after 2007. Generally, for all regions except Europe and the Caucasus and North America, there is a need for substantial further efforts to complete baselines surveys. This shortfall is reflected in the many gaps that still exist in the population data entered by countries into the Domestic Animal Diversity Information System (DAD-IS)[18]. For many breeds no population data have ever been entered into the system.

Figure 6. Q5 – Have institutional responsibilities for monitoring the status of animal genetic resources in your country been established?

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[18] http://www.fao.org/dad-is/
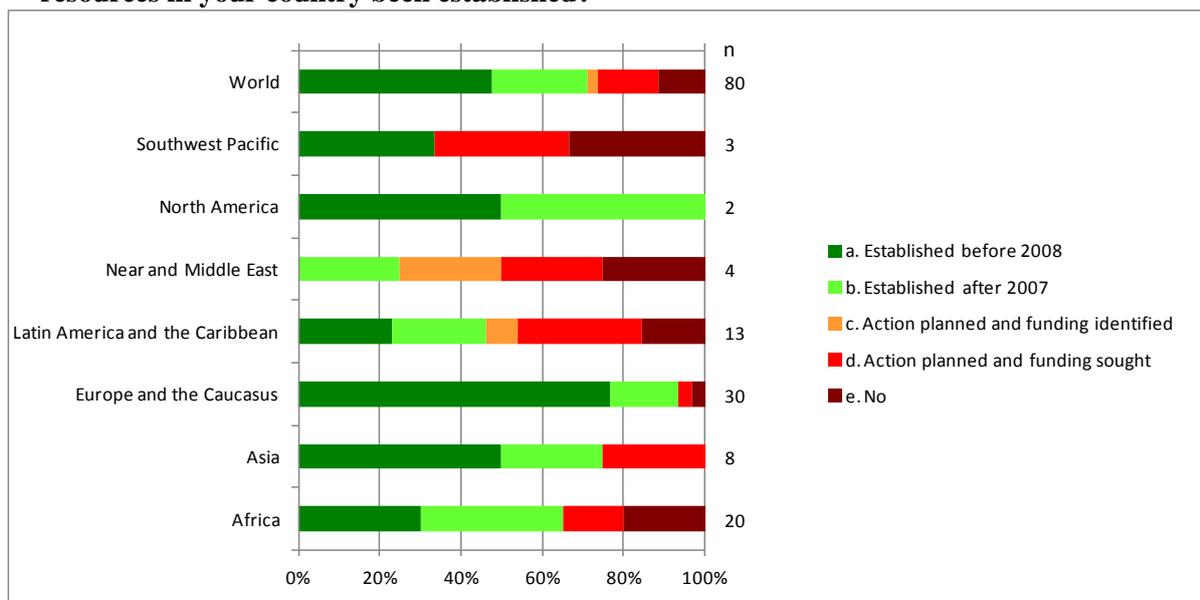
About 70 percent of responding countries have established institutional responsibilities for monitoring the status of their animal genetic resources. However, in several regions – Latin America and the Caribbean, the Near and Middle East, and the Southwest Pacific – the majority of countries have not yet established responsibilities for monitoring. A number of different institutional arrangements are reported. For example, responsibility may be given to government agencies, research institutions, breeding organizations or NGOs. In many countries different stakeholders are responsible for monitoring different species or different classes of animals. Some countries note that although responsibilities have been established, monitoring does not take place because of a shortage of funds. In other cases, organizations participate in monitoring activities without having been allocated responsibility in a formal sense.

Figure 7. Q6 – Have protocols (details of schedules, objectives and methods) been established for a programme to monitor the status of animal genetic resources in your country?
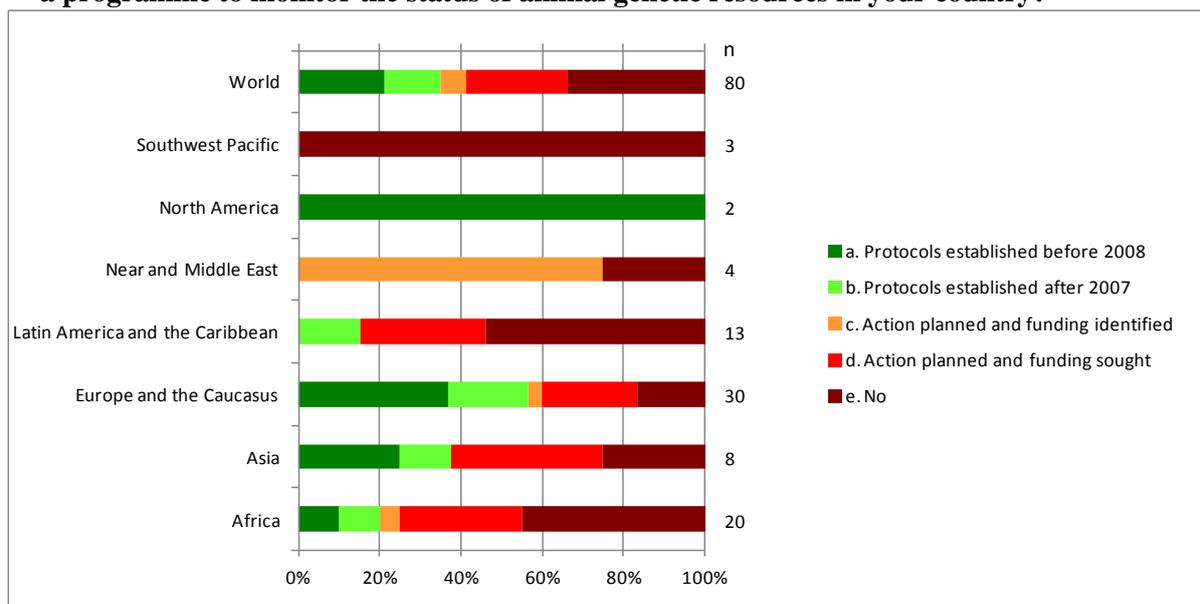
Close to 40 percent of reporting countries have established protocols (details of schedules, objectives and methods) for programmes to monitor the status of their animal genetic resources. Almost half of these countries have established their protocols after the adoption of the *Global Plan of Action*. Protocols for monitoring are particularly lacking in Africa, Latin America and the Caribbean, the Near and Middle East and the Southwest Pacific. Moreover, some countries that report that they have such protocols also indicate that they are still being developed or require further elaboration.

Figure 8. Q7 – Are the population status and trends of your country's animal genetic resources being monitored regularly for all livestock species of economic importance?
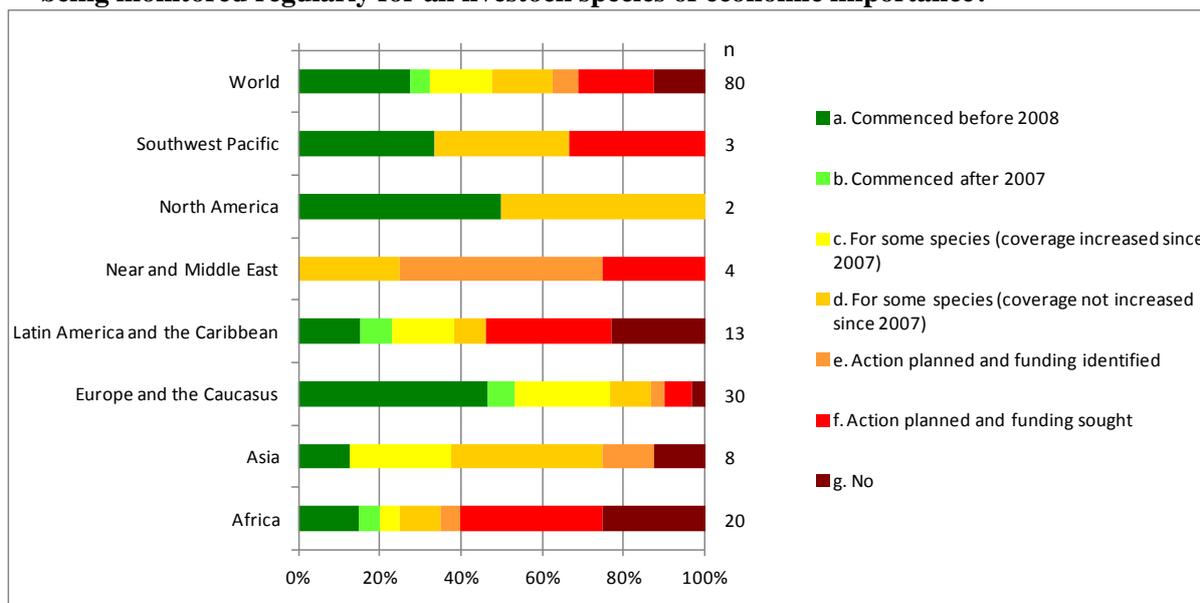
About 30 percent of reporting countries have commenced regular monitoring of the population status and trends of their animal genetic resources in all livestock species of economic importance. Progress in terms of increased coverage since 2007 is reported by about 20 percent of countries. More progress has been made in Asia, Europe and the Caucasus, and Latin America and the Caribbean than in other regions. Action is particularly required in the countries of the Near and Middle East and Africa. An interesting example is provided by Côte d'Ivoire, which reports that monitoring is combined with vaccination programmes for contagious bovine pleuropneumonia and peste des petits ruminants.

Figure 9. Q8 – Which criteria do your country use for assessing the risk status of its animal genetic resources?
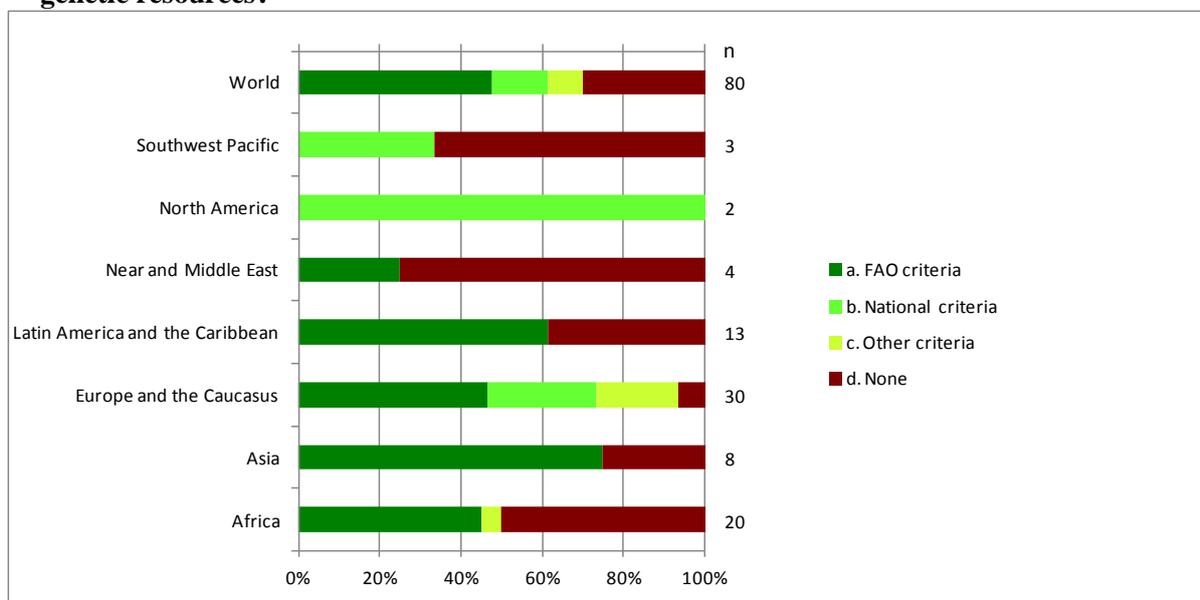
Close to 70 percent of responding countries have criteria for assessing the risk status of their animal genetic resources. FAO criteria are the most widely used. However, close to 80 percent of the countries of the Near and Middle East, more than 60 percent of the countries of the Southwest Pacific and around 50 percent of the countries of Africa do not use any criteria to assess the risk status of their animal genetic resources.

Figure 10. Q9 – Has your country established an operational emergency response system[19] that provides for immediate action to safeguard breeds at risk in all important livestock species?
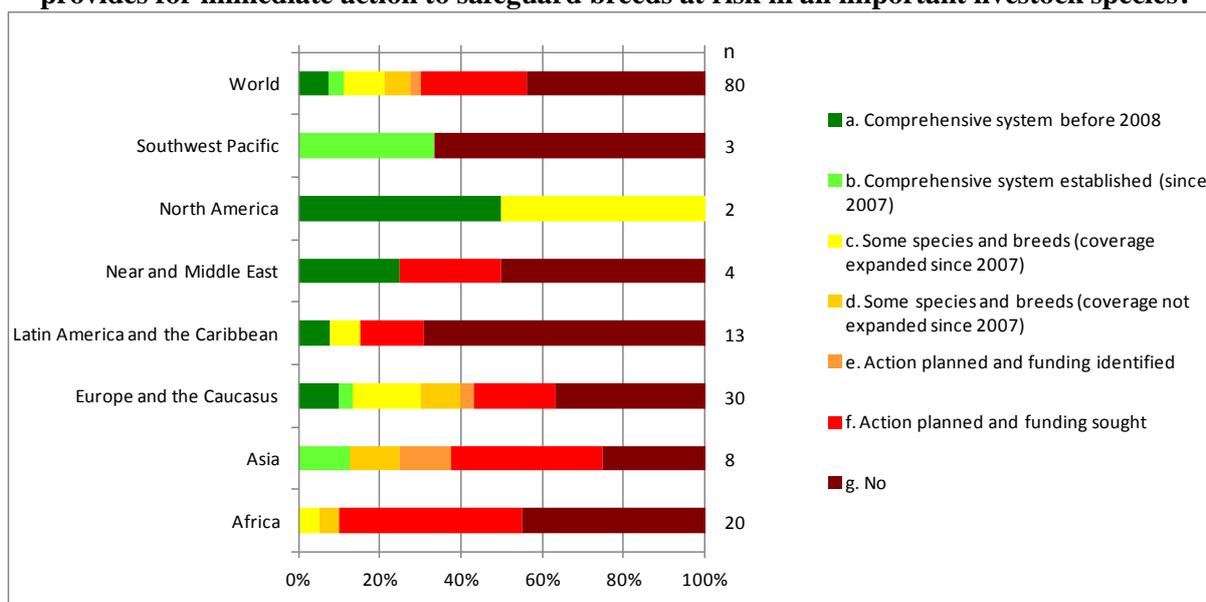
Only 10 percent of reporting countries have established an operational emergency response system that provides for immediate action to safeguard breeds at risk in all important livestock species. None of these countries are in Africa. A few countries describe organized links between monitoring programmes and action to protect breeds that are identified as being at risk. Others describe specific measures to counter specific threats such as disease outbreaks. Substantial further action is required in all regions.

Additional questions contributing to Indicator SPA1

Figure 11. Q11 – Has your country identified the major barriers and obstacles to enhancing its inventory, characterization and monitoring programmes?
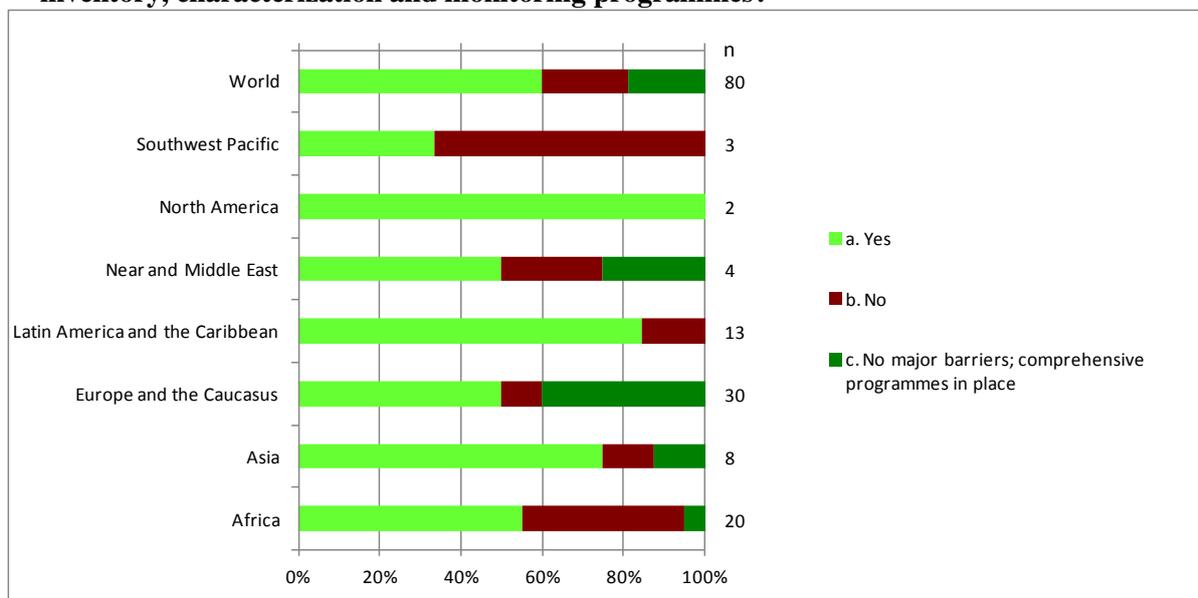
In nearly 20 percent of reporting countries no major barriers or obstacles have been identified because comprehensive characterization and monitoring programmes are already in place. In another 60 percent of countries barriers have been identified. However, 20 percent of countries have not yet

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[19]CGRFA/WG-AnGR-5/09/4; http://www.fao.org/docrep/meeting/021/K3812e.pdf

identified barriers. This lack of information and analysis is particularly prevalent in countries of the Southwest Pacific, Africa, and the Near and Middle East.

The most frequently mentioned barriers and obstacles to the improvement of programmes for the inventory, characterization and monitoring of animal genetic resources are lack of financial, technical and human capacity. Also mentioned by several countries are lack of awareness of the relevance of such activities on the part of livestock keepers and other stakeholders. Several countries mention practical constraints associated with the large size of the country, location of livestock in remote areas or on small farms, variable climate or changing production systems. Other reported problems include lack of coordination among stakeholders, lack of livestock keepers' groups or associations, difficulties in obtaining data from commercial operators, lack of policy and legislative frameworks, legal restrictions on access to data, and problems in defining concepts such as the breed. Several reports note with regret that national censuses and surveys are not broken down by breed. Others describe the lack, or limited scope, of animal identification and recording programmes.

Figure 12. Q57.1 – Are there any national NGOs active in your country in the field of characterization?
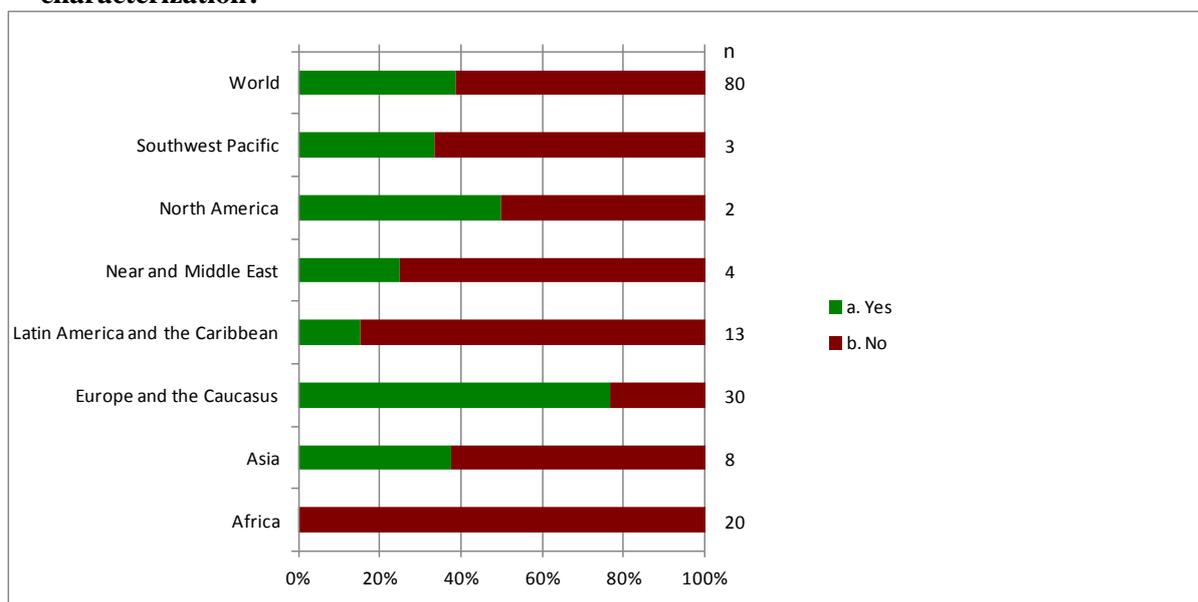
Close to 40 percent of responding countries indicate that national NGOs are active in the field of characterization. This is the case in close to 80 percent of the countries of Europe and the Caucasus and close to 40 percent of the countries of Asia. In contrast, not one African country reports that it has any national NGOs active in the field of characterization.

Strategic Priority Area 2: Sustainable use and development

Long-term goal: Enhanced sustainable use and development of animal genetic resources in all relevant production systems, as a key contribution to achieving sustainable development, poverty eradication and adaptation to the effects of climate change.

SP3: Establish and strengthen national sustainable use policies

Indicator SP3: The state of national sustainable use policies

Figure 13. Q14 – Does your country have adequate national policies in place to promote the sustainable use of animal genetic resources[20]?
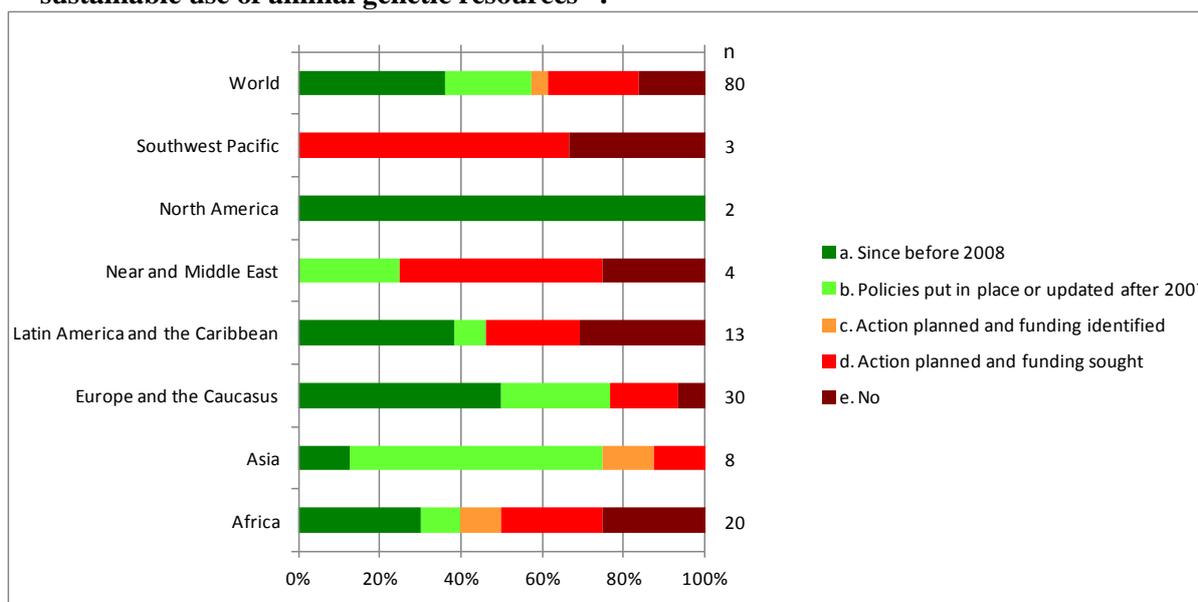
More than half of the reporting countries state that they have adequate national policies in place to promote the sustainable use of their animal genetic resources. In about 60 percent of countries in Asia, this advanced state has been reached thanks to developments since the adoption of the *Global Plan of Action*. Many countries, however, still need establish or strengthen their policies. This is particularly the case in the Southwest Pacific, the Near and Middle East, and Africa.

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[20] see also questions 46 and 54.

Figure 14. Q23 – Has your country developed agreements for equitable sharing of the benefits resulting from access to, and use and development of, animal genetic resources and associated traditional knowledge?
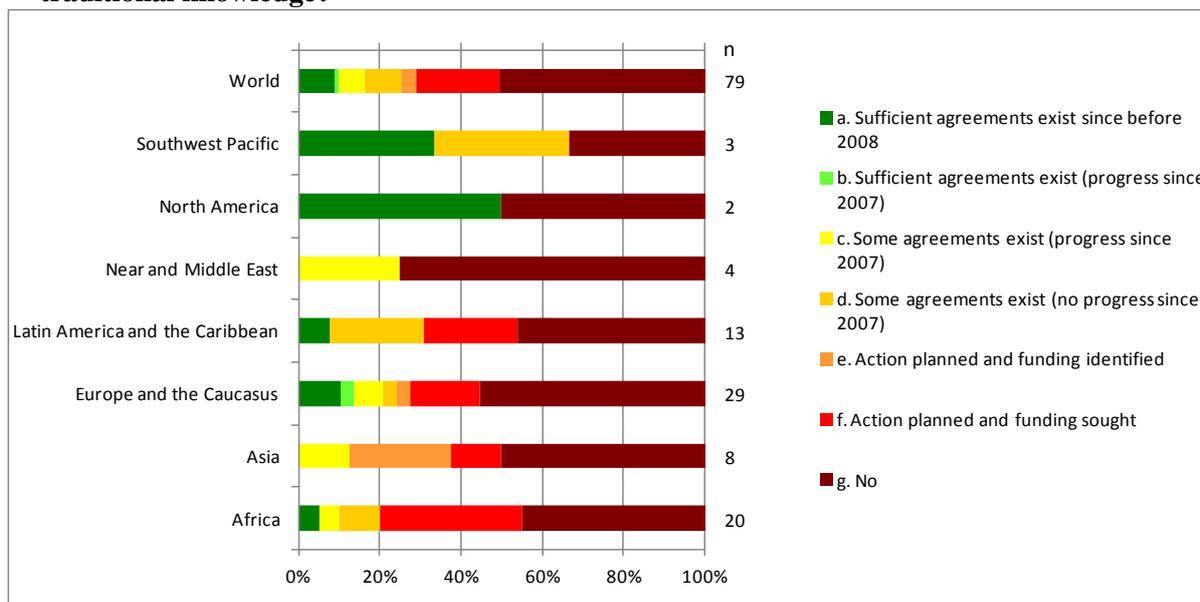
Across the world as a whole, the percentage of reporting countries that have developed any agreements for equitable sharing of benefits resulting from access to and use and development of animal genetic resources and associated traditional knowledge is quite low (about 25 percent). Even fewer countries (about 10 percent) regard these agreements as sufficient. Some countries, however, consider that the issue is sufficiently addressed by private arrangements between buyer and seller, and hence require no specific policy or legal measures on the part of the state.

SP4: Establish national species and breed development strategies and programmes

Indicator SP4: The state of national species and breed development strategies and programmes

Figure 15. Q16 – Are breed development programmes revised, for all major species and breeds in your country, with the aim of meeting foreseeable economic and social needs and market demands?
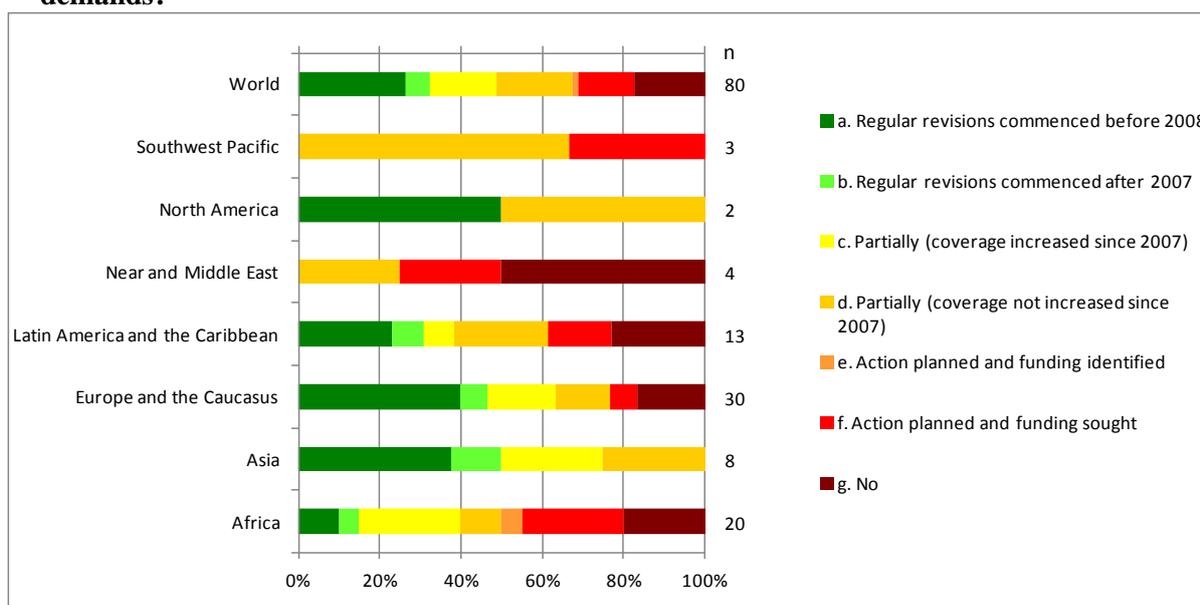
In more than 30 percent of reporting countries, breed development programmes are regularly revised for all major species and breeds. A larger proportion of countries report regular revisions in some species. More than 20 percent of countries report progress in terms of increased coverage since the adoption of the *Global Plan of Action*. However, coverage needs to be increased in all regions. Breeders' organizations are the most frequently mentioned players in the development, revision and implementation of breeding programmes.

Figure 16. Q17 – Is long-term sustainable use planning – including, if appropriate, strategic breeding programmes – in place for all major livestock species and breeds?
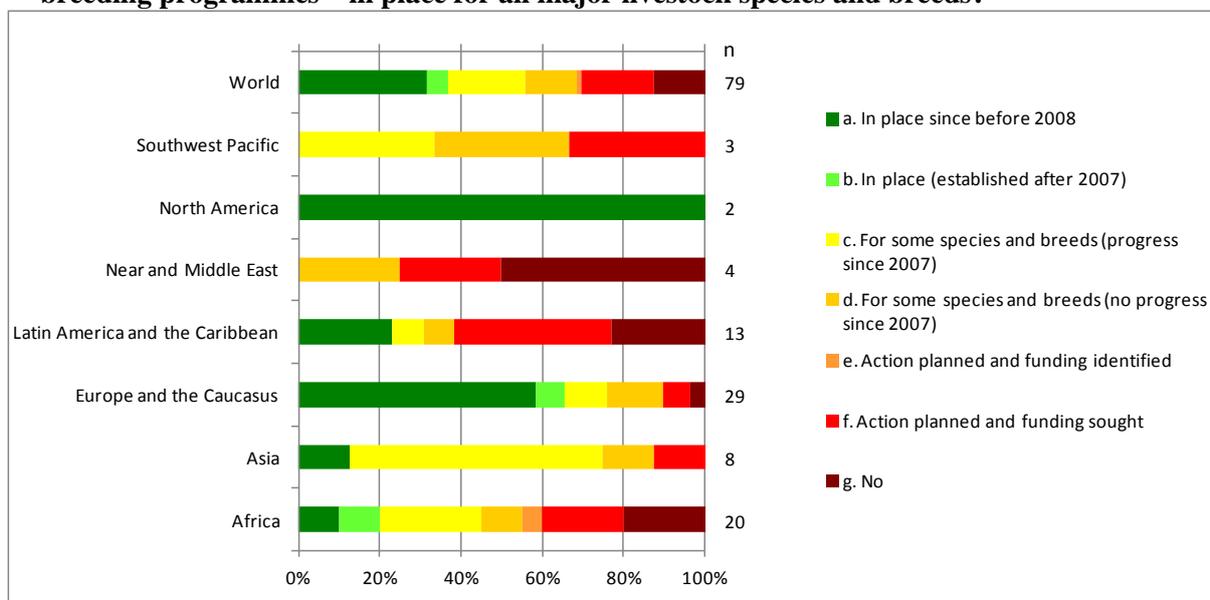
Long-term sustainable use planning is in place for all major livestock species and breeds in more than 35 percent of reporting countries. A similar proportion of countries have such plans in place for some species. Considerable progress since 2007 is reported in some regions such as Africa and particularly Asia. However, a substantial number of countries report that they have no such plans in place for any species.

Figure 17. Q19 – Have the long-term impacts of the use of exotic breeds on local breeds (e.g. economic, environmental or genetic impacts) and on food security been assessed in your country?
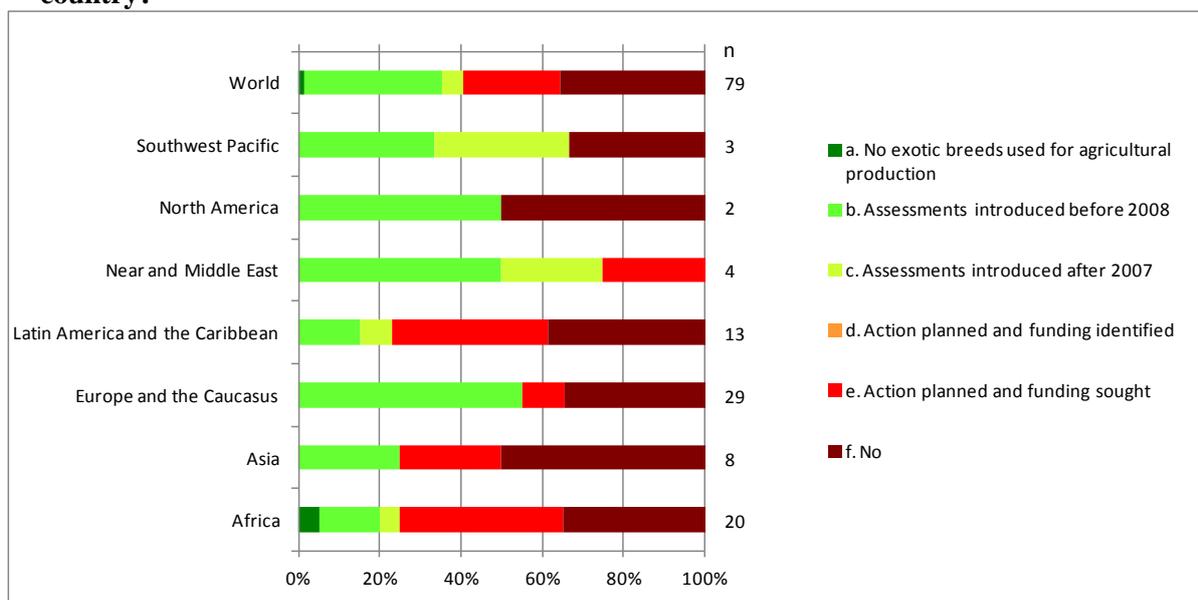
Note: Answer "d" was not selected by any country.

Assessments of the impact of introducing exotic breeds have been undertaken in less than 40 percent of reporting countries. Such assessments are particularly lacking in Africa, Asia, and Latin America and the Caribbean. Little additional progress has been made since 2007.

A few countries describe structured arrangements for assessing the potential impact of exotic genetic resources prior to their importation. Several countries note that the introduction of exotic genetic resources has in the past or is currently having an adverse effect on genetic diversity. Some countries describe cases in which importations were unsuccessful because of the poor adaptation of the exotic breeds to local conditions.

Figure 18. Q20 – Have recording systems and organizational structures for breeding programmes been established or strengthened?
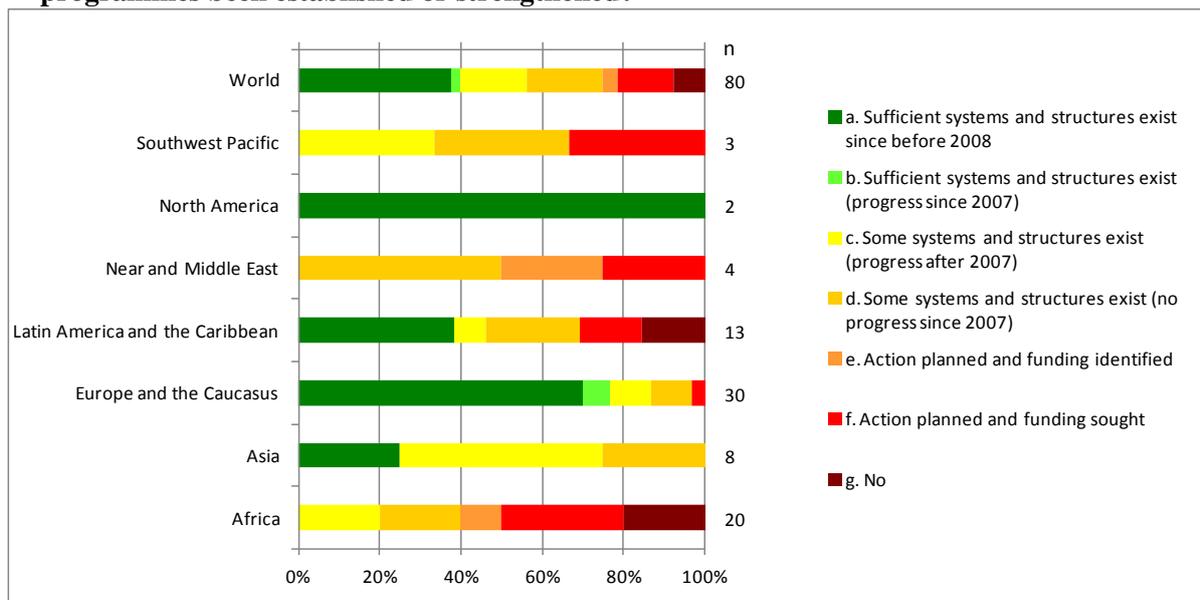
About 40 percent of reporting countries consider that they have sufficient recording systems and organizational structures in place for their breeding programmes. However, further progress is required in a large majority of countries outside Europe and the Caucasus and North America. About 20 percent of countries indicate that they have made progress since 2007. The figure is higher (about 50 percent) in Asia than in other regions.

Figure 19. Q22 – Have measures been implemented in your country to provide farmers and livestock keepers with information that facilitates their access to animal genetic resources?
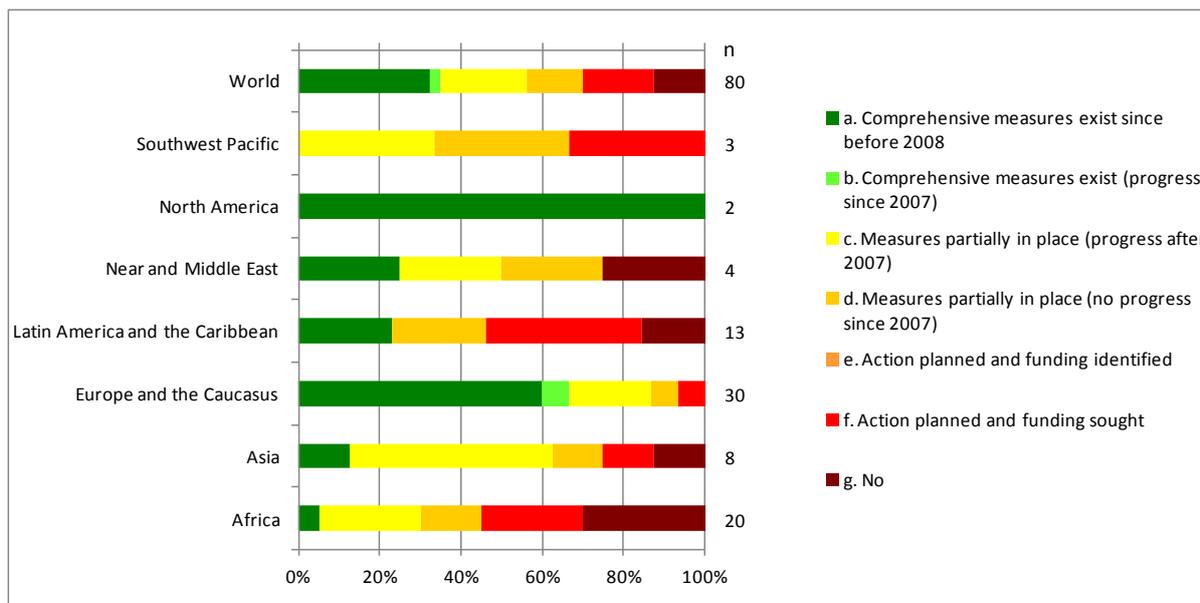
Note: Answer "e" was not selected by any country.

About 35 percent of reporting countries have comprehensive measures in place for providing farmers and livestock keepers with information that facilitates their access to genetic resources. However, about 30 percent of countries – and more than 50 percent in Africa and Latin America and the Caribbean – report that they have no such measures in place. More than 20 percent of countries report that they have made progress since 2007.

Figure 20. Q24 – Have training and technical support programmes for the breeding activities of livestock-keeping communities been established or strengthened in your country?
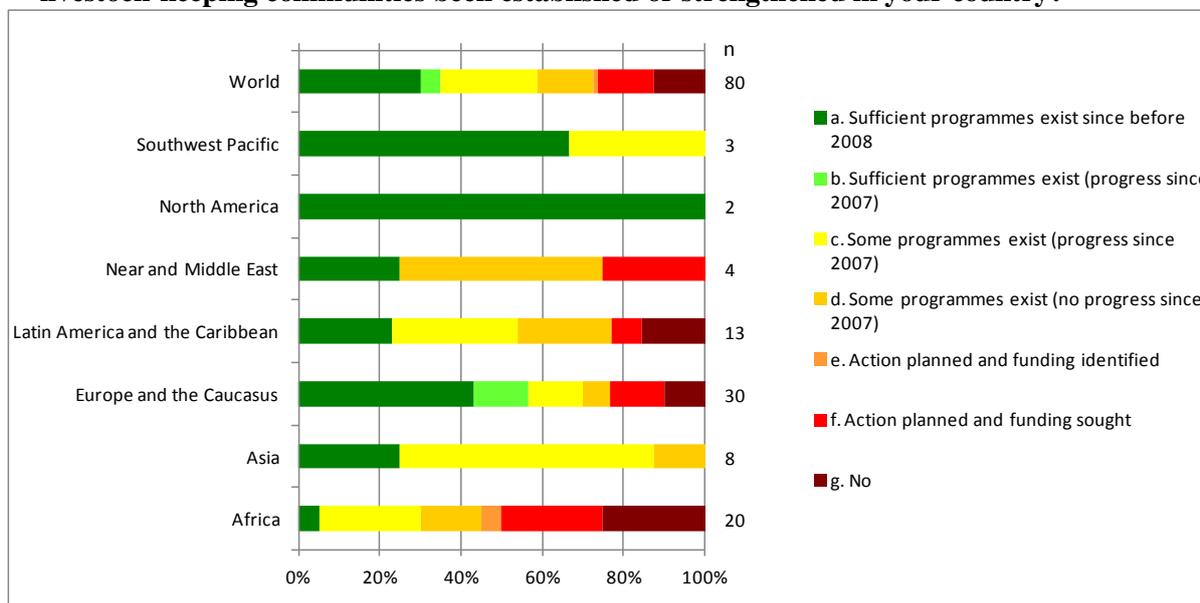
About 35 percent of reporting countries indicate that they have sufficient training and technical support programmes for the breeding activities of livestock-keeping communities in place. More than 70 percent have some programmes of this type. Coverage is, however, uneven. For example, more than half the reporting countries in Africa indicate that they have no such programmes. About 25 percent of countries report that they have made progress since 2007.

Figure 21. Q25 – Have priorities for future technical training and support programmes to enhance the use and development of animal genetic resources in your country been identified?
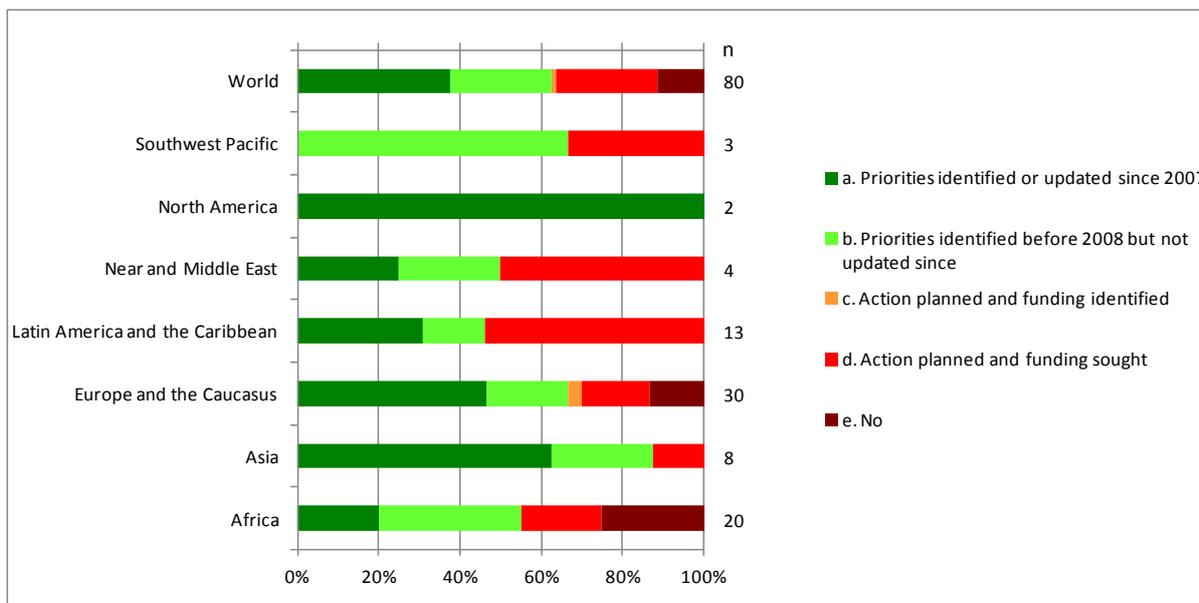
More than 60 percent of reporting countries have identified priorities for training and support programmes to enhance the use and development of animal genetic resources. Almost 40 percent have identified or updated priorities since 2007.

SP5: *Promote agro-ecosystems approaches to the management of animal genetic resources*

Indicator SP5: The state of efforts to promote agro-ecosystems approaches to the management of animal genetic resources

Figure 22. Q15 – Do these policies[21] address the integration of agro-ecosystem approaches into the management of animal genetic resources in your country[22]?

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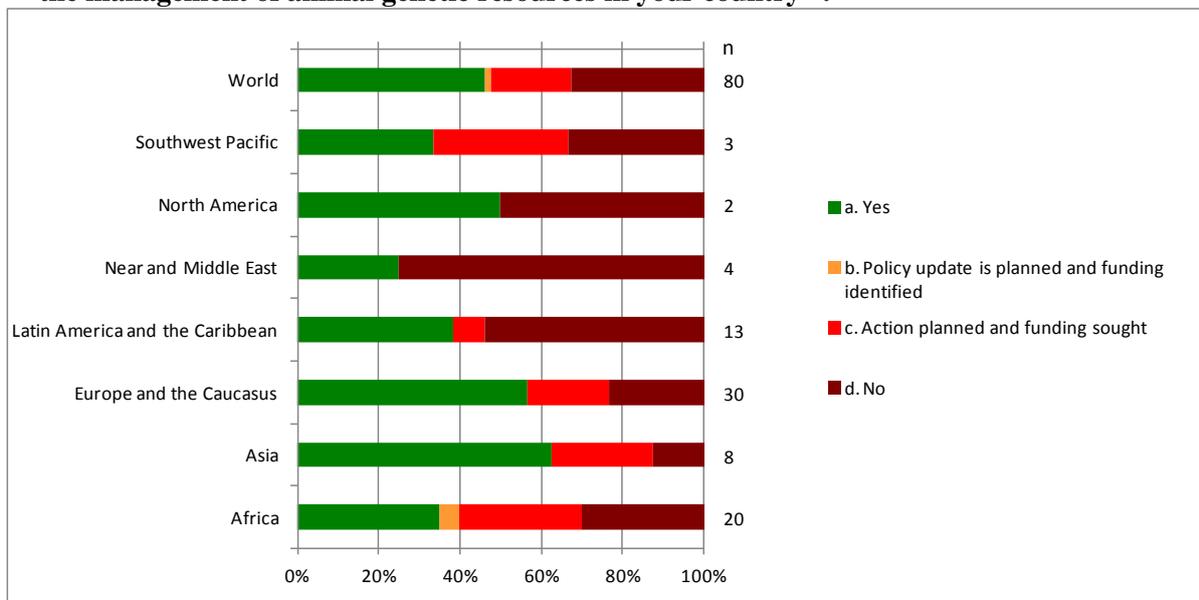
[21] see Q 14: adequate national policies in place to promote the sustainable use of animal genetic resources.
[22] see also questions 46 and 54.

Almost 50 percent of reporting countries have policies that address the integration of the agro-ecosystem approach into the management of their animal genetic resources. Among the remaining countries most have no plans to integrate agro-ecosystem approaches into their policies.

Figure 23. Q21 – Are mechanisms in place in your country to facilitate interactions among stakeholders, scientific disciplines and sectors as part of sustainable use development planning?
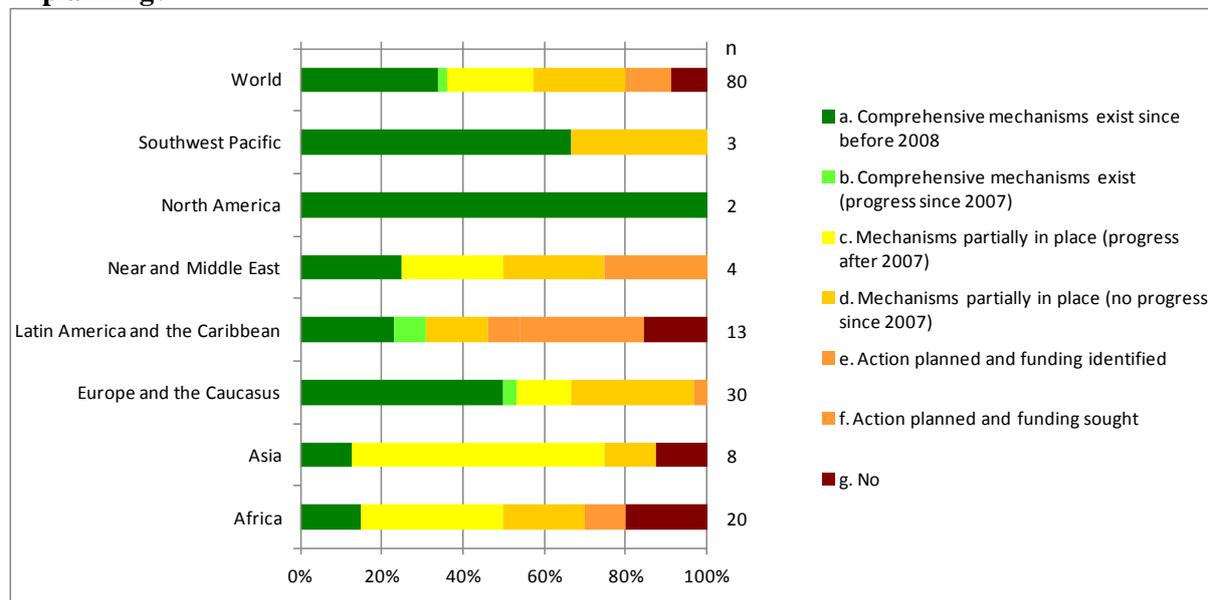
More than 35 percent of reporting countries have comprehensive mechanisms in place to facilitate interactions among stakeholders as part of sustainable use planning for animal genetic resources; 80 percent of countries have at least some such mechanisms in place. However, more than half the countries in Latin America and the Caribbean indicate that they do not yet have any such mechanisms in place, although many countries from this region report that they are planning action and have identified funding for this purpose. More than 20 percent of all reporting countries indicate that they have made progress since 2007. The figure is particularly high in Asia.

SP6: Support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources

Indicator SP6: The state of efforts to support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources

Figure 24. Q26 – Have efforts been made in your country to assess and support indigenous or local production systems and associated traditional knowledge and practices related to animal genetic resources?
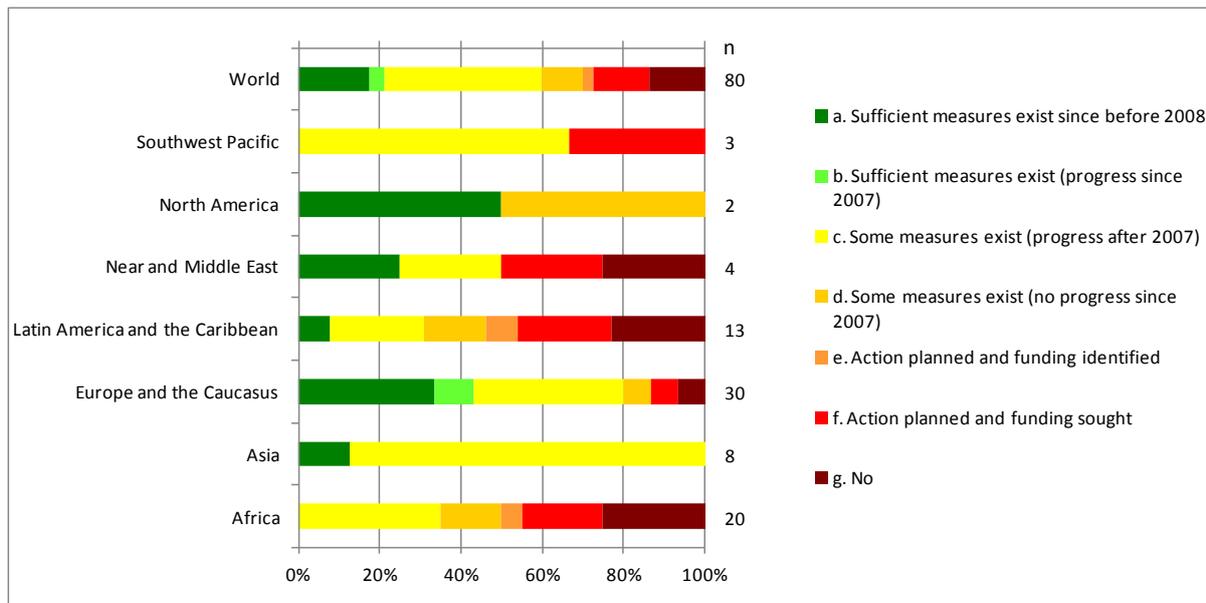
Only about 20 percent of reporting countries consider that they have put sufficient measures in place to assess and support indigenous or local production systems and associated traditional knowledge and practices related to animal genetic resources. A further 50 percent, approximately, have some measures in place. The regions with the largest shortfalls in this field of action are Latin America and the Caribbean, the Near and Middle East, and Africa. More than 40 percent of countries indicate that they have made progress since 2007; this includes all reporting countries from Asia that did not already have sufficient measures in place before the adoption of the *Global Plan of Action*.

Figure 25. Q27 – Have efforts been made in your country to promote products derived from indigenous and local species and breeds, and facilitate access to markets?
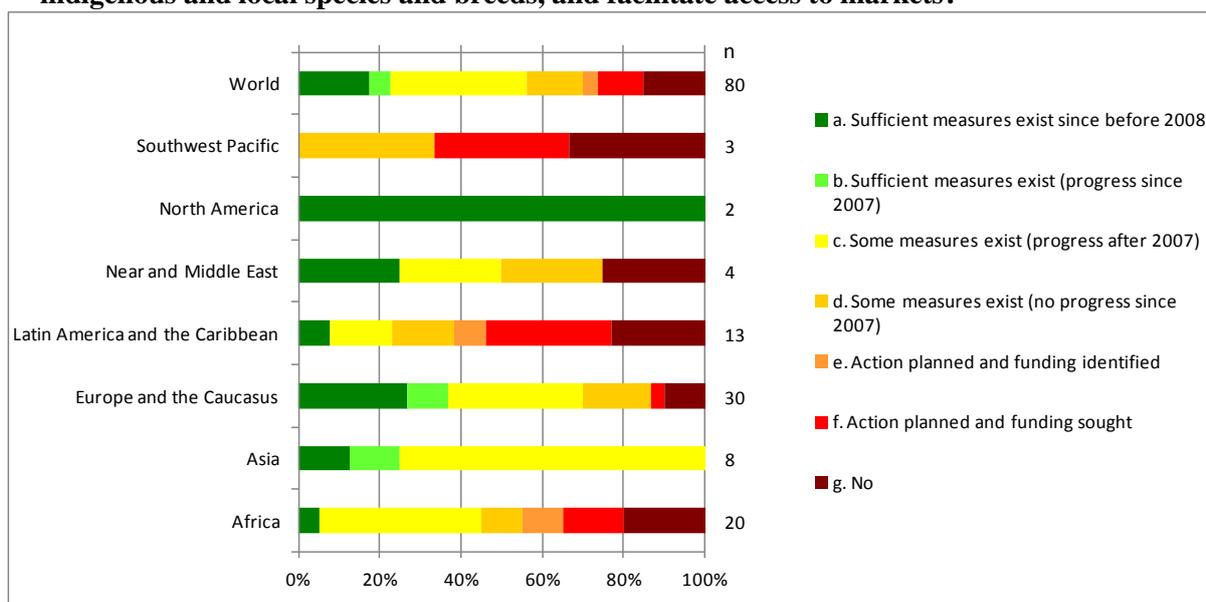
Only about 20 percent of reporting countries consider that their measures to promote products derived from indigenous and local species and breeds and promote access to markets are sufficient. Another 50 percent of countries, approximately, have implemented some measures of this type. Regions in which such measures are not widespread include Latin America and the Caribbean, the Southwest Pacific and Africa. About 40 percent of countries report progress since 2007. Progress since the adoption of the *Global Plan of Action*, has been quite substantial in all regions except the Southwest Pacific (and North America, where sufficient measures were already in place). In Asia, almost 90 percent of countries report progress since 2007.

Additional questions contributing to Indicator SPA2

Figure 26. Q18 – Have the major barriers and obstacles to enhancing the sustainable use and development of animal genetic resources in your country been identified?
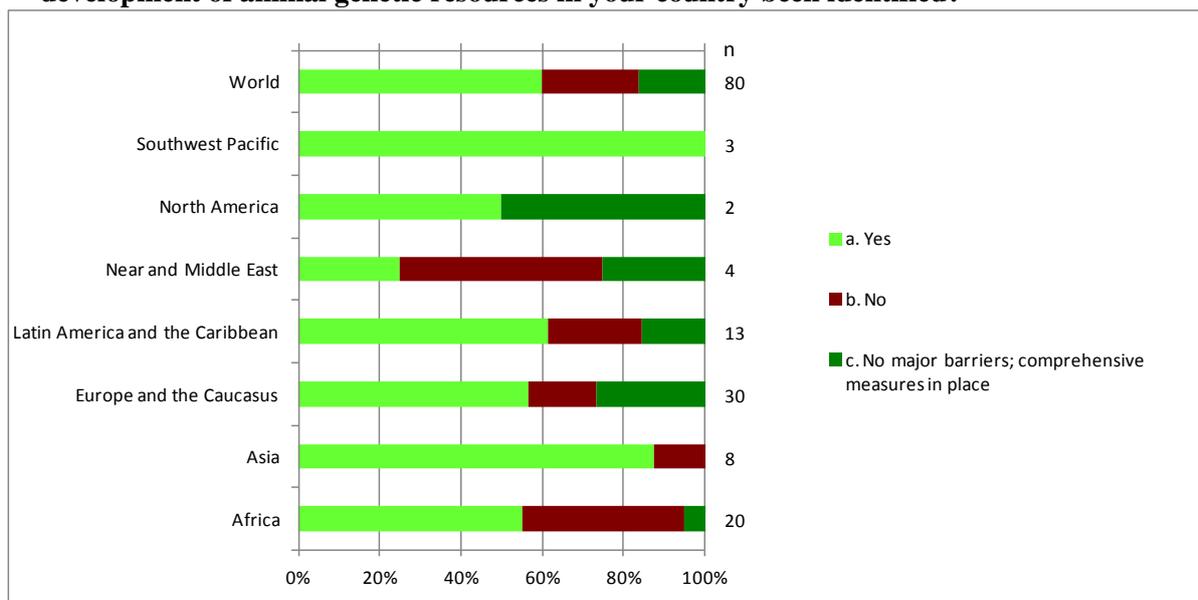
About 60 percent of reporting countries have identified the major barriers and obstacles to enhancing the sustainable use and development of their animal genetic resources. The regions with the largest

proportions of countries not having undertaken such assessments are the Near and Middle East, and Africa.

The most frequently mentioned constraint is a lack of financial resources. Many countries mention a lack of coordinated national policies or plans for animal genetic resources management. Lack of the necessary technical and human resources is also cited relatively frequently. As well as such general constraints to the implementation of measures to promote sustainable use and development, many specific problems associated with animal genetic resources management and livestock production are also reported. Problems with marketing are among the most frequently mentioned. Several countries also mention that short-term objectives lead to a preference for exotic breeds and thereby threaten the sustainable use of locally adapted breeds.

Figure 27. Q57.2 – Are there any national NGOs active in your country in the field of sustainable use and development?
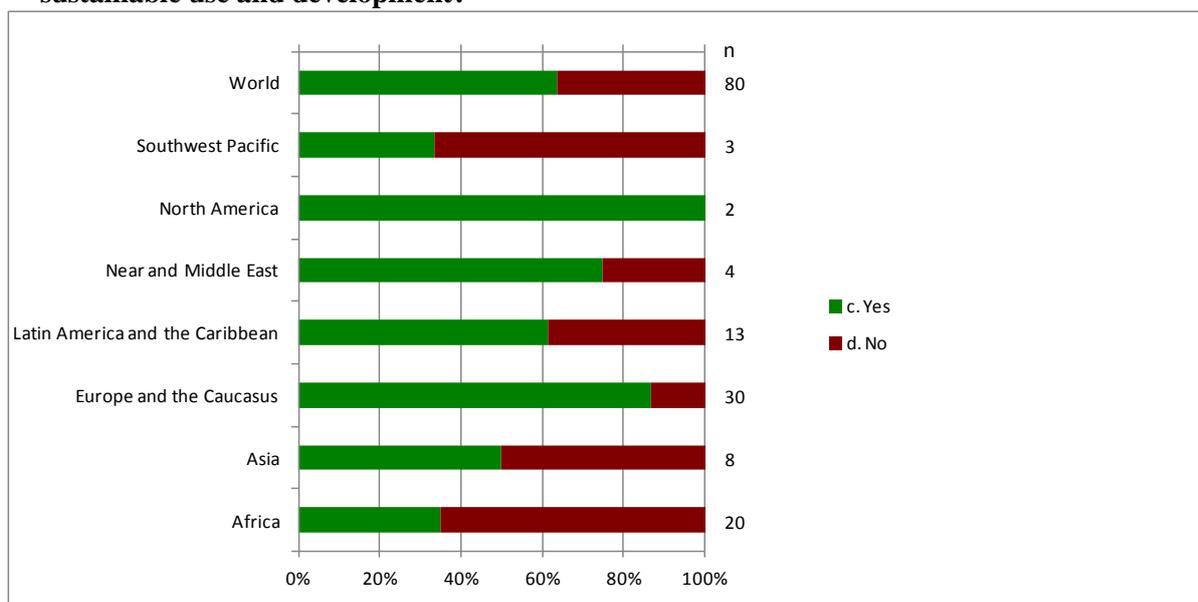
More than 60 percent of reporting countries have national NGOs that are active in the field of sustainable use and development of animal genetic resources. However, a majority of countries in the Southwest Pacific and Africa have no national NGOs active in this field.

Strategic Priority Area 3: Conservation

Long-term goal: Secure the diversity and integrity of the genetic base of animal genetic resources by better implementing and harmonizing measures to conserve these resources, both *in situ* and *ex situ*, including in the context of emergencies and disasters.

SP7: Establish national conservation policies

Indicator SP7: The state of national conservation policies

Figure 28. Q32 – Does your country have conservation policies and programmes in place to protect breeds at risk in all important livestock species?
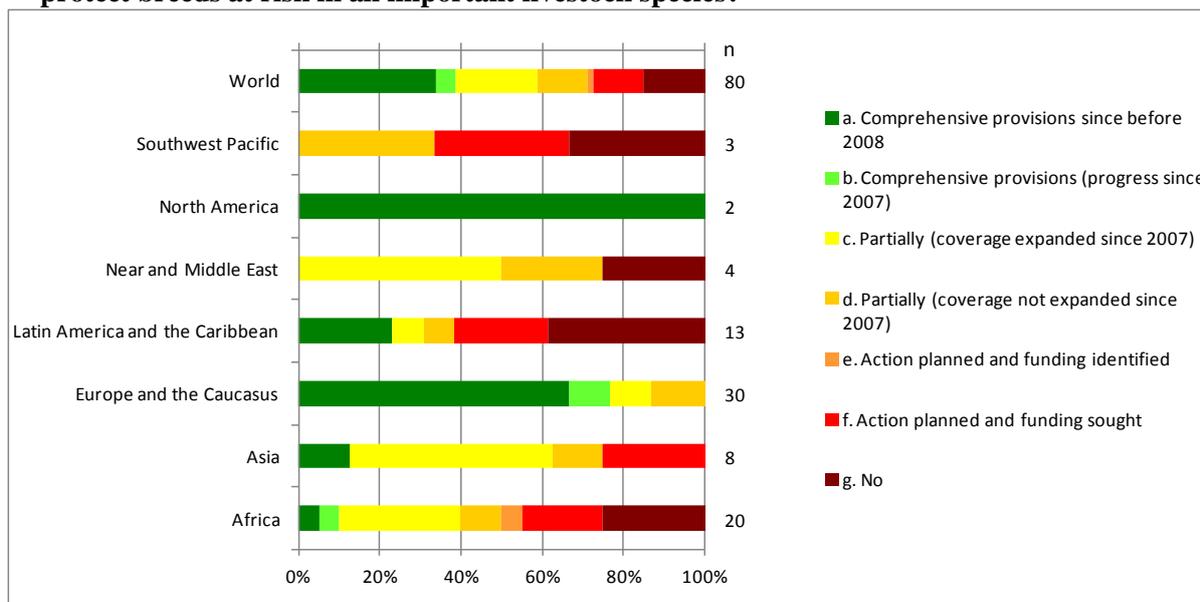
Almost 40 percent of reporting countries consider that they have comprehensive conservation policies and programmes in place to protect breeds at risk in all important livestock species. A further 30 percent, approximately, have some such programmes in place. However, coverage is uneven. In some regions – most notably in the Southwest Pacific, Latin America and the Caribbean, the Near and Middle East, and Africa – a large proportion of countries have no provisions in place. About 25 percent of countries report progress since 2007. As many countries in the developed regions of the world already had comprehensive programmes in place before the adoption of the *Global Plan of Action*, progress is most frequently reported by the countries of Asia, the Near and Middle East, and Africa. The reported state of progress in Latin America and the Caribbean, and the Southwest Pacific is less encouraging.

The following question is not considered in the calculation of the indicator because it was only addressed to a subset of countries.

Figure 29. Q33 – If conservation policies and programmes are in place, are they regularly evaluated or reviewed?
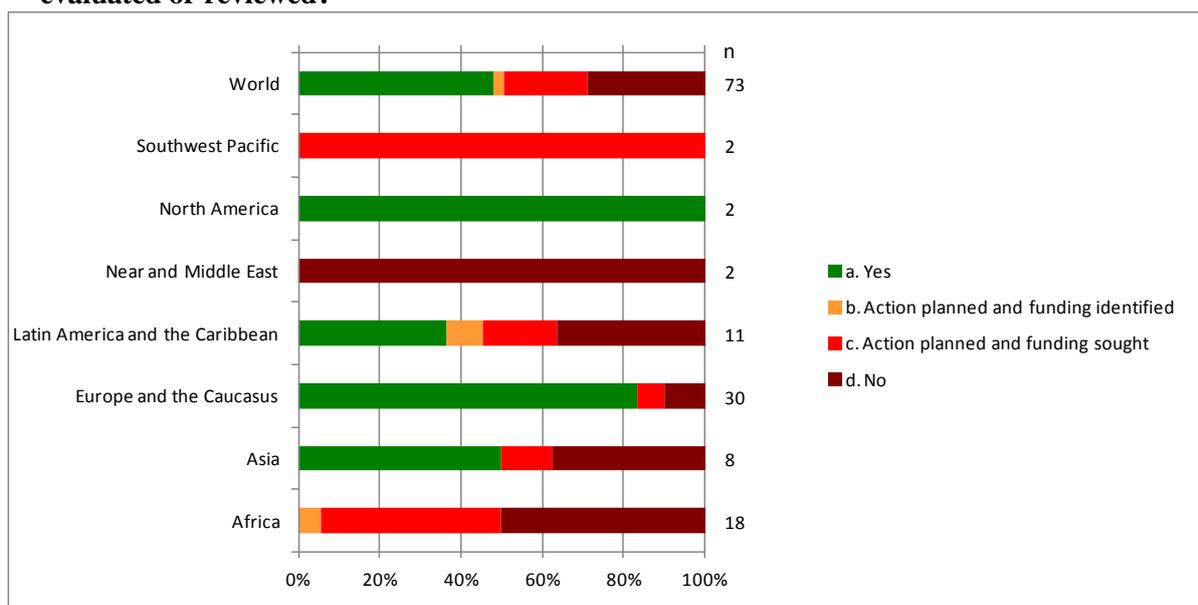
In almost 50 percent of reporting countries that have conservation programmes, the programmes are evaluated or reviewed regularly. Regular evaluations and revisions are, however, rare in a number of regions, particularly Africa and the Southwest Pacific.

SP8: Establish or strengthen in situ conservation programmes

Indicator SP8: The state of in situ conservation programmes

Figure 30. Q34.1 – Are *in situ* measures are being used in your country to conserve breeds at risk of extinction and to prevent breeds from becoming at risk?
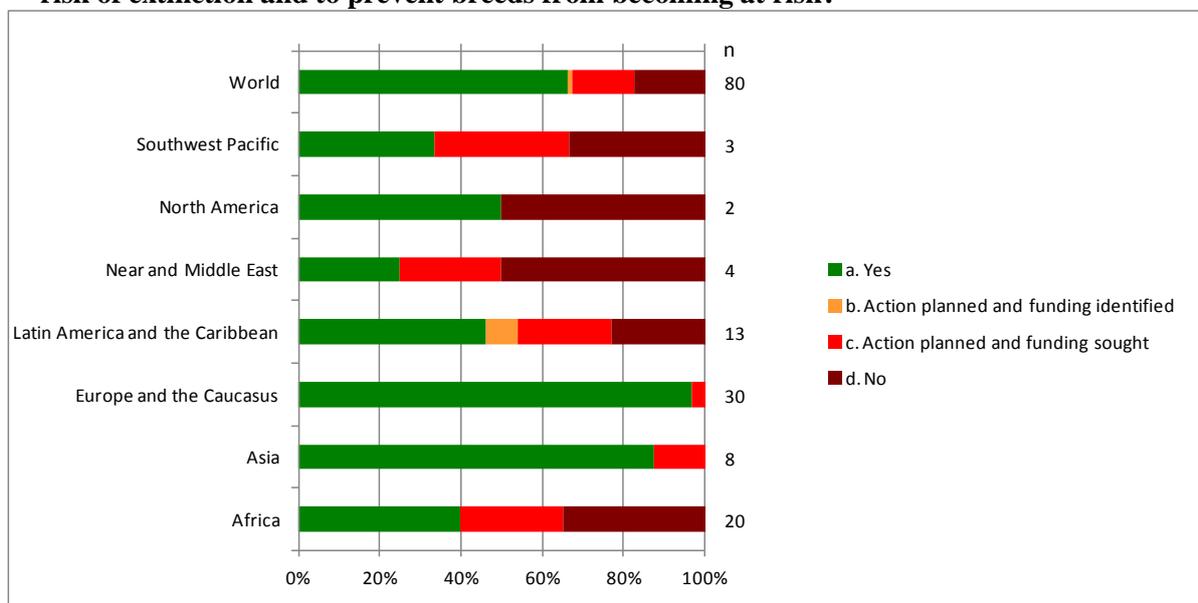
In situ conservation measures for animal genetic resources are in place in more than 60 percent of reporting countries. However, a majority of countries in the Near and Middle East, the Southwest Pacific, Latin America and the Caribbean, and Africa have no measures of this type. *In situ* conservation measures are most widespread in Europe and the Caucasus; many countries from this region report that financial support is provided to keepers of breeds at risk. Other conservation measures mentioned by countries from various regions include state-run conservation or breeding

farms, support for marketing or breeding programmes, and various measures to support the sustainability of livestock production systems.

SP9: Establish or strengthen ex situ conservation programmes

Indicator SP9: The state of ex situ conservation programmes

Figure 31. Q34.2 – Are *ex situ in vivo* measures are being used in your country to conserve breeds at risk of extinction and to prevent breeds from becoming at risk?
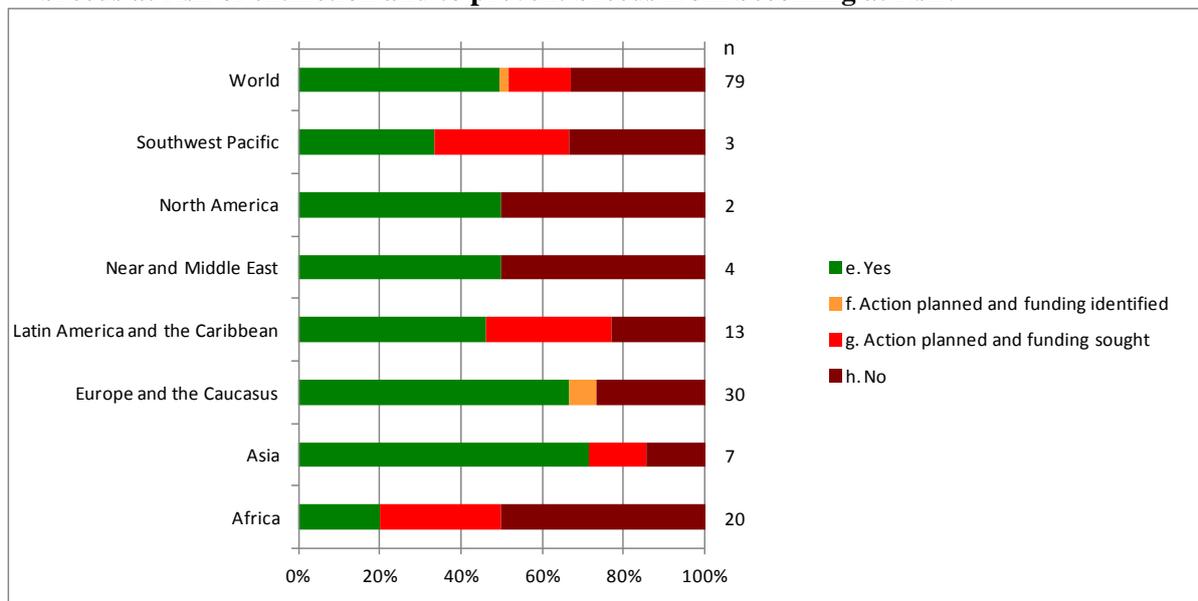
Ex situ in vivo measures for animal genetic resources are in place in almost half the reporting countries. Africa, the Southwest Pacific and Latin America and the Caribbean are the regions where a majority of countries have no such measures in place. Various types of *ex situ in vivo* conservation are mentioned, including conservation farms and parks, zoos and research and breeding farms.

Figure 32. Q34.3 – Are *ex situ in vitro* measures being used in your country to conserve breeds at risk of extinction and to prevent breeds from becoming at risk?
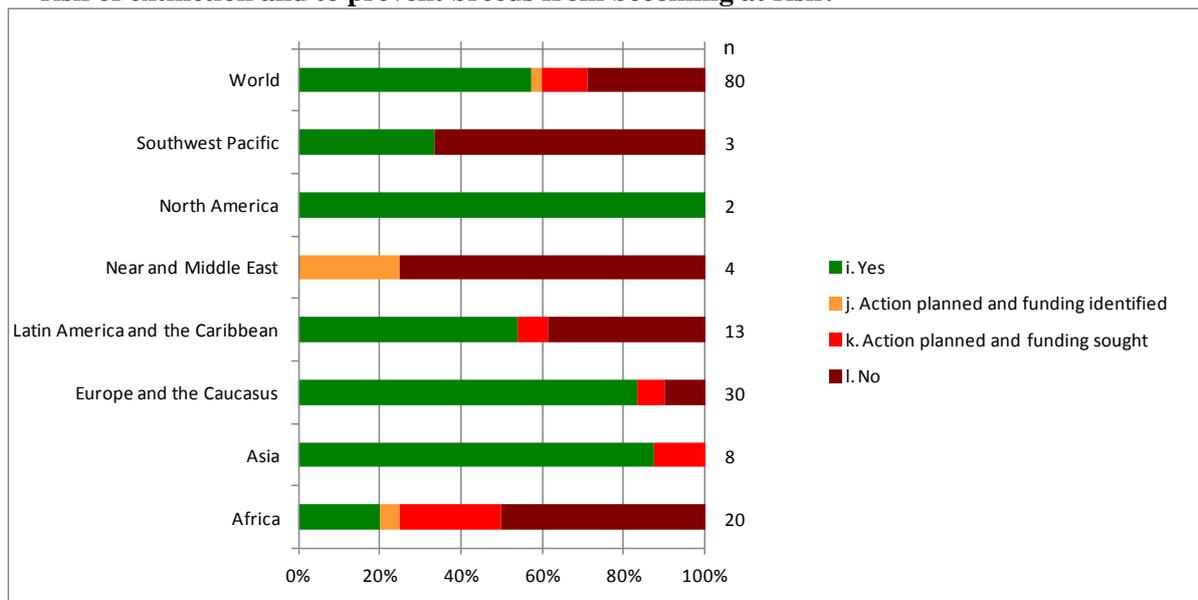
Almost 60 percent of reporting countries have *ex situ in vitro* conservation measures in place for animal genetic resources. The extent of coverage varies greatly from region to region. No *ex situ in*

vitro measures are reported from the Near and Middle East, and 80 percent of reporting countries in Africa indicate that they have no such measures.

The following question is not considered in the calculation of the indicator because it was only addressed to a subset of countries.

Figure 33. Q35 – If your country has not established any conservation programmes, is this a future priority?
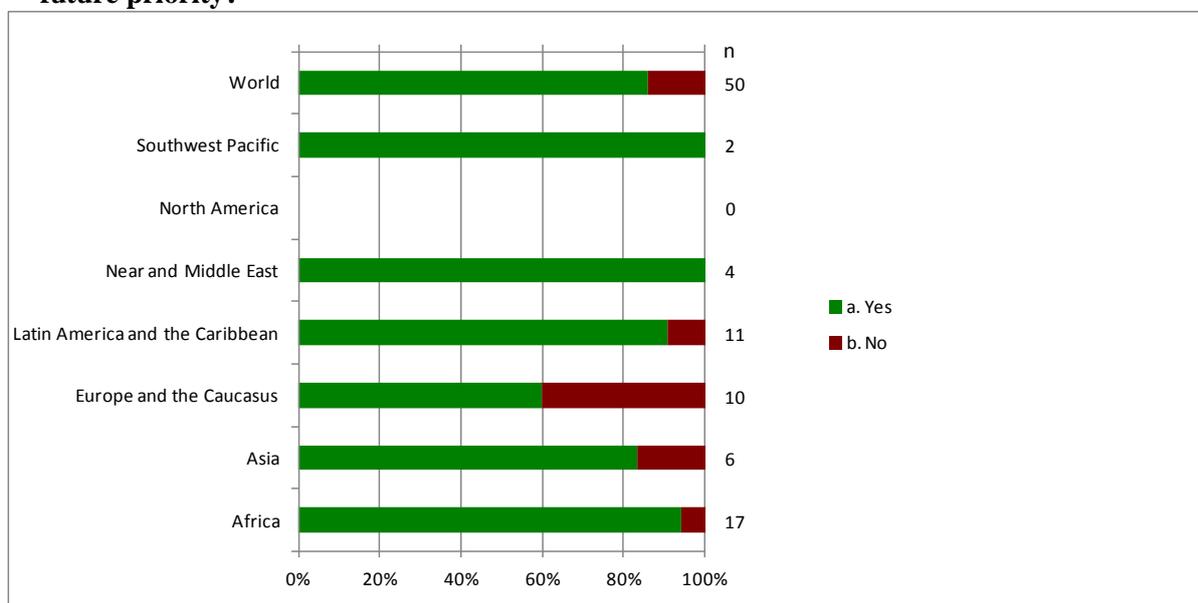
Most countries that have not yet established conservation programmes report that this is a priority for the future.

Figure 34. Q39 – Are arrangements in place in your country for extraction and use of conserved genetic material following loss of animal genetic resources (e.g. through disasters), including arrangements to enable restocking?
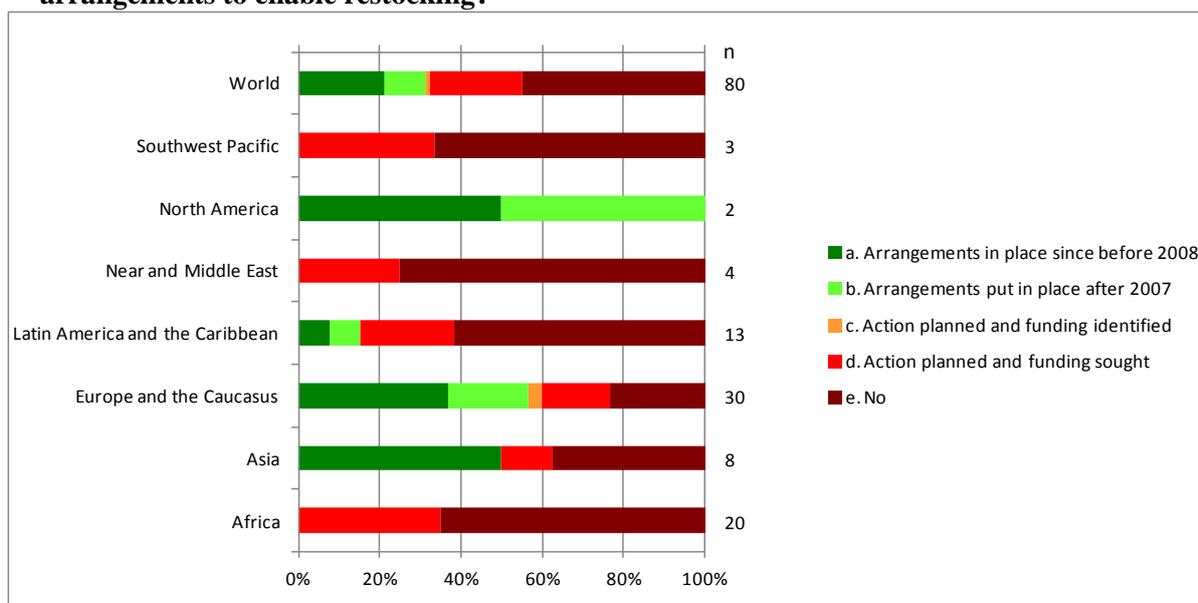
Almost 70 percent of reporting countries have no arrangements in place for extraction and use of conserved genetic material following loss of animal genetic resources including arrangements for restocking. No countries in Africa, the Near and Middle East or the Southwest Pacific – and few in

Latin America and the Caribbean – have such arrangements in place. About 10 percent of countries report that such measures were put in place after 2007.

Additional question contributing to Indicator SPA3

Figure 35. Q30 – Does your country regularly assess factors leading to the erosion of its animal genetic resources?
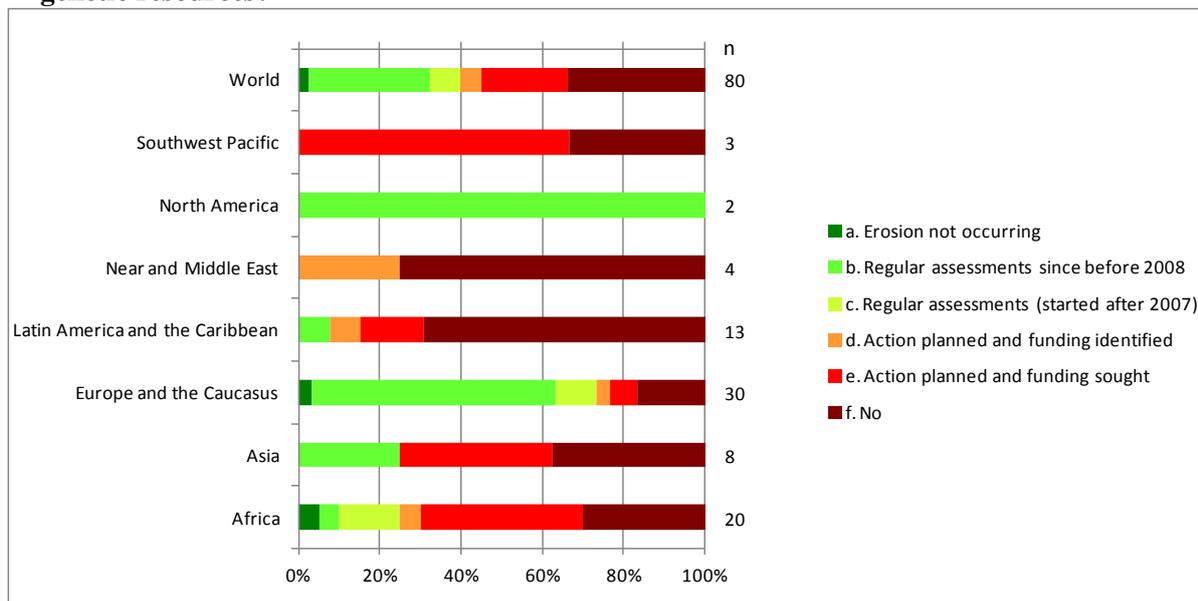
Almost 40 percent of reporting countries regularly assess factors leading to the erosion of their animal genetic resources. No such assessments are reported from the Southwest Pacific or from the Near and Middle East, and few from Latin America and the Caribbean, Africa or Asia. Less than 10 percent of countries started to undertake such assessments after 2007.

Figure 36. Q36 – Has your country identified the major barriers and obstacles to enhancing the conservation of its animal genetic resources?
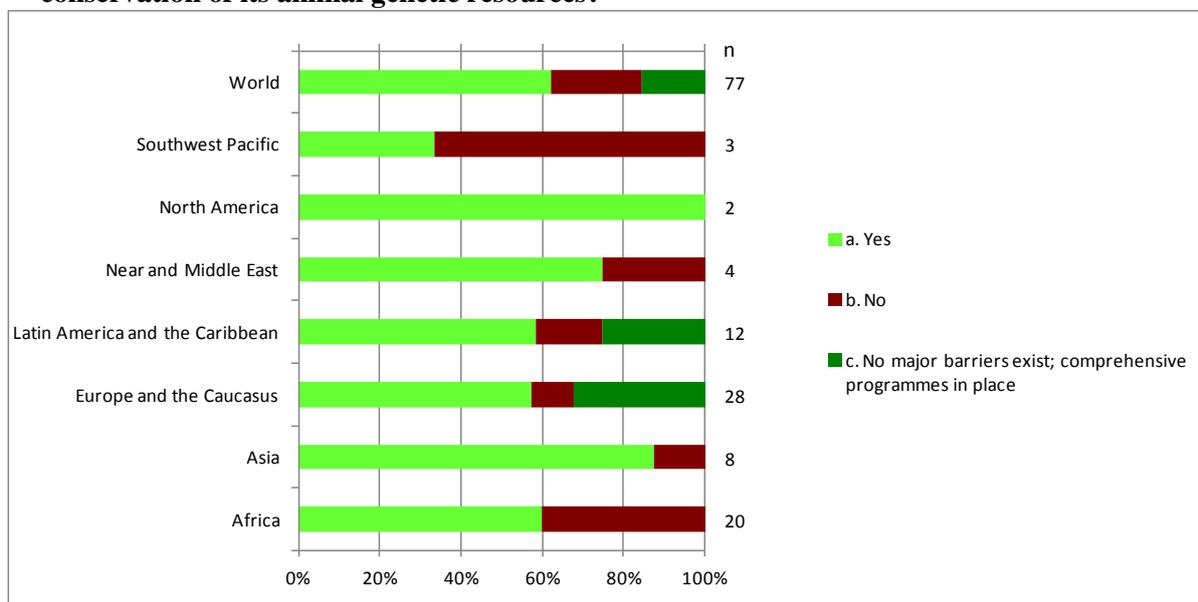
Most reporting countries have identified the major barriers and obstacles to enhancing the conservation of their animal genetic resources. However, two-thirds of countries in the Southwest Pacific and 40 percent in Africa report that they have not identified barriers and obstacles.

By far the most frequently mentioned obstacle is a lack of financial resources. Lack of skilled personnel and lack of technical capacity are also reported as problems by many countries. Another frequently mentioned constraint is a lack of information on animal genetic resources, including breed

population sizes, locations and characteristics. Several countries mention a lack of national policies and legal frameworks; in some cases legal restrictions are reported to constrain conservation activities. Some countries note the need for better coordination among stakeholders. Practical problems, such as remoteness, long distances and insecurity, that hamper *in situ* activities are mentioned by a few countries. Some countries describe more general challenges that threaten the diversity of animal genetic resources rather than specific obstacles to implementation of conservation measures. The most frequently mentioned among these are factors associated with changing production systems and market demands.

Questions 37.1 and 37.2 are not considered in the calculation of the indicator because they were only addressed to a subset of countries.

Figure 37. Q37.1 – If your country has existing *ex situ* collections of animal genetic resources, are there major gaps in these collections?
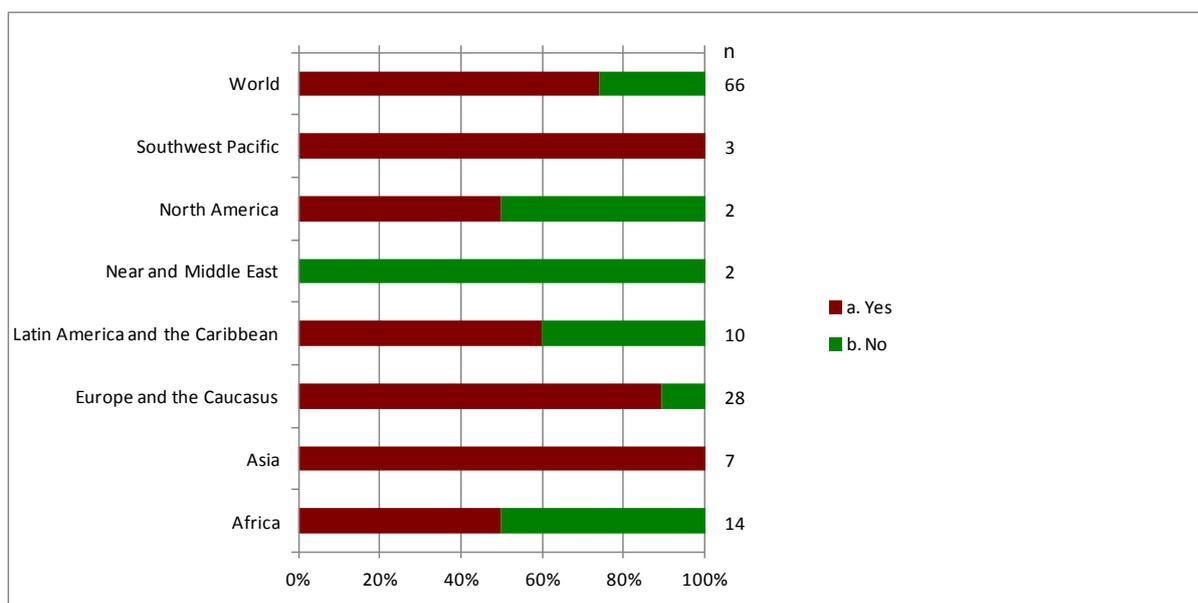
In total, 66 out of 80 countries reported that they have existing *ex situ* collections of animal genetic resources. However, a large majority of such countries indicate that these collections have major gaps.

Figure 38. Q37.2 – If yes, have priorities for filling the gaps been established?
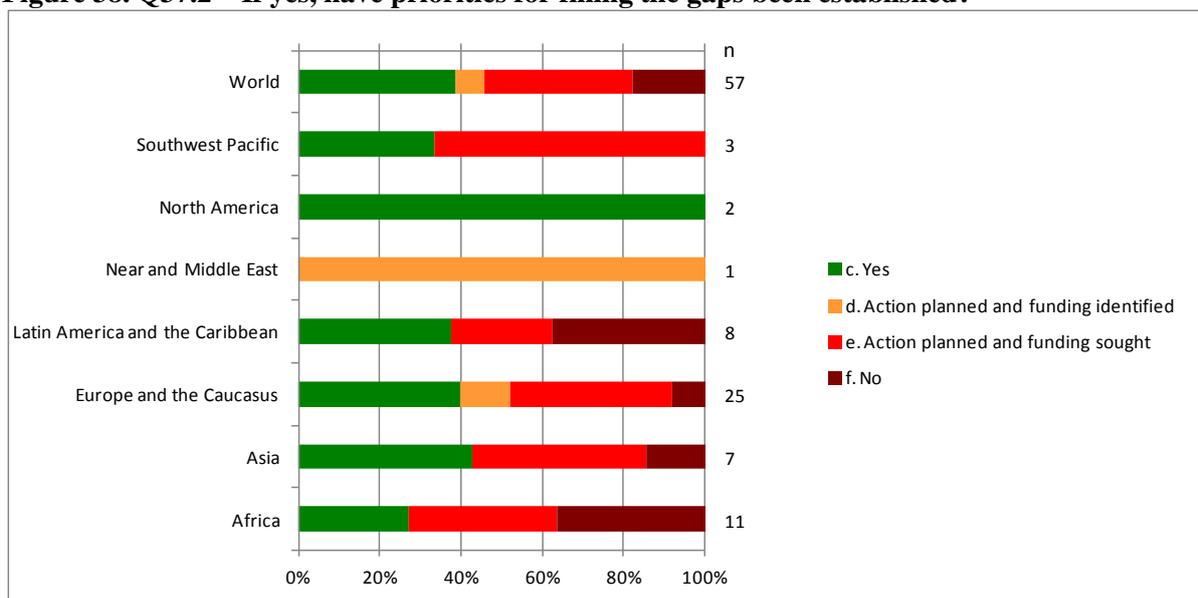
About 40 percent of countries that have major gaps in their *in situ* collections have identified priorities for filling these gaps. Such prioritization is not widespread in any region except for North America.

Figure 39. Q38 – Are arrangements in place in your country to protect breeds and populations that are at risk from natural or human-induced disasters?
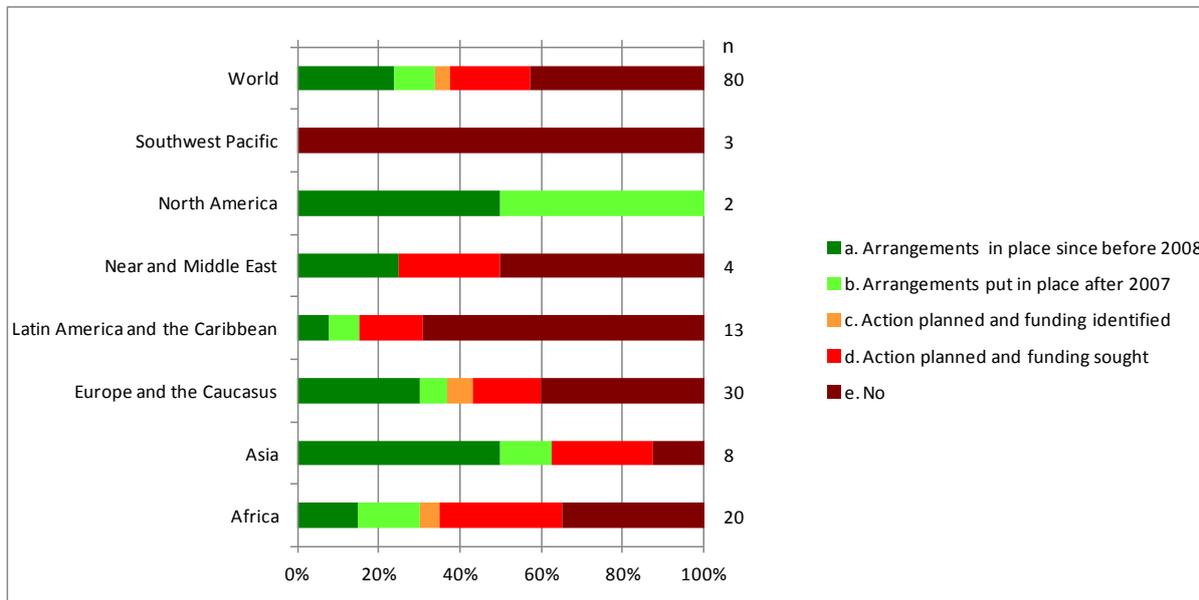
More than a third of reporting countries have arrangements in place to protect their breeds and populations from natural or human-induced disasters. The most comprehensive coverage is reported from North America, followed by Asia. The regions with the largest deficits in this respect are the Southwest Pacific, and Latin America and the Caribbean. About 10 percent of countries report that arrangements were put in place after 2007.

Figure 40. Q40 – Is your country conducting research to adapt existing, or develop new, methods and technologies for *in situ* and *ex situ* conservation of animal genetic resources?
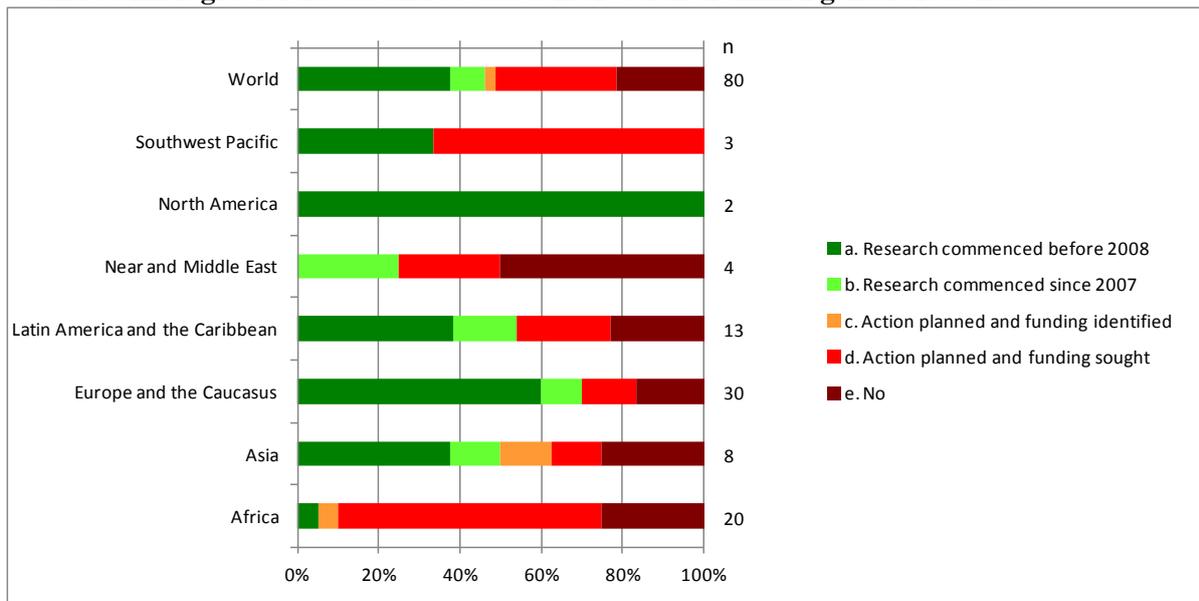
Almost half the reporting countries indicate that they are undertaking research on conservation methods for animal genetic resources. However, there are large differences among the regions of the

world. Very few countries in Africa are undertaking research on conservation methods. About 10 percent of countries report that they commenced such research after 2007.

Figure 41. Q41 – Does your country implement programmes to promote documentation and dissemination of knowledge, technologies and best practices for conservation?
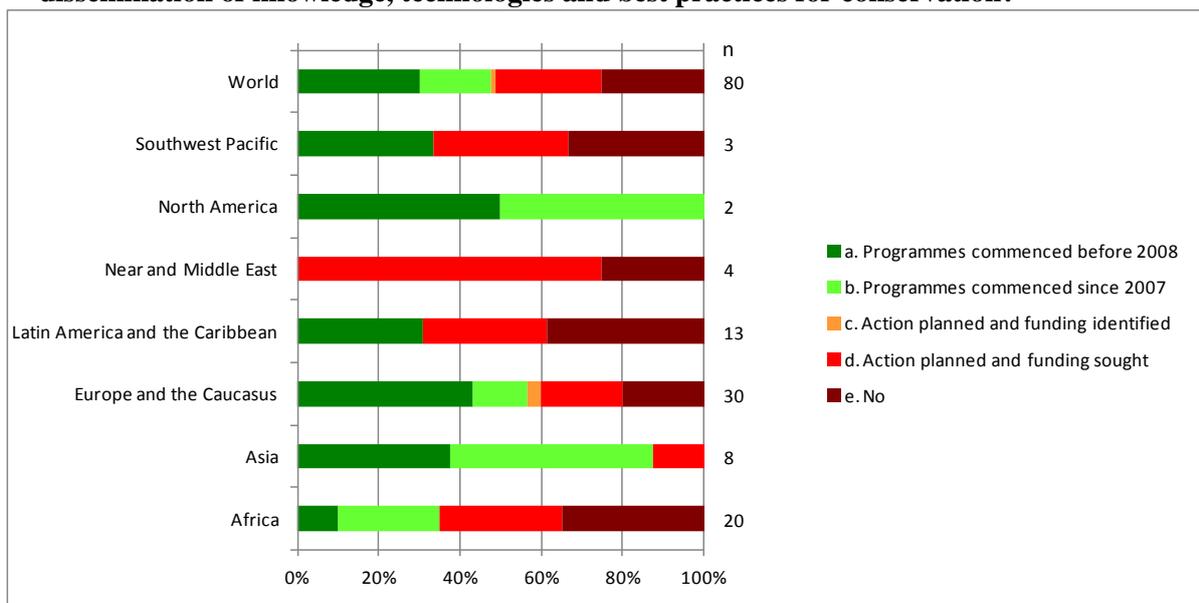
Almost half the reporting countries indicate that they implement programmes to promote documentation and dissemination of knowledge, technologies and best practices for conservation. Such programmes are relatively uncommon in Africa and the Southwest Pacific, and none are reported from the Near and Middle East. Almost 20 percent of countries commenced programmes of this type after 2007.

Figure 42. Q57.3 – Are there any national NGOs active in your country in the field of conservation of breeds at risk?
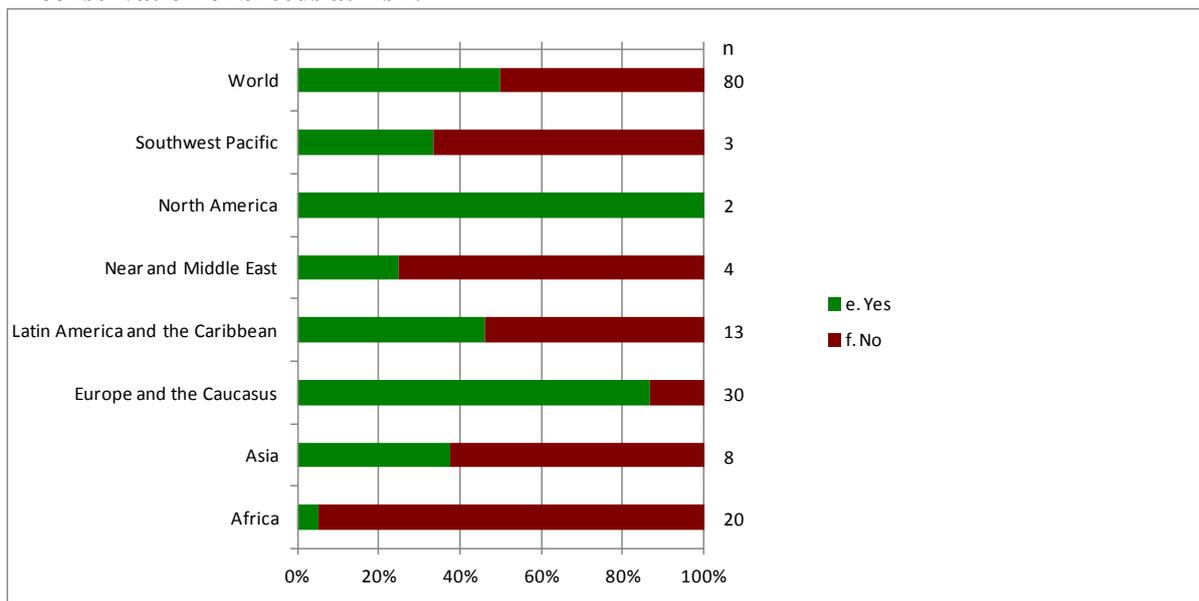
About 50 percent of reporting countries indicate that they have national NGOs active in the field of conservation. Such NGOs are widespread in North America, and Europe and the Caucasus, but are less common elsewhere, particularly in Africa.

Q31: What factors or drivers are leading to the erosion of animal genetic resources?

This was an open-ended rather than multiple-choice question, and did not contribute to any of the indicators. The most frequently mentioned factors were breed replacement (in most cases specifically

replacement by exotic breeds) and cross-breeding (variously described as indiscriminate, uncontrolled, unplanned, anarchic, non-structured, replacement or absorptive). While the answers relating to breed replacement are perhaps more descriptive than explanatory (i.e. the reasons for the replacement are generally not given), the responses related to cross-breeding highlight the need for better control and planning of this practice in many countries. Problems related to cross-breeding are reported more frequently by countries from developing regions (about 50 percent of countries in both Africa and Asia, for example, as opposed to about 13 percent of countries in Europe and the Caucasus and no North American countries). Several countries report that heavy selection pressure contributes to genetic erosion or report problems caused by unspecified inadequacies in breeding strategies or by a lack of such strategies. A number of countries referred to inbreeding as a factor without specifying the circumstances in which this is occurring.

Also frequently mentioned were economic or market-related drivers, sometimes expressed in terms of the lack of competitiveness of some breeds. Such factors were mentioned by a higher proportion of countries in Europe and the Caucasus than in any other region.

A third factor mentioned was a lack of knowledge or awareness of animal genetic resources. This factor was more frequently mentioned in developing regions than in Europe and the Caucasus or North America. Both a general lack of awareness of the importance of maintaining genetic diversity and a more specific lack of knowledge of the positive attributes of particular breeds seem to be involved.

Among factors operating at the level of the household or production system, the most frequently mentioned were the effects of migration from rural areas or the availability of alternative employment activities, loss of (or loss of access to) grazing resources or farmland (causes mentioned include invasive species, bush encroachment, drought, urbanization and expansion of cropping) and the effects of the intensification of production.

Diseases were quite frequently mentioned as a threat by countries from Africa (about 25 percent) and the Near and Middle East (two out of four countries). Other natural and human-induced disasters were mentioned slightly less frequently (about 20 percent of countries from Africa and few or no countries in other regions); a few countries specifically mentioned the effects of droughts or armed conflicts. A few countries mentioned global climate change.

Another factor noted by several countries from Asia and the Near and Middle East, and a few from Europe and the Caucasus, was the effect of mechanization or other developments that replace livestock functions.

Strategic Priority Area 4: Policies, institutions and capacity-building

Long-term goal: Established cross-cutting policies and legal frameworks, and strong institutional and human capacities to achieve successful medium- and long-term planning for livestock sector development, and the implementation of national programmes for the long-term.

SP12: Establish or strengthen national institutions, including national focal points, for planning and implementing animal genetic resources measures, for livestock sector development

Indicator SP12: The state of efforts to strengthen national institutions for planning and implementing animal genetic resources measures

Figure 43. Q44 – Has your country assessed its national institutional capacity to support holistic planning of the livestock sector since the adoption of the *Global Plan of Action*?
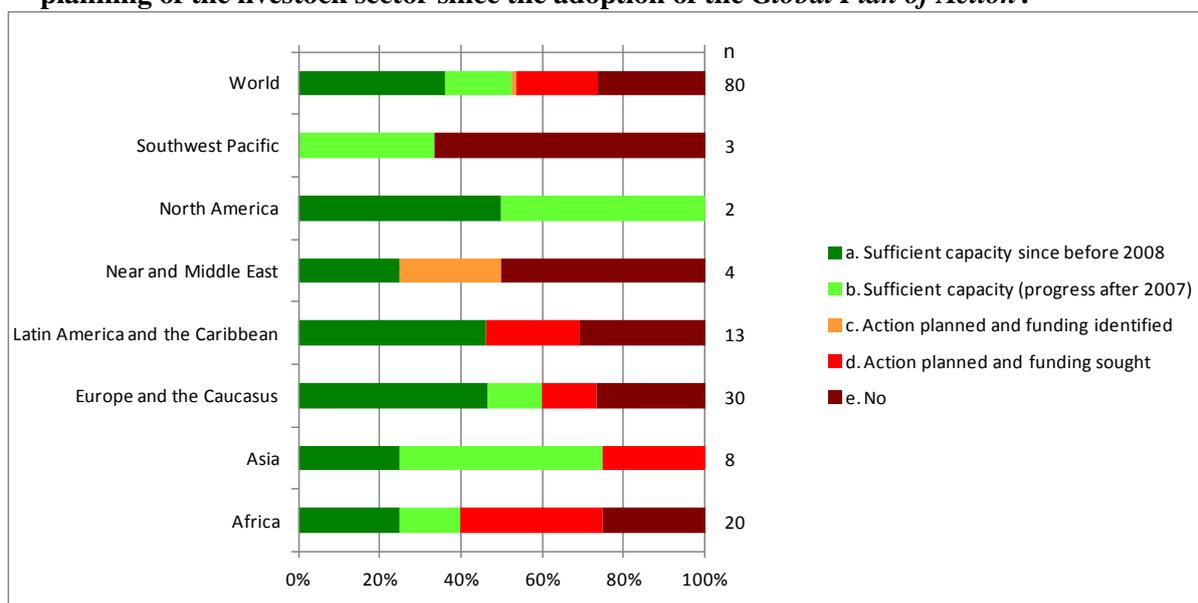
More than 50 percent of reporting countries indicate that their national institutional capacity to support holistic planning of the livestock sector is sufficient. The regions with the lowest proportions of countries reporting that their capacity is sufficient are the Near and Middle East and the Southwest Pacific. Almost 20 percent of countries report that they reached a sufficient state of capacity because of progress after 2007.

Figure 44. Q45 – Have tools been developed for national planners to use in shaping the future development of the livestock sector in accordance with national priorities, including in relation to the deployment of animal genetic resources?
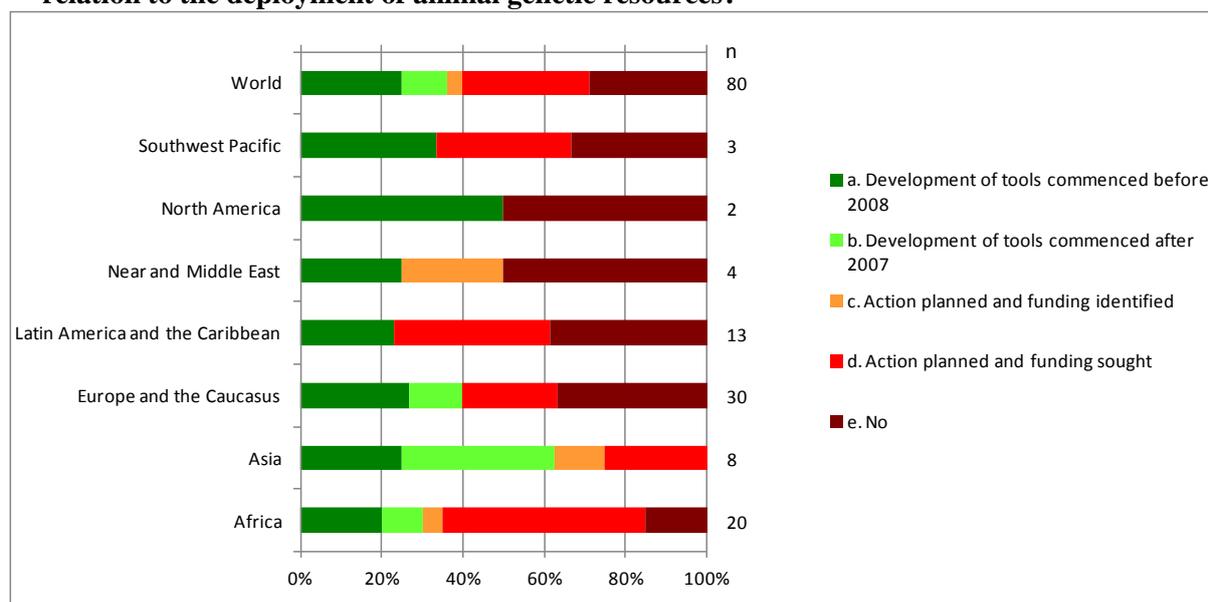
About 40 percent of reporting countries indicate that tools have been developed for national planners to use in shaping the future development of the livestock sector in accordance with national priorities, including in relation to the deployment of animal genetic resources. Such tools are relatively widespread in Asia. About 10 percent of countries report that they began developing such tools after 2007.

Figure 45. Q50 – Has your country established a National Advisory Committee for Animal Genetic Resources?
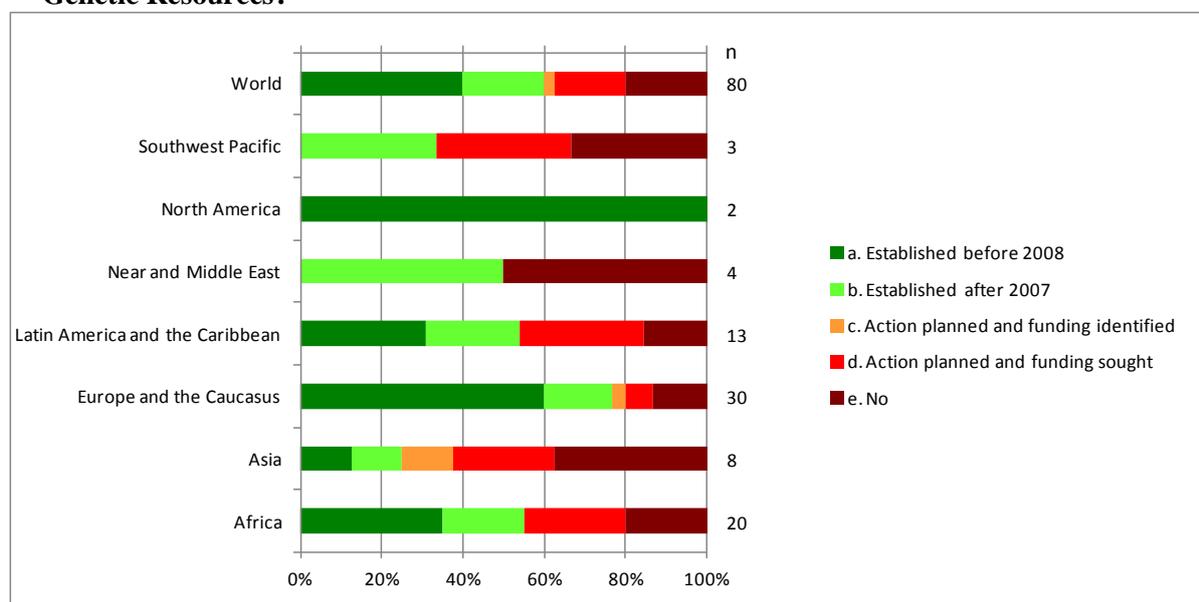
Sixty percent of reporting countries have established a national advisory committee for animal genetic resources. Such committees are relatively rare in Asia and in the Southwest Pacific. Twenty percent of countries report that their committees were established after 2007. Generally, the committees play an advisory and consultative role on a range of animal genetic resources management issues at national level. Some countries mention that their committees contribute to mobilizing resources, raising public awareness or promoting linkages and exchange of information among stakeholders. A few countries report that although they have a committee it has not been very active since the end of the country

reporting process for *The State of the World's Animal Genetic Resources for Food and Agriculture*, i.e. since before the adoption of the *Global Plan of Action*.

Figure 46. Q51 – Is there strong coordination and interaction between the National Focal Point and stakeholders involved with animal genetic resources, such as the breeding industry, livestock keepers, government agencies, research institutes and civil society organizations?
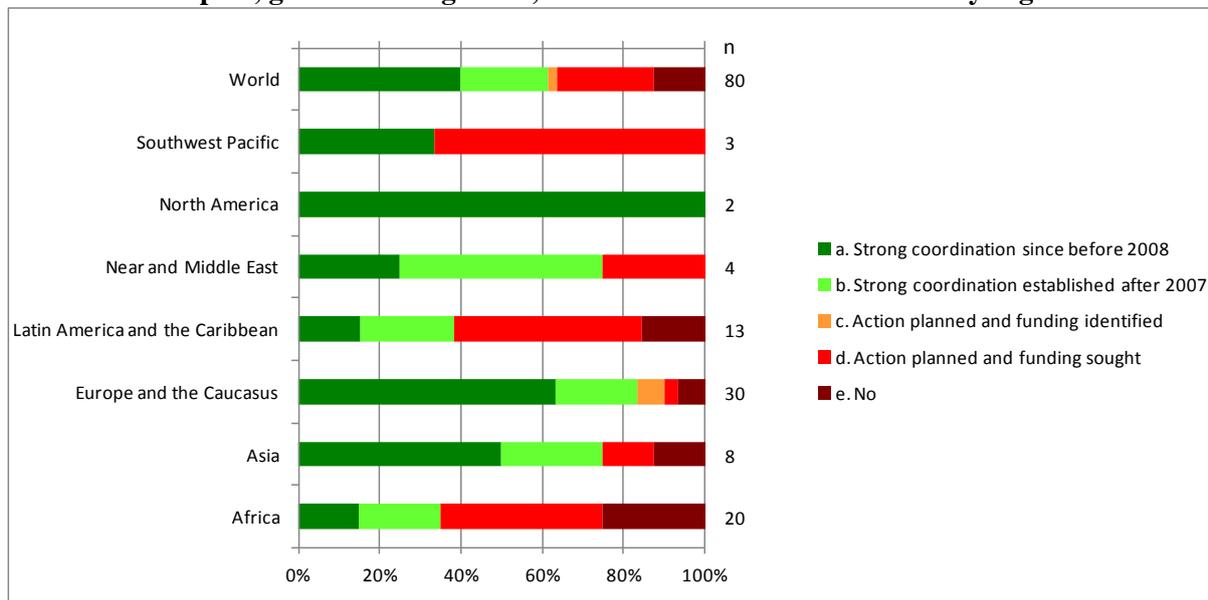
More than 60 percent of reporting countries indicate that strong coordination exists between their National Focal Points for Animal Genetic Resources and other stakeholders in the sector. The weakest regions in this respect are Africa, the Southwest Pacific, and Latin America and the Caribbean. More than 20 percent of countries report that strong coordination exists because of progress made after 2007.

SP13: Establish or strengthen national educational and research facilities

Indicator SP13: The state of efforts to strengthen national educational and research facilities

Figure 47. Q54 – Have your country's needs for research and education been reviewed in all areas of management of animal genetic resources since the adoption of the *Global Plan of Action*?
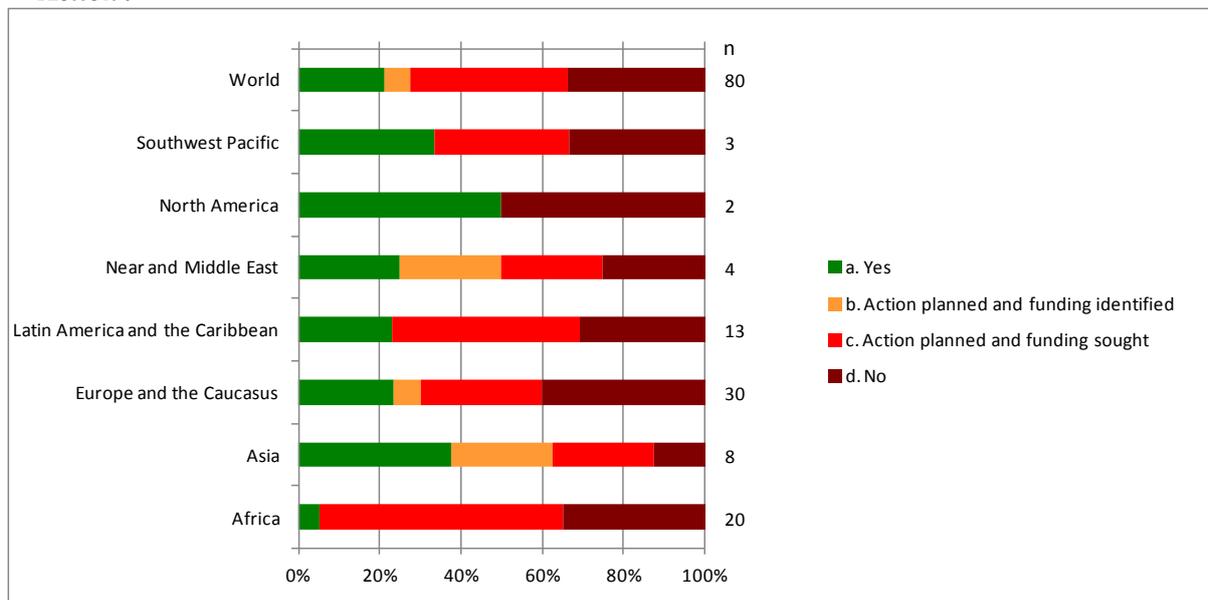
Slightly over 20 percent of reporting countries indicate that their needs for research and education have been reviewed in all areas of animal genetic resources management since the adoption of the *Global Plan of Action*. Such reviews have been relatively common in North America, Asia and the Southwest Pacific, and rare in Africa. A few countries indicate that reviews of research and education requirements are conducted regularly. Some report that they reviewed their requirements during the preparation of their national strategies and action plans.

Figure 48. Q58 – Has your country established or strengthened research or educational institutions in the field of animal genetic resources management?
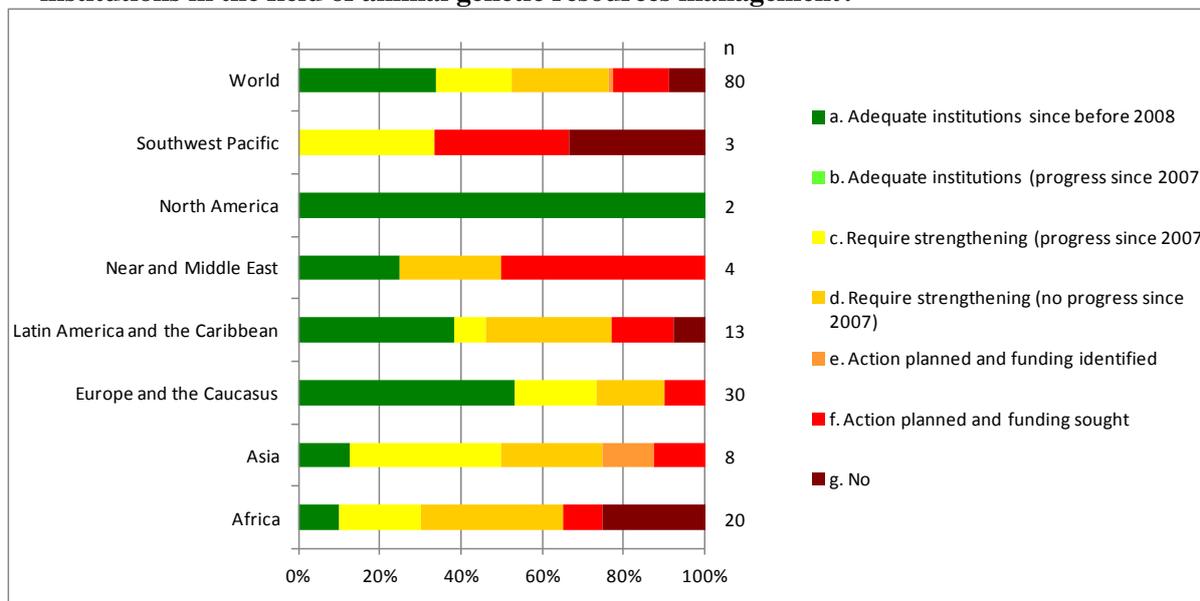
Note: Answer b was not selected by any country.

More than 75 percent of reporting countries have established research or educational institutions in the field of animal genetic resources management. In the majority of cases, the institutions still require strengthening. Complete absence of such institutions is reported to be more common in the countries of the Southwest Pacific and the Near and Middle East than in other regions. About 20 percent of countries report they have made progress in strengthening their institutions since 2007.

SP14: Strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation

Indicator SP14: The state of efforts to strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation

Figure 49. Q55 – Have partnerships been established among research, training and extension institutions and networks of researchers, breeders and conservation organizations to support the implementation of the *Global Plan of Action*?
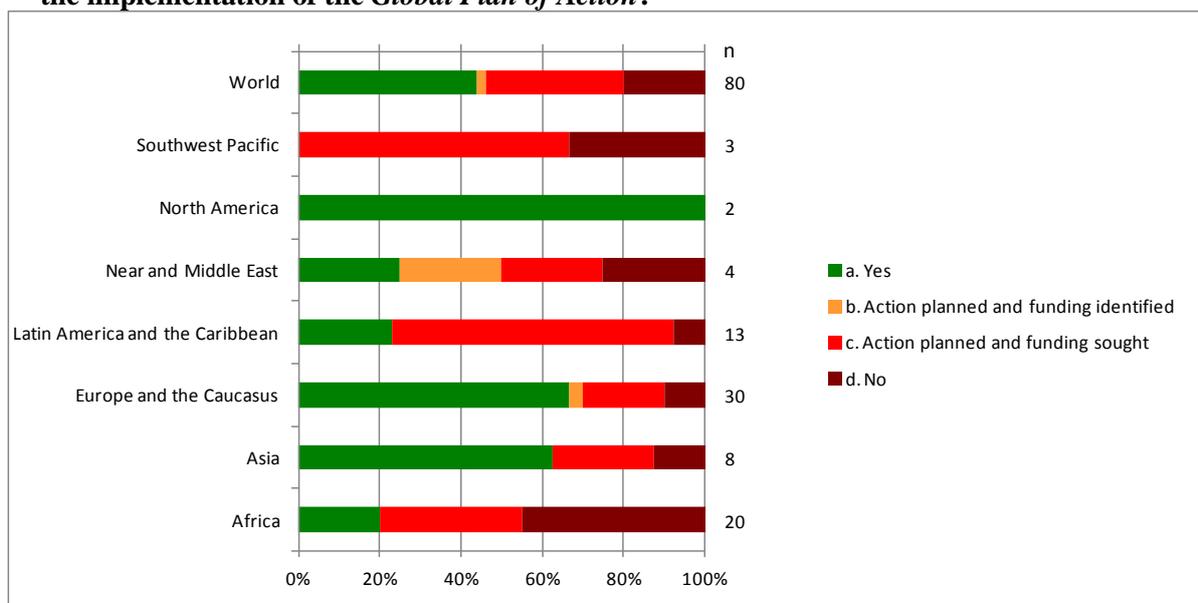
Fewer than half the reporting countries report that partnerships among research, training and extension institutions and networks of researchers, breeders and conservation organizations to support the implementation of the *Global Plan of Action* have been established. Such partnerships are particularly lacking among the countries of the Southwest Pacific, Africa, Latin America and the Caribbean, and the Near and Middle East.

Figure 50. Q56 – Have organizations (including where relevant community-based organizations), networks and initiatives for sustainable use, breeding and conservation been established or strengthened?
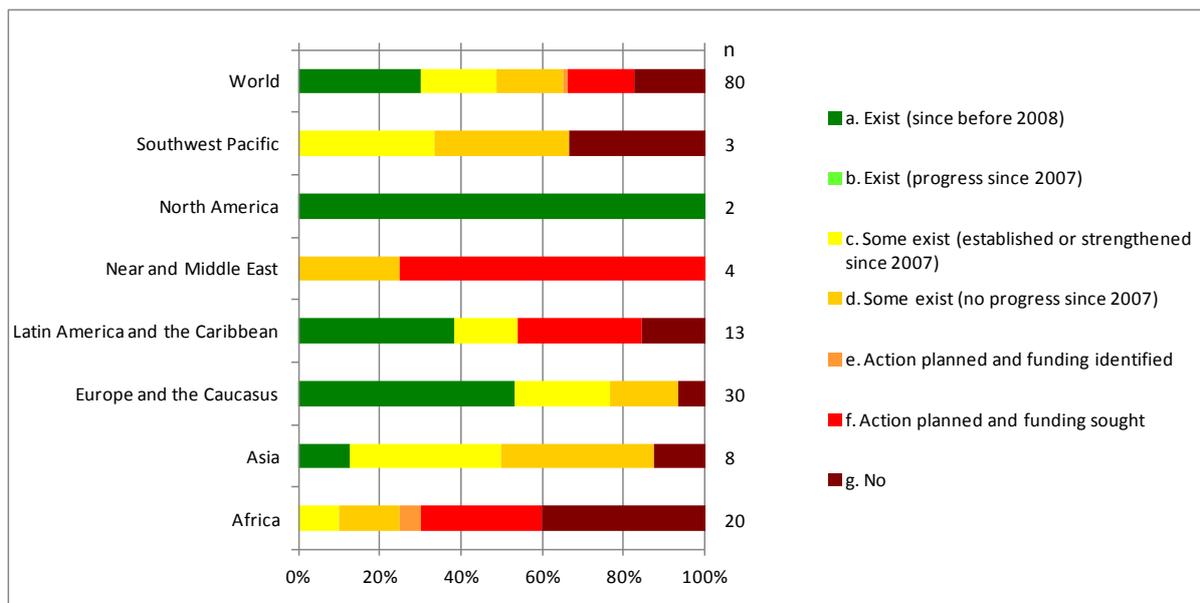
Note: Answer b was not selected by any country.

Organizations (including where relevant community-based organizations), networks and initiatives for sustainable use, breeding and conservation exist in about 65 percent of reporting countries. Organizations, networks and initiatives of this type are less frequently reported by countries from Africa and the Near and Middle East than by those from other parts of the world. About three-quarters of countries in these two regions report that no such organizations, networks and initiatives are in place. About 20 percent of all reporting countries indicate that they have made progress in establishing or strengthening their organizations, networks and initiatives since 2007.

SP18: Raise national awareness of the roles and values of animal genetic resources

Indicator SP18: The state of efforts to raise national awareness of the roles and values of animal genetic resources

Figure 51. Q52 – Does the National Focal Point undertake activities to increase public awareness of the roles and values of animal genetic resources?
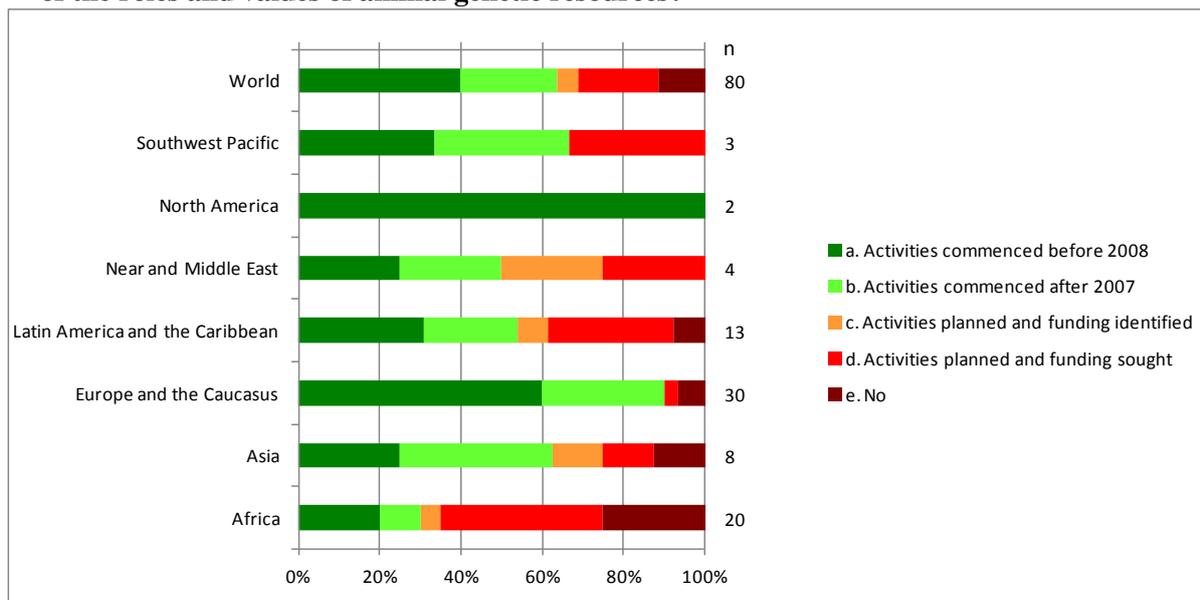
About 65 percent of reporting countries indicate that their National Focal Points undertake activities to increase public awareness of the roles and values of animal genetic resources. Such activities are

relatively uncommon in Africa, where they are reported by only about 30 percent of countries. About 20 percent of National Focal Points commenced their public awareness-raising activities after 2007.

SP20: Review and develop national policies and legal frameworks for animal genetic resources

Indicator SP20: The state of national policies and legal frameworks for animal genetic resources

Figure 52. Q46 – What is the current status of your country's national strategy and action plan for animal genetic resources?
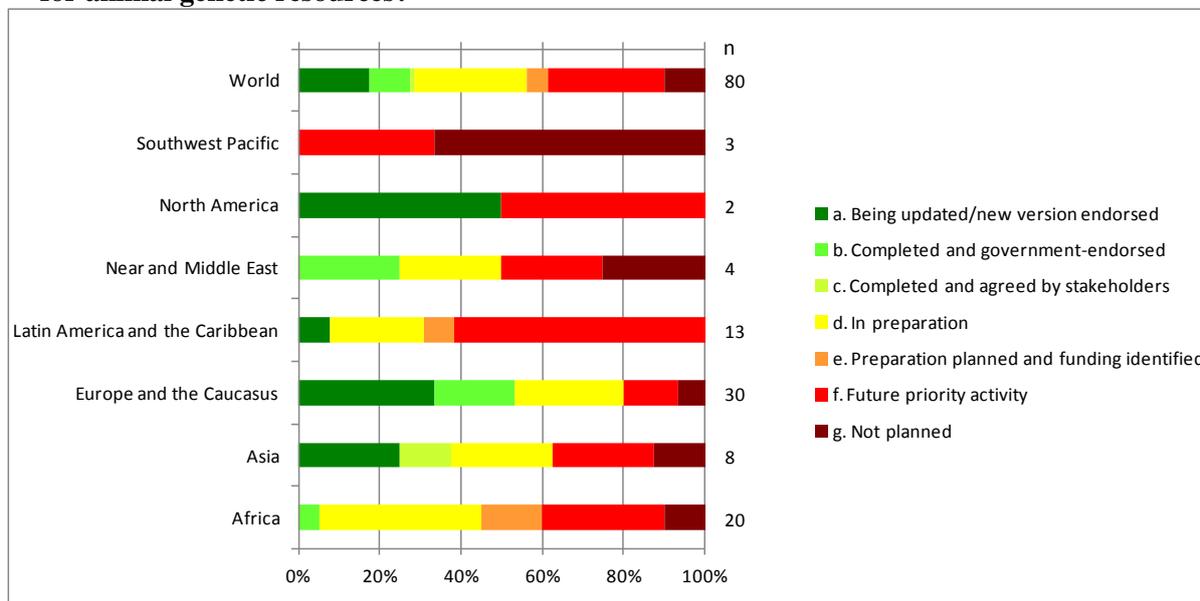
Almost 30 percent of reporting countries indicate that they have a national strategy and action plan for animal genetic resources that has been endorsed by the government or are already in the process of updating their existing strategy and plan. A similar proportion of countries are in the process of preparing or endorsing their strategies and plans. Progress in terms of the proportion of countries that have started to prepare a national strategy and action plan has been slowest in the Southwest Pacific and in Latin America and the Caribbean.

Figure 53. Q53 – Have national policies and legal frameworks for animal genetic resources been reviewed and appropriate changes made if necessary?
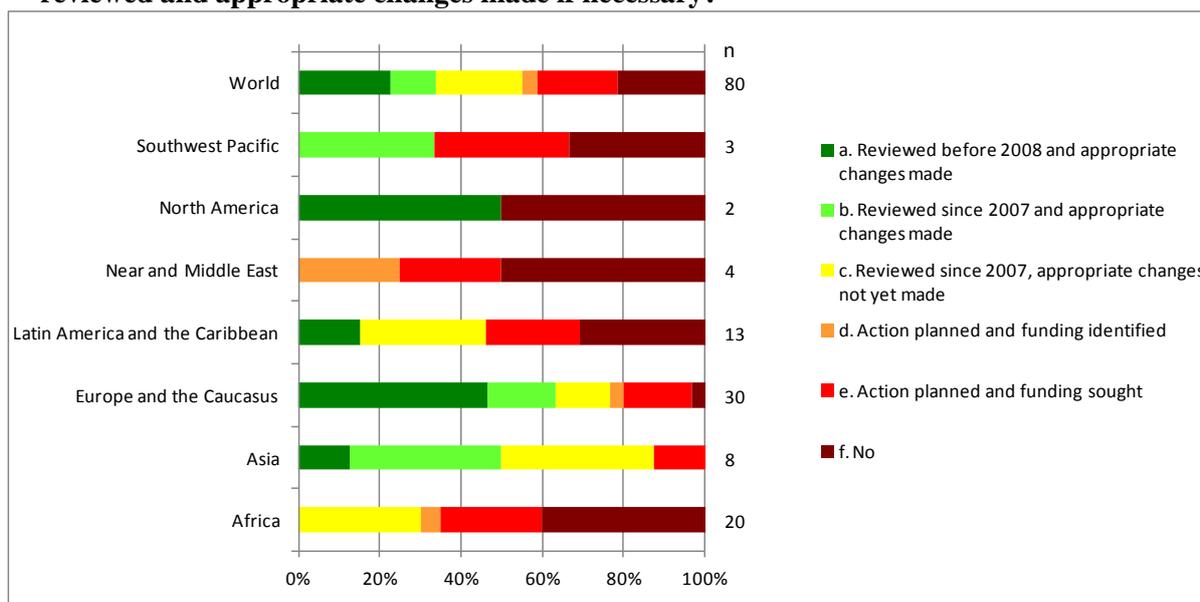
More than 30 percent of reporting countries indicate that their national policies and legal frameworks for animal genetic resources have been reviewed and appropriate changes made. Europe and the Caucasus is the only region in which the majority of reporting countries regard their polices and legal frameworks as having been appropriately reviewed and updated. No countries in Africa or the Near and Middle East regard their frameworks as being sufficiently up to date. About 10 percent of countries have reviewed and made appropriate changes to their frameworks since 2007, and a further 20 percent have conducted reviews but have not yet made changes.

Additional questions contributing to Indicator SPA4

Figure 54. Q47 – Are animal genetic resources addressed in your country's National Biodiversity Strategy and Action Plan[23]?
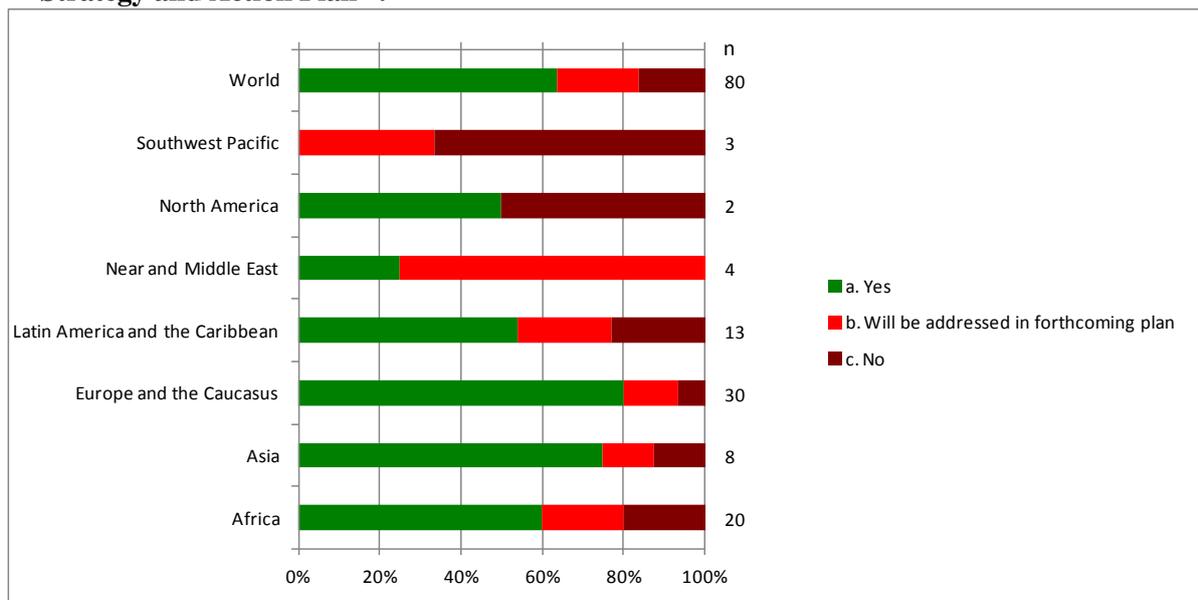
More than 65 percent of reporting countries indicate that animal genetic resources are addressed in their Biodiversity Strategy and Action Plans. However, no reporting countries in the Southwest Pacific, and only one in the Near and Middle East, indicate that this is the case. An additional 20 percent of countries report that animal genetic resources will be addressed in their forthcoming plan.

Figure 55. Q48 – Has your country established or strengthened a national database for animal genetic resources?

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[23] http://www.cbd.int/nbsap/
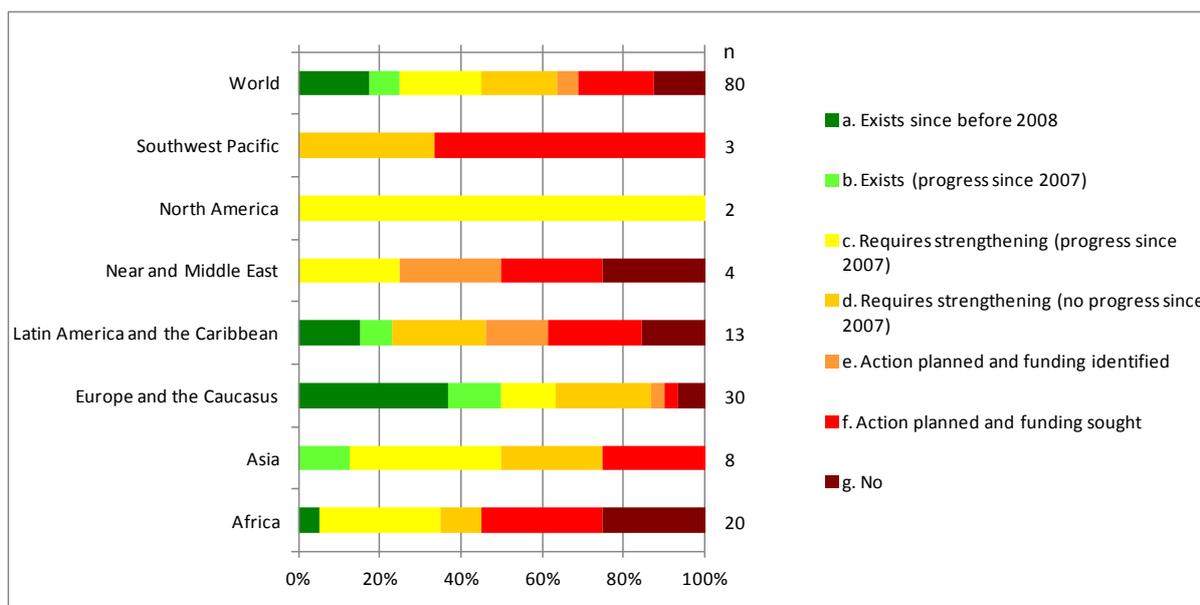
More than 60 percent of reporting countries indicate that they have established a national database for animal genetic resources. In most cases, the database still requires strengthening. Progress has been limited in the Southwest Pacific, the Near and Middle East, and Africa. In the latter regions, 50 percent or more of countries report that they have no national databases. About 30 percent of countries report progress since 2007.

Figure 56. Q49 – Have your country's national data on animal genetic resources been regularly updated in DAD-IS?
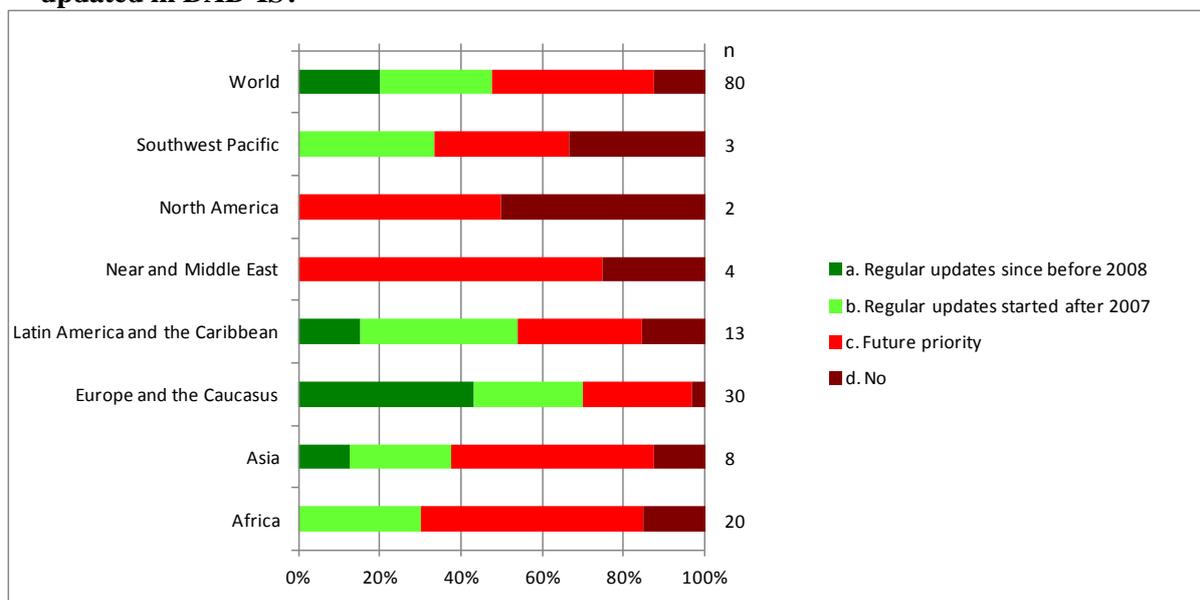
Less than 50 percent of reporting countries indicate that their national data on animal genetic resources have been regularly updated in DAD-IS. The majority of these countries started their regular updates after 2007. No countries in North America or the Near and Middle East report that their data are updated regularly.

Implementation and financing of the *Global Plan of Action*: collaboration

Indicator: The state of international collaboration for planning and implementing animal genetic resources measures

Figure 57. Q60.1 – Has your country established or strengthened international collaboration in characterization?
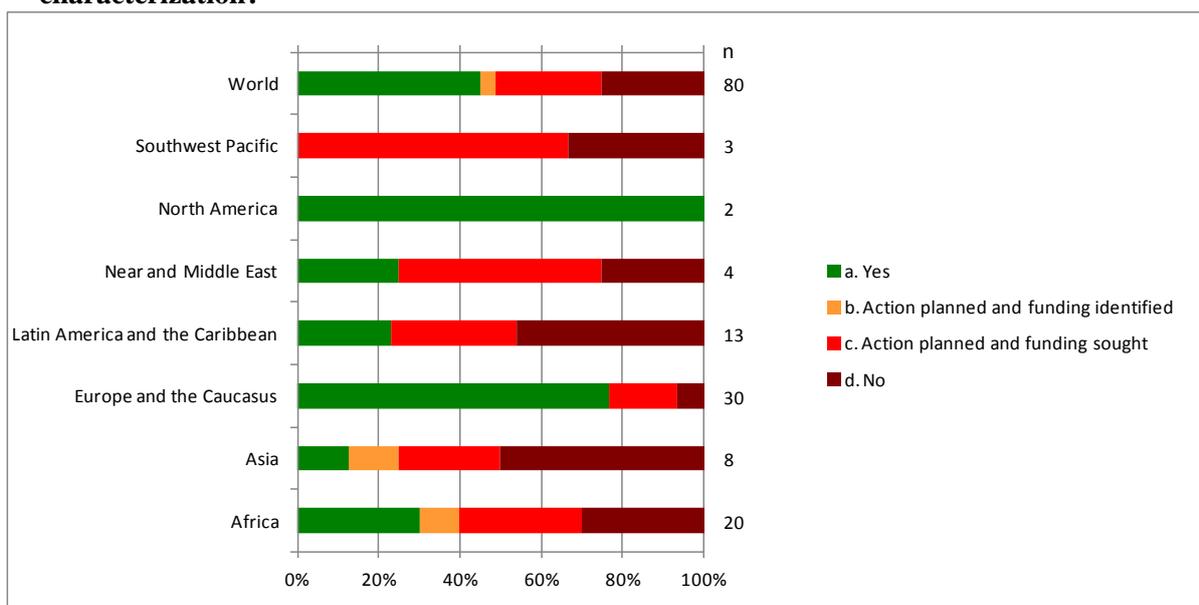
About 45 percent of reporting countries indicate that they have established or strengthened international collaboration in the field of characterization. More countries report international actions in this field than in other areas of animal genetic resources management (see following questions). However, action is far more frequently reported in North America and Europe than in other regions. In several regions, action to date has been very limited or non-existent.

Figure 58. Q60.2 – Has your country established or strengthened international collaboration in sustainable use and development?
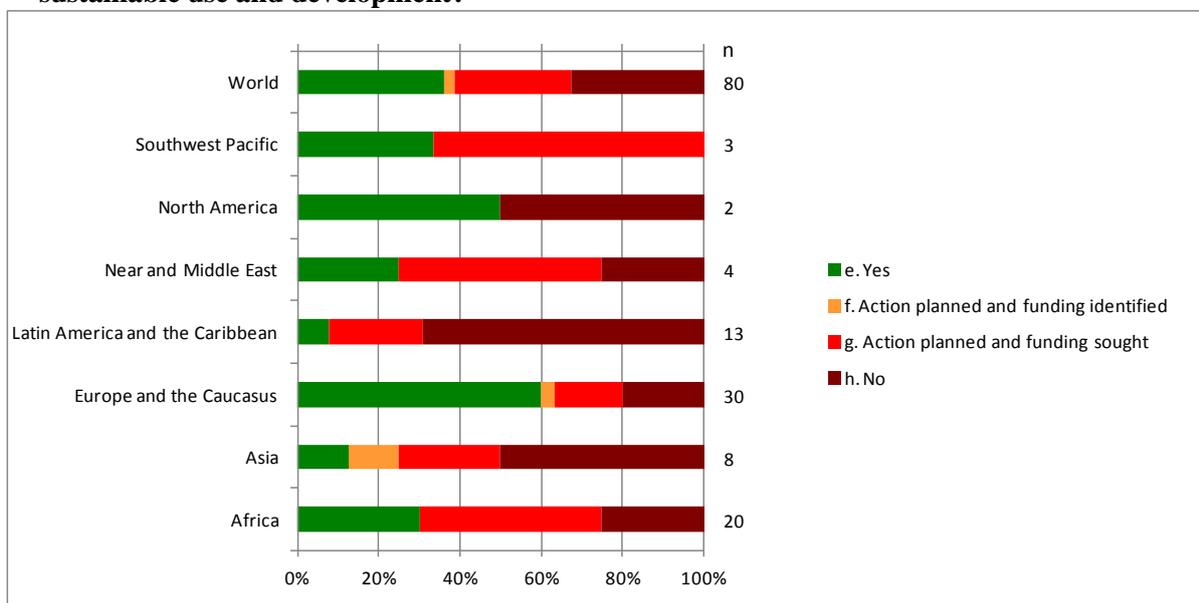
Less than 40 percent of reporting countries indicate that they have established or strengthened international collaboration in the field of sustainable use and development. The lack of such initiatives is particularly marked in Latin America and the Caribbean and in Asia.

Figure 59. Q60.3 – Has your country established or strengthened international collaboration in conservation of breeds at risk?
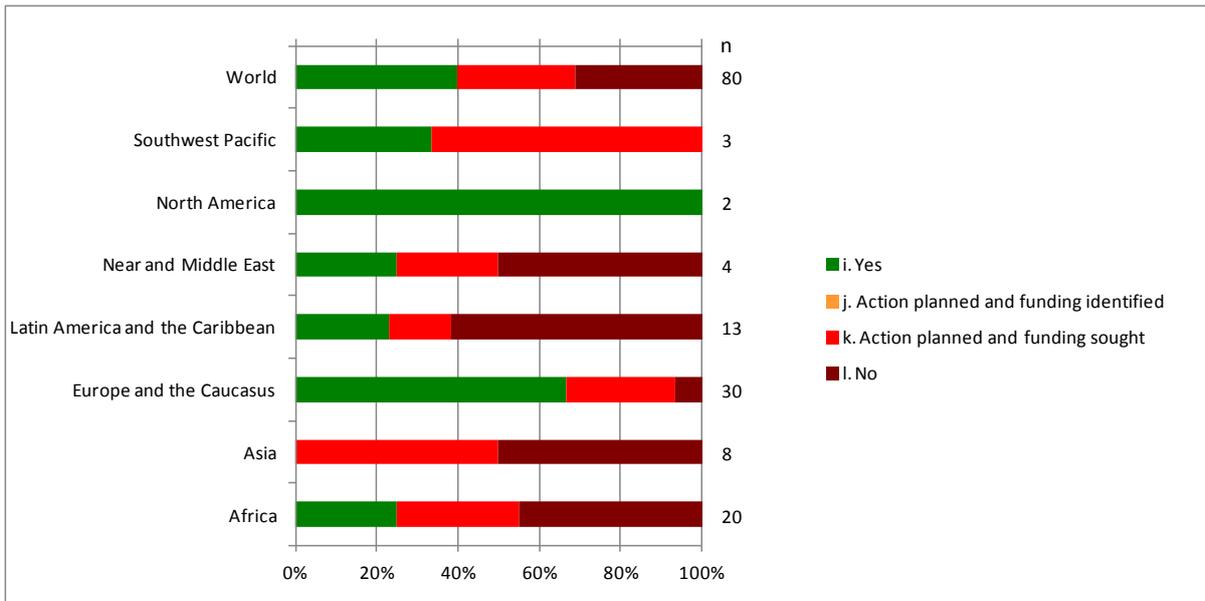
Note: Answer "j" was not selected by any country.

About 40 percent of reporting countries indicate that they have established or strengthened international collaboration in the field of conservation. No such initiatives are reported from Asia, and relatively few from Africa, the Near and Middle East, and Latin America and the Caribbean.

Figure 60. Q61.1 – Are there any international NGOs active in your country in the field of characterization?
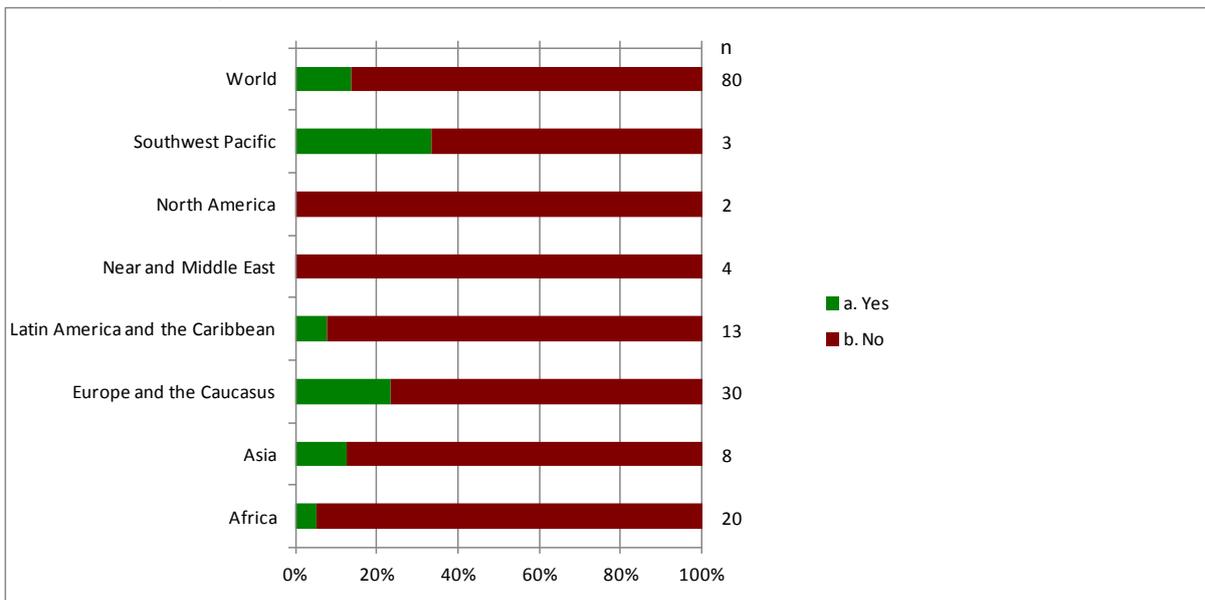
Figure 61. Q61.2 – Are there any international NGOs active in your country in the fields of sustainable use and development?
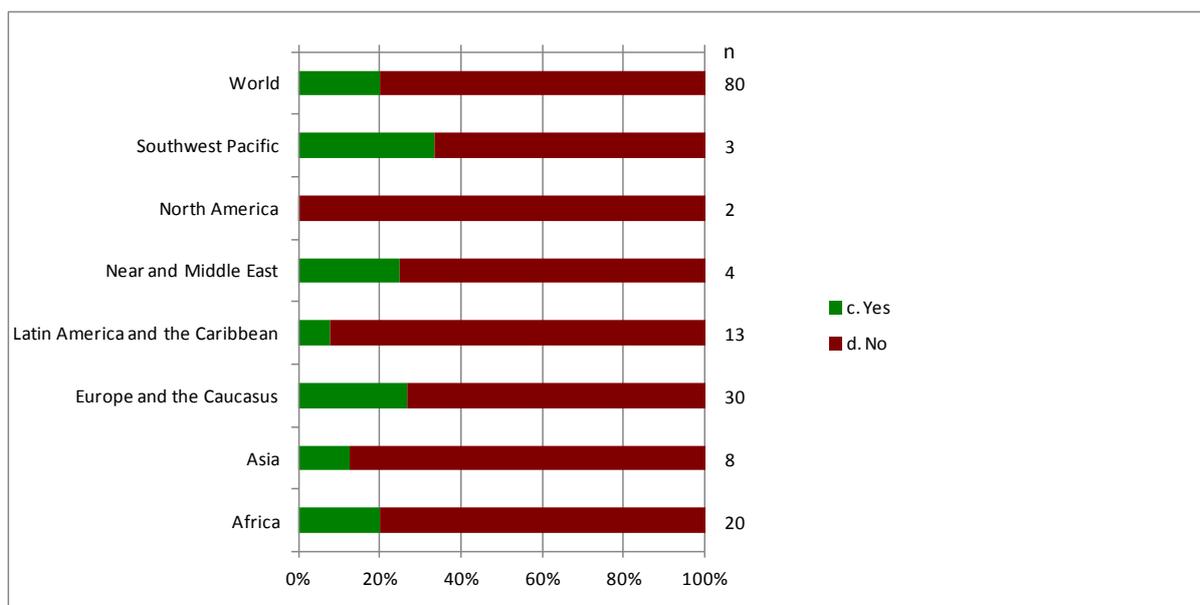
Figure 62. Q61.3 – Are there any international NGOs active in your country in the field of conservation of breeds at risk?
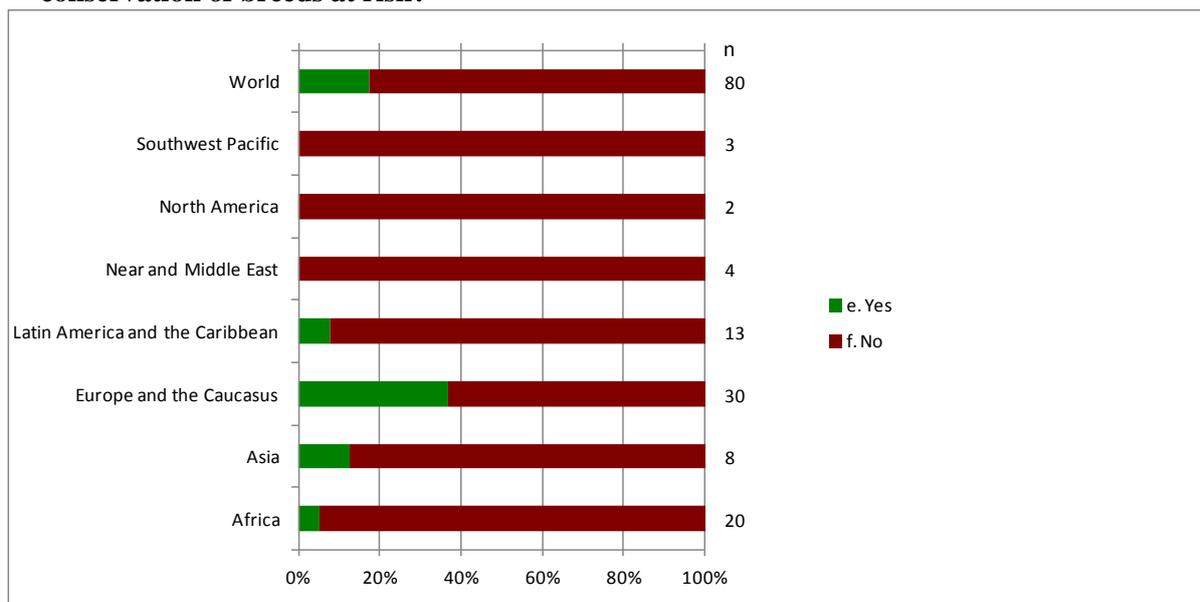
The reported activity of international NGOs working in the fields of characterization, conservation and sustainable use and development is generally low in all regions. No international NGOs are reported to be active in North America (Figures 60 to 62).

Figure 63. Q64 – Has your country established or strengthened international research and education programmes to assist developing countries and countries with economies in transition to better manage animal genetic resources?
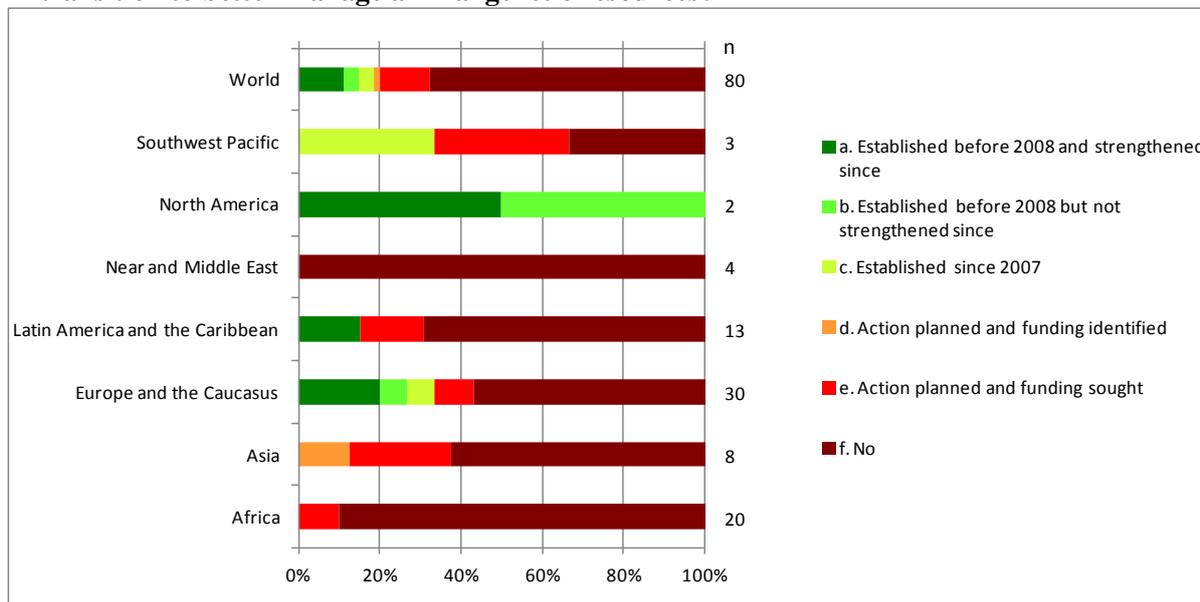
Less than 20 percent of reporting countries indicate that they have established or strengthened international research and education programmes to assist developing countries and countries with economies in transition to better manage animal genetic resources. Such programmes have been established mainly by developed countries. Both North American countries have established such programmes, as have Brazil and New Zealand. As yet, only a minority of countries from Europe and the Caucasus have done so. Most countries that report such activities have either established or strengthened them since 2007.

Figure 64. Q65 – Has your country established or strengthened international support to assist developing countries and countries with economies in transition to obtain training and technologies and to build their information systems?
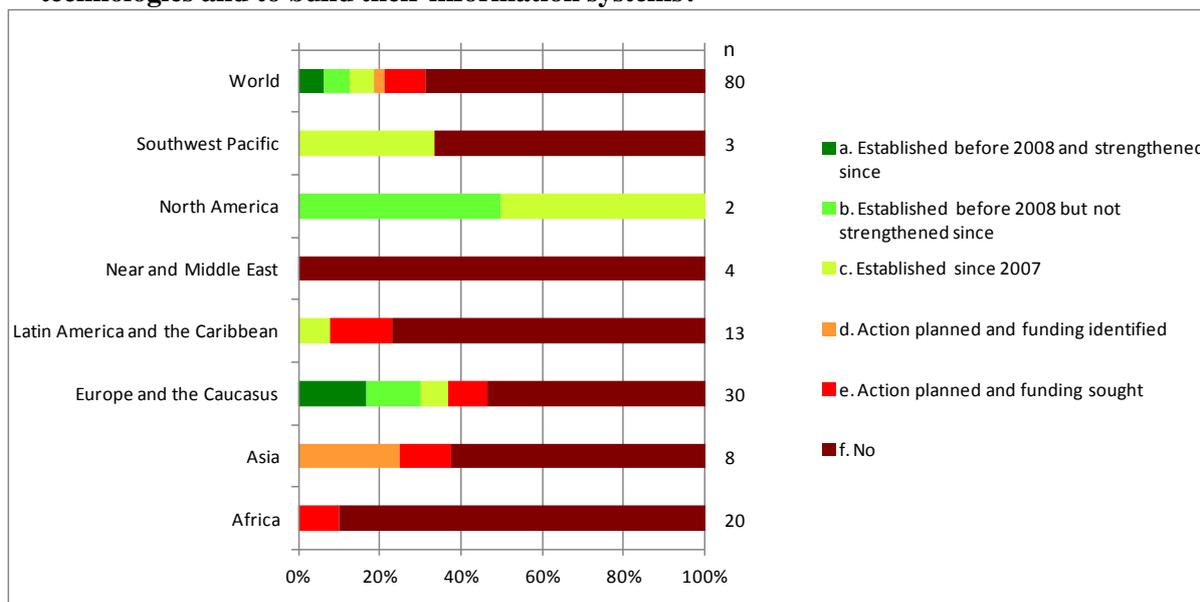
The answers to Question 65 reveal that the reported pattern of international support in training and technology transfer is similar that in research and education (Question 64).

Implementation and financing of the *Global Plan of Action*: funding

Indicator: The state of funding for the conservation, sustainable use and development of animal genetic resources

Figure 65. Q62 – Has national funding for animal genetic resources programmes increased since the adoption of the *Global Plan of Action*?
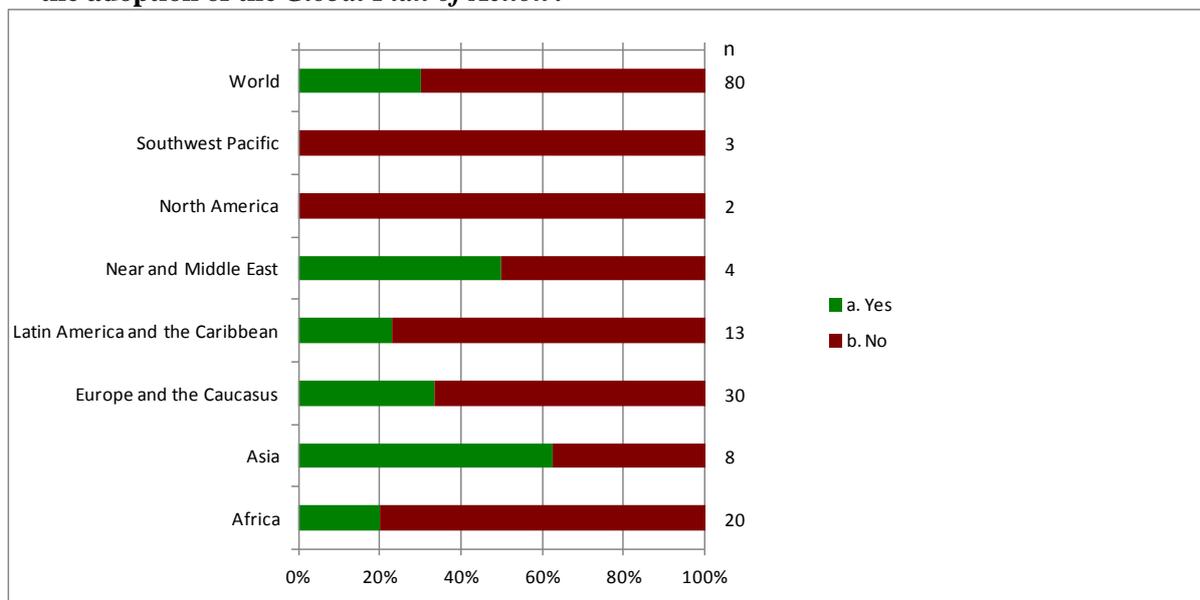
National funding for implementation of the *Global Plan of Action* has increased since its adoption in about 30 percent of reporting countries. Asia is the region with the highest proportion of countries that have increased funding.

Figure 66. Q63 – Has your country received external funding for implementation of the *Global Plan of Action*?
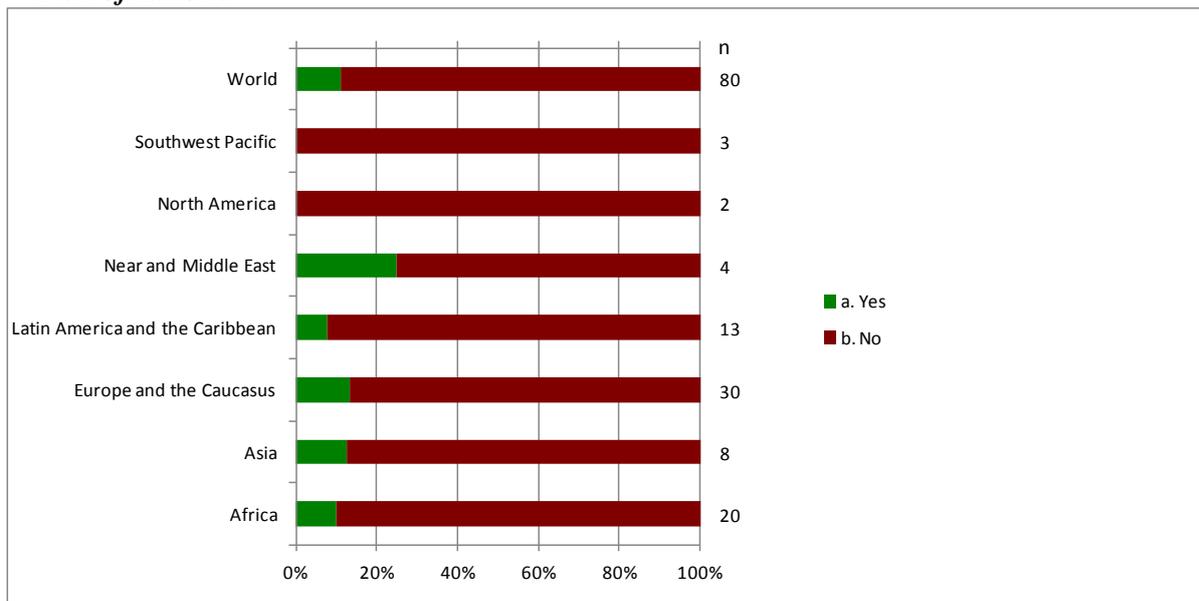
Only about 10 percent of reporting countries have received external funding for the implementation of the *Global Plan of Action*.

Figure 67. Q66 – Has your country provided funding to other countries for implementation of the *Global Plan of Action*?
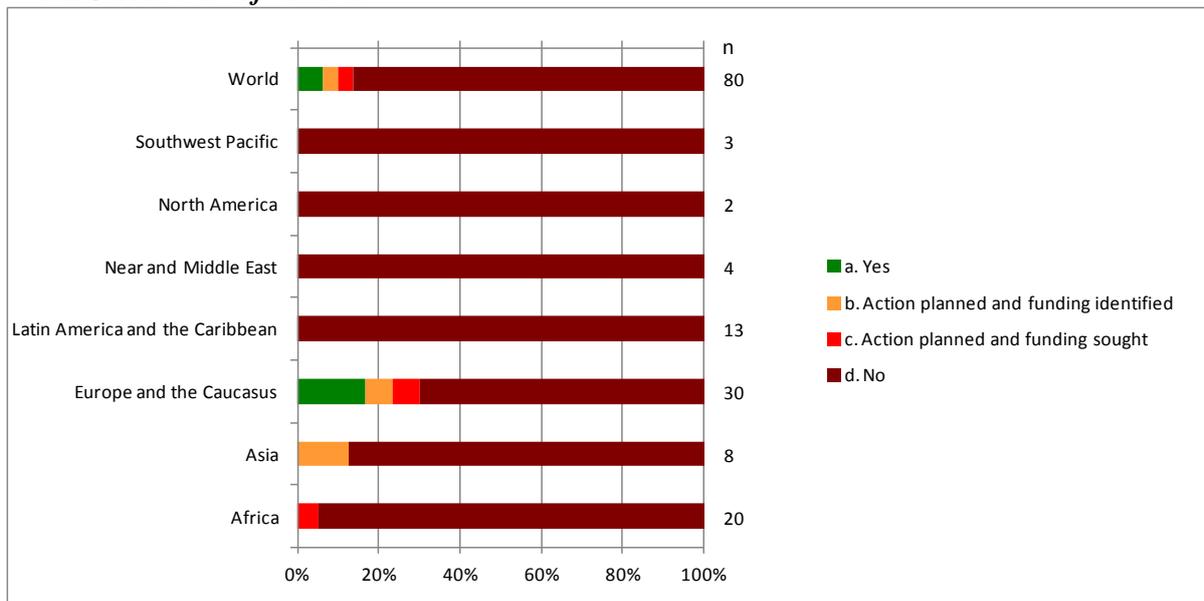
Less than 10 percent of reporting countries have provided funding to other countries for the implementation of the *Global Plan of Action*. All the countries that have provided funding are from Europe and the Caucasus.

Indicators

Indicators at the level of strategic priority areas, collaboration and funding

Table 4 presents a global summary of the indicators for the four strategic priority areas and for collaboration and funding expressed as colours and as average scores (see Table 2 for details of the indicator colour scheme). Table 4 also shows the percentage of reporting countries falling into the high, medium and low categories. Tables 5 and 6 present summaries of the indicators for the four strategic priority areas, plus those for collaboration and funding, at regional and subregional levels. Table 7 shows the indicator for each reporting country. This set of tables allows for easy comparisons between countries, regions and subregions. The indicator scores (numeric values), which provide the baseline for future comparisons, are presented in Annexes 2 and 3.

Table 4. Global overview of indicators for strategic priority areas and collaboration and funding

Reference in the *Global Plan of Action*	Countries low (%)	Countries medium (%)	Countries high (%)	Indicator colour and average score
SPA1	31	31	38	1.11
SPA2	30	31	39	1.04
SPA3	39	20	41	1.01
SPA4	34	32	34	0.98
Collaboration	73	20	7	0.53
Funding	93	0	7	0.32

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. Indicator scores:

0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00
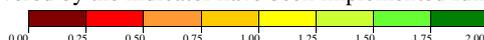
Table 5. Indicators for strategic priority areas – regional summary

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Africa						
Asia						
Europe and the Caucasus						
Latin America and the Caribbean						
Near and Middle East						
North America						
Southwest Pacific						
World						

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. Indicator scores:

0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00

Tables 4 and 5 show that, globally, the indicators for all four strategic priority areas of the *Global Plan of Action* show a medium level of implementation. Strategic Priority Area 4 (Policies, Institutions and Capacity Building) has a slightly lower level of implementation than the other three strategic priority areas. Collaboration, and particularly funding, remain at low levels.

Table 6. Indicators for strategic priority areas, collaboration and funding – subregional summary

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Africa						
East Africa						
North and West Africa						
Southern Africa						
Asia						
East Asia						
South Asia						
Southeast Asia						
Europe and the Caucasus						
Latin America and the Caribbean						
Caribbean						
Central America						
South America						
Near and Middle East						
North America						
Southwest Pacific						
World						

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. Indicator scores:

0.00   0.25   0.50   0.75   1.00   1.25   1.50   1.75   2.00

Tables 5 and 6 show that for the Africa Region as a whole the indicators for all four strategic priority areas and for collaboration and funding are at low levels. The lowest scoring indicator for this region is the indicator for funding, followed by the indicators for conservation (Strategic Priority Area 3) and collaboration. At subregional level, Southern Africa has reached a medium level of implementation for Strategic Priority Areas 1, 2 and 4. All other indicators for this subregion, fall in the low categories. In the two other subregions of Africa all indicators show low levels of implementation. Among individual countries (Table 7), there are a few exceptions to the low level of implementation that is generally prevalent in the region. For each of Strategic Priority Areas 1, 2, and 3, as well as for funding, one country has reached a high level of implementation. Likewise, a few countries have reached at least a medium level of implementation for two or more indicators. Some countries, however, have very low levels of implementation across all the indicators.

The Asia Region as a whole has reached a medium level of implementation in Strategic Priority Areas 1, 2 and 4, and a high level of implementation in Strategic Priority Area 3. Collaboration and funding are less advanced, and fall within the lower categories. East Asia is a little more advanced than the other subregions, having attained a high level of implementation in three strategic priority areas. Across all strategic priority areas, most countries in Asia have reached high or medium levels of implementation. All countries in Asia, however, report a low level of collaboration and, with one exception, a low level of financing. The subregional and regional results for Asia have to be interpreted with care as the country coverage for this region (percentage of countries providing a Country Progress Report) is rather low (see Table 2).

The Europe and the Caucasus Region as a whole has reached a high level of implementation for all four strategic priority areas. Collaboration is rather less well advanced and the state of funding remains at a low level. Almost half the countries in the region have reached a high level of implementation in all four strategic priority areas and several more have only one strategic priority area that is less well advanced. However, a number of countries remain at medium or low levels of implementation in several strategic priority areas.

The Latin America and the Caribbean Region as a whole has reached a medium level of implementation in all four strategic priority areas. As in many other regions, levels of collaboration and funding are very low. The region is characterized by great variability in the state of implementation of the *Global Plan of Action* at country level. A few countries have achieved high levels of implementation across all four strategic priority areas, while a number of others remain at low levels of implementation for all or most strategic priority areas.

The Near and Middle East Region as a whole has reached a medium level of implementation in Strategic Priority Area 2. However, all other strategic priority areas remain at low levels of implementation. Collaboration and funding are also at low levels. There is some variation across the countries of the region. Some have reached at least a medium level of implementation in two or more strategic priority areas. As in Asia, the low country coverage should be taken into account when interpreting regional results for the Near and Middle East.

Both North American countries have reached high levels of implementation across all four strategic priority areas. Collaboration and funding are less well developed.

The reporting countries of the Southwest Pacific have generally reached low or medium levels of implementation across all strategic priority areas and in the fields of collaboration and funding. The only exception is that New Zealand has reached a high level of implementation in Strategic Priority Area 4. The country coverage in this region is very low (20 percent) and thus the regional summaries presented in the tables should be treated with caution.

Table 7. Indicators for strategic priority areas, collaboration and funding at country level

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Africa						
East Africa						
Burundi						
Ethiopia						
Kenya						
Rwanda						
North and West Africa						
Algeria						
Cameroon						
Central African Republic						
Côte d'Ivoire						
DRC[24]						
Gabon						
Ghana						
Guinea						
Liberia						
Nigeria						
Senegal						
Sierra Leone						
Togo						
Southern Africa						
Botswana						
Madagascar						
Zimbabwe						

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[24]Democratic Republic of Congo.

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Asia						
East Asia						
China						
Mongolia						
Republic of Korea						
South Asia						
Bhutan						
Nepal						
Southeast Asia						
Malaysia						
Philippines						
Thailand						
Europe and the Caucasus						
Albania						
Austria						
Bulgaria						
Croatia						
Cyprus						
Czech Republic						
Denmark						
Finland						
France						
Germany						
Greece						
Hungary						
Iceland						
Ireland						
Latvia						
Luxembourg						
Montenegro						
Netherlands						
Norway						
Poland						
Portugal						
Serbia						
Slovakia						
Slovenia						
Spain						
Sweden						
Switzerland						
Turkey						
Ukraine						
United Kingdom						

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Latin America and the Caribbean						
Caribbean						
Suriname						
Central America						
Costa Rica						
El Salvador						
Guatemala						
Mexico						
South America						
Argentina						
Bolivia (Plurinational State of)						
Brazil						
Chile						
Colombia						
Ecuador						
Paraguay						
Uruguay						
Near and Middle East						
Egypt						
Iraq						
Jordan						
Kuwait						
North America						
Canada						
United States of America						
Southwest Pacific						
Cook Islands						
New Zealand						
Niue						
World						

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. Indicator scores:

0.00　0.25　0.50　0.75　1.00　1.25　1.50　1.75　2.00
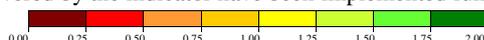
Indicators at the level of strategic priorities

Table 8 presents a global summary of the indicators at the level of strategic priorities expressed as colours and as average scores (see Table 2 for details of the indicator colour scheme). Table 8 also shows the percentage of reporting countries falling into the high, medium and low categories for each indicator. Tables 9 and 10 present summaries of the strategic priority-level indicators at regional and subregional levels. Table 11 shows the indicator for each reporting country. This set of tables allows for easy comparisons between countries, regions and subregions.

Table 8. Global overview of indicators for strategic priorities

Reference in the *Global Plan of Action*		Countries low (%)	Countries medium (%)	Countries high (%)	Indicator colour and average score
SPA1	SP1a	30	6	64	1.19
	SP1b	34	25	41	1.06
SPA2	SP3	41	14	19	0.75
	SP4	37	19	44	1.06
	SP5	44	16	40	1.04
	SP6	35	40	25	0.92
SPA3	SP7	29	32	39	0.80
	SP8	34	0	66	1.33
	SP9	49	0	51	0.92
SPA4	SP12	35	23	42	1.05
	SP13	58	21	21	0.76
	SP14	50	8	42	0.91
	SP18	36	0	64	1.28
	SP20	49	17	34	0.87

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. Indicator scores:

0.00   0.25   0.50   0.75   1.00   1.25   1.50   1.75   2.00

Table 9. Indicators for strategic priorities – regional summary

Region	SPA1		SPA 2				SPA 3					SPA 4		
	SP1a	SP1b	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP12	SP13	SP14	SP18	SP20
Africa														
Asia														
Europe and the Caucasus														
Latin America and the Caribbean														
Near and Middle East														
North America														
Southwest Pacific														
World														

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. Indicator scores:

0.00   0.25   0.50   0.75   1.00   1.25   1.50   1.75   2.00

Table 10. Indicators for strategic priorities – subregional summary

Region	SPA1		SPA 2				SPA 3			SPA4				
	SP1a	SP1b	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP12	SP13	SP14	SP18	SP 20
Africa														
East Africa														
North and West Africa														
Southern Africa														
Asia														
East Asia														
South Asia														
South East Asia														
Europe and the Caucasus														
Latin America and the Caribbean														
Caribbean														
Central America														
South America														
Near and Middle East														
North America														
Southwest Pacific														
World														

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. Indicator scores:

0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00

Tables 8 and 9 show that, globally, most indicators show a medium level of implementation of the respective strategic priorities. Only Indicators SP8 (The state of *in situ* conservation programmes) and 18 (The state of efforts to raise national awareness of the roles and values of animal genetic resources) show high levels of implementation, and even in these cases some regions remain at a low level of implementation.

Tables 9 and 10 show that for the Africa Region as a whole, the majority of indicators for strategic priorities remain at low levels. Only three indicators show that even a medium level of implementation has been reached. Particularly low levels of implementation are reported with respect to Indicator SP9 (The state of *ex situ* conservation programmes), SP13 (The state of efforts to strengthen national educational and research facilities), SP14 (The state of efforts to strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation) and SP20 (The state of national policies and legal frameworks for animal genetic resources). *In vitro conservation* is a high-tech activity and until recent years was given relatively low priority in conservation strategies for animal genetic resources. In contrast, human capacity, research, education and policy development might be described as prerequisites or major building blocks for effective animal genetic resources management. Weakness in these areas is thus a concern. It should, however, be noted that Indicator SP13 refers to "efforts to strengthen" research and education facilities. It should therefore not be concluded that all countries falling into the low categories for this indicator necessarily have poor research and education facilities. Nonetheless, the indicator suggests that in most countries research and education facilities need to be strengthened and that efforts to do so need to be stepped up.

The overall picture across the three subregions of Africa is quite similar. However, Southern Africa has reached an upper-medium level of implementation for several strategic priorities and in the case of Indicator SP18 (The state of efforts to raise national awareness of the roles and values of animal genetic resources) has reached a high level of implementation.

The country-level indicators for Africa (Table 11) show that, despite the generally low level of implementation across the region, most countries have achieved a high-level of implementation in at least one, and often several, strategic priorities. The areas in which the largest number of countries have achieved a high level of implementation are Indicators SP1a (The completeness of characterization), SP 8 (The state of *in situ* conservation programmes) and SP12 (The state of efforts to strengthen national institutions for planning and implementing animal genetic resources measures). Pockets of national success exist across almost all indicators. The exception is Indicator SP6 (The state of efforts to support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources), for which no country in the region has progressed beyond a lower-medium level of implementation. This latter finding seems rather to contradict the high level of implementation that many African countries report in the field of *in situ* conservation. However, indicator SP6 is based on questions referring specifically to support for indigenous knowledge and practices and efforts to promote products from indigenous and local species and breeds. It appears that activities of this kind are rare in Africa.

For the Asia Region as a whole, most indicators at strategic-priority level show that a medium level of implementation has been attained. Three indicators SP1a (The completeness of characterization) SP8 (The state of *in situ* conservation programmes) and SP9 (The state of *ex situ* conservation programmes) show high levels of implementation.

In interpreting the indicators for the subregions of Asia, the low level of geographical coverage in all regions except East Asia should be recalled. The data that are available indicate that East Asia is rather more advanced than the other two Asian subregions with respect to the indicators at strategic-priority level, having achieved a high level of implementation across 10 of the 14 indicators. South and Southeast Asia, in contrast, both have several indicators that show low levels of implementation. Indicator SP7 (The state of national conservation policies) appears to stand out as a problem area in South Asia. However, while the two reporting countries from this subregion may not have national

conservation policies *per se*, the other conservation-related indicators suggest that they have in fact been relatively active in this field. Indicators SP3 (The state of national sustainable use policies) and SP13 (The state of efforts to strengthen national educational and research facilities) also have low scores in this subregion. The latter two indicators also have low scores in Southeast Asia. Also weak in the latter subregion is Indicator SP18 (The state of efforts to raise national awareness of the roles and values of animal genetic resources).

Across the Asia Region as a whole there are quite marked contrasts in terms of the extent of implementation at country level. Some countries have high scores for ten or more indicators. In contrast, some countries have low scores for seven indicators.

Europe and the Caucasus as a whole has high scores for all indicators at strategic priority level except for Indicators SP3 (The state of national sustainable use policies) and SP13 (The state of efforts to strengthen national educational and research facilities). As noted above, it should be recalled that a high score for Indicator SP13 requires ongoing efforts to improve research and education facilities. In the case of Indicator SP3, most European countries have policies in place to promote sustainable use, but in many cases the indicator score is relatively low because of a lack of policies addressing access and benefit sharing.

Most individual European countries report a generally high level of implementation. A large majority of countries have high scores for at least half their indicators at strategic priority level. A few countries have high scores for all these indicators. Nonetheless, the European section of Table 11 contains a substantial number of red cells. Indicators SP3 and SP13 are discussed above. In addition, low scores are widespread for Indicators SP5 (The state of efforts to promote agro-ecosystems approaches to the management of animal genetic resources) (11 countries) and SP14 (The state of efforts to strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation) (8 countries). In the case of the latter indicator, it should, however, be recalled that the related questions in the Country Progress Report questionnaire focus specifically on the establishment of partnerships, organizations and networks rather than on activities addressing the development of human capacity in a more general sense.

The strategic priority-level indicators for the Latin America and the Caribbean Region as a whole show mostly medium levels of implementation, but several indicators show low (levels of implementation. Indicators SP6 (The state of efforts to support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources) and SP20 (The state of national policies and legal frameworks for animal genetic resources) show lower levels of implementation than any other indicators for this region. The caveat mentioned above, in the discussion on Africa, regarding the scope of Indicator SP6, should be borne in mind in this case also. The highest-scoring indicator for Latin America and the Caribbean is Indicator SP18 (The state of efforts to raise national awareness of the roles and values of animal genetic resources).

At subregional level, there is a marked contrast between the relatively high level of implementation achieved in South America and the lower levels in the Caribbean and Central America. In the former subregion almost all indicators show a medium level of implementation, while the latter two subregions most indicators show low levels of implementation in. It should, however, be noted that only one country from the Caribbean completed a Country Progress Report.

The individual countries of Latin America and the Caribbean are quite diverse in terms of their levels of implementation as shown by the indicators. The countries of the region can be roughly allocated to three groups: a small group of countries with a high level of implementation across most indicators; a second (larger) group with very low levels of implementation across most indicators; and a third group that are advanced with respect to some indicators but weak in other areas. Diverse levels of implementation can be found across all 14 indicators, with all having several countries at the lowest level and at least one country at the highest level.

For the Near and Middle East Region as a whole, all indicators at strategic-priority level show either low or medium levels of implementation. At country level, there are several examples of high indicator scores. Two countries, for example, have very high levels of implementation for Indicator SP18 (The state of efforts to raise national awareness of the roles and values of animal genetic resources). The only indicator that has a low score across all countries in this region is Indicator SP9 (The state of *ex situ* conservation programmes).

The North America Region has a high level of implementation across most elements the *Global Plan of Action*. Only 2 out of 14 indicators at the strategic-priority level fail to show a high level of implementation. The individual countries of the region both have mostly high levels of implementation, with only a few indicators showing low or medium levels.

The Southwest Pacific Region as a whole has low levels of implementation across most strategic priorities, the main exception being Indicator SP18 (The state of efforts to raise national awareness of the roles and values of animal genetic resources) which shows a high level of implementation. The three reporting countries from this region are quite diverse in terms of their indicator scores, with New Zealand having several indicators showing a high level of implementation.

Generally, the indicators at the level of strategic priorities give more detailed insights than the indicators at the level of strategic priority areas and are therefore a more precise tool for decision-makers.

Table 11. Indicators for strategic priorities – country level

Region	SPA1		SPA 2						SPA 3				SPA 4				
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP12	SP13	SP14	SP18	SP20
Africa														
East Africa														
Burundi														
Ethiopia														
Kenya														
Rwanda														
North and West Africa														
Algeria														
Cameroon														
Central African Republic														
Côte d'Ivoire														
Democratic Republic of Congo														
Gabon														
Ghana														
Guinea														
Liberia														
Nigeria														
Senegal														
Sierra Leone														
Togo														
Southern Africa														
Botswana														
Madagascar														
Zimbabwe														

Region	SPA 1		SPA 2				SPA 3			SPA 4				
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP12	SP13	SP14	SP18	SP20
Asia														
East Asia														
China														
Mongolia														
Republic of Korea														
South Asia														
Bhutan														
Nepal														
South East Asia														
Malaysia														
Philippines														
Thailand														
Europe and the Caucasus														
Albania														
Austria														
Bulgaria														
Croatia														
Cyprus														
Czech Republic														
Denmark														
Finland														
France														
Germany														
Greece														
Hungary														
Iceland														
Ireland														
Latvia														
Luxembourg														
Montenegro														

Region	SPA 1		SPA 2				SPA 3			SPA 4				
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP12	SP13	SP14	SP18	SP20
Netherlands														
Norway														
Poland														
Portugal														
Serbia														
Slovakia														
Slovenia														
Spain														
Sweden														
Switzerland														
Turkey														
Ukraine														
United Kingdom														
Latin America and the Caribbean														
Caribbean														
Suriname														
Central America														
Costa Rica														
El Salvador														
Guatemala														
Mexico														
South America														
Argentina														
Bolivia (Plurinational State of)														
Brazil														
Chile														
Colombia														
Ecuador														
Paraguay														
Uruguay														

Region	SPA1		SPA 2				SPA 3				SPA 4				
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP12	SP13	SP14	SP18	SP20	
Near and Middle East															
Egypt															
Iraq															
Jordan															
Kuwait															
North America															
Canada															
United States of America															
Southwest Pacific															
Cook Islands															
New Zealand															
Niue															
World															

scores:

2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00

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. Indicator

Impact of the implementation of the *Global Plan of Action*

The indicators presented above describe the state of various aspects of animal genetic resources management after approximately four years of implementation of the *Global Plan of Action*. However, in many cases, countries had been working on these aspects of animal genetic resources management before the adoption of the *Global Plan of Action*. Thus, an advanced state of management cannot necessarily be attributed to the implementation of the *Global Plan of Action* (although it may in part be attributable to the "State of the World" process that led to the development and adoption of the *Global Plan of Action*). As described above, many of the questions in the Country Progress Report questionnaire allow countries to indicate whether or not progress has been made in the respective field of action since the adoption of the *Global Plan of Action*. For individual questions, the proportions of countries reporting progress since 2007 can be seen in Figures 1 to 67. Figures 68 to 72 summarize the findings to give an overview of the impact of the various strategic priority areas of the *Global Plan of Action* at regional and global levels.

As described above, the multiple-choice answers in the Country Progress Report questionnaire were allocated to three categories according to whether they indicate that the respective activity had been completed before the adoption of the *Global Plan of Action*, has progressed since the adoption of the *Global Plan of Action* or has not progressed. A conservative approach was taken, in that the latter category includes any answer that do not indicate actual action; i.e. answers referring to actions still being planned are assigned to the "no progress" category. It should also be recalled that the multiple-choice questions in the questionnaire merely distinguish progress from no progress (since the adoption of the *Global Plan of Action*). The answers do not indicate whether the progress made by an individual country in implementing a given aspect of the *Global Plan of Action* has been large or small.

Figures 68 to 72 show the average proportion of countries giving answers falling into each of the three categories " completed before" (B-SPA1 – B-SPA4, B-GPA), "progress" (P-SPA1 – P-SPA4, P-GPA), and " no progress" (N-SPA1 – N-SPA4, N–GPA) across all the questions related to the respective strategic priority area. This can also be described as the proportion of all the answers related to the respective strategic respective strategic priority area, across all the reporting countries, falling into each category.

Figure 68. Summary of progress made in implementing Strategic Priority Area 1
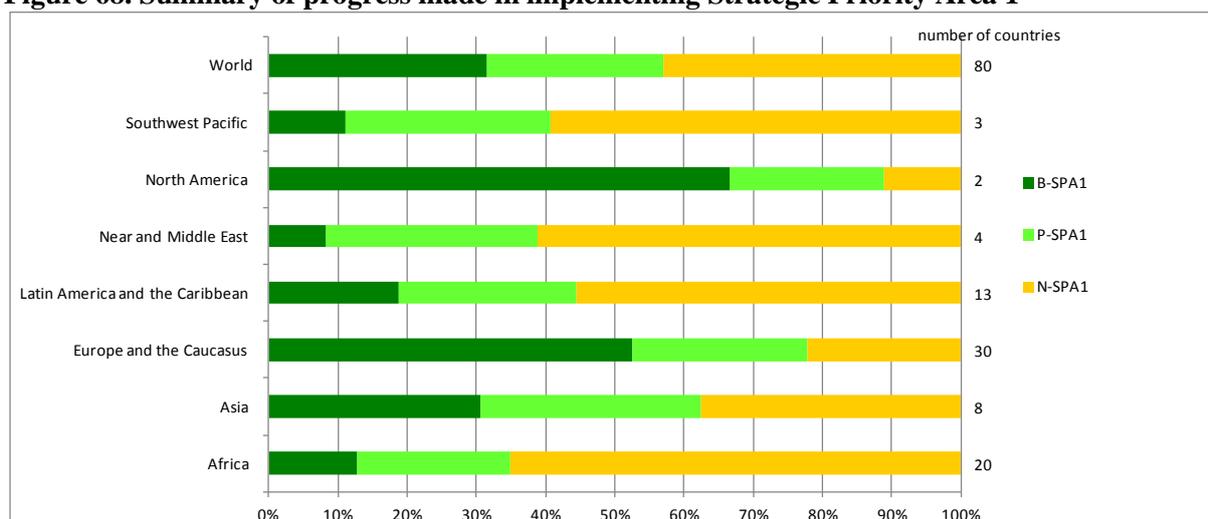
Figure 68 shows that across the world (i.e. all the reporting countries) the most frequent category of answer to the questions related to Strategic Priority Area 1 is "no progress", which accounts for more than 40 percent of answers. More than 30 percent of answers indicate that the respective aspect of the *Global Plan of Action* had been implemented to a satisfactory level before the adoption of the *Global Plan of Action*. About 25 percent of answers indicate that progress has been made since the adoption of the *Global Plan of Action*. There is some variation among the regions of the world. The developed

regions of North America and Europe and the Caucasus stand out as having had a relatively high level of implementation in place before the adoption of the *Global Plan of Action*. Moreover, in these regions the majority of activities still requiring attention have progressed, to some degree at least, thanks to the implementation of the *Global Plan of Action*. The other regions of the world started from a lower initial level of implementation. They also have a relatively high proportion of answers indicating that the respective aspect of the *Global Plan of Action* requires action but has not progressed since 2007. In Africa, the Near and Middle East, the Southwest Pacific, and Latin America and the Caribbean, the majority of answers fall into this category.

Figure 69. Summary of progress made in implementing Strategic Priority Area 2
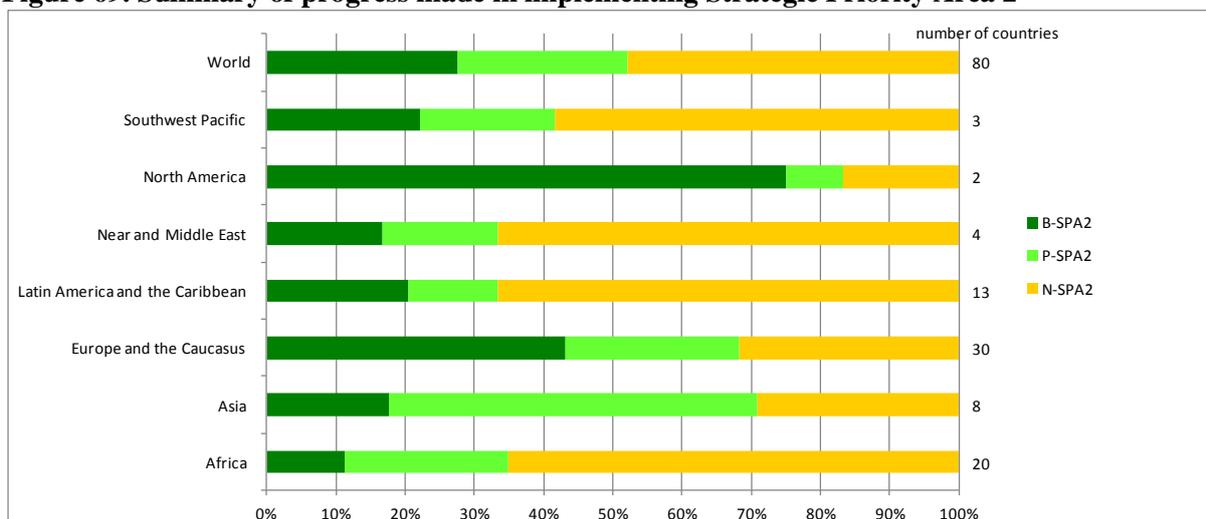
Figure 69 shows that across the world the most frequent category of answer to the questions related to Strategic Priority Area 2 is, again, "no progress", which accounts for almost 50 percent of answers. Almost 30 percent of answers indicate that the respective activity had already been implemented to a satisfactory level before the adoption of the *Global Plan of Action*. About 25 percent of responses indicate progress. Again, the developed regions, particularly North America, report relatively high levels of implementation before the adoption of the *Global Plan of Action*. Progress is reported more frequently by countries from Asia than by those from any other region.

Figure 70. Summary of progress made in implementing Strategic Priority Area 3
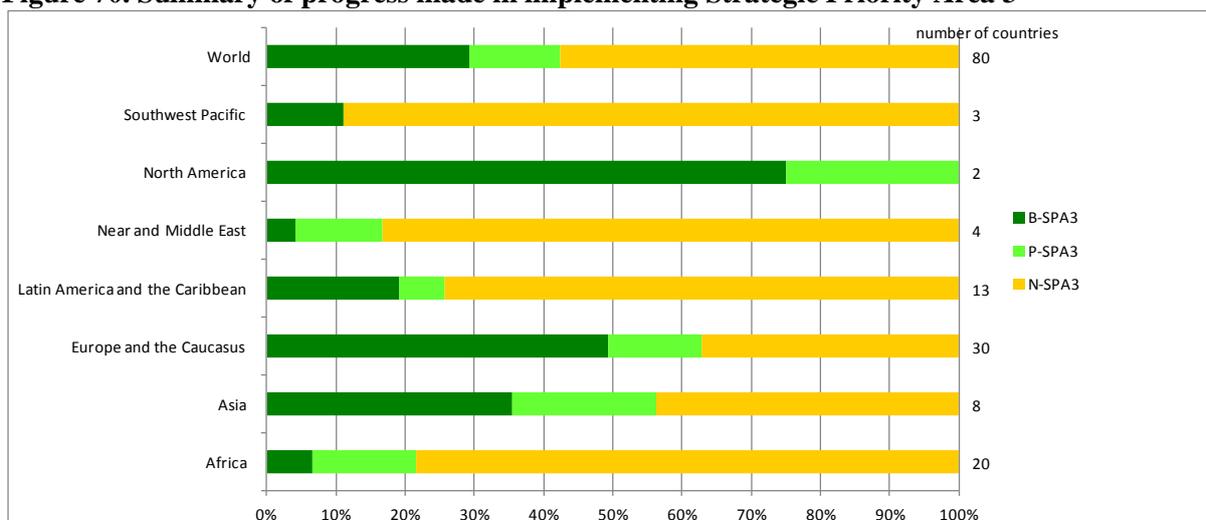
Figure 70 shows that across the world the most frequent category of answer to the questions related to Strategic Priority Area 3 is "no progress", which accounts for almost 60 percent of answers. Almost 30 percent of answers indicate that the respective aspect of implementation had been completed to a satisfactory degree before the adoption of the *Global Plan of Action*. About 15 percent of answers

indicate progress. Strategic Priority Area 3 (Conservation) is thus the strategic priority area in which the least progress is reported. Apart from North America, all regions are far from having reached a satisfactory level of implementation in conservation activities, and reported progress since the adoption of the *Global Plan of Action* is small relative to the improvements required.

Figure 71. Summary of progress made in implementing Strategic Priority Area 4
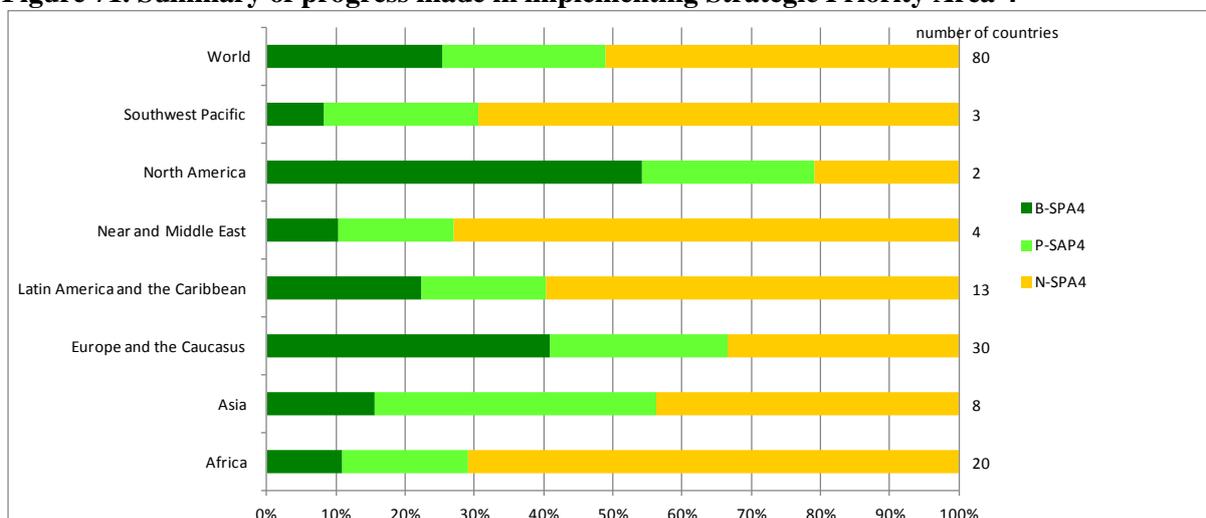
Figure 71 shows that across the world the most frequent category of answer to the questions related to Strategic Priority Area 4 is "no progress", which accounts for almost 50 percent of answers. Almost 30 percent of answers indicate that the respective aspect of the *Global Plan of Action* had already been implemented to a satisfactory degree before the adoption of the *Global Plan of Action*. The remaining answers indicate progress. As in Strategic Priority Area 2, progress is more frequently reported by Asian countries than by those from other regions.

Figure 72. Summary of progress made in implementing the *Global Plan of Action*
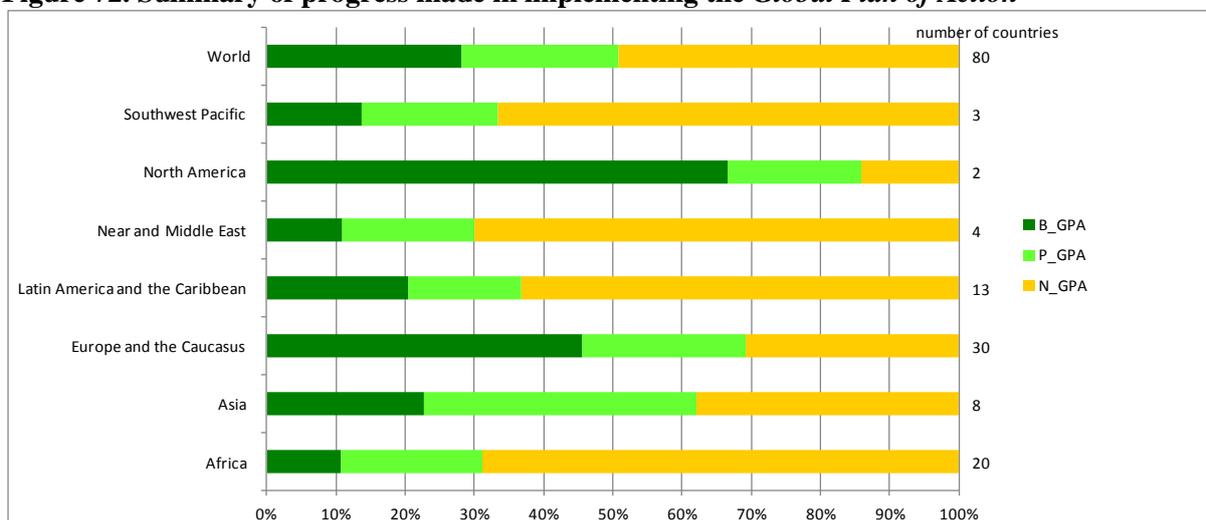
Figure 72 shows that across the world and across all elements of the *Global Plan of Action* covered by the Country Progress Report questionnaire, the most frequent category of answer is "no progress", which accounts for almost 50 percent of answers. Almost 30 percent of answers indicate that the respective aspect of the *Global Plan of Action* had already been implemented to a satisfactory degree before the adoption of the *Global Plan of Action*. The remaining answers indicate progress since 2007.

While it is clear that much remains to be done, the light-green bars in Figures 68 to 72 demonstrate that substantial progress has been made in all regions since the adoption of the *Global Plan of Action* and that in almost all cases, this progress extends across all four strategic priority areas.

IV.   PROGRESS MADE IN THE IMPLEMENTATION OF THE *GLOBAL PLAN OF ACTION* BY REGIONAL FOCAL POINTS AND NETWORKS

In accordance with the reporting schedule agreed by the Commission, in December 2011 FAO invited Regional Coordinators for the Management of Animal Genetic Resources to report on progress made in their regions in the implementation of the *Global Plan of Action*. An electronic questionnaire was made available on the FAO web site[25]. Regional Coordinators were asked to submit their completed questionnaires electronically by 31 March 2012. They were reminded that the objective should be to "highlight collaborative efforts and indicate regional priorities for capacity building in relation to the implementation of the *Global Plan of Action*"[26] rather than to summarize activities at country level.

Responses were received from all the regional focal points and networks so far established and in existence:

1.   the Animal Genetic Resources Network – Southwest Pacific;
2.   the European Regional Focal Point for Animal Genetic Resources;
3.   the Regional Focal Point for Latin America and the Caribbean; and
4.   the Sub-Regional Focal Point for West and Central Africa.

STRATEGIC PRIORITY AREA 1. CHARACTERIZATION, INVENTORY AND MONITORING OF TRENDS AND ASSOCIATED RISKS

In Europe, the European Union-funded FABISnet Project, which ran from 2007 to 2010 and received additional annual contributions from the European Regional Focal Point (ERFP), further developed the European Farm Animal Biodiversity Information System (EFABIS). Fifteen European countries have started to use the system for managing their animal genetic resources data. Another project financially supported by ERFP under its "Call for Action" aimed to harmonize the various existing concepts of risk status and endangerment criteria in order to provide comparable risk-status figures internationally. The ERFP Task Force on Risk Status and Indicators[27] continues to work on this issue. In addition to the work of the ERFP itself, several other stakeholders are reported to be active in multi-country activities in Europe. NGOs such as the SAVE Foundation and the International Association for the Conservation of Animal Breeds in the Danubian Region (DAGENE) organize data collection, recording and documentation activities. A number of countries undertake collaborative activities in surveying, characterization and monitoring, and in related research.

In an initiative that links the Latin American and the Caribbean Region to the North America Region, Brazil, Canada and the United States of America are developing an information system for their animal genetic resources, which when fully developed will be offered to other countries in the region.

The priorities of the Sub-Regional Focal Point for West and Central Africa include supporting and coordinating baseline studies on inventory and characterization of animal genetic resources and their production systems, with a particular focus on transboundary breeds; the development of harmonized methodologies and protocols for data collection in country studies as a basis for meta-analyses at regional level; and the establishment of a regional information system on animal genetic resources and improving reporting to DAD-IS.

In the Southwest Pacific, the main activity within Strategic Priority Area 1 has been a characterization project on indigenous pigs and chickens, which involved a number of countries.

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[25] http://www.fao.org/ag/againfo/programmes/en/genetics/Reporting_system.html
[26] CGRFA-12/09/Report. Appendix G.
[27] http://www.rfp-europe.org/index.php?id=492

STRATEGIC PRIORITY AREA 2. SUSTAINABLE USE AND DEVELOPMENT

Reported regional-level activities within this strategic priority area are restricted mainly to Europe. The SUBSIBREED Project ("Proper way of supports for endangered livestock breeds"), which received financial support under the "ERFP Call for Action", focused on appropriate support measures for locally adapted livestock breeds in the European Union. Several other cross-border or multi-country projects are also reported. The European Union operates three schemes that promote and protect the names of quality agricultural products, some of which help to maintain the profitability of keeping specific breeds of livestock. In addition, a number of NGOs operate labelling, certification and award schemes that play a similar role.

The Sub-Regional Focal Point for West and Central Africa reports several priorities for future collaborative work on sustainable use and development, including support for regional breeding programmes, support for regional projects on animal identification and recording, support for regional projects on the valorisation of local breeds and their products and the improvement of their marketing and commercialization, and support for the establishment and strengthening of breeders' organizations including at regional level.

STRATEGIC PRIORITY AREA 3. CONSERVATION

ERFP has a working group on *ex situ* conservation, which provides guidance to the ERFP Assembly and supports and coordinates work on *ex situ* conservation throughout Europe. ERFP co-funded a "European Training Workshop on Gene Banking and Cryopreservation" held in the Netherlands in 2010[28]. As part of the above-mentioned FABISnet Project, the CryoWEB[29] software was developed as a generally applicable gene bank documentation system. It is already being used in a number of European countries. ERFP has also supported a number of *in situ* conservation projects under its Call for Action.
Among other stakeholders in Europe, several multi-country projects on the conservation of transboundary breeds are reported. The NGOs mentioned under Strategic Priority Area 1 also organize conservation projects and related activities. The Nordic Genetic Resource Center (NordGen) has developed tools for the design of cryobanks and for maintaining genetic variation in living populations.

Priorities for the Sub-Regional Focal Point for West and Central Africa include support for *in situ* conservation projects for transboundary breeds and for the establishment of subregional facilities for *ex situ* conservation and in particular *in vitro* conservation.

The Animal Genetic Resources Network – Southwest Pacific also stresses the importance of establishing regional *ex situ* conservation facilities because of the continuous threats facing the region's animal genetic resources.

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[28] http://www.cgn.wur.nl/UK/CGN+General+Information/Education+and+information/Seminars/
[29] http://cryoweb.tzv.fal.de/; ftp://ftp.tzv.fal.de/pub/cryoweb/doc/cryoweb_manual.pdf

STRATEGIC PRIORITY AREA 4. POLICIES, INSTITUTIONS AND CAPACITY-BUILDING

Since its establishment in 2001, ERFP has been involved in facilitating regional communication; providing technical assistance; coordinating training, research and planning activities among countries; development of regional policies; assisting in the identification of projects; and interacting with government agencies, donors, research institutions and NGOs. Based on experience gained over the preceding decade, new terms of reference[30] for the ERFP were adopted in 2010, along with a multi-year programme of work for the period 2010 to 2014. ERFP seeks to collaborate with other European organizations including NGOs.

The ERFP Task Force on Agri-environmental Measures[31] has provided inputs to the development of the European Union's policies and regulations on animal genetic resources. The ERFP Task Force on Access and Benefit Sharing[32], established in 2010, is involved in discussions on access to and fair and equitable sharing of benefits arising from the use of animal genetic resources. Several projects financed under the ERFP Call for Action have facilitated capacity-building and provided training opportunities for National Coordinators and other stakeholders. Several individual countries and NGOs also organize workshops and training activities aimed at an international audience.

In the Southwest Pacific, regional activities on animal genetic resources are coordinated by the Animal Production Officer of the Secretariat of the Pacific Community, who acts as the Regional Coordinator. Various awareness-raising activities including talks, interviews, presentations and distribution of promotional materials, have been undertaken in the region. However, these activities are hampered by the geographical dispersedness of the region's countries and the limited availability of funds. The region also has a regional e-mailing list that is used for information sharing, discussions and other collaboration.

Priorities for subregional-level activities in West and Central Africa include facilitating communication, organizing training activities and the establishment of regional "centres of excellence".

In Latin America and the Caribbean, several regional workshops for National Coordinators for the Management of Animal Genetic Resources have been organized, and have provided opportunities for improving the integration of work on animal genetic resources within the region. Most countries are reported not to be actively involved in international collaboration. However, two regional projects have been submitted in response to the First Call for Proposals under the Funding Strategy for the Implementation of the *Global Plan of Action*. Several other organizations and networks in the region, including Red CONBIAND and the Brazilian Society of Genetic Resources, hold regional conferences related to animal genetic resources. At subregional level, among the countries of the Southern Cone of South America, the Inter-American Institute for Cooperation on Agriculture's Platform REGENSUR – originally devoted to plant genetic resources – has been extended to include work on animal and micro-organism genetic resources and it is expected that common activities will be initiated to reinforce the national plans of action for genetic resources of participating countries.

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[30] http://www.rfp-europe.org/index.php?id=364
[31] http://www.rfp-europe.org/index.php?id=493
[32] http://www.rfp-europe.org/index.php?id=491

V.   PROGRESS MADE IN THE IMPLEMENTATION OF THE *GLOBAL PLAN OF ACTION* BY INTERNATIONAL ORGANIZATIONS

In accordance with the reporting schedule agreed by the Commission, FAO, in early 2012, invited international organizations to report, via an electronic questionnaire made available on the FAO web site[33], on their activities in implementing the *Global Plan of Action*. Organizations were asked to submit their reports (completed questionnaires) by 30 April 2012. This was the second round of reporting by international organizations, who had previously been invited (at the end of 2010) to complete the same questionnaire.

A detailed analysis of the activities of international organizations in implementing the *Global Plan of Action* as reported in the previous round of reporting was provided in the document *Progress report of international organizations on the implementation of the Global Plan of Action for Animal Genetic Resources[34]*, which was presented to the Commission at its Thirteenth Regular Session in 2011. The report concluded that a number of international organizations were making important contributions to the implementation of the *Global Plan of Action*, often via innovative, efficient and participatory programmes and projects, but that given the limited uptake of the survey, it was unclear to what extent the *Global Plan of Action* had influenced the activities of the mass of international organizations working in the livestock sector. Activities of international organizations were distributed quite evenly across the four strategic priority areas of the *Global Plan of Action*. The latest round of reporting did not give cause to revise these general conclusions. As such, a lengthy discussion of the latest reports is unnecessary. Some new developments are highlighted below. The complete reports can be accessed via the FAO web site[35].

A total of 11 reports were received in 2012. This is fewer than the 18 received in the previous round of reporting. The short period of time between the two rounds may have discouraged some organizations from submitting second reports. The following organizations provided updates of their previously submitted reports: European Federation of Animal Science; Heifer International; International Center for Agricultural Research in the Dry Areas; International Centre for Integrated Mountain Development; International Livestock Research Institute; League for Pastoral Peoples and Endogenous Livestock Development; and RED CONBIAND. The following organizations submitted reports for the first time: European Forum of Farm Animal Breeders; Rare Breeds International; and World Intellectual Property Organization.

The reports submitted by organizations that had not submitted reports during the previous round describe a wide range of activities, with each organization having its own particular focus in line with its mandate. The majority of activities reported by the European Forum of Farm Animal Breeders relate to Strategic Priority Areas 2 and 4 of the *Global Plan of Action* and include work on recording systems, sustainable intensification, regulatory frameworks, access and benefit sharing, promotion of networking among stakeholders and the provision of training. The organization also reports work on molecular characterization. Activities reported by Rare Breeds International include work on many aspects of characterization, as well as breeding and marketing programmes for rare breeds, *in situ* and *ex situ in vivo* conservation, networking and support for the development of policies and legal frameworks. The World Intellectual Property Organization reports that its patent landscape report on animal genetic resources can serve as a source of information for stakeholders involved in various aspects of animal genetic resources management. For the most part, the organization deals with intellectual property issues related to genetic resources in general, rather than to animal genetic resources specifically. Reported activities include the development and updating of an online database of relevant contractual practices, preparation of draft guidelines on intellectual property clauses in access and benefit-sharing agreements, preparation of a set of case studies related to intellectual

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[33] http://www.fao.org/ag/againfo/programmes/en/genetics/Reporting_system.html
[34] CGRFA-13/11/Inf.16; http://www.fao.org/docrep/meeting/022/am648e.pdf
[35] http://www.fao.org/ag/againfo/programmes/en/genetics/Reporting_system.html

property and genetic resources, and training and capacity-building activities related to intellectual property, including tools such as branding that can be used to add value to products.

Most organizations that had previously submitted reports do not describe many major changes in their activities. Ongoing projects and other activities have progressed and new publications have been published or are in preparation. In some cases, new projects have commenced or activities have been expanded into new areas. For example, the International Centre for Integrated Mountain Development, an organization that reported few concrete animal genetic resources-related activities in its last report, describes activities in several fields including phenotypic and molecular characterization and population surveys (yaks); breeding programmes (yaks and sheep); product marketing (yaks and other ruminants); and integration of yak conservation, grassland restoration and pastoral development.

VI.   CONCLUSIONS

Eighty-four countries submitted Country Progress Reports on their implementation of the *Global Plan of Action*. This compares to 169 country reports submitted during the reporting process for *The State of the World's Animal Genetic Resources*. Fewer than half the countries that adopted the *Global Plan of Action* in 2007 submitted a Country Progress Report in 2012, despite the high number of countries (160) that have National Coordinators. The reasons for this relatively low response rate are unclear. However, if it is assumed that non-response is associated either with a lack of commitment to the *Global Plan of Action* or with a lack of progress to report, then it can perhaps be concluded that the state of implementation across all the world's countries is likely to be less advanced than that achieved in the reporting countries.

Few countries that do not have a National Coordinator submitted Country Progress Reports. Gaps in the geographical coverage of reporting could thus probably have been reduced if additional countries (particularly larger countries) had nominated National Coordinators. This is particularly the case in Latin America (e.g. Guyana, Peru and the Bolivarian Republic of Venezuela), Africa (e.g. South Sudan) and the Near and Middle East (e.g. Afghanistan and Sudan).

Among reporting countries, the indicators for the state of implementation of the various elements of the *Global Plan of Action* reveal substantial variations among the world's regions. Implementation is generally at a high level in Europe and the Caucasus and North America, at a medium level in Asia, and at a low level in other regions. However, individual countries from all regions have reached high levels of implementation of some aspects of the *Global Plan of Action*. Likewise, some countries from developed regions have reached only low levels of implementation in some aspects. For the world as a whole, the indicator for Strategic Priority Area 4 (Policies, institutions and capacity building) shows a lower level of implementation than the indicators for the other three strategic priority areas. However, for several developing regions, it is Strategic Priority Area 3 (Conservation) that has the lowest indicator scores. While the most frequently mentioned obstacles to enhancing conservation programmes are resource-related constraints, many countries mentioned that a lack of information on animal genetic resources is an important constraint. This underlines the fundamental importance of implementing Strategic Priority Area 1 (Characterization, inventory and monitoring of trends and associated risks).

In all regions, the indicators for the state of collaboration and for the state of funding show a lower level of implementation than those for the strategic priority areas themselves. Financial constraints are also the most frequently mentioned obstacles and barriers to implementation of the *Global Plan of Action*. Funding gaps thus remain substantial despite the fact that by endorsing the *Global Plan of Action* countries recognized that implementation required "substantial and additional financial resources"[36] and committed themselves to ensuring "due priority and attention to the effective allocation of predictable and agreed resources for the implementation of ... the *Global Plan of Action*"[37] and in the case of developed countries to attaching "due attention, including funding, to the implementation of ... the *Global Plan of Action* ... through bilateral, regional and multilateral cooperation"[38]. More recently, the Commission "appealed to all FAO Members and relevant international mechanisms, funds and bodies, to give due priority and attention to the effective allocation of predictable and agreed resources for the implementation of activities within the strategic priority areas of the *Global Plan of Action*"[39].

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[36]*Global Plan of Action for Animal Genetic Resources*, paragraph 50;
   www.fao.org/docrep/010/a1404e/a1404e00.htm
[37]*Global Plan of Action for Animal Genetic Resources*, paragraph 67;
   www.fao.org/docrep/010/a1404e/a1404e00.htm
[38]*Global Plan of Action for Animal Genetic Resources*, paragraph 68.
[39]CGRFA-13/11/Report, paragraph 73; http://www.fao.org/docrep/meeting/024/mc192e.pdf

Analysis of the impact of the *Global Plan of Action*, measured in terms of whether or not progress has been made since 2007, reveals that substantial improvements have been achieved. Nonetheless, in many cases where improvements to a particular aspect of animal genetic resources management at country level are needed (as judged by the reporting countries themselves), no action is reported to have occurred since the adoption of the *Global Plan of Action*. Many countries are still in the process of preparing or endorsing national strategies and action plans for animal genetic resources. Many others regard this as a priority for the future. Once these strategies and plans start to be implemented, it can be expected that some of the gaps in countries' existing animal genetic resources management activities will be addressed.

Where methodology is concerned, the analysis of country-level activities revealed that some indicators are not fully covered by the related set of questions in the Country Progress Report questionnaire, i.e. the questions do not allow countries to report on all fields of activity relevant to the respective indicator. Thus, the comprehensiveness of future rounds of reporting would be enhanced by the inclusion of a few additional questions to improve the coverage of the questionnaire.

The relationship between process indicators and resource indicators remains largely unexplored because of a lack of data on the side of the resource indicators. However, in the case of Strategic Priority Area 1, results (see Annex 4) show that subregions with higher indicator scores for implementation tend to have more complete population data for their breeds.

The Regional Progress Reports present a mixed picture. Several regions of the world do not yet have a Regional Focal Point or regional network. The ERFP, the longest established Regional Focal Point, reports a range of activities across all the strategic priority areas of the *Global Plan of Action*. Other stakeholders, such as NGOs, individual countries and the European Union, are also reported to be active in collaborative activities related to animal genetic resources management in Europe. A more limited range of activities is reported by the Regional Focal Point for Latin America and the Caribbean and the Animal Genetic Resources Network – Southwest Pacific. The Sub-Regional Focal Point for West and Central Africa, launched only in June 2011, has established regional priorities for action in the various strategic priority areas of the *Global Plan of Action*.

A small number of international organizations continue to make an important contribution to the implementation of the *Global Plan of Action*, often via innovative, efficient and participatory programmes and projects. The activities of these organizations span the four strategic areas of the *Global Plan of Action*.

Despite the significant impact of the *Global Plan of Action,* the task of improving the management of the world's animal genetic resources management remains far from complete. The reason for this lies mainly in a lack of sufficient financial resources, but also in low levels of collaboration between countries, a lack of established policies and legal frameworks, and a lack of strong institutional and human capacity for planning in the livestock sector. Decision-makers are encouraged to use the country-level indicators presented in this report as a means of identifying strategic priority areas and strategic priorities where action is particularly required.

Annex 1

Overview: Indicators and targets of the *Global Plan of Action* by strategic priority area (SPA) and implementation and financing (collaboration and financing) and questions used for their calculation

SPA 1 Characterization, inventory and monitoring of trends and associated risks

SPA 1 Goal	Improved understanding of the status, trends and associated risks, and characteristics of all aspects and components of animal genetic resources, to facilitate and enable decision-making for their sustainable use, development and conservation	
SPA 1 Indicator	The completeness of characterization and inventory and the regularity of monitoring of trends and associated risks	
SPA 1 Target	Increase the completeness of characterization and inventory and improve monitoring of trends and associated risks	
SP 1 a[40]	Inventory and characterize animal genetic resources, monitor trends and risks associated with them, and establish country-based early-warning and response systems	
SP 1 a Indicator	The completeness of characterization	
SP 1 a Target	Increase the completeness of characterization	
	Q 2	Which of the following options best describes your country's progress in molecular characterization of its animal genetic resources covering all livestock species of economic importance?
	Q 3	Which of the following options best describes your country's progress in molecular characterization of its animal genetic resources covering all livestock species of economic importance?
	Q 10	Is your country conducting research to develop methods, technical standards or protocols for phenotypic or molecular characterization, or breed evaluation, valuation or comparison?
SP 1 b	Inventory and characterize animal genetic resources, monitor trends and risks associated with them, and establish country-based early-warning and response	
SP 1 b Indicator	The completeness of inventory and the regularity of monitoring of trends and associated risks	
SP 1 b Target	Increase the completeness of inventory and improve monitoring of trends and associated risks	
	Q 1	Which of the following options best describes your country's progress in building an inventory of its animal genetic resources covering all livestock species of economic importance?
	Q 4	Has your country conducted a baseline survey of the population status of its animal genetic resources for all livestock species of economic importance?
	Q 5	Have institutional responsibilities for monitoring the status of animal genetic resources in your country been established?
	Q 6	Have protocols (details of schedules, objectives and methods) been established for a programme to monitor the status of animal genetic resources in your country?
	Q 7	Are the population status and trends of your country's animal genetic resources being monitored regularly for all livestock species of economic importance?
	Q 8	Which criteria do your country use for assessing the risk status of its animal genetic resources?
	Q 9	Has your country established an operational emergency response system that provides for immediate action to safeguard breeds at risk in all important livestock species?

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[40] SP = strategic priority (please note that SP1 has been split in SP1a and b).

Questions contributing in addition to SPA 1

	Q 11	Has your country identified the major barriers and obstacles to enhancing its inventory, characterization and monitoring programmes?
	Q57_1	Are there any national NGOs active in your country in the fields of: Characterization?

SPA 2 Sustainable use and development

SPA 2 Goal	Enhanced sustainable use and development of animal genetic resources in all relevant production systems, as a key contribution to achieving sustainable development, poverty eradication and adaptation to the effects of climate change
SPA 2 Indicator	The state of sustainable use and development
SPA 2 Target	Improve the state of sustainable use and development
SP 3	Establish and strengthen national sustainable use policies
SP 3 Indicator	The state of national sustainable use policies
SP 3 Target	Improve the state of sustainable use policies

	Q 14	Does your country have adequate national policies in place to promote the sustainable use of animal genetic resources?
	Q 23	Has your country developed agreements for equitable sharing of the benefits resulting from access to, and use and development of, animal genetic resources and associated traditional knowledge?

SP 4	Establish national species and breed development strategies and programmes
SP 4 Indicator	The state of national species and breed development strategies and programmes
SP 5 Target	Improve the state of national species and breed development strategies and programmes

	Q 16	Are breed development programmes revised, for all major species and breeds in your country, with the aim of meeting foreseeable economic and social needs and market demands?
	Q 17	Is long-term sustainable use planning - including, if appropriate, strategic breeding programmes - in place for all major livestock species and breeds?
	Q 19	Have the long-term impacts of the use of exotic breeds on local breeds (e.g. economic, environmental or genetic impacts) and on food security been assessed in your country?
	Q 20	Have recording systems and organizational structures for breeding programmes been established or strengthened?
	Q 22	Have measures been implemented in your country to provide farmers and livestock keepers with information that facilitates their access to animal genetic resources?
	Q 24	Have training and technical support programmes for the breeding activities of livestock-keeping communities been established or strengthened in your country?
	Q 25	Have priorities for future technical training and support programmes to enhance the use and development of animal genetic resources in your country been identified?

SP 5	Promote agro-ecosystems approaches to the management of animal genetic resources
SP 5 Indicator	The state of efforts to promote agro-ecosystems approaches to the management of animal genetic resources
SP 5 Target	Increase efforts to promote agro-ecosystems approaches to the management of animal genetic resources

	Q 15	Do these policies address the integration of agro-ecosystem approaches into the management of animal genetic resources in your country?
	Q 21	Are mechanisms in place in your country to facilitate interactions among stakeholders, scientific disciplines and sectors as part of sustainable use development planning?

SP 6	Support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources

SP 6 Indicator		The state of efforts to support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources
SP 6 Target		Increase efforts to support indigenous and local production systems and associated knowledge systems of importance to the maintenance and sustainable use of animal genetic resources
	Q 26	Have efforts been made in your country to assess and support indigenous or local production systems and associated traditional knowledge and practices related to animal genetic resources?
	Q 27	Have efforts been made in your country to promote products derived from indigenous and local species and breeds, and facilitate access to markets?
Questions contributing in addition to SPA 2		
	Q 18	Have the major barriers and obstacles to enhancing the sustainable use and development of animal genetic resources in your country been identified?
	Q57_2	Are there any national NGOs active in your country in the fields of: Sustainable use and development?
SPA 3 Conservation		
SPA 3 Goal		Secure the diversity and integrity of the genetic base of animal genetic resources by better implementing and harmonizing measures to conserve these resources, both in situ and ex situ, including in the context of emergencies and disasters
SPA 3 Indicator		The state of conservation
SPA 3 Target		Improve the state of conservation
SP 7		Establish national conservation policies
SP 7 Indicator		The state of national conservation policies
SP 7 Target		Improve the state of national conservation policies
	Q 32	Does your country have conservation policies and programmes in place to protect breeds at risk in all important livestock species?
SP 8		Establish or strengthen in situ conservation programmes
SP 8 Indicator		The state of in situ conservation programmes
SP 8 Target		Improve the state of in situ conservation programmes
	Q34_1	Are in situ measures being used in your country to conserve breeds at risk of extinction and to prevent breeds from becoming at risk?
SP 9		Establish or strengthen ex situ conservation programmes
SP 9 Indicator		The state of ex situ conservation programmes
SP 9 Target		Improve the state of ex situ conservation programmes
	Q34_2	Are ex situ *in vivo* measures being used in your country to conserve breeds at risk of extinction and to prevent breeds from becoming at risk?
	Q34_3	Are ex situ in vitro measures being used in your country to conserve breeds at risk of extinction and to prevent breeds from becoming at risk?
	Q 39	Are arrangements in place in your country for extraction and use of conserved genetic material following loss of animal genetic resources (e.g. through disasters), including arrangements to enable restocking?

Questions contributing in addition to SPA 3

	Q 30	Does your country regularly assess factors leading to the erosion of its animal genetic resources?
	Q 36	Has your country identified the major barriers and obstacles to enhancing the conservation of its animal genetic resources?
	Q 38	Are arrangements in place in your country to protect breeds and populations that are at risk from natural or human induced disasters?
	Q 40	Is your country conducting research to adapt existing, or develop new, methods and technologies for in situ and ex situ conservation of animal genetic resources?
	Q 41	Does your country implement programmes to promote documentation and dissemination of knowledge, technologies and best practices for conservation?
	Q 57_3	Are there any national NGOs active in your country in the fields of: Conservation of breeds at risk?

SPA 4 Policies, institutions and capacity-building

SPA 4 Goal	Established cross-cutting policies and legal frameworks, and strong institutional and human capacities to achieve successful medium- and long-term planning for livestock sector development, and the implementation of national programmes for the long-term
SPA 4 Indicator	The state of national policies and legal frameworks and efforts to strengthen institutional and human capacities
SPA 4 Target	Improve the state of national policies and legal frameworks and increase efforts to strengthen institutional and human capacities
SP 12	Establish or strengthen national institutions, including national focal points, for planning and implementing animal genetic resources measures, for livestock sector development
SP 12 Indicator	The state of efforts to strengthen national institutions for planning and implementing animal genetic resources measures
SP 12 Target	Increase efforts to strengthen national institutions for planning and implementing animal genetic resources measures

	Q 44	Has your country assessed its national institutional capacity to support holistic planning of the livestock sector since the adoption of the *Global Plan of Action*?
	Q 45	Have tools been developed for national planners to use in shaping the future development of the livestock sector in accordance with national priorities, including in relation to the deployment of animal genetic resources?
	Q 50	Has your country established a National Advisory Committee for Animal Genetic Resources?
	Q 51	Is there strong coordination and interaction between the National Focal Point and stakeholders involved with animal genetic resources, such as the breeding industry, livestock keepers, government agencies, research institutes and civil society organizations?

SP 13	Establish or strengthen national educational and research facilities
SP 13 Indicator	The state of efforts to strengthen national educational and research facilities
SP 13 Target	Increase efforts to strengthen national educational and research facilities

	Q 54	Have your country's needs for research and education been reviewed in all areas of management of animal genetic resources since the adoption of the *Global Plan of Action*?
	Q 58	Has your country established or strengthened research or educational institutions in the field of animal genetic resources management?

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 14 Indicator	The state of efforts to strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation

SP 14 Target		Increase efforts to strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for sustainable use and development, and for conservation
	Q 55	Have partnerships been established among research, training and extension institutions and networks of researchers, breeders and conservation organizations to support the implementation of the *Global Plan of Action*?
	Q 56	Have organizations (including where relevant community-based organizations), networks and initiatives for sustainable use, breeding and conservation been established or strengthened?
SP 18		Raise national awareness of the roles and values of animal genetic resources
SP 18 Indicator		The state of efforts to raise national awareness of the roles and values of animal genetic resources
SP 18 Target		Increase efforts to raise national awareness of the roles and values of animal genetic resources
	Q 52	Does the National Focal Point undertake activities to increase public awareness of the roles and values of animal genetic resources?
SP 20		Review and develop national policies and legal frameworks for animal genetic resources
SP 20 Indicator		The state of national policies and legal frameworks for animal genetic resources
SP 20 Target		Improve the state of national policies and legal frameworks for animal genetic resources
	Q 46	What is the current status of your country's national strategy and action plan for animal genetic resources?
	Q 53	Have national policies and legal frameworks for animal genetic resources been reviewed and appropriate changes made if necessary?
Questions contributing in addition to SPA 4		
	Q 47	Are animal genetic resources addressed in your country's National Biodiversity Strategy and Action Plan?
	Q 48	Has your country established or strengthened a national database for animal genetic resources?
	Q 49	Have your country's national data on animal genetic resources been regularly updated in DAD-IS?
Implementation and financing of the *Global Plan of Action*: Collaboration		
Indicator		The state of international collaboration for planning and implementing animal genetic resources measures
Target		Improve the state of international collaboration for planning and implementing animal genetic resources measures
	Q60_1	Has your country established or strengthened international collaboration in: Characterization?
	Q60_2	Has your country established or strengthened international collaboration in: Sustainable use and development?
	Q60_3	Has your country established or strengthened international collaboration in: Conservation of breeds at risk?
	Q61_1	Are there any international NGOs active in your country in the fields of: Characterization?
	Q61_2	Are there any international NGOs active in your country in the fields of: Sustainable use and development?
	Q61_3	Are there any international NGOs active in your country in the fields of: Conservation of breeds at risk?
	Q 64	Has your country established or strengthened international research and education programmes to assist developing countries and countries with economies in transition to better manage animal genetic resources?
	Q 65	Has your country established or strengthened international support to assist developing countries and countries with economies in transition to obtain training and technologies and to build their information systems?

Implementation and financing of the *Global Plan of Action*: Funding

Indicator	The state of funding for the conservation, sustainable use and development of animal genetic resources
Target	Improve the state of funding for the conservation, sustainable use and development of animal genetic resources

	Q 62	Has national funding for animal genetic resources programmes increased since the adoption of the *Global Plan of Action*?
	Q 63	Has your country received external funding for implementation of the *Global Plan of Action*?
	Q 66	Has your country provided funding to other countries for implementation of the *Global Plan of Action*?

Annex 2

Indicator scores for strategic priority areas, collaboration and funding at country, subregional, regional and world levels

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Africa	0.68	0.67	0.49	0.60	0.29	0.20
East Africa	0.69	0.40	0.41	0.66	0.13	0.33
Burundi	0.92	0.40	0.27	0.50	0.00	1.33
Ethiopia	0.58	0.47	0.18	0.43	0.00	0.00
Kenya	0.83	0.47	0.36	1.00	0.50	0.00
Rwanda	0.42	0.27	0.82	0.71	0.00	0.00
North and West Africa	0.62	0.68	0.47	0.52	0.38	0.21
Algeria	1.25	1.07	1.36	0.71	0.00	0.00
Cameroon	1.08	1.07	0.36	0.86	1.00	0.00
Central African Republic	0.17	0.60	0.45	0.21	0.75	0.00
Côte d'Ivoire	1.00	0.73	0.18	0.71	0.00	0.00
Democratic Republic of the Congo	0.08	0.00	0.00	0.00	0.00	0.67
Gabon	0.67	1.00	0.73	1.14	1.00	0.67
Ghana	0.75	1.27	0.91	0.79	0.50	0.00
Guinea	0.42	0.67	0.45	0.79	0.50	0.00
Liberia	0.08	0.00	0.00	0.00	0.00	0.00
Nigeria	1.25	0.73	0.64	0.50	0.00	0.00
Senegal	0.33	0.80	0.64	0.64	0.75	0.67
Sierra Leone	0.17	0.00	0.00	0.00	0.00	0.00
Togo	0.75	0.93	0.36	0.36	0.50	0.67
Southern Africa	0.92	0.96	0.70	0.88	0.08	0.00
Botswana	0.67	0.73	1.09	0.86	0.25	0.00
Madagascar	0.58	1.07	0.45	0.86	0.00	0.00
Zimbabwe	1.50	1.07	0.55	0.93	0.00	0.00

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Asia	1.23	1.14	1.26	1.10	0.16	0.50
East Asia	1.42	1.22	1.42	1.26	0.08	0.89
China	1.50	1.73	1.73	1.57	0.00	0.67
Mongolia	1.50	0.87	1.00	0.86	0.25	1.33
Republic of Korea	1.25	1.07	1.55	1.36	0.00	0.67
South Asia	1.08	1.07	0.82	1.11	0.00	0.33
Bhutan	1.17	1.27	0.91	1.43	0.00	0.00
Nepal	1.00	0.87	0.73	0.79	0.00	0.67
Southeast Asia	1.14	1.11	1.39	0.93	0.33	0.22
Malaysia	1.08	1.07	1.18	0.93	0.00	0.00
Philippines	0.75	0.80	1.00	0.79	0.25	0.67
Thailand	1.58	1.47	2.00	1.07	0.75	0.00
Europe and the Caucasus	1.53	1.36	1.46	1.34	0.90	0.42
Albania	1.33	1.40	1.90	1.43	1.50	0.67
Austria	2.00	1.80	1.82	1.86	1.00	0.67
Bulgaria	1.58	1.40	1.36	1.14	0.00	0.67
Croatia	2.00	1.73	1.82	1.93	1.75	0.67
Cyprus	1.00	0.47	0.82	0.71	0.25	0.00
Czech Republic	1.17	1.13	1.82	1.50	0.25	0.00
Denmark	1.33	1.33	1.64	1.07	1.75	0.00
Finland	1.58	1.60	1.45	1.21	1.50	0.67
France	1.83	1.60	2.00	1.86	1.25	0.00
Germany	1.67	1.53	1.55	1.57	1.50	0.67
Greece	1.83	1.20	1.27	1.29	1.00	0.00
Hungary	1.67	0.80	1.27	1.07	0.75	1.33
Iceland	1.67	1.73	1.82	1.64	1.25	0.00
Ireland	1.83	1.80	1.82	1.79	1.25	0.00
Latvia	1.33	1.13	1.27	0.50	0.25	0.00
Luxembourg	1.42	1.67	0.91	0.57	0.75	0.00
Montenegro	1.00	1.07	0.73	1.14	0.75	0.67
Netherlands	1.92	1.73	2.00	1.86	1.25	0.00
Norway	2.00	2.00	2.00	2.00	1.25	0.67
Poland	1.50	1.40	1.64	1.57	0.75	1.33
Portugal	1.92	1.73	2.00	1.64	1.00	1.33
Serbia	0.92	0.47	0.45	0.86	0.75	0.00
Slovakia	1.25	1.53	1.00	0.93	0.50	0.00
Slovenia	1.67	1.60	1.09	1.64	1.50	0.00
Spain	1.83	1.73	1.45	1.71	0.75	1.33
Sweden	1.25	1.60	1.27	1.29	0.50	0.67
Switzerland	1.58	1.53	1.45	1.79	1.25	0.67
Turkey	0.75	0.27	1.27	0.86	0.50	0.67
Ukraine	1.67	1.47	2.00	1.43	0.00	0.00
United Kingdom	1.25	0.40	1.00	0.43	0.25	0.00
Latin America and the Caribbean	0.86	0.82	0.77	0.80	0.25	0.21

Region	SPA 1	SPA 2	SPA 3	SPA 4	Collaboration	Funding
Caribbean	0.17	0.20	0.00	0.29	0.00	0.00
Suriname	0.17	0.20	0.00	0.29	0.00	0.00
Central America	0.79	0.65	0.55	0.66	0.00	0.00
Costa Rica	0.25	0.53	0.00	0.43	0.00	0.00
El Salvador	0.33	0.20	0.18	0.14	0.00	0.00
Guatemala	0.67	0.27	0.55	0.50	0.00	0.00
Mexico	1.92	1.60	1.45	1.57	0.00	0.00
South America	0.98	0.98	0.98	0.93	0.41	0.33
Argentina	0.92	1.20	1.36	1.14	1.00	0.00
Bolivia (Plurinational State of)	1.08	0.87	0.73	1.07	0.00	0.00
Brazil	1.67	1.80	1.82	1.64	1.00	0.67
Chile	0.25	0.80	0.55	0.50	0.00	0.67
Colombia	1.17	0.80	1.27	0.64	0.75	0.67
Ecuador	0.83	0.60	0.36	0.14	0.00	0.00
Paraguay	0.75	0.40	0.91	0.86	0.00	0.00
Uruguay	1.17	1.40	0.82	1.43	0.50	0.67
Near and Middle East	0.73	0.80	0.48	0.57	0.25	0.50
Egypt	1.25	1.33	0.82	0.79	0.75	0.67
Iraq	0.50	0.00	0.45	0.50	0.00	0.67
Jordan	0.75	1.07	0.00	1.00	0.25	0.00
Kuwait	0.42	0.80	0.64	0.00	0.00	0.67
North America	1.75	1.73	1.82	1.43	1.13	0.00
Canada	1.58	1.60	2.00	1.50	1.00	0.00
United States of America	1.92	1.87	1.64	1.36	1.25	0.00
Southwest Pacific	0.69	0.93	0.45	0.52	0.50	0.00
Cook Islands	0.83	1.07	0.27	0.14	0.50	0.00
New Zealand	0.92	1.00	1.09	1.36	1.00	0.00
Niue	0.33	0.73	0.00	0.07	0.00	0.00
World	1.11	1.04	1.01	0.98	0.53	0.32

Note: Indicator scores range from a minimum score of 0 to 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.

Annex 3

Indicator scores for strategic priorities at country, subregional, regional and world levels

Region	SPA 1		SPA 2					SPA 3		SP12	SP13	SPA 4		SP20
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9			SP14	SP18	
Africa	0.67	0.70	0.53	0.63	0.78	0.55	0.60	0.80	0.27	0.80	0.43	0.33	0.60	0.40
East Africa	0.67	0.75	0.13	0.46	0.63	0.38	0.50	1.00	0.33	0.75	0.25	0.38	1.00	0.25
Burundi	0.33	1.14	0.00	0.57	0.50	0.50	1.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Ethiopia	0.67	0.43	0.50	0.29	0.50	0.50	0.00	0.00	0.00	0.00	0.50	0.00	2.00	0.50
Kenya	1.33	0.86	0.00	0.71	0.50	0.50	0.00	2.00	0.00	1.00	0.50	1.50	2.00	0.50
Rwanda	0.33	0.57	0.00	0.29	1.00	0.00	1.00	2.00	1.33	1.50	0.00	0.00	0.00	0.00
North and West Africa	0.64	0.60	0.58	0.57	0.81	0.58	0.54	0.77	0.21	0.73	0.35	0.27	0.31	0.50
Algeria	1.33	1.29	0.00	1.00	1.50	1.00	1.00	2.00	1.33	0.50	0.50	0.00	0.00	1.00
Cameroon	1.33	1.00	1.00	0.57	2.00	1.00	0.00	0.00	0.00	2.00	0.50	0.00	0.00	0.50
Central African Republic	0.00	0.00	0.00	0.57	0.50	1.00	1.00	2.00	0.00	0.00	0.50	0.00	0.00	1.00
Côte d'Ivoire	0.33	1.29	1.00	0.71	1.00	0.00	2.00	0.00	0.00	1.50	0.00	0.00	0.00	0.50
Democratic Republic of the Congo	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gabon	0.33	0.71	1.50	0.71	1.50	1.00	0.00	0.00	0.00	1.50	0.50	1.50	0.00	1.50
Ghana	1.33	0.43	2.00	1.00	2.00	0.00	0.00	2.00	0.67	1.00	0.50	1.50	0.00	0.50
Guinea	0.00	0.43	0.00	0.29	1.00	1.00	1.00	0.00	0.00	1.00	0.50	0.00	2.00	1.00
Liberia	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nigeria	1.67	1.14	1.00	0.57	0.50	1.00	1.00	2.00	0.00	0.50	0.50	0.00	0.00	0.50
Senegal	0.67	0.29	1.00	0.86	0.50	0.50	1.00	2.00	0.00	1.00	1.00	0.50	0.00	0.00
Sierra Leone	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Togo	1.33	0.71	0.00	1.14	0.00	1.00	0.00	0.00	0.67	0.50	0.00	0.00	2.00	0.00
Southern Africa	0.78	1.05	0.83	1.10	0.83	0.67	1.00	0.67	0.44	1.17	1.00	0.50	1.33	0.17
Botswana	0.67	0.86	1.50	1.00	0.50	0.00	2.00	2.00	1.33	1.50	1.00	0.00	2.00	0.00
Madagascar	0.33	0.57	1.00	0.71	1.50	1.00	1.00	0.00	0.00	1.50	0.50	0.00	0.00	0.50
Zimbabwe	1.33	1.71	0.00	1.57	0.50	1.00	0.00	0.00	0.00	0.50	1.50	1.50	2.00	0.00

Region	SPA 1		SPA 2					SPA 3				SPA 4		
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP12	SP13	SP14	SP18	SP20
Asia	1.50	1.11	0.81	1.16	1.13	1.19	0.88	1.75	1.42	1.19	0.81	1.13	1.25	1.19
East Asia	1.56	1.38	1.17	1.29	1.17	1.33	1.00	2.00	1.56	1.33	1.33	1.17	1.33	1.33
China	1.33	1.43	1.50	1.71	2.00	1.50	1.00	2.00	2.00	1.50	1.00	2.00	2.00	2.00
Mongolia	1.33	2.00	1.00	0.86	1.00	1.50	1.00	2.00	0.67	1.00	1.50	0.00	0.00	1.00
Republic of Korea	2.00	0.71	1.00	1.29	0.50	1.00	1.00	2.00	2.00	1.50	1.50	1.50	2.00	1.00
South Asia	1.17	1.07	0.50	0.93	1.00	1.25	0.00	2.00	0.67	1.00	0.50	1.50	2.00	1.00
Bhutan	1.00	1.29	1.00	1.00	1.50	1.50	0.00	2.00	1.33	1.50	0.50	1.50	2.00	1.50
Nepal	1.33	0.86	0.00	0.86	0.50	1.00	0.00	2.00	0.00	0.50	0.50	1.50	2.00	0.50
South East Asia	1.67	0.86	0.67	1.19	1.17	1.00	1.33	1.33	1.78	1.17	0.50	0.83	0.67	1.17
Malaysia	1.67	0.86	1.00	1.00	1.50	1.00	1.00	2.00	2.00	0.50	1.50	0.50	0.00	1.50
Philippines	1.33	0.43	0.00	1.00	0.50	1.00	1.00	0.00	1.33	1.50	0.00	0.50	2.00	0.50
Thailand	2.00	1.29	1.00	1.57	1.50	1.00	2.00	2.00	2.00	1.50	0.00	1.50	0.00	1.50
Europe and the Caucasus	1.58	1.46	0.98	1.42	1.32	1.27	1.77	1.93	1.38	1.30	0.95	1.40	1.80	1.37
Albania	1.00	1.29	1.00	1.43	0.50	2.00	1.00	2.00	2.00	1.50	0.50	2.00	2.00	2.00
Austria	2.00	2.00	2.00	1.57	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	2.00
Bulgaria	1.00	1.71	1.00	1.57	1.00	1.00	1.00	2.00	1.33	2.00	0.50	0.50	2.00	1.50
Croatia	2.00	2.00	1.50	1.71	2.00	1.50	2.00	2.00	1.33	2.00	1.50	2.00	2.00	2.00
Cyprus	1.67	1.00	0.00	0.71	0.50	0.50	1.00	2.00	0.67	1.00	0.50	0.00	2.00	0.00
Czech Republic	0.67	1.43	0.00	1.43	0.50	1.00	2.00	2.00	2.00	1.00	2.00	1.50	2.00	1.50
Denmark	1.33	1.14	1.00	1.57	0.50	1.00	2.00	2.00	2.00	1.00	1.00	0.50	2.00	2.00
Finland	1.33	1.57	1.00	1.57	2.00	1.50	2.00	2.00	0.67	1.00	0.50	1.50	2.00	1.00
France	2.00	1.71	1.00	1.71	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.50
Germany	1.67	1.57	2.00	1.29	2.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00	2.00
Greece	2.00	1.71	1.00	1.29	1.50	1.00	2.00	2.00	0.67	1.00	1.00	1.50	2.00	0.50
Hungary	2.00	1.43	0.50	0.57	0.50	1.00	2.00	2.00	1.33	1.00	0.00	1.00	2.00	1.50
Iceland	1.33	1.71	1.00	2.00	1.00	2.00	2.00	2.00	1.33	1.00	2.00	1.50	2.00	2.00
Ireland	2.00	1.71	1.00	2.00	2.00	1.50	2.00	2.00	2.00	2.00	2.00	1.50	2.00	1.00
Latvia	1.33	1.14	1.00	1.14	0.50	1.00	2.00	2.00	1.33	0.50	0.50	0.50	0.00	0.00
Luxembourg	1.67	1.14	2.00	1.60	2.00	1.00	2.00	2.00	0.00	0.50	0.00	2.00	2.00	0.00
Montenegro	1.00	1.00	0.00	1.43	1.50	0.50	2.00	2.00	0.00	0.50	0.50	1.50	2.00	1.50

Region	SPA 1		SP3	SPA 2				SPA 3		SP12	SP13	SPA 4		SP20
	SP1a	SP1b		SP4	SP5	SP6	SP7	SP8	SP9			SP14	SP18	
Netherlands	2.00	1.86	1.00	1.71	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00
Norway	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Poland	1.67	1.57	1.00	1.43	2.00	0.50	2.00	2.00	1.33	1.50	0.50	2.00	2.00	1.50
Portugal	2.00	1.86	1.00	1.71	2.00	2.00	2.00	2.00	2.00	1.50	0.50	2.00	2.00	2.00
Serbia	1.00	1.14	0.00	0.29	0.50	1.00	1.00	2.00	0.00	0.50	0.50	0.50	2.00	0.50
Slovakia	1.67	0.86	1.00	1.57	1.50	1.50	1.00	2.00	0.67	0.50	1.00	0.50	2.00	0.50
Slovenia	1.33	1.71	1.00	1.43	2.00	2.00	2.00	0.00	1.33	1.50	1.00	2.00	2.00	1.50
Spain	1.67	1.86	1.00	1.71	2.00	2.00	2.00	2.00	1.33	2.00	1.00	2.00	0.00	2.00
Sweden	1.33	1.29	1.00	2.00	2.00	1.00	2.00	2.00	2.00	1.50	1.00	1.00	2.00	2.00
Switzerland	2.00	1.29	1.50	1.86	0.50	1.00	2.00	2.00	1.33	2.00	1.00	2.00	2.00	1.50
Turkey	1.33	0.43	0.00	0.43	0.50	0.00	2.00	2.00	1.33	1.00	0.50	0.00	2.00	1.50
Ukraine	2.00	1.71	2.00	1.57	0.50	1.00	2.00	2.00	2.00	1.50	1.00	2.00	2.00	2.00
United Kingdom	1.33	1.00	0.00	0.14	0.00	0.50	1.00	2.00	1.33	0.50	0.00	0.50	0.00	1.00
Latin America and the Caribbean	0.97	0.77	0.65	0.81	0.77	0.50	0.62	0.92	0.77	0.81	0.81	0.69	1.08	0.50
Caribbean	0.00	0.29	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
Suriname	0.00	0.29	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
Central America	0.58	0.68	0.75	0.68	0.75	0.00	0.50	0.50	0.33	0.75	0.75	0.25	1.00	0.38
Costa Rica	0.00	0.14	1.00	0.57	1.00	0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.50
El Salvador	0.33	0.14	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
Guatemala	0.33	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	2.00	0.00
Mexico	1.67	2.00	2.00	1.71	2.00	0.00	2.00	2.00	1.33	2.00	2.00	1.00	2.00	1.00
South America	1.29	0.88	0.69	0.96	0.88	0.81	0.75	1.25	1.08	0.94	0.94	1.00	1.00	0.63
Argentina	1.67	0.57	0.00	1.57	0.50	1.00	1.00	2.00	1.33	1.00	1.00	0.50	2.00	1.00
Bolivia (Plurinational State of)	1.67	0.86	0.00	0.57	1.50	2.00	0.00	2.00	0.67	1.00	1.50	2.00	2.00	0.00
Brazil	2.00	1.71	1.50	2.00	2.00	1.00	2.00	2.00	2.00	1.50	2.00	2.00	2.00	2.00
Chile	0.00	0.14	0.50	0.43	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	0.50
Colombia	1.67	1.29	1.50	0.43	0.00	1.00	2.00	2.00	1.33	0.50	0.50	1.00	0.00	1.00
Ecuador	0.67	0.86	1.00	0.43	1.00	0.00	0.00	0.00	0.67	0.00	0.50	0.00	0.00	0.00
Paraguay	1.33	0.43	0.00	0.57	0.00	0.00	0.00	2.00	1.33	1.50	1.00	0.00	0.00	0.00
Uruguay	1.33	1.14	1.00	1.71	1.00	0.50	1.00	0.00	1.33	2.00	1.00	1.50	0.00	0.50

Region	SPA 1			SPA 2				SPA 3				SPA 4		
	SP1a	SP1b	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP12	SP13	SP14	SP18	SP20
Near and Middle East	1.00	0.54	0.38	0.79	0.75	0.88	0.75	0.50	0.33	0.88	0.63	0.38	1.00	0.38
Egypt	1.67	1.14	1.00	1.29	1.50	1.00	1.00	2.00	0.67	1.00	0.50	0.50	0.00	1.00
Iraq	0.67	0.29	0.00	0.00	0.00	0.00	1.00	0.00	0.67	1.00	0.00	0.00	2.00	0.50
Jordan	1.67	0.29	0.00	1.14	1.00	2.00	0.00	0.00	0.00	1.50	2.00	1.00	2.00	0.00
Kuwait	0.00	0.43	0.50	0.71	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North America	1.83	1.79	1.50	1.79	1.50	1.75	2.00	1.00	1.67	1.75	1.50	2.00	2.00	1.00
Canada	2.00	1.57	1.00	1.57	2.00	1.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
United States of America	1.67	2.00	2.00	2.00	1.00	2.00	2.00	0.00	1.33	1.50	1.00	2.00	2.00	2.00
Southwest Pacific	0.67	0.71	0.50	1.00	1.17	0.50	0.33	0.67	0.44	0.67	0.50	0.33	1.33	0.33
Cook Islands	0.00	1.14	1.00	1.00	2.00	0.50	1.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
New Zealand	1.33	0.71	0.50	1.00	0.50	1.00	0.00	2.00	1.33	2.00	1.50	0.50	2.00	1.00
Niue	0.67	0.29	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
World	1.19	1.06	0.76	1.06	1.04	0.92	1.10	1.33	0.93	1.05	0.76	0.91	1.28	0.87

Note: Indicator scores range from a minimum score of 0 to 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.

Annex 4

Relationship between implementation of Strategic Priority Area 1 and the availability of breed population data at subregional level