# The legal framework for the management of animal genetic resources

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# LIST OF ACRONYMS

| | |
|---|---|
| ACP | African Caribbean and Pacific |
| ABS | Access and benefit-sharing |
| AI | Artificial Insemination |
| AIA | Advanced Informed Agreement |
| AMS | Aggregate Measurement of Support |
| AnGR | Animal Genetic Resources |
| AoA | Agreement on Agriculture (WTO) |
| BSE | Bovine Spongiform Encephalopathy |
| BV | Breeding Value |
| CAC | Codex Alimentarius Commission |
| CAP | Common Agriculture Policy |
| CBD | Convention on Biological Diversity |
| CBPP | Contagious Bovine Pleuopneumonia |
| CGIAR | Consultative Group on International Agricultural Research |
| CGRFA | Commission on Genetic Resources for Food and Agriculture |
| COP | Conference of the Parties |
| DAD | Domestic Animal Diversity |
| EAGGF | European Agricultural Guidance and Guarantee Fund |
| EFSA | European Food Safety Authority |
| EPAs | European Partnership Agreements |
| ET | Embryo Transfer |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FFPs | LMOs intended for direct use as food or feed or for processing |
| FMD | Foot and Mouth Disease |
| FVO | Food and Veterinary Office |
| GATT | General Agreement on Tariffs and Trade |
| GATS | General Agreement on Trade in Services |
| GSP | Generalised System of Tariff Preferences |
| GMOs | Genetically Modified Organisms |
| IARCs | International Agricultural Research Centres |
| IGC | Intergovernmental Committee |
| IP | Intellectual Property |
| IPRs | Intellectual Property Rights |

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|---|---|
| ITPGRFA | International Treaty on Plant Genetic Resources for Food and Agriculture |
| IVM/IFM | *in vitro* maturation and fertilization |
| LMOs | Living modified organisms |
| MAFF | Ministry of Agriculture, Forestry and Fisheries (Japan) |
| MERCOSUR | Mercado Común del Sur |
| MFN | Most Favoured Nation |
| MTA | Multilateral Transfer Agreement |
| NC | National Coordinator for the Management of AnGR |
| NCC | National Consultative Committees for the State of the World's AnGR |
| NDP | National Development Plan |
| NGOs | Non Governmental Organizations |
| OAU | Organization of African Unity |
| OIE | Office International des Epizooties |
| OPU | Ovum Pick-Up |
| PGR | Plant Genetic Resources |
| PIC | Prior Informed Consent |
| SARD | Sustainable Agriculture and Rural Development |
| SACU | Southern Africa Customs Union |
| SBSTTA | Subsidiary Body on Scientific, Technical and Technological Advice |
| SCP | Standing Committee on the Law of Patents |
| SoW-AnGR | State of the World's Animal Genetic Resources |
| SPLT | Substantive Patent Law Treaty |
| SPMs | Sanitary and Phytosanitary Measures |
| SPS | Agreement on the Application of Sanitary and Phytosanitary Measures |
| TBT | Technical Barriers to Trade Agreement |
| TK | Traditional Knowledge |
| TRIPS | Agreement on Trade-Related Intellectual Property Rights Agreement |
| UNCED | United Nations Conference on Environment and Development |
| UPOV | International Union for the Protection of New Varieties of Plants |
| WIPO | World Intellectual Property Organization |
| WTO | World Trade Organization |
| WWL-DAD | World Watch List for Domestic Animal Diversity (FAO) |

# FOREWORD

The Animal Production and Health Division (AGA) of FAO is leading and coordinating the development of the *Global Strategy for the Management of Farm Animal Genetic Resources*. In this context, the importance of legal and policy frameworks for the sustainable management of animal genetic resources (AnGR) has been recognized. However, information on regulatory frameworks for AnGR is scarce compared with the wealth of knowledge available on legal frameworks for plant genetic resources.

A series of workshops have been conducted in the region of the Southern African Development Community on various aspects of AnGR management, including on the development of policies, incentive measures and legal frameworks[1]. These workshops identified the need for FAO to assess and analyse legal frameworks for the management of AnGR. As a result, a background study paper on the subject matter was prepared in 2004 for the Commission on Genetic Resources for Food and Agriculture (CGRFA), which has since been further revised and broadened for the present publication. The study was jointly coordinated and prepared by staff of FAO's Animal Production Service, Development Law Service and the Secretariat of the CGRFA and jointly funded by the FAO Netherlands Partnership Programme, the Secretariat of the CGRFA, and FAO's Animal Production Service and Development Law Service.

The scope of this preliminary study is to inform a wider public about the current status of regulatory texts governing AnGR management. Based on information gathered through national surveys and other sources, the study provides an overview of the main relevant legal instruments at both international and national levels, including some aspects of customary law. The regulatory framework of the European Union is presented as an example of an integrated regional legal framework. A general assessment of the status of national regulatory frameworks is given as well as general recommendations for the development of national legislation.

As the policy debate on AnGR management evolves, the discussion of legal issues becomes more complex. There is an increasing appreciation of the importance of indigenous breeds, and greater efforts are being made for their conservation and protection in legal terms. Such initiatives, mainly driven by civil society organisations, range from the registration and description of local breeds and traditional knowledge

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[1] **Köhler-Rollefson I**. 2004 *Farm animal genetic resources. Safeguarding national assets for securing food security and trade. A summary of workshops on farm animal genetic resources held in the Southern African Development Community (SADC)*. FAO, BMZ/GTZ, SADC, CTA, Eschborn, (2004): 54 pp. (http://dad.fao.org/).

associated with their breeding to the call for unrestricted access, use and exchange of AnGR and the refusal of patenting of indigenous breeds or parts thereof. Issues of traditional knowledge, folklore and genetic material, and the rights of the communities where these originate, are currently discussed under the Convention on Biological Diversity (CBD), the TRIPS Council and the World Intellectual Property Organization (WIPO). In addition, since the continued use of AnGR, in particular in pastoral systems, largely depends on access to other natural resources, those issues are also discussed in other fora such as the International Labour Organisation or the UN Economic and Social Council.

A number of people have made useful contributions to this publication at various stages of its development, participating in different ways either through their regular advisory work or through consultations with national counterparts in member countries, as well as through collaboration in conceptualizing, writing and reviewing the chapters of this study. The efforts of those who have made distinct inputs, such as the National Coordinators for the management of AnGR who completed questionnaires, are particularly acknowledged.

The authors and collaborators would like to thank Lawrence Christy (FAO), Dan Leskien (FAO), Dafydd Pilling (FAO), Beate Scherf  (FAO) Hermann Schulte-Coerne (Federal Ministry of Consumer Protection, Food and Agriculture, Germany), Martin Eric Smith (FAO) and Clive Stannard (FAO) for their helpful comments and advice on earlier drafts of this study. They would also like to thank Ariella D'Andrea, Nila Petralli and Frederic St Martin for their contributions in compiling the literature research for analysis.

It is hoped that this study will be of interest to the legal community of professionals, policy-makers, technicians and NGOs, researchers and practitioners working in the area of AnGR. The *Legal Framework for the Management of Animal Genetic Resources* ultimately aims to generate more debate, thought and commitment towards further development of appropriate regulatory frameworks for the conservation and sustainable management of AnGR.

Research in this area will continue and result in future publications which will be based on the updated information that is being progressively gathered through the Country Reports in the framework of the First Report on the State of the World's Animal Genetic Resources.

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# 1.    INTRODUCTION

In view of the growing importance that animal genetic resources (AnGR) have gained, FAO launched an initiative for the development of a *Global Strategy for the Management of Farm Animal Genetic Resources*. One element of this strategy is the preparation of periodic Reports on the State of the World's Animal Genetic Resources. The latter is a country-driven process which requires governments to develop national policies for the conservation and sustainable use of farm animal genetic resources. To this end, governments will need to review the overall legal framework governing these resources.

In this light, the present study aims to describe the state of development of relevant international and regional law, and to review approaches taken and problems identified in national legislation.

The first part of the study contains a review of the international legal framework and is intended to contribute to the setting of an international agenda for the management of farm animal genetic resources. The second part is in support of the work of the FAO Commission on Genetic Resources for Food and Agriculture and FAO's legal advisory service to member countries.

With regard to national legislation, the study is largely based on questionnaires sent to relevant national bodies, as well as country reports submitted to FAO. The questionnaires were sent to National Coordinators[1], Chairs and Technical Secretaries of the National Consultative Committees[2], responsible for preparation of country reports. This process helped to gather valuable information on the development and implementation of legislation relevant to the livestock sector and agriculture at the national level, as well as information on the institutional framework of each country. The survey conducted through questionnaires was complemented by an extensive internet search. The results were combined with information on existing legislation that was contained in the country reports submitted to FAO, either in final or in a draft form, before September 2003.

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[1]    http://dad.fao.org/cgi-dad/$cgi_dad.dll/nfptable

[2]    http://dad.fao.org/cgi-dad/$cgi_dad.dll/nationalsow

## 1.1    The FAO Global Strategy for the Management of Farm Animal Genetic Resources

FAO initiated the development of a Global Strategy for the Management of Farm Animal Genetic Resources (Global Strategy) in 1993, based on the recognition of the significant contribution that animal genetic resources make towards global food security and community identity, the accelerating decline of these resources and the poor state of current management.

The FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) started the intergovernmental process for developing the strategy in 1994. The 1995 deliberation of FAO's Governing Body broadened the Commission's mandate to cover all components of biodiversity relevant to food and agriculture (including animal genetic resources) and instructed it to begin implementation of same.

In the Seventh Session of the CGRFA in May 1997, a subsidiary Intergovernmental Technical Working Group on Animal Genetic Resources (ITWG-AnGR) was established to address issues relevant to the conservation and sustainable use of AnGR for food and agriculture

The FAO Global Strategy emphasizes the need to ensure an effective and adequate response at the global level to enhance awareness of the many roles and values of animal genetic resources. It provides a framework for local, national, regional and global efforts to make better use of, develop and conserve these resources through policies, strategies and actions. It mobilizes the financial support necessary to develop and implement the Strategy and facilitates and coordinates the activities of several independent organizations that operate for sustainable agricultural and rural development.

The Global Strategy aims to assist countries in developing capacity to manage their AnGR for food and agriculture, mainly through planning sustainable and cost-effective livestock production systems. It refers to conservation, which should be cost-effective and focused on farmers' interests. The Global Strategy will be a key element in country efforts to use and conserve biodiversity, particularly global agrobiodiversity, in a sustainable manner. Accordingly, it has been designed to complement work under way to implement other international agreements, most notably the Convention on Biological Diversity.

The Global Strategy consists of several inter-related components and elements. The major components are:

- intergovernmental mechanisms to ensure direct government involvement and continuity of policy advice and support;
- a planning and implementation structure, providing the enabling framework for country action and regional and global support;
- a technical programme of work, aimed to support effective management of AnGR at the country level; and
- reporting and evaluation mechanisms to provide the critical data and information required for guidance, cost-effective planning and action, as well as to report on the state of diversity and the state of country capacity in the implementation of the Global Strategy.

## 1.2    Agrobiodiversity and animal genetic resources

Agricultural biodiversity is a broad term embracing all components of biological diversity relevant to food and agriculture, and those constituting the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, necessary to sustain key functions of the agro-ecosystem, its structure and processes. Agrobiodiversity is of widespread and complex significance to society culturally, economically and environmentally.

To clarify the relationships between animal genetic diversity, animal genetic resources and breeds, which are all important components of agrobiodiversity, it is worth defining the terms. The following are working definitions developed for use in the preparation of country reports[3].

**Domestic Animal Diversity (DAD)**: is the spectrum of genetic differences within each breed, and across all breeds within each domestic animal species, together with the species differences of interest for food and agriculture production.

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[3]   Annex 2 to the Guidelines for the development of Country Reports in the preparation of the first State of the World's Animal Genetic Resources. Animal Genetic Resources Information. Special Issue No. 30: Country Guidelines. FAO. 2001.

**Animal genetic resources (AnGR)***: refer to those animal species that are used, or may be used, for the production of food and agriculture, and the populations within each species. The populations within each species can be classified as wild and feral populations, landraces and primary populations, standardised breeds, selected lines, varieties, strains and any conserved genetic material - all of which are currently categorized as breeds.

**Breeds**: are either (a) a sub-specific group of domestic livestock with definable and identifiable external characteristics that enable it to be separated by visual appraisal from other similarly-defined groups within the same species; or (b) a group for which geographical and/or cultural separation from phenotypically similar groups has led to acceptance of its separate identity.

The Global Strategy for the Management of AnGR, and the First Report on the State of the World's Animal Genetic Resources, focus on those avian and mammalian species that are of interest to food and agriculture. The populations within each species can be classified as wild populations, feral populations, and breeds – including the populations described as landraces, varieties, selected lines, primary populations, standardized breeds, and any *in vivo* and *in vitro* conserved genetic material of those populations. The main mammalian and avian species of concern are: buffalo, cattle, yak, goat, sheep, pig, ass, horse, Bactrian camel, dromedary, alpaca, llama, deer, rabbit, chicken, duck, turkey, goose, Muscovy duck, guinea fowl, quail, ostrich.[4]

Breeds provide the best indication of total farm animal genetic diversity, in the absence of direct indicators.

## 1.3    Roles and values of farm animal genetic resources

The contribution of domestic animals to food production is perhaps their most widely recognized role. Domestic animals, directly and indirectly, account for 30 to 40 percent of the total value of global food and agricultural production. They are an important component of food security and of human livelihoods in most developing countries, serving as sources of food (milk, meat, eggs), shelter and protection (fiber, hides), power (animal draught,

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[4]    FAO/UNEP. 2000. World Watch List for Domestic Animal Diversity. Table 1.1.1. Third Ed. Beate D. Scherf,. FAO, Rome.

transport), fuel and fertilizer (manure), savings (cash value of animals) and cultural values.

The role of domestic animals as a source of power is perhaps tends to be overlooked and not valued in monetary terms. Draught power provided by livestock is in fact an essential resource in many parts of the world. Animal power is used to irrigate and harvest crops, and to transport people and agricultural products. It constitutes an essential source of power for many non-agricultural activities, such as hauling logs and fuel wood. Special genetic qualities are needed to provide draught capability, and thus many breeds have been developed specifically for draught power. These animals will remain the most cost-effective power source for many small and medium scale farms in developing countries.

Another important role of livestock is that of providers of fuel. Manure is a widely used fuel for cooking and heating, and in treeless areas, for example, it often provides the only available source of fuel. Domestic animal waste products serve also as a source of fertilizer and soil conditioner, essential for a sustainable agricultural system.

Livestock have an important social and cultural value, especially for indigenous and local communities for whom fundamental aspects of social and cultural identity (e.g. marriage, religious practices) are frequently linked to specific types of livestock.

Finally, domestic animals provide a valuable source of income and are extremely important economic resources, in both developed and developing countries. They make essential contributions at the farm, community and national level, reducing farmers' exposure to economic risks, generating employment and contributing to rural development.

From the beginning of the 1970s to the mid 1990s, consumption of meat and milk in developing countries increased at more than twice the rate for developed countries. Global livestock production continues to grow more dynamically than any other agricultural sector.

Driven by population growth, higher incomes, urbanization and changing dietary habits (per capita consumption is rising fastest in regions where urbanization and rapid income growth result in people adding variety to their diets), the livestock industry is expanding at unprecedented rates in many parts of the developing world, where demand for meat and milk is projected to

increase by 80 and 190 million tons in the next two decades. The effects of this dramatic pressure to increase livestock production will be felt beyond the livestock sector and have environmental, social, health, and ethical implications. The process has been described as the "livestock revolution".

## 1.4      Sustainable use, development and conservation

Many are the challenges in trying to achieve global food security and enhance rural development. Animal genetic resources offer opportunities to significantly improve food security through rural economic diversification and development. In order to realize this potential, sustainable use, development and conservation of animal genetic resources must be effectively planned.

Sustainable use is defined in the Convention on Biological Diversity as: "the use of the components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations" (art. 2). The working definition of utilization of animal genetic resources, provided in the Country Guidelines developed by FAO[5] and adopted by CGRFA, refers to the use and development of animal genetic resources for the production of food and agriculture.

In the past indigenous breeds within developing countries were often seriously undervalued, as far too little attention was given to their adaptations to specific production conditions and stressors. In order to be successful, future livestock development programmes will need both to enhance productivity and maintain adaptations to local conditions. On a global scale, the improvement of food and agricultural production systems will involve the use and development of a much wider spectrum of genetic resources within each of the major livestock species.

Development of AnGR includes a broad mix of activities, which must be well planned and executed. Careful definition of breeding objectives is needed, as well as the establishment and maintenance of effective animal recording and breeding strategies. Such strategies encompass all policy, technical and operational facets of the genetic improvement.

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[5]     FAO. 2001. Animal Genetic Resources Information. Special Issue: Country Guidelines.

Conservation of AnGR refers to all human activities including policies, strategies, plans and actions undertaken to ensure that AnGR diversity is maintained to contribute to food and agricultural production and productivity for the present and future. Conservation encompasses *in-situ* and *ex-situ* measures.

*In-situ* conservation of animal genetic diversity refers to all measures to maintain live animal breeding populations, including those involved in active breeding programmes in the agro-ecosystem, together with husbandry activities that are undertaken to ensure the continued contribution of these resources to sustainable food and agricultural production.

*Ex-situ* conservation of genetic material is within living animals but out of the environment in which it developed (*ex situ in vivo*), or external to the living animals in an artificial environment, usually under cryogenic conditions including, *among others*, the cryo-conservation of semen, oocytes, embryos, cells or tissues (*ex situ in vitro*).

Gene banks (or genomebanks) are the physical location for conservation of collections of well-identified genetic material in the form of live animals, *in situ* or *ex situ*, or *ex-situ* stored semen, oocytes, embryos, cells or tissues.

Because of the shared costs with the private sector, in-situ conservation measures are generally cheaper for the public sector than *ex-situ*. In most countries, *ex-situ* conservation is rare, compared to *in-situ* measures.[6]

The most rational and sustainable way to conserve animal genetic resources is to ensure that locally-adapted breeds remain functional parts of production systems. This requires characterization and identification of their economically important and unique attributes.

Local communities play an important part in the sustainable use and conservation of such resources. Community-based management of AnGR is a distinct form of *in-situ* conservation, combining farmers' socio-economic values and indigenous technical knowledge. Community-based conservation is

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6    http://dad.fao.org/en/refer/library/stakeholders/guidelines.pdf

the prevailing form of conservation for many animal breeds in developing countries. Because of a lack of documentation, much of what is happening in this field is known only to the local populations involved.

Conservation of AnGR is essential to enable farmers to adapt to inevitable changes to environmental and economic conditions and to consumer demand. To effectively respond to such variations, farmers and breeders should have access to a wide range of AnGR. Thus, conservation of AnGR is not an end in itself, but a means to an end. The role of conservation is to ensure that unique genetic resources remain available to farmers and breeders. Accordingly, with a view to adopting a wide-ranging and progressive approach to AnGR this study refers to "management" of AnGR, in which sustainable utilization, conservation and development are combined.

## 1.5     The status of animal genetic resources: risk of erosion

Globally, the demand for animal products, such as milk, meat and eggs, is increasing and is expected to continue growing in the future. However, animal genetic resources are rapidly eroding as a result of, among other factors, human population and development pressures, the rapid transformation of traditional agricultural systems, imports of exotic breeds and inappropriate cross-breeding, and policies disadvantaging pastoralists and low external input production systems. The greatest impact of the loss of AnGR may result in the reduction in overall food security and a reduced flexibility in responding to change.

It has been estimated that loss of animal genetic resources has been greatest in developed countries, where there was a tendency to concentrate on a few high-output breeds. The same is also happening at an alarming rate in developing countries which have limited resources for designing and implementing conservation programmes and where traditional agricultural systems are being rapidly transformed[7]. This transformation often includes the indiscriminate use of exotic animal genetic resources, and the loss of indigenous livestock breeds.

The Global Databank for Farm Animal Genetic Resources contains more than 9,000 breeds of more than 30 mammalian and avian species. In Europe, half of

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[7]    Such analysis could also be the result of an easier availability of data on developed countries, compared to the insufficient information on developing countries which could probably experience a greater erosion.

the breeds in existence at the turn of the last century are now extinct and a high percentage of the remaining breeds (for which population data are available) are in danger of disappearing over the next 20 years. In North America, over one third of livestock and poultry breeds are rare or in decline. Much less is known about the status of breeds in the developing world, where there is greater diversity. A recent survey undertaken by FAO, has determined that many breeds of livestock have already become extinct, and that 35 percent of all remaining mammalian breeds and 63 percent of avian breeds, reported on an on-going basis by countries to FAO, are currently at risk of extinction[8].

## 1.6    Need for action

Countries and their farmers are facing critical challenges in their efforts to achieve food security and develop their economies – their rural economies in particular. Sustainable agricultural intensification, with particular regard to animal production systems[9], is essential to successfully meet such challenges, and requires a systematic approach to the management of AnGR.

Despite the valuable efforts of individuals, governments and NGOs, AnGR continue to decline. In order to prevent further loss, particularly with regard to indigenous animal breeds, it is important to acknowledge their vital role for food security, rural income generation, social cohesion and cultural identity. Local, national and global actions are required to conserve such resources. These actions should be based on a comprehensive framework, encompassing technical, social, economic, institutional and legal aspects. Collaboration among government agencies and other stakeholders (e.g. NGOs) will be required.

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[8]    FAO, 2001. The First report on the State of the World's Animal Genetic Resources for Food and Agriculture: A Contribution to the Implementation of the Agricultural Biological Diversity Programme of Work under the Convention on Biological Diversity, Document submitted at the 7th Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the CBD, Montreal 12-16 November 2001 (available at www.ukabc.org).

[9]    Sustainable agricultural intensification is the manipulation of inputs to, and outputs from, livestock production system aimed at increasing production and/or productivity and/or changing product quality, while maintaining the long-term integrity of the system and their surrounding environment.

Countries are required to take policy decisions and consequent actions on a number of issues, such as: (1) the best use of both locally-adapted and exotic AnGR; (2) how to achieve the sustainable use of their production systems; (3) which genetic resources to conserve; and (4) what are the critical capacity building needs in the AnGR sector.

Given scarce human and financial resources, the challenge is also to identify a spectrum of breeds currently at risk of extinction that will provide an essential and undiminished resource for continued livestock breeding activities. Livestock development targets should address the needs and recognize the aspirations of farmers, consumers, and communities.

Given the major role played by local farming communities in conserving AnGR, those communities should be involved in the development of national policies; and permanent linkages between indigenous communities and national administrative bodies should be established.

There is a need for action at both the international and national levels. In both respects, legal elements are significant. At the international level, the legal framework may affirm a policy agenda with priorities and commitments. At the national level, well-designed laws, looking at AnGR as a whole or focussing on single aspects of their management, may help to protect rights and define responsibilities for environmentally responsible behaviour. Functioning institutions that are established by law may enable the meaningful participation on the part of all types of stakeholders, from central government to local communities.

## 2.    THE INTERNATIONAL FRAMEWORK:
## MAJOR INSTRUMENTS

International awareness of the importance of animal genetic resources (AnGR), and concern for their rapid erosion, must be translated into effective action at the national, regional and global level. The fact that 32 percent of livestock breeds worldwide risk extinction[10] is a serious cause for concern. However, this has not prompted the development AnGR-specific legal instruments either globally or regionally. Nevertheless, in recent years this issue

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[10]    FAO, 2000. World Watch List for Domestic Animal Diversity, Third ed., Rome.

has become very important and a series of workshops have been held to address it.[11]

The following paragraphs will shed light on some international instruments, which constitute the background to the possible development of specific policy and legal frameworks for AnGR.

## 2.1    Legally binding instruments

### 2.1.1.  The Convention on Biological Diversity (CBD)

The Convention on Biological Diversity was signed in 1992 at the Earth Summit in Rio de Janeiro. It has 188 Parties. Although not focussing on animal genetic resources as such, it does cover the complete range of biological diversity including agro-biodiversity and its different sectors. Article 2 of the Convention further defines genetic resources as "genetic material" meaning any material of plant, animal, microbial or other origin, containing functional units of heredity.

The cornerstone of the Convention is the principle of the sovereign right of states to exploit their own genetic resources pursuant to their own environmental policies, and their responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. These principles apply to AnGR as well.

The three objectives of the Convention, as set out in Article 1, are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the utilization of genetic resources.

*Conservation* of biological diversity includes that of animal and plant genetic resources. The Convention states that, while nations have sovereign right to

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[11]    See the results of the workshop on Legal and Regulatory Framework for Farm Animal Genetic Resources - Generating benefits through Sustainable Use and Conservation of Farm-Animal Genetic Resources in the SADC region, held in Maputo, Mozambique, on 20-24 May 2003 and Farm Animal Genetic Resources - Safeguarding National Assets for Food Security and Trade', FAO, November 2004 (available at http://dad.fao.org/).

exploit their own resources (art. 3) they also have the duty to conserve them. The Convention stresses the need for policy development and integration, in that governments are required to develop national strategies on biodiversity and to integrate the conservation and *sustainable use* of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.

One of the three objectives of the Convention, as mentioned above, is the "*fair and equitable sharing*" of the benefits arising from of the utilization of genetic resources. This is to be achieved by appropriate access to genetic resources, and transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding.

With regard to access, the Convention recognizes the sovereign rights of States over their natural resources and indicates that access is subject to national legislation. Access is to be granted on mutually agreed terms, i.e. through agreements under which suppliers and recipients of genetic material must agree on the terms and conditions of the transfer. Access must be subject to the prior informed consent of the contracting party providing the genetic resources, unless otherwise determined by that party.

Under the Convention, legislative, administrative or policy measures are required in order to share bilaterally in a fair and equitable manner, the results of research and development, and the benefits arising from the commercial and other utilization of genetic resources.

Furthermore, the Convention extends the benefit-sharing dimension to include utilization of the knowledge, innovations and practices of indigenous and local communities.

The relationship between biological resources and intellectual property rights is clearly indicated in Article 16, which states that contracting parties shall cooperate to ensure that such rights are supportive of, and do not run counter to, the Convention's objectives. The relationship between IPRs, benefit-sharing, and conservation and sustainable use of biological diversity, is an issue which has not yet found a specific answer at the international level. The issue raises concerns among policy-makers at the national level, especially in developing countries, where the rationale of IPRs, which is to reward the intellectual contribution to innovation as an individual process through a monopoly granting ownership and control of knowledge, is often perceived to be in tension with the CBD objectives.

### 2.1.2 The issue of agricultural biodiversity within the context of the CBD

The special nature of agricultural biodiversity was recognized at the second Conference of the Parties (COP 2) in 1995 and reported in Decision II/15. COP 3 adopted Decision III/11 "Conservation and sustainable use of agricultural biological diversity", which, included as an objective the establishment of a multi-year programme of activities on agricultural biological diversity.

In Decision III/11, paragraph 20, COP 3 expressed general support for the Global Strategy for the Management of Farm Animal Genetic Resources under FAO. Decision V/5, Annex 5, adopted by COP 5, defines the overall aim of the multi-year work programme on agricultural biodiversity as the promotion of the objectives of the Convention in the area of agricultural biodiversity. The programme of work endorsed by Decision V/5 contains the following elements, namely (1) assessment; (2) adaptive management; (3) capacity building; and (4) mainstreaming.

All of the above four elements may be applied to AnGR.

Decision V/5 Annex 5 further specifies that the programme of work is intended "to build upon existing international plans of action, programmes and strategies that have been agreed by countries, in particular […] the Global Strategy for the Management of Farm Animal Genetic Resources". It also aims to "support the ongoing or planned assessments of different components of agricultural biodiversity, for example,… the *Report on the State of the World's Animal Genetic Resources for Food and Agriculture*, … elaborated in a country-driven manner through consultative processes". The programme is also to contribute to the implementation of Chapter 14 of Agenda 21 (Sustainable Agriculture and Rural Development).

At its sixth meeting, the COP adopted Decision VI/5 on agricultural biodiversity, which contains, among other elements, a specific set of decisions related to animal genetic resources, which confirms the central role of FAO's Global Strategy. The COP welcomed the process initiated by FAO for the preparation of the first Report on the State of World's Animal Genetic Resources, and encouraged Parties to participate in this process. Moreover, the COP invited Parties, other governments, the financial mechanism and funding organizations, to provide adequate and timely support to enable countries to participate fully in the preparatory process and implement follow-up action.

As a follow-up to Decision VI/5, COP 7, in its Decision VII/3, invited Governments to consider and promote the mainstreaming of agricultural biodiversity in their plans, programmes and strategies, with the active participation of local and indigenous communities. It also invited Governments to recognize and support the efforts of local and indigenous communities in conserving agricultural biodiversity.

### 2.1.3   The Biosafety Protocol to the CBD

The Cartagena Protocol on Biosafety was adopted in January 2000 by the Conference of the Parties to the Convention on Biological Diversity, as a supplementary agreement to the Convention, and came into force on 11 September 2003. It has 125 parties. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms (LMOs)[12] resulting from modern biotechnology. It applies to the transboundary movement, transit, handling and use of all living modified organisms that may have adverse effects on the conservation and sustainable use of biological diversity, as well as risks to human health. However, LMOs that are pharmaceuticals for human consumption are excluded from the scope of the Protocol, provided that they are covered by another international agreement or arrangement.

The Protocol establishes an advanced informed agreement (AIA) procedure to ensure that countries are provided with the necessary information to take decisions before agreeing to the import of such organisms into their territory (art. 7). The purpose of this procedure is to ensure that recipient countries have both the opportunity and the capacity to assess risks that may be associated with the LMO before agreeing to its import. The Biosafety Protocol also sets forth requirements for the handling, transportation, packaging and identification of biotechnology-derived agricultural commodities destined for food, feed or processing. Each party to the Protocol has the obligation to take the necessary measures to ensure that LMOs are handled, packaged and transported under conditions of safety, taking into consideration relevant international rules and standards. Commodities, including animal products,

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[12] The Protocol defines LMOs as "any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology", where living organism means "any biological entity capable of transferring or replicating genetic material, including sterile organisms, viruses and viroids".

shall be identified with the words "may contain" living modified organisms (art. 18).

However, certain categories of LMOs are excluded from the AIA procedure - taking into account the specific activity or intended use of the particular LMO. These are: (1) LMOs in transit; (2) LMOs destined for contained use; and (3) LMOs intended for direct use as food or feed or for processing (FFPs).

With regard to the latter category, a party to the Protocol that makes a final decision regarding domestic use, including placing on the market, of a LMO that may be subject to transboundary movement for direct use as food or feed, or for processing shall, within fifteen days of making that decision, inform the Parties through the Biosafety Clearing-House. This information shall contain, as a minimum, the information specified in an Annex to the Protocol. Thus, the operation of the Biosafety Clearing House will be crucial to the effectiveness of the Protocol's provisions on LMO-FFPs.

At the first Meeting of the Parties to the Protocol (MOP) in February 2004, it was decided to establish an Open-ended Technical Expert Group on Identification requirements of LMO-FFPs. In the same meeting, modalities for the transition of the Biosafety Clearing-House from the pilot phase to the fully operational phase were approved. In March 2005, an expert meeting to address identification requirements of living modified organisms intended for food, feed or processing were unable to finalize agreement on the issue. The meeting aimed to facilitate a decision by the Parties to the Biosafety Protocol regarding the detailed requirements of identification measures, which, according to the Protocol's text, must be adopted no later than two years after its entry into force. Participants discussed issues related to: information to be provided in the accompanying documentation, including information on the LMOs, a statement to be incorporated in the documentation, and contact information; the extent and modality of using unique identifiers; thresholds for adventitious or unintentional presence, including thresholds for approved and for unapproved LMOs; and available LMO sampling and detection techniques, with a view to harmonization.

The Protocol reserves the right of parties to take decisions on imports based on the precautionary principle, in relation to both LMOs to be introduced into the environment and LMO-FFPs. It states that lack of scientific certainty regarding the extent of potential adverse effects of an LMO, shall not prevent an importing party from taking a decision with regard to the import of that LMO in order to avoid or minimise such potential adverse effects. Socio-

economic considerations arising from the impact of LMOs on biodiversity may also be taken into account when taking decisions with regard to import. The first Meeting of the Parties to the Protocol adopted procedures and mechanisms to facilitate decision-making by importing parties.

While the Protocol focuses on transboundary movements of LMOs, it also requires parties to ensure that the development, handling, transport, use, transfer and release of any living modified organisms are undertaken in a manner that prevents or reduces the risks to biological diversity, taking also into account risks to human health.

The Protocol covers LMOs only, thus living modified animals, including embryos. However, it covers neither animal products (e.g. meat, eggs, milk) nor semen/ovocytes of transgenic animals.

The elements of the Protocol related to risks to biodiversity as well as those covering risks to human health may be of relevance to the management of AnGR. The potential to develop more productive animals and products such as meat with higher protein and lower fat content, eggs with lower cholesterol level, milk containing pharmaceutical products, or even tissue and organs suitable for human transplantation has stimulated the development transgenic livestock. However, as with any new technology it is difficult to establish that there are no risks involved in the utilization of animals produced in this way. Indeed, a number of apprehensions have been raised. Some concern, for example, has been expressed over the ability of certain genetically engineered organisms to escape and reproduce in the natural environment. Genetically engineered insects, shellfish, fish, and other animals that are highly mobile, are of particular concern, especially if they are more successful at reproduction than their natural counterparts. As such, governments' decisions on the transboundary movement of LMOs of animal origin and domestic use of LMO-FFPs of the same origin may be based on the Protocol's principles.

### 2.1.4  The World Trade Organization's Basic Principles

An analysis of the World Trade Organization (WTO) Agreements relevant to AnGR management, must be read within the framework of some of the WTO's basic principles, which are the following:

Trade without discrimination – The basic principles of the multilateral trading system, as embodied in the WTO Agreement, derive mostly from the principles constituting the foundations of the General Agreement on Tariffs

and Trade (GATT). Trade without discrimination is one of these, guaranteed through several clauses contained in the multilateral agreements on trade in goods, in the General Agreement on Trade in Services (GATS), and in the TRIPS Agreement.

Most-favoured nation clause (MFN) - The most-favoured nation clause has been a pillar provision of the system since the inception of the GATT in 1947. The Contracting Parties were bound to grant to the products of other Contracting Parties treatment no less favourable than that accorded to products of any other country. WTO Members have entered into similar commitments – under the GATT 1994 (art. I) for trade in goods, under the GATS (art. II) in relation to treatment of service suppliers and trade in services, and under the TRIPS Agreement (art. 4) with regard to the protection of intellectual property.

National treatment – The national treatment principle condemns discrimination between foreign and national goods or between foreign and national services and service suppliers or between foreign and national holders of intellectual property rights. GATT 1994 and the TRIPS Agreement provide for national treatment as one of the main commitments of WTO Members. Imported goods, once duties have been paid, must be given the same treatment as domestic products in relation to any charges, taxes, or administrative or other regulations (GATT, Article 3). With regard to the protection of intellectual property rights, and subject to exceptions in existing international conventions, WTO Members are committed to grant nationals or other WTO Members treatment no less favourable than that accorded to their own nationals (Article III). GATS, due to the special nature of trade in services, deals with national treatment under its Part III, Specific Commitments, (Article XVII), where national treatment becomes a negotiated concession and may be subject to conditions or qualifications that Members have inscribed in their schedules on specific commitments in trade in services.

Transparency - Provisions on notification requirements and the Trade Policy Review Mechanism are set out in the WTO Agreement and its Annexes, with the objective of guaranteeing the fullest transparency possible in the trade policies of its Members, regarding goods, services and the protection of intellectual property rights. Article X of GATT 1994 deals with the publication and administration of trade regulations; Article III of GATS sets out

provisions on transparency as one of the general obligations and disciplines under that agreement; and Article 3 establishes transparency rules for the TRIPS Agreement[13].

### 2.1.5   The WTO Agreement on Agriculture

The WTO Agreement on Agriculture (AoA), adopted in 1994, governs world trade in agricultural products. The AoA sets out commitments which countries had to apply over a six-year implementation period (1995-2000), but which will remain in force until a new agreement is made. These commitments are to: (1) reduce domestic support; (2) improve market access; and (3) cut export subsidies[14]. There is no direct reference to AnGR in the AoA. Nevertheless, it is worth mentioning the Agreement within the framework of this study, as it regulates trade in agricultural products, including products of animal origin. As noted above, the increasing demand for such products, which is bolstered by international regimes of trade liberalization, is generating high pressure on the utilization of livestock genetic resources.

WTO members agreed to initiate negotiations for continuing the agricultural trade reform process one year before the end of the implementation period, i.e. by the end of 1999. These talks began early in 2000 under the original mandate of Article 20 of the AoA. At the Doha Ministerial Conference of November 2001, the agriculture negotiations became part of the single undertaking in which all the negotiations were to end by 1 July 2005. The Fifth WTO Ministerial Conference was held in Cancún (Mexico) in September 2003 with the main task of taking stock of progress in negotiations and other work under the Doha Development Agenda. Unfortunately no major achievements were reached in Cancun, as the Conference ended without consensus[15]. Notwithstanding this setback, the Doha Declarations and Decisions were reaffirmed, as well as the recommitment to work to implement them fully and faithfully. In August 2004, WTO Members issued the so-called "July Package" which spells out the modalities for further negotiations. This document marks

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[13]   Available at www.wto.org.

[14]   Available at www.defra.gov.uk

[15]   Despite considerable movement in consultations, members remained entrenched, particularly on the "Singapore" issues – trade and investment, trade and competition policy, transparency in government procurement, trade facilitation.

a degree of progress in the negotiations and lays a basis for a possible outcome in the 6th Ministerial Conference to be held in Hong Kong in December 2005.

In the view of the WTO and of the developed country representatives, the Agreement on Agriculture is an instrument for the liberalization of world trade in agricultural products – hence there is expectation that any new agreement reached will carry the process of trade liberalization further. However, there are alternative interpretations of the existing Agreement.

The existing Agreement on Agriculture provided that member countries would reduce barriers to market access, market-distorting domestic support to agriculture and export subsidies[16]. For market access, all barriers to trade were subject to a process of tariffication, and these tariff levels were bound, and were then to be reduced by an average of 36 percent, with a minimum cut of 15 percent by 2000 for developed countries, and by 24 percent with a minimum cut of 10 percent, for developing countries four years later. Members were also to reduce market-distorting domestic support[17], as measured by an Aggregate Measurement of Support (AMS), comprising support through administered internal commodity prices which are above world market levels.

A wide range of domestic government support was exempted from inclusion in the AMS, on the grounds that it is production-limiting ('blue box' exemptions), or minimally market-distorting ('green box' exemptions). In practice, developing countries do not exercise production-limiting exemptions, mainly because the limitation of domestic production is hardly a priority. Moreover, such measures entail high budget costs. 'Blue box' exemptions include direct payments to farmers - where the farmers are required to limit production; government assistance programmes to encourage agricultural and rural development in developing countries; and other support on a small scale ("*de minimis*") - when compared with the total value of the product or products supported (five percent or less in the case of developed countries and ten

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[16]   Roberts, Buetre & Jotzo, 2002.

[17]   The main complaint about policies which support domestic prices, or subsidize production in some other way, is that they encourage over-production. This squeezes out imports or leads to export subsidies and low-priced dumping on world markets. The Agriculture Agreement distinguishes between support programmes that stimulate production directly, and those that are considered to have no direct effect (www.wto.org).

percent or less for developing countries). 'Green box' support includes (a) provision of services, such as research, disease control, infrastructure and domestic stockholding for food security, domestic food aid, (b) subsidies for regional and environmental assistance, such as payments made directly to farmers that do not stimulate production, (c) assistance to help farmers restructure agriculture, and (d) direct payments under environmental and regional assistance programmes. Least developed countries that are members of the WTO were exempted from all reduction commitments under the Agreement. It has been estimated that the prices of farm commodities would increase if international trade in agriculture were truly liberalised[18].

With regard to market access for agricultural products, developing countries generally will consider greater access to developed country markets as high priority. In this context, the EU has already granted tariff-free access to essentially all products from the least developed countries (the 'Everything but Arms' Agreement). In addition, many developing countries already benefit considerably from preferential and non-reciprocal market access to the EU, for example, under the ACP Cotonou Agreement and the EU Generalised System of Preferences.

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**ACP Cotonou Agreement**

From 1975 to 2000, four successive Lomé Conventions governed the development of trade relations between the African, Caribbean and Pacific (ACP) countries and the European Union (EU). Within this development framework, the EU has granted non-reciprocal trade preferences for ACP exports to its market. Most ACP products were allowed to enter the European market duty free, with the exception of some 'sensitive' agricultural products covered by the EU Common Agricultural Policy (CAP). Four commodity protocols, annexed to the Lomé Convention, provided free access for a specified quantity of exports from a selected group of traditional ACP providers of bananas, rum, sugar and beef.

In February 2000 the fourth Lomé Convention, which governed the cooperation between the EU and the ACP countries, expired. In early 2000

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[18]  "Trade Liberalization, the 'Livestock Revolution' and the Impact on South Africa's Rangelands", Nick Vink and Theo Kleynhans.

the Cotonou Agreement was established. This agreement defined the nature of the cooperation between the EU and individual ACP countries over the next 15 years. On 27 September 2002, the ACP and the EU officially launched the negotiations on European Partnership Agreements (EPAs).

After almost three decades of non-reciprocal preferential access to the EU market, EPAs are meant to replace the existing trade regime by reciprocal agreements that are fully WTO-compatible, while providing for differential and asymmetric treatment.

The current preferential trade regime has been extended for the period of negotiations, until the end of 2007. Basically, the EPAs, as proposed by the European Commission, should be enhanced, development-oriented free trade areas (FTAs) between ACP (regional) groupings and the EU. They will cover trade in goods, agricultural products and services, and will address tariff, non-tariff and technical barriers to trade. Other trade- related areas could also be covered, through increased cooperation between the EU and the ACP, such as competition, protection of intellectual property rights, standardization and certification, sanitary and phytosanitary (SPS) measures, trade and environment, trade and labour standards, consumer policy regulation and consumer health protection, food security, public procurement.

**"Generalised System of Tariff Preferences" (GSP)**

In 1968, the United Nations Conference on Trade and Development (UNCTAD) recommended the creation of a "Generalised System of Tariff Preferences" through which industrialized countries would grant trade preferences to all developing countries. The EU's GSP allows products imported from GSP beneficiary countries either duty-free access or a tariff reduction, depending on the sensitivity of the product and the GSP arrangement enjoyed by the country concerned. This authorizes developed countries to establish individual "Generalised Schemes of Tariff Preferences". The European Community was the first to implement a GSP

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[19] The Guide to the Rules of Origin explains the requirements which products covered by the GSP have to meet for being considered as originating in the exporting country (available at http://europa.eu.int).

scheme in 1971. The EU GSP enables products imported from GSP beneficiary countries to gain either duty-free access or a tariff reduction – depending on which of the five GSP arrangements the country enjoys[19]

### 2.1.6 The WTO Agreement on the Application of Sanitary and Phytosanitary Measures

The WTO Agreement on the Application of Sanitary and Phytosanitary measures (SPS) deals with sanitary (human and animal health) and phytosanitary (plant health) measures that can be applied in the international trade in, among other things, plant and animal products.

The SPS Agreement builds on previous GATT rules to restrict the use of unjustified sanitary and phytosanitary measures for the purpose of trade protection. The basic aim of the SPS Agreement is to maintain the sovereign right of any government to provide the level of protection it deems appropriate, but to ensure that these sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to international trade.

The SPS Agreement encourages governments to establish national SPS measures consistent with international standards, guidelines and recommendations. This process is often referred to as "harmonization". International standards are frequently higher than the national requirements of many countries (including developed countries), but the SPS Agreement explicitly permits governments to choose not to use the international standards. However, if the national requirement, which differs from international standards results in a greater restriction of trade, a country may be asked to provide scientific justification or give evidence of consistent risk decisions, based on an appropriate risk assessment.

Due to differences in climate, existing pests or diseases, or food safety conditions, it is not always appropriate to impose the same sanitary and phytosanitary requirements on food, animal or plant products coming from different countries. Therefore, the risk assessment and the resulting sanitary and phytosanitary measures may vary, depending on the country of origin of the food, animal or plant product concerned.

If so requested, governments shall make known what factors were taken into consideration, the assessment procedures used and the level of risk which was determined to be acceptable in the risk assessment process. The agreement includes provisions on control, inspection and approval procedures.

Governments are required to notify other countries of any new or changed sanitary and phytosanitary requirements affecting trade, and to set up offices ("Enquiry Points") to respond to requests for further information on new or existing measures. Governments must also be open to scrutiny of their methods of applying their food safety and animal and plant health regulations. The systematic exchange of information among the WTO member governments provides the basis for the development of national standards[20].

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**Animal Welfare And Trade**

Animal welfare is a complex issue encompassing important scientific, ethical, economic and political dimensions. The WTO legal framework does not deal with animal welfare and other ethical issues. Growing consciousness of, and concern for, animal welfare has reached the WTO level. This is part of a broader debate regarding linkages between morality and trade, and the flexibility of the multilateral trading system to accommodate non-trade issues. The key to the WTO debate is whether measures based on animal welfare objectives, which are not animal-health related, are consistent with WTO rules. The majority view is that non-health-related measures involving animal welfare are not permitted as trade-restrictive, although this has never been tested under WTO dispute settlement procedures.

In response to proposals to have animal welfare included in the WTO agreement, the view has been put forward that suggestions to address animal welfare concerns are much more likely to receive broad-based international support and achieve the same objectives, if they remain outside the WTO sphere.

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The OIE in collaboration with FAO may well appropriate, established, intergovernmental organizations to address animal welfare issues and seek agreement on international standards (see sect. 2.1 (f))

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[20]   Available at www.wto.org.

2.1.7 The Office International des Epizooties and the Codex Alimentarius Commission: Standard setting instruments under the SPS

One of the primary goals of the SPS Agreement is to encourage the harmonization of sanitary and phytosanitary measures (SPMs) on the basis of international standards, guidelines and recommendations promulgated by the international organizations.

In the SPS Agreement, the Office International des Epizooties (OIE) is recognized as the standard-setting body for animal health. The OIE standards are relevant to the management of AnGR in the import–export context. OIE guidance includes internationally-agreed principles and methods for risk-analysis, with specific application in the evaluation of risk for animal diseases, and outlines measures to be taken.

An OIE Working Group on Animal Production Food Safety has been created with the primary objective of complementing the work of the Codex Alimentarius Commission (CAC) and on a broad geographical basis, reducing food-borne risks to consumers' health, through the prevention, elimination or control of hazards related to animals or animal products not yet processed. The Working Group has a detailed work programme for the development of standards on animal production food safety, covering pre-slaughter issues and those prior to the first transformation of animal products, with a primary focus on food safety measures applicable at the farm level.

Animal health measures have been grouped in the Terrestrial Animals and Aquatic Animals Codes (in the form of standards, guidelines and recommendations), which have been formally adopted by the OIE International Committee.

The aim of the Terrestrial Animal Health Code is to ensure the sanitary safety of international trade in terrestrial animals and animal products. This is achieved through the detailing of health measures to be used by the veterinary authorities of importing and exporting countries to avoid the transfer of agents pathogenic for animals or humans, while avoiding unjustified sanitary barriers. The Code is a reference document for use by Veterinary Authorities, import/export services, epidemiologists and all those involved in international

trade. The Terrestrial Animals Health Code is in its 14th edition as of May 2005[21].

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**FMD – Economic impact and Export International Rules**

Animal diseases are an increasingly-important factor affecting trade in livestock and livestock products, particularly affecting developing countries. Import and export markets are hit when a ban is declared in order to prevent the transboundary spread of disease. On a global scale, perhaps the most significant disease in this respect is Foot and Mouth Disease (FMD), which is caused by a fast-spreading virus. Even a limited outbreak of FMD can be devastating for a country's trade in animals and animal products. The ability or failure to maintain FMD-free status is likely to have a marked effect on a country's patterns of livestock development. Of course, the impact may not be

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Based on the linkages between animal health and animal welfare, the representatives of the OIE's 164 Member Countries asked the Organization to take the lead role in animal welfare. A permanent Working Group on Animal Welfare was established and held its first meeting in October 2002.

A Conference on the theme was held in February 2004 in order to start the preparation of internationally applicable guiding principles and standards for animal welfare and ensure that those international standards are science-based. Based on the work of the Conference, key animal welfare issues are divided into various categories, as follows: (1) space and environment; (2) management, handling and transport; (3) pain, fear, and distress; 4) injury and disease; and 5) food, water and malnutrition. The OIE's initial activities decided by its member countries, in developing animal welfare guiding principles and standards focus on: (a) land transport; (b) sea transport; (c) humane slaughter for human consumption; and (d) depopulation for disease control purposes.

In May 2005, the OIE International Committee adopted resolutions on genetic engineering applications for livestock and biotechnology products, and the implementation of Committee standards in the framework of the SPS Agreement. Members requested the development of standards and guidelines

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[21] Available at www.oie.int.

relating to animal vaccines produced through biotechnology, animal health risks linked to cloning, the exclusion of unapproved animals and products from the livestock population, and genetically engineered animals.

The Codex Alimentarius Commission (CAC) is the SPS-designated standard-setting body for food, including food of animal origin. For the purposes of this study, it is worth highlighting the work of the Ad Hoc Intergovernmental Task Force on Animal Feeding. The task force completes and extends what has already been done by relevant Codex Committees on the Recommended Code of Practice for Good Animal Feeding[22]. In addition, it addresses other aspects which are important for food safety, such as problems related to toxic substances, pathogens, microbial resistance, new technologies, storage, control measures and traceability.

The goal of the code is to establish a feed safety system for food-producing animals which covers the whole food chain, taking into account relevant aspects of animal health and the environment in order to minimize risks to the health of consumers. The code applies to feed manufacturing and to all feeds, other than those taken while grazing free-range. The primary objective of the code is to encourage adherence to good manufacturing practices during the production, harvesting, handling, storage, processing and distribution of feed for food-producing animals. A further objective is to encourage good on-farm feeding practices.

The Task Force completed its work at its 4th Session, held in Denmark in March 2003, by forwarding the Proposed Draft Code of Practice to the Commission for final adoption. However, since there were a number of controversial areas that could not be resolved, the Codex commission extended the task force mandate to 2004 and is still active. The definition of feed additives, labelling of feeds that contain GMOs, and the record keeping required to maintain traceability of feed and feed ingredients are the most controversial points under examination.

An *ad hoc* Intergovernmental Task Force on Foods Derived from Biotechnology was established by the CAC in 1999, to consider the health and nutritional implications of such foods. Among the list of expert consultations that are held under the umbrella of the Task Force, of relevance is that on

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[22]   CAC/RCP 54 (available at www.codexalimentarius.net).

"*Safety Assessment of Foods Derived from Genetically Modified Animals including Fish*" (2003). This expert consultation is continuing the work of FAO and WHO on the safety assessment of genetically modified foods and is focussing on GM animals, including fish, and the foods derived therefrom.

### 2.1.8  WTO Trade-Related Intellectual Property Rights Agreement (TRIPS)

The TRIPS Agreement, which came into force in January 1995, is the most comprehensive multilateral agreement on intellectual property in place to date. It established minimum standards of protection and is binding upon WTO Member Countries and Regions. It covers the following areas of intellectual property, such as: (1) copyright and related rights (i.e. the rights of performers, producers of sound recordings and broadcasting organizations); (2) trademarks, including service marks; (3) geographical indications, including appellations of origin; (4) industrial design; (5) patents, including the protection of plant varieties; (6) the layout-designs of integrated circuits; and (7) undisclosed information, including trade secrets and test data.

Under Part II of the Agreement ('Standards concerning the availability, scope and use of intellectual property rights'), WTO Members are bound to general basic principles, notably national-treatment and most-favoured-nation, and to rules for each type of intellectual property right. Types of IPRs relevant to animal genetic resources and the resulting products, are geographical indications, trademarks, trade secrets and patents. With regard to the latter, the TRIPS Agreement (art. 27) requires member countries to make patents available for any inventions, whether products or processes, in all fields of technology, without discrimination between local and imported products, subject to the normal tests of novelty, inventiveness and industrial applicability.

Members may exclude certain inventions from patentability. The exception relevant to animal genetic resources is that contained in Article 27.3(b), which states that members may exclude plants and animals as well as essentially biological processes, other than microbiological and non-biological, for the production of plants or animals. However, any member excluding plant varieties from patent protection shall provide an effective *sui generis* (i.e. of its own kind) system of protection. This *sui generis* system exception does not apply to animals.

In the animal sector, contractual arrangements, trade secrets and trademarks seem to be more recurring than patenting in the practice of industry.

In particular, poultry and pig breeders use the following approach. Two steps of multiple crossing of pure lines produce F2 cross-bred progeny which has a heterosis effect, like plant hybrids. Poultry breeders keep control of their pure lines, and release grandparent and even parent stock under careful supervision. These final products are hybrids, as in the pig sector. This strategy is not applicable for traditionally cross-bred animals but is now being employed by pig breeding companies with their larger customers. Such companies produce cross-bred breeding replacement for multiplying farms, or terminal cross-breeds for fattening units. Genotypes of produced breeding stock are protected as trade secrets.

Even where animals or parts thereof are deemed, patentable in principle, a patent application may be rejected on moral or public order grounds, in accordance with Article 27.2 of the TRIPS Agreement. Nevertheless, the notions of morality and public order are quite vague and changing, and their content will depend on national perceptions by patent offices and judges. In fact, determining whether a certain conduct may be deemed contrary to the fundamental values of a society, is a matter of national public policy.

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**The revision of Article 27.3(b) and the relationship between TRIPS and the CBD**

In line with the requirements of Article 27.3(b), a review process was initiated four years after the entry into force of the Agreement. No major achievements have been obtained to date in terms of amendment to the provisions. Several developing countries have advocated the introduction of an obligation to disclose the country and area of origin of any biological resource and traditional knowledge used or involved in an invention, including:

- proof of compliance with all access regulations of the country of origin;
- evidence of prior informed access to the material or the knowledge; and
- evidence of equitable sharing of benefits under the relevant national regimes.

The CBD through various COPs, including COP-7 which took place in Malaysia in February 2004, has been discussing various issues relating to intellectual property. It is in this context that the Bonn Guidelines on Access and Benefit Sharing were developed and on the basis of which the Working Group (WG) on Access to Genetic Resources and Benefit-sharing (ABS) has

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been mandated to elaborate and negotiate an international regime on ABS (see below section 2.2.b). The WG on ABS is expected to carry out its work in collaboration with the WG on Article 8(j), which deals with indigenous community issues. In this context, there has been a clear trend at the CBD to elaborate and consolidate an ABS regime as well as to develop elements for sui generis systems for the protection of traditional knowledge and to explore the conditions under which the use of existing intellectual property rights can contribute to achieving the objectives of the CBD.

A number of countries have explicitly excluded patents for animals in national legislation (Canada, China, Denmark, Ireland, Netherlands, Norway, Russia, Belarus, Brazil, Thailand, India and Philippines). The United States Patent Office[23] and the European Patent Office grant animal patents, the latter even though 'animal varieties' are excluded from patent protection under the European Patent Convention[24]. Animal patenting may soon become an issue, with the introduction of transgenic production animals. In this context, it is worth noting that many of the enabling technologies and processes used in modern biotechnology are IPR-protected. Process patents may be used to have very effective protection of the direct products of breeding processes[25].

**TRIPS-plus**

"TRIPS-plus" refers to any requirement, contained in bilateral agreements between Governments, which require stronger intellectual property protection than the TRIPS Agreement. Free trade agreements, bilateral investment treaties, development aid programmes or research cooperation deals are the contexts where IPR requirements are set forth.

In a period of two years (2002–2004), the United States negotiated, or is negotiating, free trade agreements with intellectual property components with all Latin and Central American and Caribbean countries individually, in groups or collectively and with Australia, Morocco, the Southern Africa Customs Union (SACU) countries, Singapore and Thailand. The EU has also been

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[23]   454 Animal Patents Issued as of 21 September 2003, see American Anti-vivisection Society, Animal Patenting Fact Sheet (www.icta.org).

[24]   Article 53(b) of the EPC. See also Harvard/Onco-Mouse [1990] E.P.O.R. 4 EPO (Examining Div.), section 13.3.1.

[25]   In February 2005 Monsanto Corporation filed multiple patent applications for more than 160 countries and territories before the World Intellectual Property Organisation (WIPO) for methods of pig breeding and the detection of a gene sequence related to faster growth. The patent application can be found www.wipo.int.

negotiating a free trade area with MERCOSUR countries where intellectual property is included.

In the field of agriculture, TRIPS-plus agreements typically contain obligations which are not in the TRIPS Agreement, to:

- patent plants and animals; or
- provide legal protection for biotechnological inventions.

TRIPS-plus standards could eventually form a new international regime for IPR. The World Intellectual Property Organisation is facilitating negotiations on a Substantive Patent Law Treaty which already points in this direction (see below, section 2.1.9).

### 2.1.9   The World Intellectual Property Organization

In 1974, the World Intellectual Property Organization (WIPO) became a specialized agency of the United Nations system of organizations, with a mandate to administer intellectual property matters recognized by the member states of the UN. WIPO expanded its role to the management of globalized trade in 1996 by entering into a cooperation agreement with the WTO.

A WIPO Intergovernmental Committee (IGC) on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, was established in September 2000 by WIPO member states. The Committee is a forum where governments discuss intellectual property relevant to three primary themes: access to genetic resources and benefit-sharing; protection of traditional knowledge, whether or not associated with those resources; and protection of expressions of folklore.

The WIPO IGC had accomplished substantial work in previous sessions on traditional knowledge (TK), including a "toolkit" for managing intellectual property (IP) when documenting TK and genetic resources (GR); a survey of intellectual property protection of TK; and a database of IP clauses in bilateral access agreements. Nevertheless, many subjects remained contentious. The WIPO General Assembly in September – October 2003 extended and modified the IGC's mandate for another two years. Member states of the WIPO decided to push ahead with work relating to the intellectual property aspects of traditional knowledge, folklore and genetic resources. The General Assembly authorized "the possible development of an international instrument or instruments" only after a divisive debate. Brazil, Venezuela, and some African countries insisted on the drawing up of an international treaty within

two years, but industrialized nations wanted a more gradual approach. The debate centres on ownership of genetic resources and traditional knowledge[26].

Another issue for consideration, given its potential relevance to AnGR management, is the Substantive Patent Law Treaty (SPLT), which has been under negotiation for the past three years in the WIPO Standing Committee on the Law of Patents in Geneva. The draft SPLT covers a number of basic legal principles underpinning the grant of patents in different countries of the world, such as the definition of prior art, novelty, inventive step (non-obviousness), industrial applicability (utility), sufficiency of disclosure, and the structure and interpretation of claims.

From 2001 to 2003, the Standing Committee on the Law of Patents agreed in principle on some issues, such as the scope of the SPLT, the right to a patent, novelty, inventive step/non-obviousness or the requirement of sufficient disclosure as basic requirements. Some other topics, such as patentable subject-matter or the exceptions to patentability, are in the negotiation agenda.

WIPO's Substantive Patent Law Treaty picks up where the WTO TRIPS Agreement left off. TRIPS dealt with minimum standards for intellectual property protection, which are burdensome for developing countries, but came as part of a package deal for joining WTO. The WIPO SPLT has evidenced trends towards stronger (i.e. beyond minimum requirements) patent law harmonization and will raise those standards much further, with little, if any, space for national adaptation.

## 2.2   Soft law

Soft law refers to legally non-binding instruments that are utilized for a variety of reasons such as strengthening member commitment to agreements, reaffirming international norms, and establishing an informal precedent for subsequent treaties.

### 2.2.1.   Agenda 21

Chapter 14 of Agenda 21 on Promoting Sustainable Agriculture and Rural Development (SARD) highlights the fact that SARD's major objective is to increase food production in a sustainable manner and enhance food security.

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[26]   Kapp, C. 2003. UN steps up action on traditional knowledge, The Lancet, Vol. 362, No. 9391, October. Provided by GRAIN.

Among the programme areas included in Chapter 14, of particular relevance is programme area (h) on the conservation and sustainable utilization of animal genetic resources for sustainable agriculture. According to the management-related activities specified in this programme, governments should: (a) draw up breed conservation plans for populations at risk or threatened, including semen/embryo collection and storage, farm-based conservation of indigenous stock and *in-situ* preservation; (b) plan and initiate breed development strategies; and (c) select indigenous populations, on the basis of regional importance and genetic uniqueness, for a ten-year programme, followed by the selection of an additional cohort of indigenous breeds for development.

At the World Summit on Sustainable Development held in Johannesburg in 2002, sustainable agriculture and rural development was one of the issues considered in the Plan of Implementation. Paragraphs 6(i) and 38 stress the importance of sustainable agriculture and rural development as essential to the implementation of an integrated approach to increasing food production and enhancing food security and food safety in an environmentally sustainable way. This would include action at all levels.

### 2.2.2    Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising from their Utilization

The issue of access and equitable benefit-sharing is a major battleground between the providers (typically traditional farmers) and the users (typically industrial breeders) of genetic resources. It is not yet a major issue in the discussion of farm animal genetic diversity, but it might become so in the near future.

Access and benefit-sharing (ABS) is one of the priority themes addressed by the parties to the CBD. A major achievement of COP 6 was the adoption of the Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from their Utilization (Decision VI/24). The guidelines will be kept under review by the COP which will consider the need for their further refinement, on the basis of relevant developments under the Convention.

The guidelines provide for a set of voluntary rules to assist parties, governments and other stakeholders when establishing legislative, administrative or policy measures on access and benefit-sharing and/or when negotiating contractual arrangements for access and benefit-sharing. They also provided a response to concerns in many developing countries that the

commercial and scientific gains realized from their genetic resources were going mainly to the industrialized world.

At the national level, the CBD is implemented through national legislation or biodiversity action plans. Several formats and procedures have been adopted by national parliaments, creating diverse and innovative mechanisms for assuring legal access and equitable benefit-sharing. The Bonn Guidelines establish for the first time a precise set of options for, among other things, developing procedures for access and benefit sharing, clarifying the relationship with traditional knowledge and identifying practical mechanisms for monitoring, and providing space for legal remedies. The guidelines also deal with some aspects of the role of intellectual property in the access and benefit sharing process.

The Bonn Guidelines state that, before collecting any genetic resources, a collector should have a written agreement that includes certain key provisions: (1) prior informed consent from the national government of the country of origin; (2) access to genetic resources or the "traditional knowledge" of an indigenous community or communities will normally require obtaining the prior informed consent of that community or communities; (3) the non-monetary and/or monetary benefits the collector will provide; and (4) whether, and under what conditions, the collector may transfer the collected genetic resources to another party.

The development of mutually-agreed terms should be based on the principles of legal certainty and minimization of cost. These principles were included in the guidelines, to respond to the concerns of scientific researchers and users of genetic resources that national procedures for obtaining access could be too complex and burdensome. The guidelines enumerate a detailed description of the type of provisions that could form part of a contractual arrangement. Some of the proposed provisions are quite innovative and include the specification of uses, the regulation of those uses in the light of ethical concerns, the continuation of customary uses over genetic resources, the possibility of joint ownership of intellectual property rights according to contributions, and the existence of confidentiality clauses and sharing of benefits from commercial and other utilization of genetic resources, including derivatives (paras. 41-44).

The guidelines are also intended to assist governments in setting fair and practical conditions for users seeking genetic resources. The guidelines suggest that resource users should in return offer benefits derived from their use in the

form of profits, royalties, scientific collaboration, or training. The guidelines also aim at improving the manner in which researchers, collectors, foreign companies and other users gain access to valuable genetic resources, in return for sharing the benefits with the countries of origin. The potential benefits that parties might expect from legal access include both monetary and non-monetary benefits. A non-exhaustive list of these types of benefits has been also been included in the guidelines, thus creating a more predictable atmosphere for governments, potential commercial or non commercial users and stakeholders when negotiating benefits in the context of an access contract (paras. 45-50).

The guidelines include, for the first time, a set of measures designed to support prior informed consent and the negotiation of mutually-agreed terms. Monitoring may include reporting of activities, follow up on whether the use is in line with the terms of the access contract, checking of research and development activities, and the application of IPRs (paras. 55-58). Enforcement measures encouraged by the guidelines include the disclosure of information, certification schemes and measures against unfair trade practices.

Notwithstanding the adoption of the Bonn Guidelines, the Conference of the Parties, at its seventh meeting, decided to mandate the ad hoc open-ended working group on access "to elaborate and negotiate an international regime on access to genetic resources and benefit-sharing" and adopted the terms of reference for this process (Decision VII/19). In 2005, the working group on ABS has made progress on certain topics, such as the consideration of an international certificate of origin/source/legal provenance.

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**An example of bilateral ABS in the AnGR sector: the Material Transfer Agreement in the Pig Biodiversity Project**

Material transfer agreements are contractual arrangements that set out the conditions and the agreed terms under which the genetic material is to be transferred. MTAs have been used mostly in the private seed sector, but also by public research organizations.

Following a pig biodiversity research project funded by the EU[27], an agreement for the long-term conservation and use of genetic resources was developed and signed initially by 13 contracting parties, including FAO. The objective of the initial agreement was to protect the ownership and property

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[27]    Available at http://europa.eu.int.

rights of the blood and DNA samples transferred among participants to the project. Written permission from both the individual provider and the country of origin was an obligatory requirement for using the material, which remains the property of the individual providers.

A second long-term agreement, to be applied in a manner consistent with the provisions of the CBD, is aimed at facilitating the conservation of the genetic material collected under the project, to be used for international research and development; clarifying property rights in all genetic material sampled in the project; and establishing a structure for the management and use of the stored DNA and project data. According to the agreement, a management group, representing the interests of all parties, is responsible for the governance of the agreement and for taking decisions on control of access to the stored DNA and project data, taking into account the provisions of the CBD and of FAO's Global Strategy for the Management of Farm Animal Genetic Resources.

Under this agreement, stored DNA will be maintained for each breed and animal, using internationally accepted methods. The original material providers own the intellectual property rights related to the genetic material. Control and access to the material providers' DNA for further research and any other use resides with the original material provider. The project DNA remaining with the typing laboratories can be retained by the laboratory or returned to the material providers, as specified by the material provider. The MTA is for a period of ten years, renewable for another five unless otherwise specified. Any dispute between the contracting parties, arising out of the interpretation or execution of the Agreement, shall be settled by mutual accord.

## 3.   AN EXAMPLE OF REGIONAL POLICY AND REGULATORY FRAMEWORK: THE EUROPEAN UNION

Legal frameworks are frequently negotiated in political and regional groups of countries to improve cooperation, coordinate activities and minimise duplication of work. The EU framework is composed of a set of policy and legislative instruments embracing several aspects of relevance to AnGR management. It is worth examining them to see the complex interaction of different areas of regulation that, all together, impact on AnGR management.

### 3.1   European Union legislation

The EU legislation relevant to this study consists of directives and regulations, which must be implemented at the member state level. Directives are binding

as to the result to be achieved, upon each member state to which they are addressed, but leave to each member state the choice of form and methods to transpose the directive into national legislation (usually within two to three years after adoption). Regulations are binding in their entirety and are directly applicable in all member states. Regionally speaking, the EU has built up a significant body of legislative texts relevant to AnGR management, some in the context of the Common Agricultural Policy, others in different areas, such as conservation of genetic resources, zootechnics (animal breeding), food products, animal health, export of animals and animal products, animal feed safety, veterinary controls and GMOs.

### 3.1.1 The Common Agricultural Policy of the EU and the related legislative measures

The Common Agricultural Policy (CAP) is comprised of a set of rules and mechanisms which regulate the production, trade and processing of agricultural products in the EU, with increasing attention on rural development. The policy sets forth the overall framework within which specific measures of direct or indirect relevance to AnGR management are adopted and implemented.

The CAP's objectives, as set out in Article 33 of the EC Treaty[28], are: (a) to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilization of the factors of production – in particular labour; (b) to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture; (c) to stabilise markets; (d) to ensure the availability of supplies; and (e) to ensure that supplies reach consumers at reasonable prices. The CAP involves a broad range of areas relevant to AnGR management, which are regulated through directives and regulations. This subsection analyses some relevant examples.

The Agenda 2000 has been one of the most radical and comprehensive reforms of the CAP since its inception. It built on the process begun in 1992 and provided a sound basis for the future development of agriculture in the Union, covering all functions of the CAP, namely economic, environmental, and rural.

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[28]   Available at http://europa.eu.int.

To some extent, the Agenda 2000 was shaped by developments at the international level. The EU is a member of the World Trade Organization (WTO). Agricultural trade is of particular significance for the EU, as it is the world's largest importer, and the second largest exporter, of agricultural products. Agricultural negotiations, within the WTO framework, began in March 2000. On the whole, the EU approach in the agricultural negotiations is based on its Agenda 2000 package. The EU expectation, with regard to the negotiations, is to achieve its long-term objective of fundamental reform of the agricultural sector, making use of the experience gained from the implementation of the 1995 WTO Agreement.

In June 2003, the CAP was substantially reformed again. The new CAP gives EU farmers the freedom to produce what the market wants, since the vast majority of subsidies will be paid in the form of single farm payments, thus independently from the volume of production. These new "single farm payments" are linked to the respect of environmental, food safety and animal welfare standards. More money is being made available to farmers for environmental, quality or animal welfare programmes by reducing direct payments for bigger farms[29].

Relevant EU legislation implementing the CAP is, among others, the Council Regulation (EEC) No. 2078/92 which in the meanwhile has been repealed by Council Regulation (EC) No. 1257/99. The Regulation 2078/92 is one of the so-called "accompanying measures" to the CAP, which were designed to provide a framework for the implementation of agricultural production methods which are compatible with both environmental protection and the preservation of the countryside. In particular, it introduced incentive measures for *in-situ* conservation of genetic resources for agriculture. The regulation established funding schemes for conservation activities and an aid mechanism for farmers who voluntarily undertake certain agri-environmental measures. In fact, the scheme may include aid for farmers who conserve, among other things, animals of local breeds in danger of extinction and ensure the upkeep of abandoned farmland.

The support to rural development is an important aspect of conservation. In this field, the EU policy aims to introduce a sustainable and integrated rural development policy governed by a single legal instrument, to ensure better

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[29] The single farm payment will enter into force in 2005. If a Member State needs a transitional period due to its specific agricultural conditions, it may apply the single farm payment from 2007 at the latest.

coherence between rural development and the prices and market policy of the CAP. The policy also aims to promote all aspects of rural development by encouraging the participation of local actors. Along these lines, the Regulation 1257/1999 "on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF)" establishes the framework for Community support for sustainable rural development, from 1 January 2000. Chapter VI of this regulation focuses on agri-environment and emphasizes that support for agricultural production methods designed to protect the environment and to maintain the countryside (agri-environment) is an essential element for achieving the Community's policy objectives with regard to agriculture and the environment.

Within the agri-environment programme, the Commission Regulation (EC) No. 445/2002 was the first instrument that provided farmers rearing farm animals of local breeds indigenous to the area and in danger of being lost to farming with financial support. Such support was granted for eligible species of farm animals and based on criteria for determining the threshold of loss to farming of local breeds. The figures referred to the number, calculated for all EU member states, of breeding females of the same breed available for pure-bred reproduction, included in a register recognized by the member state (such as herd book, flock book or stud book).

The Commission Regulation (EC) No. 817/2004 lays down the new rules for the application of the Regulation 1257/1999 and repealed the Regulation (EC) 445/2002. With regard to agri-environment and animal welfare, Article 14 specifies that financial support may relate to the commitment to rear farm animals of local breeds indigenous to the area and in danger of being lost to farming, provided that such local breeds play a role in maintaining the environment in that area. Annex I to the regulation sets forth the list of eligible animal species (namely cattle, sheep, goat, equidae, pigs and avian) as well as the numeric thresholds under which a local breed is considered as being in danger of being lost to farming. Figures are calculated as in the Regulation 445/2002. It is specified in Annex II that the number shall be certified by a duly recognized technical body (or breeder's organization/association) which shall register and keep up to date the herd, flock or stud book for the breed.[30]

As the second pillar of the CAP, and a major factor in economic and social cohesion, the Community's rural development policy is not restricted to boosting the competitiveness of agriculture. It also encourages the

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[30]  See also http://lasig.epfl.ch/projets/econogene.

development of new activities and sources of employment. In this context, Leader+31 defines the Commission's guidelines for the Community Initiative for Rural Development. The aim of Leader+ is to encourage rural actors to think about the longer-term potential of their area. The local actors implement the original strategy they themselves have designed, experimenting with new ways of: enhancing natural and cultural heritage; reinforcing the economic environment in order to create jobs; and improving the organizational capabilities of their community.

### 3.1.2    Organic production

Organically-produced agricultural products and foodstuffs is another important area of the CAP relevant to AnGR management. Its objective is to set up a harmonized framework for the production, labelling and inspection of agricultural products and foodstuffs, so as to increase consumer confidence in such products and ensure fair competition between producers. Of relevance is Council Regulation (EEC) No. 2092/91 of 24 June 1991 "on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs" which sets up a harmonized framework for the labelling, production and control of agricultural products bearing or intended to bear indications referring to organic production methods. Organic farming itself can be defined as a method of production which puts the greatest emphasis on environmental protection and animal welfare considerations (with regard to livestock production).  It avoids or largely reduces the use of synthetic chemical inputs, such as fertilizers, pesticides, additives and medicinal products.

In the field of livestock production, organic farming practices have minimum indoor and outdoor area requirements in order to permit the animals to live more naturally. Animals should be fed with organically-produced foodstuffs, but temporary exceptions are allowed. Breeds should be selected taking into account their natural environment and resistance to disease. The use of antibiotics and other additives is not permitted in regular foodstuffs, as well as the use of hormones and growth promoters. As far as possible, treatments should be based on natural medical products. Antibiotics and other chemical allopathic treatments may be used for therapeutic purposes but under strict conditions and control. Proper management of manure is also a requirement,

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[31]  Commission Communication of 14 April 2000 to the Member States laying down guidelines for the Community Initiative for Rural Development (Leader+), Official Journal C 139, 18 May 2000.

to avoid environmental contamination. The regulation also states that organic products must satisfy all the requirements (safety or otherwise) of the corresponding conventional products.

Extensive and organic farming systems may encompass rare and endangered livestock breeds. Regulation (EEC) No. 2092/91 did not include any standards for livestock and for that reason it was supplemented by Regulation (EC) No. 1804/1999 of 21 August 2000, which includes livestock production. This new regulation recommends maintaining indigenous breeds and strains that have adapted to local conditions. It also establishes rules of production for species such as namely bovine, ovine, caprine, equine and poultry. Rules for other species are to be developed by Commission regulation. With regard to feedstuffs, the regulation states that the Commission is to develop detailed provisions related to labelling, and detailed inspection measures.

### 3.1.3    Conservation of genetic resources

The EU is also Party to the CBD and, as a consequence, all EU countries are obliged to develop national biodiversity strategies that, in the context of agricultural biodiversity, also address conservation of livestock genetic resources. *In-situ* conservation is regarded as the preferable approach, as it enables utilization and further characterization of AnGR. At the regional level, the Biodiversity Action Plan for Agriculture was adopted in 2001. The CAP instruments as shaped by Agenda 2000 and subsequent reforms provide the framework for integrating biodiversity concerns into EU agricultural policy. The priorities of the action plan are: the promotion and support of environmentally-friendly farming practices and systems that benefit biodiversity directly or indirectly; the support of sustainable farming activities in biodiversity-rich areas; the maintenance and enhancement of good ecological infrastructures, and the promotion of actions to conserve local or threatened livestock breeds or plant varieties. All these priorities are supported by research, training and education actions. Biodiversity conservation greatly depends on the sufficient and targeted application of measures within the CAP, notably compensatory allowances for less favoured areas and agri-environmental measures.

A relevant Council Regulation implementing the Action Plan and focussed on conservation and research in the area of genetic resources, is the Council Regulation (EC) No. 870/2004 on the conservation, characterization, collection and utilization of genetic resources in agriculture, which repealed the Council Regulation No. 1467/94 on the same subject. A Mid-Term Report by

the Commission to the Council and the European Parliament on the implementation of Council Regulation 1467/94 emphasised that farm animal genetic resources received less attention than those of agricultural plants, in terms of number of research projects that were financed within this CR. As the management aspects of animal and plant genetic resources are significantly different, the discrepancy in research support was most disadvantageous for AnGR management.

The main aims of the new programme are to:

- finance measures to promote the conservation, characterization, collection and utilization of genetic resources in agriculture, allowing for a wider coverage of plant and animal diversity with particular emphasis on complementing the scope (as regards beneficiaries and/or eligible actions for funding) of the Regulation 1257/1999.
- promote in situ / on-farm genetic resource conservation activities which should be a means to promote the conservation of genetic material on a trans-national basis but taking into account, if appropriate, biogeographic regional aspects.

The new programme will function based on proposals for actions, to be reviewed and selected by independent experts. Such proposals may be submitted by a public-sector body or any natural or legal person who is a national of a member state and established in the Community. Prospective applicants include gene banks, non governmental organizations, breeders, technical institutes and experimental farms. Bodies or persons established in third countries may also submit proposals. The first calls for proposals cover the actions and areas referred to in the Annex of the regulation.

As for animal genetic resources maintained on farms, targeted actions include a European network of national inventories of administrative aspects (origin and status of funding, state of breeds and their endangerment, location of herdbooks, etc.), which should be managed in conformity with DAD-IS[32], the information system for the Global Strategy for the Management of Farm Animal Genetic Resources hosted by FAO. With regard to *ex-situ* conservation of animal genetic resources (semen, embryos), a web-based network of national inventories and a European search catalogue for minimum passport data should be developed. The inventory is to consist principally of the

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[32] Available at www.fao.org/dad-is.

establishment, regular updating and regular publication of the facilities (storage and conservation) for genetic resources in agriculture collected in the Community, and the listing of current work on the conservation, characterization, evaluation, collection, documentation, development and utilization of those genetic resources. Minimum passport data of individual accessions may be included.

Areas for animal genetic resources eligible for funding include: (a) the development of European-wide standardized and comparable criteria to identify the national priorities for action in the field of sustainable conservation and utilization of Animal Genetic Resources and related requirements for international cooperation; (b) the establishment of European cryo-conserves for animal genetic resources based upon national or institutional cryo-conserves; (c) the characterization and evaluation of animal genetic resources (species and breeds) used or potentially useful for food and agriculture; (d) the establishment of a standardized European performance testing regime for animal genetic resources in agriculture, and documentation of characteristics of endangered farm animal breeds and populations; (e) the establishment and coordination of a European-wide network of "Ark farms", rescue-stations and farm animal parks for endangered European farm animal breed; (f) the development of common cross-national breeding programmes for endangered breeds and populations as well as the establishment of rules for the exchange of information, genetic material and breeding animals; (g) the development of strategies which support the enhancement of profitability of local breeds in order to develop links between local breeds and their typical products, to identify and to promote the value of local breeds for their environmental services (e.g. landscape conservation, agro-ecosystems management) and for their contribution to the multifunctional character of agriculture (e.g. maintenance of rural cultural diversity, rural development and tourism, etc.); and (h) the development of strategies which promote the utilization of underutilized animal genetic resources that could be of interest on a European level.

### 3.1.4    Zootechnics[33]

The list of relevant EU legislation is recorded in the tables online (available at www.fao.org/legal) which is based on the information given in the EU Commission's web site.[34]

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[33]   This paragraph has been written under the kind assistance of Mr Hermann Schulte-Coeme.

[34]   Available at http://europa.eu.int.

The legislation regulates breeding activities for: (a) bovine animals; (b) porcine animals; (c) ovine and caprine animals; and (d) equine animals. Poultry and rabbits, which are important commercial species, are not covered.

For each category, the legislation regulates aspects such as the recognition of breeding organizations, the keeping of herd-books, pedigree certificates, performance testing and genetic evaluation and acceptance for breeding.

The following general principles are to be remarked:
- The definition of pure-bred animals is linked to the registration of these animals and their ancestors in a herd-book for a breed[35]
- Breeders' associations are state-approved and are thereby mandated to keep herd-books for pure-bred animals and to perform breeding programmes including preservation breeding programmes[36];

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[35] For cattle, article 1 of the Council Directive 77/504/EEC defines purebred animals as; 'pure-bred breeding animal of the bovine species including buffalo; any bovine animal the parents and grandparents of which are entered or registered in a herd-book of the same breed, and which is itself either entered or registered and eligible for entry in such a herd-book'. Similar definitions are in the Council Directive 88/661/EEC for pigs, the Council Directive 89/321/EEC for ovine and caprine animals (sheep and goats)

[36] As for the recognition of breeding organisations for cattle, the Annex to the Commission Decision 84/247/EEC prescribes that, in order to be officially recognized, a breeders' organization or association which maintains or establishes a herd-book shall:

1. have legal personality in accordance with the legislation in force in the Member State where the application is made;

2. prove to the competent authorities: (a) that it operates efficiently; (b) that it can carry out the checks necessary for recording pedigrees; (c) that it has a sufficiently large herd to carry out a breed improvement programme, or that it has a sufficiently large herd to preserve the breed where this is considered necessary; (d) that it can make use of the livestock performance data necessary for carrying out its breed improvement or preservation programme;

3. have a set of rules covering: (a) the definition of the breed's (or breeds') characteristics; (b) the system for identifying animals; (c) the system for recording pedigrees; (d) the definition of its breeding objectives, (e) the systems for making use of livestock performance data, (f) the division of the herd-book, if there are different conditions for entering animals or if there are different procedures for classifying the animals entered in the book;

4. have rules of procedure, adopted in accordance with its articles of association, laying down, in particular, the principle of non-discrimination between members.

- Breeders' associations have to be approved if they meet the conditions laid down by legislation, provided that such approval can be refused if the organization would endanger the preservation of a breed[37];
- Breeders' associations shall not discriminate between their members, and private undertakings are not allowed for pure-bred breeding programmes[38];
- There is a right of mutual registration in herd-books of the same breed[39];
- Rules on entries in herd-books focus on genetic preservation and controlled evolution of breeds[40];

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[37] See, for example, Article 2 of the Commission Decision 84/247/EEC. It could be inferred from the rule that there is no kind of property right on a breed for a breeding organisation in that way, that it can exclusively breed this breed. Rather, any group of breeders can make up a new breeding organisation for an existing breed, unless partition of the population, resulting from an additional organisation, would endanger the preservation of the breed.

[38] See Annex No. 4 to the Commission Decision 84/247/EEC. This rule does not apply to breeding organizations or private undertakings breeding hybrid pigs (see Commission Decision 89/504/EEC). Consequently, private undertakings can only be approved for breeding hybrid pigs but not for any purebreeding.

[39] For cattle, Article 4 of the Commission Decision 84/419/EEC sets forth that breeders' organizations or associations officially recognized by a Member State may not oppose the entry in their herd-books of purebred breeding animals of the bovine species from other Member States provided that they meet the prescribed requirements for approval.

[40] For cattle, article 1 of the Commission Decision 84/419/EEC requires that an animal be descended from parents and grandparents entered in a herd-book of that same breed in order to enter the main section of the herd-book of its breed. Article 3 prescribes that a breeders' organization or association keeping a herd-book may decide that a female, which does not meet the criteria laid down in article 1, may be entered in a supplementary section of that herd-book, provided that it is identified in accordance with the herd-book rules, judged to conform to the breed standard, and meets minimum performance criteria as laid down by the herd-book rules. According to article 4, a female whose mother and maternal grandmother are entered in a supplementary section of the herd-book and whose father and two grandfathers are entered in the main section of the book in accordance with the criteria laid down in article 1, shall be regarded as a pure-bred female and entered in the main section of the book. It can be concluded from those provisions that preservation as parents and grandparents must come from a herd-book of the same breed and controlled evolution as open herdbooks with supplementary sections is envisaged foreseen for non-purebreds.

- In the case of equidae, an additional legal privilege for breeding organizations that maintain the studbook on the origin of the breed, is established[41].

### 3.1.5 Overview of selected EU legislation on food safety

The reform of the CAP within the framework of Agenda 2000 is an important development, making food safety and quality the main objectives. As a second pillar of this policy, support is available to farmers through the rural development strategy.

Many developing countries are concerned that they are not prepared to meet increasingly complex and burdensome standards and regulations. Environmental, Sanitary and Phytosanitary (SPS) measures and other technical requirements are considered by a number of developing countries to be a greater constraint to their ability to export agricultural and food products than are tariffs and quantitative restrictions – particularly in the case of their exports to the European Union.

Due to newly-discovered health hazards and newly-developed technologies, such as genetic engineering, EU legislation with regard to food has recently undergone significant reform. At present, the EU follows an integrated approach to food safety, which aims to ensure a high level of food safety, animal health, animal welfare and plant health within the European Union through coherent farm-to-table measures and adequate monitoring, while ensuring the effective functioning of the internal market.

The implementation of this approach has involved the development of legislative and other actions: (1) to ensure effective control systems and evaluate compliance with EU standards in the food safety and quality, animal health, animal welfare, animal nutrition and plant health sectors within the EU and in third countries in relation to their exports to the EU; (2) to manage international relations with third countries and international organizations

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[41] See Annex to the Commission Decision 92/353/EEC on the requirements that an organization or association which maintains stud-books, establishes sections of stud-books, and establishes stud-books for registered equidae is to meet. In substance, a "Studbook on the origin of a breed" can set up certain principles, which must be respected by filial-studbooks but cannot prevent other breeding organizations for the same breed (branch studbooks) from being approved.

concerning food safety, animal health, animal welfare, animal nutrition and plant health; and (3) to manage relations with the European Food Safety Authority (EFSA) and ensure science-based risk management.[42]

In the White Paper on Food Safety, the EU has identified food safety as one of its top priorities. The White Paper on Food Safety, dated 12 January 2000, sets out the plans for a proactive new food policy. EU legislation is changing in the direction of regulatory requirements in the field of chain management, transparency, and tracking and tracing.

The linchpin of the new legislation governing food safety and forming the basis of the new approach is Regulation (EC) No. 178/2002 of the European Parliament and of the Council of 28 January 2002 "laying down the general principles and requirements of food law, establishing the EFSA and laying down procedures in matters of food safety". This regulation provides the basis for assuring a high level of protection of human health and consumers' interest in relation to food, taking into account, in particular, the diversity in the supply of food including traditional products, whilst ensuring the effective functioning of the internal market. It establishes common principles and responsibilities, the means to provide a strong scientific base, efficient organizational arrangements and procedures to underpin decision-making in matters of food and feed safety. The rapid alert system for human food and animal feed is thus reinforced. For the purpose of this regulation, 'food' (or 'foodstuff') means any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be, ingested by humans. According to Article 2 (b), 'Food' shall not include live animals unless they are prepared for placing on the market for human consumption.

### 3.1.6 Regulations applied in animals and animal products exported to Europe

The EU has developed considerable legislation regulating the safety of food, including animals and animal products. Especially after the emergencies of Bovine Spongiform Encephalopathy (BSE), considerable attention is being paid to building mechanisms leading to safe and traceable meat products. The

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42   Available at http://europa.eu.int/comm/food/intro_en.htm

Commission is also indirectly setting out standards for the production of meat and meat products in third countries, since import from non-EU countries is permitted only if these products are produced in "establishments" approved by the European Commission. The document '*General Guidance to the Rules for the Imports of Live Animals and Animal Products into the European Union*' provides guidance to national authorities in third countries, on the rules for import of animals and animal products. References to the relevant Directives for the import of animals and animal products are also provided in this document[43].

### 3.1.7    Feed safety

Following the new regime on food safety, the EU rules on feed safety have shifted their emphasis to the protection of human and animal health and, to some extent, environmental protection. In the White Paper on Food Safety, dated February 2000, the European Commission announced a series of initiatives to improve and complete the legislation on animal feed. Community legislation on animal feed includes, among other things: (1) marketing and labelling of feed materials, compound feed, feed intended for particular nutritional purposes, bioproteins and genetically-modified feed; (2) authorization, marketing and labelling of feed additives; (3) undesirable substances contained in feed (mycotoxins, heavy metals, etc.); (4) approval and registration of animal feed producing establishments; and 5) official inspections in animal nutrition[44].

Feed materials are meant to include raw or processed materials intended for use as animal feed or for manufacturing compound feedstuffs. Council Directive 96/25/EC sets out rules for the marketing and labelling of feed materials. Feed materials may only be put on the market if they are "sound, genuine and of merchantable quality". They must not represent any danger to human or animal health or to the environment.

The new Regulation of the EU Parliament and of the Council of 26 April 2004 on feed hygiene ensures that feed safety is considered at all stages that may have an impact on feed and food safety, including primary production. In particular, it introduces the following main elements: (1) the compulsory

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[43]    Available at http://europa.eu.int/comm/food/fvo/pdf/ guide_thirdcountries_en.pdf

[44]    LEAD TRADE portal for improved decision-making in addressing livestock environment and trade issues see www.lead.virtualcentre.org.

registration of all feed business operators by the competent authority; (2) the approval system for feed businesses for cases dealing with more sensitive substances will be maintained but provisions are made to extend the current scope for the approval requirement, when necessary; (3) to ensure that all feed businesses operate in accordance with harmonized hygiene requirements; (4) to implement the application of good hygiene practice at all levels of agriculture production and use of feed; (5) to introduce the Hazard Analysis Critical Control Point (HACCP) principles for the feed business operators other than at the level of primary production; (6) to introduce compulsory requirements for feed production at farm level; and (7) to provide for a European Union framework for guides to good practice in feed production.[45]

### 3.1.8    GM food and feed

General concern over animal feed arises from the fact that genetically modified crops may be used to feed animals. The possible effects of GM feed on the animal that consumes it and the human being who ingests the animal's milk or meat, are unknown. No rigorous toxicological tests have been carried out - or if they have, the results have not been made public.

European legislation on GM Food/Feed first appeared in the 1990s. Directives on the contained use of genetically modified micro-organisms in research and industry, and on their release and placing on the market, have since been adopted. At present, the relevant framework legislation is: (1) Regulation (EC) 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed; and (2) Regulation (EC) 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms.

The Regulation (EC) No. 1829/2003 regulated applications for the placing on the market – in the territory of the European Union – of the following products:
- GMOs for food and feed use

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[45] Available at http://europa.eu.int/comm/food/food/animalnutrition/feedhygiene/ index_en.htm.

- food and feed containing GMOs, consisting of such organisms or produced from GMOs (in the Regulation these are called: "genetically modified food" and "genetically modified feed").

The principles of Regulation (EC) No. 1829/2003 are that products to which it applies must not: (1) have adverse effects on human health, animal health, or the environment; (2) mislead the consumer or user; (3) differ from the food/feed they are intended to replace to such an extent that their normal consumption would be nutritionally disadvantageous for human beings (and for animals in the case of genetically modified feed); and (4) in the case of genetically modified food and feed, harm or mislead the consumer by impairing the distinctive features of the animal products.

With regard to labeling of genetically modified food and feed, genetically modified foods which are delivered as such to the final consumer or mass caterers (restaurants, hospitals, canteens and similar caterers) must be labeled, regardless of whether the products contains DNA or proteins of the GMO. Therefore also highly refined products, such as oil obtained from genetically modified maize, has to be labeled. The same rules apply to animal feed, including any compound feed that contains transgenic components. However, animal products derived from animals fed on GM feed do not have to be labeled.[46].

The regulation puts in place a centralized, uniform and transparent EU procedure for all applications for placing on the market, whether they concern the GMO itself or the food and feed products derived therefrom.

Before the entry into force of the regulation on genetically modified food and feed, there was no EU legislation governing processed feed produced from but not containing GMOs. Only feed which contained (live) GMOs was subject to a pre-marketing authorization procedure under Directive 90/220/EEC, and several GM feeds were authorized under this directive. These are chiefly maize varieties, rape varieties and one soya variety.

On 19 July 2004, the import and processing of NK 603 maize was authorized under Directive 2001/18 on the deliberate release of GMOs into the

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[46] Available at http://europa.eu.int/rapid.

environment. A number of applications under the new regulation are pending at present.

The Labelling and Traceability Regulation (Regulation (EC) No. 1830/2003) covers all products consisting of, or containing, GMOs as well as all food and feed products produced from GMOs, provided these products have been authorised for the placing on the market. The regulation requires traceability of all these products at all stages of their placing on the market. The traceability rules oblige the operators concerned, i.e. all persons who place a product on the market or receive a product placed on the market within the EU, to be able to trace back their supplier and the companies to which the products have been supplied. With regard to labeling of genetically modified food and feed, genetically modified foods which are delivered as such to the final consumer or mass caterers (restaurants, hospitals, canteens and similar caterers) must be labelled, regardless of whether DNA or proteins derived from genetic modification are contained in the final product or not. The labelling requirement also includes highly refined products, such as oil obtained from genetically modified maize. The same rules apply to animal feed, including any compound feed that contains transgenic soya. Corn gluten feed produced from transgenic maize must also be labelled, so as to provide livestock farmers with accurate information on the composition and properties of feed[47].

### 3.1.9    Animal health

Animal health and food safety are inextricably linked. The European Union has built up a significant body of legislative texts governing the relationship between animal health, veterinary inspections and food hygiene[48]. These texts are binding in all member states, and applicable to the candidate countries and to other third countries which export to the EU. They are designed primarily to regulate imports, their placing on the market, and intra-Community trade involving animals and animal products. They lay down hygiene and safety standards, and establish controls at European level. The member states are responsible for implementing this legislation and for determining the penalties applicable in the event of infringement. In addition, the task of the Food and Veterinary Office (FVO) is to enforce international standards in the field of

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[47]    Available at http://europa.eu.int.
[48]    Available at http://europa.eu.int/scadplus/leg/en/s83000.htm.

animal health. Its inspectors and experts carry out inspections both within the member states and in the candidate countries, and in other third countries that export goods to the Union.

Concerning Veterinary Checks, Animal Health Rules, and Food Hygiene, several Council directives and regulations regulate, among other things: (1) the official control on products of animal origin intended for human consumption; (2) animal health rules governing the production, placing on the market and the importation of products of animal origin intended for human consumption; (3) veterinary controls for intra Community trade and animals entering the Community from third countries; (4) veterinary and zootechnical checks applicable in intra-Community trade in certain live animals and animal products; (5) animal health requirements governing trade in, and imports into the Community of, animals, semen, ova and embryos as well as certain products of animal origin; (6) zootechnical and pedigree requirements for the marketing of pure-bred animals; and (7) measures to monitor certain substances and residues thereof in live animals and animal products[49]. The tables holding references to the legislation are available online at www.fao.org/legal.

### 3.1.10 Biotechnology innovation

A specific legal framework is in place in the European Union to regulate patentability of living materials resulting from biotechnologies, namely the Directive 98/44/EC on the legal protection of biotechnological inventions.

According to Article 1 of the Directive, EU member states must grant patent protection for biotechnological inventions[50].

The standard criteria of novelty, inventiveness and industrial application are applied to the subject matter. Patentability is extended to products consisting of or containing biological material or a process by means of which biological material is produced, processed or used (art. 3.1). Biological material is defined

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[49] Available at http://europa.eu.int/scadplus/leg/en/s84000.htm.

[50] The Directive was challenged before the European Court of Justice by Netherlands with the support of Italy and Norway. The Court confirmed the legality of the Directive in October 2001.

as '*any material containing genetic information and capable of reproducing itself or being reproduced in a biological system*' (art. 2.1(a)).

Patentability covers not only biological material not previously occurring in nature but also biological material that is isolated from its natural environment (art. 3.2).

In line with Article 27.3(b) of TRIPs, exclusions from patentability are set out for plant and animal varieties *per se* and essentially biological processes for the production of plants or animals. However, two exceptions to the exclusions are provided. Firstly, inventions related to plants or animal are patentable if technical feasibility is not limited to a particular plant or animal variety (art. 3.2)[51]. Secondly, patentability is extended to inventions concerning microbiological or other technical process or a product obtained through such a process (art. 3.3). Microbiological process is defined as '*any process involving or performed upon or resulting in microbiological material*' (art. 2.1(b)).

### 3.1.11 Animal welfare

The EU Council adopted a regulation on the protection of animals during transport, on 22 November 2004. The regulation aims to help safeguard animal welfare by radically improving the enforcement of animal transport rules in the EU.

The regulation amounts to a radical overhaul of the existing EU rules on animal transport and it identifies the chain of all those involved in animal transport, defining "who is responsible for what" thus facilitating more effective enforcement of the new rules.

The regulation introduces new, more efficient monitoring tools such as checks on vehicles via a satellite navigation system from 2007. It also introduces much stricter rules for journeys of more than eight hours, including a substantial upgrading of vehicle standards.

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[51] Mainly on the basis of this legal provision, the Enlarged Board of Appeals of the European Patent Office determined in December 1999 that a claim directed to transgenic plants of more than one variety, but that does not claim an individual plant variety, is permissible (Novartis case).

## 4.    NATIONAL LEGAL FRAMEWORKS: MAIN FEATURES

The issues reviewed constitute the framework for the legal analysis of national legislation related to all aspects of management of AnGR, which is carried out in this part of the study. The aim of the latter is to explore the adequacy of the existing legislation to respond to the needs of countries in AnGR management. It can be inferred from the review of international and regional frameworks that AnGR management, encompasses a series of technical, policy and logistical operations involved in understanding (characterization), using and developing (utilization), maintaining (conservation), accessing and sharing the benefits of animal genetic resources.

The review and analysis of the national legislation accessed through the sources in Annex II, is the result of research by the authors of this study and a survey conducted through a questionnaire sent out early in June 2003 to all National Coordinators and Chairs and Technical Secretaries of the National Consultative Committees, which are responsible for the preparation of country reports in the framework of the First Report on the State of the World's Animal Genetic Resources (SoW-AnGR)[52]. The questionnaire was broad in scope and therefore demanding for respondents. All responses received by the end of September 2003 were included in the analysis. The results were combined with information on existing legislation contained in the country reports submitted to FAO either as official reports or in a draft form. All national contributions were extremely valuable in the preparation of this study.

The overview provided is not intended to be exhaustive. In an inquiry of this kind, the quality of information may vary from country to country and may be bound by language limitations, since most of the legal texts are available in the original languages only. Where English abstracts were available, these have been provided in the Tables online (available at www.fao.org/legal.).

Animal genetic resources related legislation encompasses various elements which, for the purpose of this part of the present study, have been grouped into four specific areas: institutional arrangements, improvement, conservation and health. The questionnaire also provided information on land and farm

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[52] In most cases, the response to the Questionnaire was prepared by the National Coordinator, or by the Chair or Secretary of the National Consultative Committee, in consultation with relevant departments of ministries and other organizations.

management, food safety and food quality, and compliance with international agreements. These additional areas are briefly reviewed as well.

## 4.1    Objective and scope

AnGR related legislation is characterized by several elements of a technical and economic nature. Legislation related to animal health, which has an impact on imports and/or exports, sits alongside laws related to conservation and animal improvement, for instance regulating breeding associations, and laws related to economic incentives, such those regulating agricultural funds.

Consequently, the development and implementation of legislation need to take into account the strong linkages between technical aspects of AnGR management (e.g. breeding programmes and conservation of breeds) and other factors that may influence the general implementation of the legislation (e.g. influencing decisions relating to breeding programmes or the keeping of traditional breeds).

## 4.2    Institutional arrangements

The importance of the institutional arrangements in AnGR management is related to the effective implementation of legislation. In fact, institutions provide the machinery for supporting livestock production in general, and utilization of animal genetic resources in particular. Legislation on the establishment and activities of farmers' associations and breeders' societies plays a crucial role in the breeding process along with incentive measures that are available for farmers and others in the livestock sector.

Infrastructure is also relevant. The physical and organizational set up for the transportation network, communication system, financial institutions and other public and private services, are all necessary for efficient economic activities.

The institutional mechanisms for the implementation of animal genetic resource-related laws may vary, according to the characteristic of each country – particularly in terms of the administrative system, financial means, economic, social and other conditions. In general, two main approaches could be followed: one is the establishment of *ad hoc* bodies to meet particular needs; the other is the optimal use of the institutions already in place, with possible adjustment to their mandate or structure.

Breeders' societies play a very important role in breeding and rearing of animals and in the pedigree sector, taking over responsibilities for various elements of the breeding process, including implementation of improvement programmes. Some societies embrace entire species but most frequently they deal with individual breeds. The activities of Breeders' societies vary. They include basic activities, such as: (1) herd-book keeping; (2) organization of sales and shows; (3) implementation of the breeding programme and associated activities; (4) support in managing reproduction (especially in the case of rare breeds, where a semen bank may be run by the Society); (5) training and extension; and (6) organization of special events (competitions). Some breeders' societies also run performance-recording schemes and support the marketing of special products. Farmers' organizations are involved in the organization of production, supplies and marketing. The establishment and activities of breeders' societies and farmers' organizations are regulated, so as to clarify their roles and responsibilities within the livestock sector.

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Herd-books (stud-books, flock-books) contain the pedigree data of individual animals belonging to the pure-bred population of a given breed. Usually, herd-books are managed by Breeders' Societies, while individual pedigree breeders provide data on new progeny, born in any given year, which has to be introduced in the herd-book.

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The way herd-books are run differs very much from one country to another. In some cases, herd-books only include data on animals that were kept for breeding, and that are easily available for breeders. In other cases, herd-books include the performance data of relatives and are kept at the headquarters of the relevant organization.

The part of the questionnaire relating to the institutional framework was intended to collect information on the role and responsibilities of various stakeholders in animal breeding and production. The stakeholders included government, research and educational institutions, specially-established organizations, breeders' societies and farmers' or producers' organizations, commercial companies and local communities. Activities considered for inclusion were: animal identification and performance recording, reproduction including artificial insemination, evaluation of breeding value and exchange of breeding stock, as well as the supply of feedstuffs and marketing of animal products. Extension services and training were also covered by this survey.

The results of the questionnaire clearly indicate that there is no single pattern regarding the distribution of responsibilities between stakeholders involved in animal breeding and production. Moreover, no distinctive trends or differences were observed between regions. The institutional frameworks in place reflect the specific situations, needs and conditions of particular countries, including infrastructure development, the state and importance of animal production and the status of breeders' organizations. Countries with a long tradition of breeders' involvement in decision-making and implementation of breeding activities have developed systems whereby breeders' societies play an instrumental role in carrying out various elements of breeding work. In countries where intensive production systems have a substantial share in the livestock sector, roles and services provided by commercial companies are gradually increasing, particularly for poultry and pig producers. In the absence of breeders' organizations, responsibilities for the organization of the breeding sector still lie with the government or with specially established organizations acting on behalf of the government, such as research and educational institutions.

Specific activities related to animal breeding and production may involve a single stakeholder or more. The majority of countries reported that animal identification was an area of significant government involvement, often implemented by specially-established organizations and supported by breeders' societies. Respondents indicated that responsibilities over performance recording were shared between breeders' societies, research/educational institutions and – where relevant – specially-established organizations. A few countries reported that performance recording was species-specific and involved different organizations. Several stakeholders were identified as being involved in animal reproduction and artificial insemination, in particular government, breeders' societies and farmers' organizations, as well as local communities and commercial companies. Evaluation of breeding value was reported as being the responsibility of research or educational organizations, special institutions and breeders' societies. Breeders' societies, farmers' organizations and commercial companies were frequently identified as being responsible for the exchange of breeding stock. Most of the countries reported that production services, such as feed supply and marketing of animal products, are provided by commercial companies or farmers' organizations. However, in many countries, such activities are also implemented by government and specially-established organizations, particularly in the field of marketing. Extension services were reported to be provided by almost all

stakeholders, while training was identified as a domain of research and educational institutions, as well as government.

According to the data collected in the tables online (available at www.fao.org/legal), in **Africa,** nine countries have legislation establishing specialized institutions, such as cooperative societies that play a role in animal and agricultural resource management; organized structures for production, marketing, research, training related to cattle keeping, as well as bodies to buy locally and to import biological, pharmaceutical, chemical and other products for animal health care. In one country, the products imported within this context will be exempted from import taxes. The institution of agricultural funds and funds to cover bank credit risks for producers of plant and animal products is also covered by national laws in two countries, with the effective involvement of the Ministries of Finance, Agriculture and Breeding, while the establishment of a Breeding Development Fund is regulated in one country.

In **Latin America and the Caribbean**, six laws regulate the establishment of agricultural associations. A comprehensive, albeit old, law is the Mexican Law on Animal Breeding Associations of 1936 (*Asociaciones Ganaderas*), repealing in part the Law on Agricultural Associations (1932), concerning the constitution and functioning of associations involved in animal industry. The relevance of this law lies in its having as an objective the study, management and promotion of all means of improving of animal breeding. Another of its aims is to manage the granting of credit to members, and to support the creation of Livestock Credit Institutions. Another relevant law regulates the establishment of agricultural associations, whose activities include promoting the development quality agricultural products and their distribution, and the development of better scientific methods, while protecting the economic interests of their members. According to this law, where such associations are established, infrastructure will be created and/or improved. Such associations will be considered by the state as cooperative associations and will be officially recognized.

In Ecuador, the creation of producers' and breeders' associations is regulated by Ministerial Agreement No. 449 (1987). These associations are in charge of "the compliance of their members towards allowed species and breeds, as well as sanitary means for the control of animal diseases" (Country Report-Ecuador). Of relevance is the law setting out the duties and powers of the Cuban National Institute of Agrarian Reformation regarding the Cattle Registries and the National Animal Registry of Pure Races and their Crosses.

This law also regulates the allocation of the registries and the determination of the territorial limitation of each.

Inspectorates and genetic improvement centres are considered to be among the relevant institutions dealing with control measures. Animal Inspectorates are entitled to carry out regional controls on animal health. This would also implement international requirements under the SPS Agreement and the OIE (see section 6.1). An example is the Animal Health Inspectorate within the Ministry of Agriculture created in Brazil through Law No. 1.052. The establishment of a National Centre for the Genetic Improvement of Bovine Cattle is regulated in Bolivia, but the text is not available.

In the **Near East** region, Mauritania has a decree regulating the creation of a bureau in charge of buying and importing biological, pharmaceutical, chemical and other products for animal health care, as well as breeding materials. A relevant provision of this decree concerns the revenue from special taxes for importing veterinary products. This revenue will go to a development breeding fund, to finance activities in breeding services.

Information on five laws was gathered for **Asia and the Pacific**. In Japan, a Dairy Council was established by national organizations related to dairy farming, in accordance with a notification from the administrative vice minister of the Ministry of Agriculture, Forestry and Fisheries (MAFF), in August 1962. The Council is made up of designated raw milk producer organizations (designated organizations) established following the adoption of the law for subsidizing dairy farmers ("Deficiency payment law") in 1966 and all organizations related to dairy farming. Article 34 of Japan Civil Law (1962) states that "This council shall aim to contribute to the sound development of dairy farming in Japan through promoting raw milk commission sales through cooperative organizations of milk producers, stabilizing the supply of raw milk and rationalizing distribution and improving quality".

A more specific law regulates the establishment of the Philippine Carabao Centre in 1993. This law ensures for, among others, Filipino farmers the following benefits: availability of quality stocks at reasonable prices; technology transfer activities on the care and management of carabao and the processing of its meat and milk; encouragement of backyard carabao development in rural areas; research activities to improve carabao productivity; and efforts to increase carabao population growth, to keep pace with the growing human population. Also of relevance is the law regulating the establishment of the

National Livestock Development Board to process, supply and market meat in Sri Lanka.

Information gathered on **Europe** represents a developed legislative framework, with 13 laws regulating institutional arrangements, some of a general nature and some more specific. The Estonian Non-profit Associations Act (1996) was mentioned in the questionnaire responses in the context of the development of organizations/associations playing a vital role in the agricultural/livestock sector. The act defines a non-profit association as a voluntary association of persons whose objective or main activity shall not be the earning of income from economic activity. The act is quite general: no reference is made to farmers' or breeding associations. Nevertheless, this should not prevent the use of this act as a basis for the creation of associations of such nature.

The Austrian Agriculture Law supports the development of civil societies, such as farmers' unions and breeders' associations. Financial backing to farmers is provided with a view to linking agriculture to other sectors of the economy, such as marketing. The German Ordinance on insemination banks and breeding programmes regulates the functioning of insemination banks, which must participate in the general breeding programme of the National Breeding Association. Concerning biotechnology, the Dutch Decree No. 5 (1997) provides for the establishment of a commission on biotechnology, its composition, its duties and powers, its work procedures and the procedures to be followed in making decisions on applications for permits, pursuant to article 66 of the Act Concerning Well-being and Health of Animals. The decree was drafted bearing in mind the constant evolution of biotechnology, and ethics regarding the use of biotechnology. The commission, which consists of specialists in the field of biotechnology, also has the task of advising the Minister.

The organizational structure of the Russian Federation State Veterinary Service is officially established by the Ministry of Agriculture and Food. It involves an office for anti-epizootic arrangements; an office for non-infectious disease, zoo hygiene and veterinary medicine; an office for veterinary and sanitary expertise and diagnostics; an office for state veterinary inspection; and an office for finance, construction, and material and technical support. Stations for combating animal disease, and veterinary laboratories, maintain economic autonomy and status of juridical persons. Zone veterinary laboratories are

subordinated directly to veterinary departments (offices) of the territorial governments, regional, provincial and autonomous regions' administration.

In Poland, the establishment of social and professional agricultural organizations and civil-professional organizations of farmers is regulated. In Hungary, a Veterinary Chamber was established by law as a self-governing corporate body of veterinarians, carrying out public functions and representing the interests of the profession. The Chamber has county-level and national branches.

Less specific laws concern the establishment of a biodiversity centre with the mandate to help promote the incorporation of the Convention on Biological Diversity, by initiating and actively participating in crucial research, education, training and information in connection with wild and domesticated biological resources. In Sweden, such a centre, acting as a liaison body, has built up an extensive contact network embracing universities, public authorities, open-air museums and zoological parks, the WWF, the Swedish Society for Nature Conservation and local organizations within the agricultural sector.

## 4.3    Genetic improvement

Legislation on genetic improvement addresses all elements of the breeding process, from animal identification and herd-book keeping through performance recording to breeding value evaluation and the dissemination of genetic progress. In particular, it covers all policy, technical and operational facets of the genetic improvement activities for a breed or several breeds, where crossing is involved (also known as breeding strategy). The breeding strategy covers the identification and planning of the total activity in accordance with the development objective for the animal population, through its implementation and further development phases, including, among other things, ongoing animal recording and evaluation, dissemination of the improved genetic material, reviewing effectiveness and the progress being achieved, as well as the socio-economic dimension of the breeding strategy. It also covers legislation on the exchange of and access to breeding stock, both within and between countries.

Improvement-specific legislation seems to be more developed in each of the regions, compared to the previous set of laws. The results of the questionnaire highlighted that, in many countries, animal breeding laws were either recently developed, or are currently being upgraded. As a result, full implementation

and monitoring have not been achieved. Some respondents, mainly from developing regions, noted that the absence of breeding legislation was a serious gap in their legal framework on the management of animal genetic resources.

Animal breeding legislation has been developed in 38 of the responding countries, and six countries indicated that such legislation was under preparation. Animal breeding laws are complemented by various subordinate legislation addressing specific issues related to animal breeding and production, setting out rules and requirements. Several countries indicated that implementation and monitoring of animal breeding legislation are only partial or have been initiated recently.

Animal reproduction, including natural service and artificial insemination, is usually addressed in animal breeding laws, with details on implementation being provided in separate subordinate legislation. One aim of this legislation is to ensure the dissemination of genetic progress through males coming from breed improvement schemes. The second purpose is to prevent dissemination of sexually-transmitted diseases. These issues are usually covered in veterinary bills. Thirty-five countries reported having animal reproduction legislation, and the majority implemented and monitored this legislation.

The enhancement of genetic progress can be facilitated by subsidies for the importation of high-quality genetic stock or through support for the national pedigree sector. Subsidies for importation are usually granted on a case-by-case basis, and on special conditions. Conversely, support for the pedigree sector, such as subsidies for raising breeding stock and for carrying out breeding activities (e.g. performance recording) is usually provided on a long-term basis. About half of the responding countries (26) reported having legislation that facilitates such subsidies. Twenty-one countries indicated that such incentive measures are not implemented. The lack of legislation to enhance genetic progress in the livestock sector was reported both in countries where most aspects of animal production are regarded as purely commercial and are not supported by the state, and in countries that are not able to provide subsidies to breeders.

Legislation providing rules for the exchange of breeding stock and breeding material within the country was reported by 30 respondents. In 17 countries, exchange of livestock is not regulated. While exchange of semen, ova and embryos are usually sufficiently addressed in animal breeding legislation and veterinary legislation, in many countries there are specific and very strict

regulations regarding the exchange of living animals, in order to protect against the introduction of animal diseases in livestock trade. In countries where seasonal outbreaks of diseases such as foot and mouth disease, are observed, emergency measures, including the prohibition of trade of live animals, are implemented.

The majority of responding countries (47) have developed legislation on the importation of breeding stock, setting out detailed and specific requirements for animal identification and breeding documentation, as well as for health status of imported stock. Such legislation may introduce obligatory health examinations, and rules regarding quarantine. Thirty-seven countries reported the implementation of legislation addressing the import of animals.

In some countries, the export of breeding stock is regarded as a commercial enterprise, so no export regulations are provided by the state. There appears to be an assumption that quality and health standards have to be laid down by the importing party. In total, 17 countries reported that they do not have relevant legislation covering the export of breeding stock. In 36 countries, such legislation has been developed in order to ensure high quality standards in international trade. While export of commercial breeds is generally not limited, there might be certain restrictions imposed on the export of indigenous species or breeds that are regarded as "national genetic reserve", with obligatory permission to be obtained from the relevant authorities, such as the. Ministry of Agriculture.

Thirty-two of the responding countries reported legislation that sets out the requirements for organizations involved in activities related to animal breeding and improvement. These requirements include herd-book keeping, performance recording and the implementation of genetic improvement programs. Usually, these specific regulations are under the animal breeding laws and are in harmony with legislation on civil society organizations.
Thirty-two countries indicated that they have legislation supporting agricultural research. In six countries, such legislation is currently being developed. Fourteen countries reported the absence of legislation promoting agricultural research. In some instances, legislation specifically addresses characterization and valuation of animal genetic resources as priority research areas, as is the case in EU legislation. Special provisions on animal genetic resource characterization and valuation were reported by countries where the research component consists of an integral part of the animal genetic resources conservation program. Even in countries where legislation does not specifically

address characterization and valuation of animal genetic resources, such research can be supported by relevant authorities (grant agencies of the National Academy of Sciences, National Research Committees, etc.) within the scope of agricultural research programs.

Concerning biotechnology, the results of the questionnaire indicate that significant efforts are still required to advance legislation on biotechnology. Only 23 countries reported having such legislation, and 15 indicated that such legislation is currently being discussed. Many countries reported that their biotechnology legislation is GMO-oriented, and does not cover biotechnology as a whole. Developing countries identified a lack of capacity to develop biotechnology-related legislation. Respondents indicated that where legislation for biotechnology has been developed, implementation and monitoring follows rapidly.

Regarding the individual laws listed in the tables online, for the **African region** information on 22 specific laws has been gathered, although the text has been made available for very few. The Animal Improvement Act (1998) of South Africa constitutes a well-developed and comprehensive legislation in the area of genetic improvement. Very specific and detailed, the Act provides for the breeding, identification and utilization of genetically superior animals, in order to improve production and performance. The act contains provisions on: collection, analysis, registration and use of animal genetic material; import and export of animal genetic material; and breeding societies.

The act foresees the designation of an officer – the Registrar of Animal Improvement – responsible for keeping a register of semen collectors, inseminators, embryo collectors, embryo transferors, import agents, centres, donor animals, animal breeders' societies and registering authorities.

The act regulates certain actions in respect of animals and genetic material, such as, among other things, import and export. The import of genetic material is permitted only to persons registered as import agents, or a person acting on their behalf; the collection, evaluation, processing, packaging or storage of embryos or ova is permitted only to persons registered as embryo collectors or to the owner of an animal from which the embryos or ova are collected, evaluated, processed, packed or stored. The sale or import of genetic material is prohibited unless such material is accompanied by the prescribed written warranty. The import of an animal with the aim of recording or registering such animal in terms of any breed standards is also forbidden, as

well as the import of genetic material with the aim of recording or registering the progeny to be begotten from such genetic material in terms of any breed standards, unless such importation has been authorised by the registrar, in writing. Export of animals and genetic material of local breeds is possible only with the written authorization of the registrar.

According to the act, the Minister can establish a scheme for the evaluation and certification of the performance of animals or a kind of breed of animal specified in the notice, with the objective of improving the genetic production potential of such animals, provided that a cost benefit analysis of such a scheme has been carried out.

The act also regulates the constitution of breeding societies which provide for the promotion, breeding, recording or registration, genetic improvement and use of a kind of animal or an animal of a specified breed of such kind of animal; and for the determination and the application of breed standards. Among the requirements for constituting such a society, is the registration of a 'breed standard' defined as a written set of phenotypic or genotypic standards of excellence for the animal for which the society is being established.

Another relevant law from South Africa is the "Animal Identification Act" of 2002, which formulates measures for the marking and the registration of animals used in agriculture. A registrar of animal identification is designated by the Minister within the Department of Agriculture. A register of all identification marks must be kept by the registrar, and each animal owner must apply for registration of an identification mark and mark his or her animals in the prescribed manner.

In Uganda, genetic improvement is regulated by the Animal Breeding Act, which establishes the National Animal Genetic Resources Centre and Data Bank. The act provides for the promotion of sustainable animal and fisheries genetic improvement, regulation and control, marketing, import and export and quality assurance of animal and fisheries genetic materials. It also provides guidelines, on appropriate breeding strategies, to farmers, investors, researchers, extension workers and civic leaders on, among other things, suitable breeds for various agro-ecological zones; alternative breeding programmes; management systems for the conservation and sustainable use of indigenous genetic resources; and modern breeding technologies.

According to the Uganda Animal Breeding Act, a sample of all genetic materials – namely semen, ova, eggs, and embryos – shall be submitted to a national depository for examination and future reference. All new genetic materials shall conform to the national biosafety standards as set by the Uganda National Council of Science and Technology (UNCST) and the Uganda National Bureau of Standards (UNBS) and a satisfactory genetic impact statement shall be provided by the promoter to the Centre and other designated offices. All genetic material developed in Uganda shall be patented in accordance with the provisions of the National and International Intellectual Property Rights. Imported and locally produced genetic material shall be strictly screened, to conform to quality and performance standards established by the director.

Cattle-raising legislation in the Central African Republic regulates the improvement of breeding and cattle raising, as well as animal feeding, animal health surveillance, sanitary and quality control of animal products. Artificial insemination is regulated in Mozambique and is possible only upon release of a special permit for disposing of semen (sale, gift or exchange). Procedures for licensing and operating insemination stations, as well as requirements for people involved in such operations, are also regulated. Import and export of genetic material can be limited by the Department of Veterinary Services, which is also responsible for authorising the exportation of semen.

Twenty-one laws and subordinate legislation on breed improvement have been identified and are in force in Latin America and the Caribbean. Brazil presents some relevant legislation in the area of improvement, such as the Decree No. 187, issued under the Law No. 6.446 on controls to be carried out on animal semen destined for artificial insemination (1991). In particular, the decree and the law regulate sanitary inspections on the production and trade of animal semen, including import/exports and services involved within the aforementioned sector. Inspection and control shall be carried out under the Ministry of Agriculture and Agricultural Reform. The WTO SPS Agreement would apply. The registration and licensing requirements for producing and trading certain agricultural products, including animal semen for artificial insemination, are also regulated.

Other legislation in the region covers the sanitary conditions for obtaining and processing semen from domestic animals (Mexico); the free importation of improved seeds, animals, technologies and equipment, except those that have been declared harmful or inconvenient for the preservation of the

environment, or which could bring risks for the sustainable development of the ecosystems (Ecuador).

For the **Near East** region, it was possible to report only two improvement laws – both in Tajikistan – mainly focusing on in stock-breeding: this includes state pedigree factories, enterprises, artificial insemination stations, associations and societies operating in the field of animal breeding. The tasks of the government are defined with respect to implementation of these laws. The tasks mostly regard regulatory (i.e. issuance of regulations) and administration functions (i.e. issuance of licenses).

Concerning **Asia and Pacific**, information was gathered on 17 laws and subordinate legislation. The Korean[53] Law 4843 of 1994 amending the Livestock Industry Act contains interesting reference to the WTO concerning import and market access. Unfortunately, the text is available in the original language only, and does not allow for direct reference to the provisions; however, the abstract gathered through the internet search gives a general overview of most relevant provisions. This law regulates the provisions necessary for the management of imported livestock products and obliges any person who intends to import or export, among other things, breeding stock to report to the Minister of Agriculture, Forestry and Fisheries.

Furthermore, it allows veterinarians, as well as artificial inseminators, to perform artificial insemination of livestock; it allows a person appointed by the Minister of Agriculture, Forestry and Fisheries to purchase and to save for emergency the specified livestock, in cases where there is a need for price stabilization; it makes a new provision concerning the measures to stabilize the production of calves; and it abolishes the mandatory trade system in the livestock market(s) of, among others, Korean beef cattle.
 According to the country report, China has adopted many laws and subordinate legislation that are directly or indirectly relevant to the improvement of animal genetic resources, such as the National Plan for Horse Improvement; National Plan for Sheep Improvement; and the Regional Plan for Livestock Improvement in China. However, no further analysis could be conducted, as the text of the legislation does not appear to be available in English.

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[53]   Republic of Korea.

Japanese guidelines for "Application of Recombinant DNA Organisms in Agriculture, Forestry, Fisheries, the Food Industry and Other Related Industries" provide rules for an assessment system for transgenic plants, micro-organisms, and small laboratory animals. The purpose of these guidelines is to establish requirements concerning the appropriate application of recombinant DNA (rDNA, as in the Guidelines) organisms in agriculture, forestry, fisheries, and the food industry, as well as other related industries regulated by the Ministry. Furthermore, the aim is to provide for the safe use of these organisms and to achieve for a sound overall development of agro-industries. Improvement and increased production of livestock is the scope of another Japanese law stipulating conditions for securing breeding livestock and regulating, among other things, registration and artificial insemination. According to this law, the Minister of Agriculture, Forestry, and Fisheries shall set specific goals, by species, concerning the improvement and propagation of livestock, including cattle, horses, sheep, goats, pigs, and other species.

In Malaysia, animal reproduction, including artificial insemination, is regulated through an animal ordinance for the control of movement and of slaughter of animals; for the prevention of cruelty to animals; and for measures pertaining to the general welfare, conservation and improvement of animals.

Sustainable development of the livestock production sector, which is the main traditional economic sector in the country, is among the aims of the 1998 Law on Livestock Gene pool protection and health of Mongolia, particularly through protecting the livestock gene pool and improving livestock quality and breeding services, taking into account market demands and needs.

Concerning **Europe**, information was gathered on 67 laws on improvement. A relevant law exists in Estonia, with the Farm Animal Breeding Act (2002), providing the basis for the breeding of farm animals in order to ensure that the performance ability and genetic value of farm animals improves, that the gene pool of farm animals is preserved, and that livestock production is economically efficient. Breeding is defined in the act as the activity intended for the deliberate improvement of the performance ability and genetic value of farm animals and for the preservation or improvement of the economic utility thereof, which is carried out in the following fields: maintenance of herd-books and animal breeding registers; performance testing and assessment of the genetic value of farm animals; preservation of threatened breeds; collection, preservation, treatment and marketing (handling) of semen, ova and embryos obtained from breeding animals (breeding material).

The act contains requirements for herd-books and animal breeding registers, as well as for the recognition of breeders' associations before establishing a herd-book or animal breeding register, and recognition of persons who wish to engage in performance testing or assessment of the genetic value of farm animals. Recognition is a procedure for assessing the compliance of a breeders' association, a person engaged in performance testing or a person engaged in the preservation of endangered breeds, and of the breeding activities planned by that person with the requirements provided for in this act.

The act regulates, among other things, herd-books and animal breeding registers; performance testing and assessment of the genetic value of farm animals; artificial insemination; marketing[54] of breeding animals and breeding material which shall be carried out in accordance with the requirements of the Infectious Animal Disease Control Act. Safety requirements apply in the event of marketing of genetically tested animals of the bovine species and equidae or of breeding material collected from such animals. In this case, the animals shall be accompanied by an expert's report verifying the correctness of the parentage data of the animals and the breeding material shall be accompanied by a copy of an expert's report to this effect.

The act also contains requirements for import and export of breeding animals and breeding material. According to the act, breeding animals and breeding material may be imported for free circulation from states where the requirements for breeding activities conform to the requirements provided for by the act. Breeding animals and breeding material to be imported shall be accompanied by a certificate of parentage issued by a competent breeders' organization in the state of origin of the animals or material, in proof of the correctness of the data concerning the parentage, origin and performance of the animals.

Requirements related to support for the breeding of farm animals refer to the financial assistance used as partial compensation for the costs incurred, or to be incurred, in the development of farm animal breeding. The list of costs to be compensated by the awarding of support for the breeding of farm animals shall be established by the Minister of Agriculture.

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54   For the purposes of this Act, the marketing of breeding animals and breeding material is deemed to be the import, export, offer for sale, sale or delivery thereof in any other manner for a charge or without charge.

The Slovenia Agriculture Act is the principal act governing the field of agriculture. It defines the objectives of agricultural policy, planning of agricultural and rural development, and agricultural policy measures. It regulates animal husbandry (reproduction, selection, breeding value (BV) evaluation, assessment of production and performance of equidae at competitions, pedigree register, monitoring and honey flow forecasting in bee-keeping), and the organization of a gene bank. Collecting and recording genetic material from autochthonous and other useful breeds of domestic animals, keeping and renewing this material, along with its reproduction and interchange, have been determined as responsibilities of the government.

This act is relevant for setting out the fodder base to be used in livestock production, breeding programmes, the changing and the preservation of domestic animal features, the application of selection findings in breeding, the preservation of genetic variety, genetic reserves and indigenous breeds. It also provides principles in accordance with the goals of agricultural policy, outlines the economic, spatial, ecological and social roles of animal husbandry and sustainable development in agriculture. The relevant objectives of the act include the regulation of the field of animal husbandry, with the aim of promoting the stable production of safe, high-quality food; the conservation of settlements in rural areas, prevention of overgrowing and conservation of the cultivated landscape; the utilization of natural resources for food production by paying attention to sustainable development and maintaining the productive capacity and fertility of land; managing criteria for the operation of recognized breeding organizations and criteria for implementing the joint basic breeding programme; providing a higher level of education in the field of animal husbandry; maintaining biodiversity in animal husbandry and providing for environmental protection and nature conservation; providing a suitable income for those involved in agriculture.

The act defines the breeding of hoofed animals, cattle, pigs, sheep, goats, rabbits, poultry, fish and bees. In line with this act, the Minister of Agriculture can introduce special conditions for the breeding of individual species of other domestic animals as well. The act also applies to animals that live in the open and are bred in line with regulations referring to the preservation of nature. A livestock-breeding council is to be established as the minister's advisory body for livestock breeding, giving expert opinion on major decisions in the sector.

The Slovak Republic Act on Farm Animal Breeding is a mix of provisions encompassing institutional arrangements, improvement and conservation, as it

specifies the rights and duties of authorized organizations and certified breeders' associations to carry out their professional activities connected with animal breeding (performance testing, evaluating the animals, breeding value estimations, running artificial insemination, embryo transfers, etc.). A new amendment to the act has added a paragraph which covers the conservation of animal genetic resources and indicates measures for conservation of such resources in the form of pure-bred herds, frozen semen, oocytes and embryos. Detailed instructions on how to deal with autochthonous and endangered breeds from the viewpoint of their preservation will be specified through subordinate legislation that is under preparation. This act also settles the responsibilities and duties of institutions dealing with selection and hybridization programmes and states the conditions for performance testing, as well as data processing and storage.

Farm animal breeding laws are in force also in Poland, Norway, Germany, Croatia (stock breeding), Austria and Albania. An improvement law with conservation components is the Hungarian Law on Stockbreeding (1996). Promotion of high-quality stockbreeding is a relevant example of legislation promoting the conservation and increase of animal genetic diversity, the inclusion of environmental, animal and public health protection measures, as well as marketing measures, so as to improve the quality and competitiveness of animal products, and comply with international standards. The text was available in the original language only. Nevertheless, the summary available in the FAOLEX[55] database provides a general picture of the many requirements applying to the breeding of listed animals (also wild animals) destined for commerce and food processing; and to persons and organizations involved in the production, marketing and utilization of breeding materials. Stockbreeding regulated by this law refers to: breeding animals and materials, performance tests and evaluation of reproduction capacity, marking of animals, collection, elaboration and publicity of data, male animal supply, protected indigenous and endangered species and contributions payable to the Stockbreeding Fund.

The management and organization of stockbreeding is to be carried out primarily by the Ministry, then by breeding authorities and by recognized breeding organizations. Authorization is required for several activities, such as the operation of artificial insemination plants, the utilization of male animals

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[55]  Available at http://faolex.fao.org/faolex/index.htm.

for the production of breeding material, the operation of embryo transfer plants, the operation of poultry and fish hatcheries and of queen bee keeping plants, and the import and export of breeding animals.

The Animal Improvement Act (2001) of Turkey is setting forth basic procedures and rules for all kinds of livestock production; improvement activities for increasing livestock productivity; protection of gene resources of domestic and wild animals; breed registration; natural and artificial insemination and embryo transfer; cloning and other bio-technological activities; and other activities on livestock improvement. The act is implemented by the Regulation on Embryo and Sperm Production Entities, which regulates procedures for embryo and sperm production and the granting of licences by the Ministry of Agriculture and Rural Affairs for individuals and companies involved in embryo and sperm production. Such licences will cover operation and facilities start-up only. A licence must be issued and granted by the Ministry for every single breeding animal used for embryo and semen production. Minimum technical facility requirements are detailed for every animal species involved (cattle, sheep, goat, and horse) in embryo and sperm production. At least one veterinarian and one production technician should be employed in the facilities.

Other relevant laws are the Agriculture Production Improvement Law (Animals)-1952 of Israel, and the Law for Improvement and Increased Production of Livestock, (1950) of Japan. The laws are not available in English.

The regulatory framework in the United Kingdom encompasses Regulations on Artificial Insemination of Cattle clarifying the requirements for trade in deep-frozen semen and amendments empowering the Ministry of Agriculture to issue emergency licences during outbreaks of foot and mouth disease; the Artificial Breeding of Sheep and Goats Regulations regarding the production of the semen, ova, and embryos of sheep and goats, destined for intra-Community trade and also providing for the approval of semen collection centres and embryo collection teams, etc.

A federal law on pedigree stockbreeding in the Russian Federation sets out the legal basis for pedigree stockbreeding, animal reproduction and use of pedigree reproduction materials, determines the authority of the state pedigree stockbreeding institution in the sphere of regulating pedigree stockbreeding and the rights and duties of individuals and juridical persons in the field of

pedigree stock-breeding. Instructions on naming selection achievements regulate the need to give a name to plant varieties and animal breeds, to be approved by the state commission, which must be unique for a given variety or breed. Any individual using a given variety or breed must use the name registered in the state register of the protected selection achievements or in the state register of selection achievements approved for utilization. The name of the variety or breed must be used even after the expiration date.

## 4.4    Conservation

Conservation of animal genetic resources refers to all human activities, including strategies, plans, policies and actions undertaken to ensure that the diversity of animal genetic resources is being maintained to contribute to food and agricultural production and productivity. Conservation encompasses *in-situ* and *ex-situ* measures, such as gene banks.

Within the context of the present study, the conservation section only covers legislation related to the conservation of agricultural ecosystems and associated wildlife as well as conservation of animal genetic resources for food and agriculture within those ecosystems. Existing legislation may address *in-situ* and *ex-situ* conservation measures separately. Generally, legislation in this area is developed under the jurisdiction of the ministry responsible for environmental protection and the ministry of agriculture.

Conservation of agricultural ecosystems is implemented under nature conservation legislation, rural development strategies and agro-environmental programmes. According to the results of the questionnaire, forty countries have legislation that provides for nature conservation, including conservation of agricultural ecosystems. Four countries indicated that such legislation is being prepared. There are also many activities, on a project basis, that are being initiated and implemented by non-governmental organizations with the objective to maintain the most valuable agro-ecosystems and their associated wildlife species, including endangered flora and fauna. All EU countries have the opportunity to implement support measures for conservation of agro-ecosystems under EC Regulations 1257/1999 and 445/2002[56].

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[56]    Available at http://europa.eu.int/comm/agriculture/rur/leg/index_en.htm.

Provisions for the *in-situ* conservation of animal genetic resources were reported to be in the legislation of 31 countries. In several countries, animal breeding laws contain separate chapters on conservation and sustainable use of animal genetic resources, and provide detailed descriptions of the scope and measures for conservation. In other countries, there is no specific legislation but there are national conservation programmes in place that were endorsed and are financially supported by the Ministry of Agriculture. Implementation and monitoring of *in-situ* conservation legislation was reported by twenty-eight countries.

Only 20 countries indicated that they have legislation that supports *ex-situ* conservation of animal genetic resources, namely the establishment and management of gene banks, or cryo-conserved genetic material. Seven countries reported on the preparation of such legislation. As in the case of *in-situ* conservation, substantial efforts and activities on collection and storage of genetic material are carried out within national animal genetic resource conservation programs.

The tables online list ten laws in the **Africa** region that are related to conservation, 12 in **Latin America and the Caribbean**, 30 in **Europe**, and 1 in **North America**. General laws reported in all regions cover mainly biodiversity and environmental management. A more specific law is the 'Conservation of Agricultural Resources Act' (1983) of South Africa, but the text was not available. Typical examples for the region are the 'pastoralist charters'. In this context, Law 01-004 on the Pastoralist Charter of Mali defines the fundamental and general principles framing pastoral activities in the country. It enunciates what are the pastoral resources as natural resources necessary for feeding animals (mainly water and grazing) and also the rights and obligations of the resource users, especially regarding the protection of the environment. Animal health and trading are excluded. Essential elements of this law refer to the mobility of animals (internal and international), preservation of the environment and the sustainable use of the natural resources, access rights to pastoral resources, and proper management of pastoral resources by the local authorities. Another example of this type, in the Near East region, is the Mauritanian Pastoral Code.

In Bolivia, the Law on the Environment constitutes a legal instrument for the conservation of the environment and the genetic patrimony of native species of Bolivia. It also lays down norms for genetic research activities, the protection of the environment in development projects, and the support of the

local communities. A Wildlife Act in the Philippines regulates the protection of the environment and biological and genetic resources. The national programme on protecting livestock from natural disaster has been developed in Mongolia, where there is also an Environmental Protection Law in force with the objective of, among other things, guaranteeing ecologically-balanced social and economic development, the protection of the environment for present and future generations and the proper use of natural resources. One of the methods proposed for fauna protection in Mongolia is the registration of very rare animals and plants by entry in the Redbook of Mongolia. The use of endangered animal and plant species shall be limited, and their stock increased through breeding, reintroduction and extensive fodder supply. Moreover, the efforts to breed or reintroduce animals, cultivate plants and culture protozoa non-native to Mongolia shall be conducted only with the approval of and under the supervision of the central state administrative body and other authorized organizations.

According to the country report, China has adopted many laws and subordinate legislation that are directly or indirectly relevant to the conservation of animal genetic resources, such as Instructions on Conservation and Development of Draft Cattle and Prevention of Indiscriminate Slaughter; Regulations on Breeding Animal Administration; Agricultural Laws; Laws on Agricultural Extension; Laws on Grassland; Announcement on Strengthening Development and Conservation of Domestic Animal Genetic Resources and Promoting International Exchange and Cooperation. No references to these laws are provided.

In Europe, although some countries, such as France and Spain, have passed laws making conservation fall under subordinate legislation, and many give state support for genetic resource preservation (such as subsidies to owners of rare breeds, support of preservation programmes, coordination of work at a national level), there is still relatively little work coordinated at the national level on the conservation, sustainable use and accessibility of animal genetic resources for agriculture. On the other hand, national activities in animal genetic resources are well developed in one domain in particular, that is, the work of the herd-book societies.

The general principles defined in the Law on Agriculture in Switzerland refer to the contribution of agriculture to the conservation of natural resources and rural landscape. Agriculture is defined as including plants and animals (art. 3). Section 2 of the law dealing with 'animal selection', regulates the promotion of

high quality breeding and relates to both 'institutions' and 'improvement' aspects dealt with in the previous sections. In fact, contributions by the Confederation to well-known organizations are foreseen for, among other things, the maintenance of herd-books, for programmes aiming at the improvement of quality, and the preservation of indigenous breeds. It must be noted that similar contributions do not apply for breeding of transgenic animals. The Federal Council gives authorization for artificial insemination. Zootechnical and genealogical conditions can be set by the Federal Council *vis-à-vis* import of breeding animals, semen, embryos and ova.

## 4.5   Animal health

As noted in the review of the EU regional framework above, legislation on animal health, when linked to food safety in accordance with the 'from-farm-to-fork' approach, may encompasses a very broad area, including the prevention of animal diseases, the regulation of food of animal origin, and the discipline of biotechnology. Animal health legislation covers various activities, including reproduction, trade and movement of livestock, emergency response in disease outbreaks, and the safeguarding of animal welfare. Food safety and food quality legislation generally provides for quality standards and introduces traceability of products of animal origin, quality assurance schemes as well as other measures for product identification, such as labelling, and geographical identification.

The results of the questionnaire indicate that significant efforts have been made worldwide in developing legislation to control and protect animal health. The number of countries that have developed and implemented such legislation is larger than in any other area. In fact, stock disease regulations, animal disease acts and animal health acts are the most developed, worldwide. Animal health status has enormous impact on individual performance, on production output and efficiency of the livestock sector, and on the trade of livestock products. The tables online show that the majority of national legal instruments analysed relate to zoo-sanitary regulations. These regulations are likely to impact on the import and export of animal genetic resources, as barriers to import may depend on a variety of causes, including sanitary causes. Therefore, if on the one hand health regulations help modern breeding by minimizing the health risks associated with the use and exchange genetic material, on the other they may hinder the flow of AnGR between countries. The development of legislation relating to animal health is given impetus by the potentially serious impact on human health of zoonotic diseases. In

developing countries, animal health regulations are among the first aspects of agriculture legislation to be developed.

In general terms, according to the questionnaire, legislation addressing measures to prevent and control animal diseases is in place in fifty-two countries. The majority of countries reported to have a veterinary law that is supplemented by specific subordinate legislation. In many instances, specific bills address prevention and control of certain infectious diseases or regulate management activities that may impose risks on animal health. Implementation of veterinary laws is well advanced and was reported by forty-four countries. A few countries indicated that implementation is not yet complete, or that the legislation is currently being amended.

Livestock movement is one of specific issues usually regulated within veterinary legislation. In countries where the risk of outbreaks of infectious animal diseases is high, separate bills have been adopted, setting out strict rules on stock movement within countries, and measures to enforce their observation. According to the questionnaire, 48 countries adopted legislation on stock movement, with full implementation in 39 countries and monitoring taking place in 41 countries.

Stock disease regulations often refer to semen or to poultry and state the need for a permit for introducing, using (for AI) and disposing of semen in the country. An example is provided by the Botswana Stock Diseases – Semen-Regulations. A written permit issued by the Principal Veterinary Officer is also needed, according to the Botswana Disease of Stock (poultry) Regulations, for introducing any poultry into the country, but the permit is not needed in cases where a certificate has been issued by a veterinarian authorized to do so by the Government of the country of origin. In Zambia, the Stock Disease Act containing general provisions related to disease control, provides for quarantine stations, animal treatment and the disposal of infected animals and carcasses.

In particular, animal disease acts contain provisions on disease prevention and control, they regulate the import and export of animals or animal products that are affected by a prescribed disease, as well as any pathogens capable of causing a notifiable disease in animals (e.g. acts of Mali, Mauritius, Seychelles in the tables online). The Namibian Animal Disease and Parasites Act addresses aspects that need to be adhered to when animals are imported into or exported from Namibia. Due to the prevalence of CBPP and FMD in the northern

communal areas of Namibia, animals may be moved from south of the veterinary control fence (cordon fence/ red line) to north of the fence, but not from north to south of the fence. Health regulations have to be adhered to when animals are imported into or exported from Namibia. To facilitate the participation of communal farmers north of the current veterinary control fence in the commercial meat market and to benefit from the international market, the Ministry of Agriculture, Water and Rural Development established a national task force in 1996 for The Improvement of Animal Health Status, Marketing and Trade, Livestock Development and Sustainable Rangeland Development in Communal Areas. One of the main aims of this task force is the relocation of this veterinary control fence northwards, until it reaches the border with Angola.

In South Africa, the Animal Health Act regulates the improvement of animal health and the control of animal diseases. It covers many issues related to animal health, such as the assignment of powers to veterinarians or other animal health officers; limitations on experiments, investigations and research in animal health; limitations on importation, exportation and goods in transit; quarantine, disposal of straying animals and the obligations of the owner of the animals; and the establishment of animal health schemes. Within the context of this act, the Tariffs on Import and Master Permits fixes tariffs for persons who import or contemplate importing animals or animal products into the Republic of South Africa.

Following the outbreak of Bovine Spongiform Encephalopathy (BSE), also known as the mad cow disease, many countries were forced to develop or strengthen legislation in the area of animal health, including, among other things, stricter rules of traceability of animal by-products. The outbreak of BSE resulted in a ban on import of animals for human consumption; only if scientifically justified, could the ban have been defendable before the WTO.

Taking the example of the very favourable health status enjoyed by Argentina for BSE and Scrapie, this has enabled the country to maintain an excellent position in the international trade markets and be considered a reliable exporter of animal products.

Preventive measures to avoid the importation of BSE and Scrapie were adopted in Argentina in 1990, with the enactment of Resolution 429. The rule puts a ban on all imports from the UK of live animals, genetic material (semen/ova and embryos) and by-products of bovines, sheep and goats, and

took the necessary measures to ensure compliance. The restrictions were enforced, and in 1995, as a result of the concern caused by the greater knowledge about the diseases and their consequences, new rules were established requiring animal feed and import controls, in addition to an epidemiological surveillance programme. These rules, such as Resolution 252, put a ban on the use of bovine and/or sheep meat and bone meal as ruminant feed, as stated in the OIE recommendations. Although the causal agent was not present in the country, the ban ensured that there would be no possibility of the agent entering the feed chain of ruminants and provided additional guarantees to buyers. Subsequent Resolutions (such as Resolution 382 and its amendment, and Resolution 294) restricted imports of live animals, semen, embryos, meat and meat by-products, and milk and dairy products from countries with a different health status for BSE. In 1995, the Law No. 270 on Animal Health (Sanidad Animal) was adopted and stated that sanitary norms for animals will be applied to all animal species, domestic or wild, susceptible to contract and to spread infected-contagious, parasitic, or other animal diseases, that can injure economic interests.

In the Asia and Pacific region, China formulated the Law of Animal Disease (1997) with a view to preventing, controlling and eliminating animal diseases, developing the breeding industry and protecting human safety. After the general provisions giving the interpretation of animal production, animal diseases and epidemical prevention, this law classifies animal diseases as first, second and third degree, and lists six types of animal products forbidden to trade (art. 18). It regulates the procedures of controlling and ceasing of animal diseases, as well as the measures of animal quarantine. Provisions of inspection procedures are also regulated by this law.

Europe presents a well-developed legal framework in the area of animal health. Relevant legislation includes animal diseases acts, veterinary activities acts, quarantine regulations, various ordinances on disease prevention.

Veterinary activities acts usually encompass, prevention, control or eradication of infectious diseases in animals and the protection human health from zoonosis (e.g. the Albanian Law for "For Service and Veterinary Inspectorate" 1993). Specific requirements related to breeding is provided, for example, by the Belgium Royal Orders which regulate the production, use, storage, trade or importation of bovine semen and the sanitary requirements for animals to be admitted in semen collection centres. Another example is the Veterinary Activities Organization Act, 1999, of Estonia, providing the basis for

veterinary activities in Estonia. It defines what constitutes an animal according to the Act; what is a veterinarian, his/her duties, powers, activities and the extent of his/her authority; the scope of the activities of a veterinary laboratory; the obligations of individuals and juridical persons and liabilities connected thereto. Veterinarians have the power, among other things, to prohibit trade in animals that do not conform to veterinary requirements, as well as to prohibit the grazing of such animals and their transfer from one herd to another or to an enterprise engaged in the handling of animal products.

Animal and livestock health laws aim at fighting animal diseases that could infect human beings and animals, and contain strict rules on the export and import of any kind of livestock and animal products. The Turkish Law on Livestock Health, 1986, for example, states that a certificate of origin and health certificate issued by the exporting country is essential for importation. The first examination of the animals will be made on the transport vehicles at the entry into customs and final examinations will be made at the customs-point by veterinary surgeons. Animals and animal products that are brought to the customs without a health certificate from the exporting country, or found to have diseases, will be rejected. Those that are unable to be returned will be destroyed. The law also contains quarantine provisions.

In the same context, the UK Animal Health Act, 2002, amending the Animal Health Act of 1981, contains provisions on the slaughter of animals to prevent spread of FMD. It states that the Secretary of State must prepare guidance on the appropriate biosecurity measures to be taken in relation to FMD and such other disease as the Secretary of State specifies by order. The appropriate authority must prepare a national contingency plan indicating the arrangements that the authority intends to put in place for the purpose of dealing with any occurrence of FMD or other such disease as the authority, by order, specifies. The act also contains provisions about transmissible spongiform encephalopathies in sheep (scrapie). Liability to imprisonment is provided by this Act in cases of offence (persons causing infection to animals with a disease). Control over import and export is regulated by the Animals and Animal Products (Import and Export) (England and Wales) Regulations 2000.

Concern has been expressed about the consequences of FMD legislation and cull programmes aimed at creating "firewalls" to end the spread of the disease, irrespective of breed and their risk status, etc. There appears to be a real risk of rare breeds of traditional livestock facing extinction because of precautions against foot and mouth disease. Culling programmes were the favoured way to

try and contain the disease in the European Union, which has authorized limited vaccination programmes in the Netherlands and United Kingdom, but is wary of allowing wider inoculations – largely because it means loss of disease-free status in world trade markets and a two-year block on export of products from vaccinated animals.

Regulations on quarantine are necessary, both in the case of importation of live animals, and when disease outbreaks occur. Fifty-one countries have developed legislation setting out quarantine standards for various farm animal species. Implementation of quarantine regulations was indicated by forty-two countries. A few countries reported that emergency enforcement of quarantine measures involves compensation measures.

## 4.6    Food safety and food quality

Even though not specifically addressed in the tables online, legislation on food safety and food quality was part of the questionnaire. The main objectives of this legislation are to ensure food safety and to address food-related aspects of human health through setting minimum quality standards for various products, including animal products. Another objective is to provide for the identification of quality products by the consumer in the marketplace, which could enhance profits for food producers.

According to the questionnaire results, 39 countries have developed legislation that introduces national-level quality standards for animal products, and seven countries are working on such legislation. Implementation closely follows development and was reported by 37 countries. The legislation is usually sector specific, addressing meat, dairy and poultry industries, setting out both quality standards and control measures. Some EU countries that have not developed food safety legislation, indicated that commercial processing companies are responsible for ensuring quality standards, following good manufacturing practices, and complying with the recommendations of European bodies providing quality standards.

Introduction of traceability of products of animal origin has resulted from the 1996 BSE crisis. Legislation has been developed worldwide to ensure the identification and registration of bovine animals and the labeling of beef and beef products. Thirty-two countries have adopted legislation on traceability of animal products, especially beef. In 13 countries, such legislation is under development. Implementation and monitoring was reported in 27 and 29

countries, respectively. The rapid development of traceability legislation has been observed in those countries that are beef exporters and were forced to comply with international market requirements.

Quality assurance schemes have been introduced in order to build consumer confidence in the safety and high quality of animal products, and to satisfy consumer concerns regarding production conditions, including observation of animal welfare. Quality assurance schemes are mainly applied in organic agriculture and grazing/rangeland production systems. Twenty-seven countries (16 from Europe) have developed legislation that enables the identification of production chains and introduces quality assurance schemes. Fourteen countries reported on the preparation of such legislation and implementation was achieved in twenty-one countries. Some developing countries indicated that such schemes have been introduced but operate on a voluntary basis.

There are various ways and means to enable identification of products of animal origin on the market to enhance recognition by consumers and facilitate promotion. Legislation in this area encompasses geographical identification, identification of traditional processing procedures and origin of raw material (breed-identified products), as well as identification of the production system (such as organic produce). Legislation introducing various labeling systems was reported by 20 countries (16 from the European region) while ten countries indicated that such legislation is being developed. Twenty countries, mainly from developing regions, reported the absence of product identification legislation and indicated that they considered this a gap in their legal frameworks.

Worth mentioning is the establishment of a register of geographical indications and appellation of origins for agricultural products in the Swiss Law on Agriculture (Art 16). Geographical indication and appellation of origins are protected against any commercial utilization of other products exploiting the name of the protected designation, and against any counterfeiting and imitation.

**Geographical Indications**

For the purposes of the TRIPS Agreement, geographical indications are a type of intellectual property ("IP"). "Geographical Indications," ("GIs") are defined, at Article 22(1) of the TRIPS Agreement, as "indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographic origin." Thus, this definition specifies that the quality, reputation or other characteristics of a good can each be a sufficient basis for eligibility as a geographical indication, where they are essentially attributable to the geographical origin of the good. The TRIPS Agreement states that in respect of all geographical indications, interested parties shall have legal means in place to prevent the use of indications which mislead the public as to the geographical origin of the good, and use which constitutes an act of unfair competition within the meaning of Article 10bis of the Paris Convention (art. 22.2).

Among the two exceptions foreseen by the Agreement, relevant for the purpose of this study is that arising in situations where a trademark already exists. Where a trademark has been applied for or registered in good faith, or where the rights to the trademark have been acquired through actual use, in good faith, either (1) before the date of application of the TRIPS Agreement for a particular WTO member, or (2) before the GI was protected in its country of origin, the trademark maintains its legal presumption of superiority, based on the principle of "first-in-time, first-in-right."

Geographical indications are valuable to producers from particular regions for the same reasons that trademarks are valuable. First, they are source-identifiers - they identify goods as originating in a particular territory, or region or locality in that territory. Geographical indications are also indicators of quality – they let consumers know that the goods come from an area where a given quality, reputation or other characteristic of the goods is essentially attributable to their geographic origin. In addition, GIs are business interests - GIs exist solely to promote the goods of a particular area. Finally, for the purpose of the TRIPS Agreement, GIs are intellectual property, eligible for relief from acts of infringement and/or unfair competition.

Some typical examples of geographical indication in animals and animal products associated with high-quality and cultural heritage products are Parmiggiano Reggiano cheese, the Greek Feta cheese (linked to milk from specific local breeds), the Bresaola of Valtellina (linked to meat of a specific local breed), the 'Heavy pig of the Po' for which GI has been requested". EC Council Regulation No. 2081/92 regulates the Protection of Geographical Indications and Designations of Origin.

Consumer involvement is increasingly important, as consumer concerns and preferences have to be both better expressed and better addressed by producers and the market. In some countries, legislation is in place to enable consumer organizations to play a role in the food market, evaluating quality of products, lobbying for certain developments in food chain, including the introduction of change in production systems, etc. Twenty-four countries indicated the presence of such legislation, while eight countries indicated that legislation is being prepared. Implementation and monitoring was reported by 21 countries. It is clear that this area of legislation is still at the initial stage of development.

## 4.7    Land and farm management

Another area covered by the questionnaire and not specifically reflected in the tables online refers to legislation on land use and farm management. Land and farm management are relevant within the context of the present study for their impact on AnGR in the context of production systems. In fact, in extensive production systems, especially in the case of pastoralism, access to the land is crucial to sustain such systems and maintain and conserve AnGR used by the pastoralists. On the other hand, utilization of grazing animals facilitates the management of ecosystems, including natural resources, and contributes to vegetation control.

Regulation of land use and farm management typically deals with farm establishment and management, including the establishment and operation of industrial enterprises and setting rules regarding agricultural practices in order to prevent negative effects on the environment. Such legislation generally reflects policies on environmental protection and nature protection, and are focused on agriculture as a prime land user and a potential polluter or degrader. There is also legislation implementing state policies on agricultural development that provide incentive measures to support desirable changes in agriculture (such as promotion of specific production or agricultural practices) or to ensure the maintenance of agricultural activities in difficult production systems.

According to the Questionnaire outcomes, 44 countries have developed legislation setting out rules on access to agricultural land and land ownership, establishment of farms and requirements to conduct agricultural activities. In some countries, such legislation is connected with land reform (commercial and communal land acts). Legislation in this field is currently under

preparation in five countries. Implementation and monitoring ratios are high, being reported by 38 and 37 countries, respectively.

Respondents indicated that a relevant body of legislation regulates agricultural practices with regard to the use of fertilizers, pest control agents, and the management of manure and waste products. Some legislation is addressed to all sectors of the economy, to prevent soil, water and air pollution which also affect agricultural enterprises. Forty countries indicated that they have developed legislation on agricultural practices that prevent negative impacts on the environment, and three others have legislation under preparation. Several countries reported the implementation of soft law instruments addressing agricultural practices, in the form of codes of conduct and principles of best agricultural practice.

Specific legislation on intensive animal production systems was reported by respondents from 32 countries. Such legislation focuses either on environmental protection and human health issues in relation to the operation of industrial farms, or on the welfare of the animals that are part of such systems. In many countries, specific animal protection legislation and welfare legislation cover industrial production systems and are supported by specific regulations setting out, for example, requirements on housing facilities and management practices. Thirteen countries indicated that they have not yet developed legislation addressing industrial livestock production systems. Implementation of legislation was limited to 24 countries.

Some countries have passed legislation to provide farmers operating in difficult production systems, referred to in EU legislation as Less Favoured Areas, with general support measures. Measures to support production systems were adopted in 25 countries (15 from Europe). This legislation enables farming activities to be maintained in low productive areas through aid programmes for non-productive functions of agriculture, and in order to achieve landscape management objectives.

Thirty-nine countries reported legislation implementing agricultural and livestock policies. This legislation establishes incentive measures to support and encourage desirable developments in agricultural production. Regulations provide for preferential credit access, for subsidies for farm modernization and infrastructure development, such as water supply or the installation of manure tanks. Respondents indicated that such regulations may be temporary, depending on national financial conditions.

## 4.8 National legislation seeking compliance with international agreements

he questionnaire requested information on the development of national laws and subordinate legislation to fulfill obligations created by specific international agreements that may have a potential impact on management of animal genetic resources. The agreements include the WTO agreements on the Application of Sanitary and Phytosanitary Measures, and on the Trade Related Intellectual Property Rights, as well as the Biosafety Protocol under the Convention on Biological Diversity.

Thirty-eight of the responding countries (twenty from Europe) have developed legislation in line with the WTO SPS Agreement and in harmony with *Codex Alimentarius* standards, setting national standards for domestically-produced food and for imported food products. In eight countries, preparation of such legislation is underway. Thirty-two countries reported implementation of this legislation, while 30 indicated monitoring of implementation.

A similar situation was reported with regard to the status of national legislation that establishes control over animal health, in line with the WTO SPS Agreement, and in harmony with standards provided by the Office International des Epizooties. Thirty-seven countries (20 from Europe) have adopted such legislation, while a further eight reported that it is being developed. The state of implementation and monitoring is advanced and was reported by 35 and 33 countries, respectively.

Development of legislation in line with the WTO Trade Related Intellectual Property Rights Agreement, calling for the establishment of minimum standards for intellectual property rights, is not very widespread, as yet. Only 19 out of 54 responding countries have developed such legislation, and fourteen are examining the need and modalities for appropriate legislation. The lack of TRIPs-compliant legislation on intellectual property rights is probably an indication of the difficulties that many countries have in addressing the complex relationship between IPRs and other areas of international law, such as environmental law. Often the policy objectives of the TRIPs and the CBD are seen as competing and this results in a standstill in terms of legislative upgrading.

Development of legislation addressing Living Modified Organisms-related issues under the Biosafety Protocol of the Convention on Biological Diversity, is quite advanced. Only seven of the responding countries indicated that they have not yet initiated discussions on LMO legislation. Twenty-nine countries indicated that legislation has already been adopted, while 14 report substantial progress in legislation development at the national level. The advanced nature of LMO legislation could be attributed to the financial and technical support that has been made available to developing countries, and to the general concern related to LMOs.

## 4.9    Additional issues

The moral and political importance of animal welfare is being increasingly recognised by governments. Animal welfare is a complex, multifaceted public policy issue which includes important scientific, ethical, economic and political dimensions. The terms "health" and "welfare" overlap, in that health is an important part of welfare. The welfare of an animal is its state *vis-à-vis* its ability to cope with its environment. Hence, welfare is a characteristic of an individual animal and includes the extent of success in coping with all aspects of its environment, failure to cope – which may lead to disease, injury and death – and extent of difficulty in coping. Health is that part of welfare which concerns coping with pathogens and pathology. Both poor health and other aspects of poor welfare can have economic aspects. Farm animal disease can cause great economic problems and a number of farm animal diseases pose a risk for human health. Poor welfare which does not involve poor health can result in reduced survival of young animals, failure to conceive or successfully give birth, impaired growth or impaired production of milk or eggs.

It is felt that, because of the growing importance of animals in society, animal welfare must today be addressed in a scientifically credible manner. Thirty-six countries responding to the questionnaire reported on specific legislation regarding animal welfare, and seven recorded the preparation of such legislation. There were two approaches being adopted in the development of animal welfare legislation: in some countries, legislation focuses on the prevention of cruelty to animals, on the use of farm animals and the utilization of animals in research, entertainment and for other non-production purposes. In other countries, animal welfare legislation mainly sets standards for keeping and handling farm animals, especially during fattening, transportation and slaughter, thus following a more production-oriented approach.

The actual effect of legislation on the welfare of animals depends upon the responses of those owning and managing the animals. Some systems for farm animal production will not continue if they are made illegal, because they depend upon large manufacturers who are easily forced to change to a legal system. Other aspects of legislation can be enforced only by checks on farm, transport vehicles, markets, slaughterhouses etc. and the extent of law-breaking conducts will be significantly affected by the frequency and quality of the checks. For many transgressions, unannounced inspections are necessary if transgressors are to be discovered. Implementation and monitoring was reported by most of countries that developed welfare legislation.

An interesting outcome of the research carried out is the fact that GM animals are covered by some agriculture and welfare legislation. One example is the United Kingdom, where GM animals fall within the definition of livestock covered by the Agriculture (Miscellaneous Provisions) Act 1968 and the Northern Ireland Welfare of Animals Act 1972, under which it is an offence to cause unnecessary pain or distress to any livestock kept on agricultural land. There are also provisions in the Welfare of Farmed Animals (England) Regulations 2000 and in Northern Ireland the Welfare of Farmed Animals Regulations (Northern Ireland) 2000 to address the welfare concerns arising from both natural and artificial breeding procedures.

Another issue considered is the marketing of animal products which, according to the questionnaire, is specifically regulated in 44 of the responding countries. Only nine countries reported no legislation at all in this field. Typically, legislation sets standards for animal products and for product handling. In many instances, it is product-specific, for example, the Meat Industry Act or the Karakul Pelt and Wool Act of Namibia. Implementation of legislation on the marketing of animal products has been reported in 36 countries and is being monitored in 38 countries.

## 4.10   Customary law

The role of customary law is generally acknowledged as relevant in the context of traditional knowledge of local farming communities. According to the results of the questionnaire that was circulated for this legal study, some countries, mainly from the African region, gave examples of customary law having an impact on AnGR management. These include utilization of certain indigenous breeds (such as the West African Shorthorn cattle) as marriage payments or for other social ceremonies, as well as gifts for chiefs, etc. The

social and cultural importance of indigenous breeds provides incentive for their conservation. Other examples of customary law are related to livestock management, and include procedures such as castration of undesired males, exchange of sires, loans between families or herders and community support for restocking in situations where a family has lost their livestock. In some cases, customary law may have a negative impact on AnGR management. An example refers to the distruction, in Bolivia, of the collective property of the rangelands linked to the destruction of the centers of Management of Llama and Alpaca (*Lama glama* and *Lama pacos*) Males. In the absence of these centres, the reproduction rate of this species was negatively affected.

## 5.       NATIONAL POLICIES AND STRATEGIES

### 5.1     Relevance and general outline of policies and strategies

National policies, although not legally binding, have their relevance in the context of national legal frameworks because they set forth national priorities and could set the basis for the implementation of existing legislation and the development of future national legislation and/or strengthen the existing one. National policies of relevance to AnGR generally focus on the agricultural sector, on the development of the livestock industry and on livestock production.

There are several policy areas that may have a direct or indirect impact on management of animal genetic resources. These encompass land-use policy, agriculture policies and strategies, specific livestock development strategies, biodiversity strategies, human health protection, and policies related to governance and civil society organizations. Such policies provide a basis for setting developmental goals and objectives that influence the livestock sector as a whole, including the management of animal genetic resources.

Land-use policies usually provide general goals for agriculture development, agrarian structure and conditions for the establishment of farms. In many cases, land-use issues are included in policies aimed at the development of rural areas. The results of the questionnaire indicate that such policies are well developed at the national level. Forty-seven countries indicated having adopted these policies, which are currently under development in the other reporting countries. Implementation and monitoring of land use policies is well advanced and was reported by 43 and 40 countries, respectively.

General policies for agriculture and rural areas are usually intended to establish a long-term vision of the development of agriculture and its role in contributing to the national economy, in terms of both a contribution to the gross national product and to employment goals. The policies may support a number of specific objectives, including improvement of the agrarian structure, the creation of instruments to encourage certain production directions or farm modernization, ways and means to strengthen farmers' position in the market, as well as to encourage and support implementation of biological improvement measures. Agricultural policies also often contain goals for the sustainable development of rural areas, protection of the natural environment and cultural heritage. The livestock development policy/strategy may constitute an integral part of agricultural policy, or it may be adopted as a separate policy document establishing developmental goals for the livestock sector.

## 5.2    Analysis of national policies and strategies

National agricultural policies have been adopted by 44 of the responding countries. Eight others are currently under preparation. In the majority of countries, such policies are monitored. Separate strategies for livestock sector development were reported by 35 countries, while nine others reported that they are currently under preparation. These strategies may address livestock production as a whole, or focus on specific aspects, such as dairy production or pig production. Seven countries reported that they did not have any strategies for livestock development.

The National Development Plan 9 (NDP9) of Botswana (covering the period 2003–2009) is a good example of national policy, prepared with the aim of guiding the development of Botswana's economy and drawing up programmes of public expenditure on recurrent and development projects. Adherence to effective planning has contributed to Botswana's transformation from one of the poorest countries at Independence to a middle-income country, and changed its orientation from essentially cattle-rearing and rural-based livelihoods to a fast-growing economy. It is highlighted in NDP9, among others, that one of the major concerns of the Agriculture sector has been low productivity and its relatively-declining contribution to GDP.

It is foreseen that the review of agricultural subsidy schemes, such as the Arable Land Development Programme (ALDEP) and Services to Livestock Owners in Communal Areas (SLOCA), to determine their impact and to

retarget them better, will be completed during NDP 9. The strategy for development of arable, irrigated agriculture and dairy production is expected to help the sector to improve diversification, create more employment opportunities, boost productivity and increase agricultural output. A further initiative is the provision of agricultural insurance and credit to minimize farmer risks resulting from annual and seasonal climatic variability and natural disasters. This will also facilitate investments in agriculture.

The Tanzania Livestock Policy was drawn up in June, 1993, to chart out the broad objective of guiding the development of the livestock industry in the country, in consonance with the broader social objectives, and the need to have policies that are both clear in their objectives and feasible to implement. The main broad policy is to increase national income, increase the per capita income of rural people, attain self sufficiency in food production, increase net foreign earnings and consolidate the policy of socialism and self-reliance.

More specifically, the policy endeavoured to, among other things, increase the production of meat, milk and eggs to satisfy the domestic market, with the surplus for the export market, to earn foreign exchange; improve the incomes/earnings of the livestock-keeping peasants in the rural areas, whose livelihoods and welfare are greatly dependent on livestock; and direct smallholders and pastoralists to proper and optimal utilization of the pasture and rangelands for sustainable livestock production.

Kenya drew up its detailed livestock policy in 1980. The major national objectives targeted by the policy were outlined as: (1) alleviation of poverty through the creation of income-generating employment at all stages of livestock production (primary production, marketing, processing, transportation and retailing); (2) production of surplus over and above domestic demand for export, whenever possible, so as to earn foreign exchange; and (3) conservation of the natural resources to ensure sustained resource productivity in the future.

Zimbabwe does not have a written livestock development or breeding policy. Livestock development is based on a number of separate decisions dealing with single aspects. Key amongst these are the pricing policies established by the Cold Storage Commission and the disease control policies particularly for tick-borne disease and foot and mouth disease. Livestock production is based on two systems: the Commercial Farming System and the Communal Lands System. The bulk (70 percent) of cattle is raised in the communal sector, while

the remainder is on extensive ranches in the drier areas, or is stall-fed in the high rainfall areas with maize grain surpluses.

Improved livestock production is a very important component of Uganda's plan for modernization of agriculture. The per capita availability of livestock products is worryingly low, calling for more affordable and adequate animal products. Genetic improvement has been identified as one of the most powerful and cheapest means of increasing the efficiency of animal production. Results of animal breeding in the past have unfortunately not been satisfactory because of poor planning and lack of enabling policies. In an effort to streamline breeding activities, Uganda has put in place the National Animal Breeding Policy which is backed up by an institutional and legal framework in the form of the Animal Breeding Act (sect. 5.3.2).

A national policy that deals specifically with AnGR is the Netherlands policy on 'Sources of Existence: Conservation and Sustainable Use of Genetic Diversity'. The latter policy recognizes that genetic resources are part of the entire biological diversity and that they concern all material containing the hereditary building blocks for animals, plants and micro-organisms, with an actual or potential value for humanity. The policy highlights that governments have an essential task in creating both frameworks and legislation to guide the management of genetic resources. In this context, the Netherlands is among the countries that are most active in the development and adoption of policies and legislation pertaining to genetic resources.

The outline of the Dutch policy indicates that its main objectives pertaining to the policy on genetic resources are based on the Convention on Biological Diversity (CBD). One of the Dutch government's objectives is the drawing up and application of general basic principles for the management of genetic resources. This is achieved mainly by means of international cooperation. The Netherlands is committed to: (a) specifying the commitments under the Convention on Biological Diversity (CBD) and other conventions on genetic resources; (b) implementing the International Treaty on Plant Genetic Resources for Food and Agriculture, focusing on management and utilization of the main crops in agriculture and food production; (c) specifying the cohesion between the CBD and international agreements on intellectual property rights, primarily as stated in WTO-TRIPS, UPOV and WIPO; and implementing policy and legislation on modern biotechnology, in particular the Cartagena Protocol on Biosafety.

Section 4.2.3 of the Dutch policy deals with farm animals. The main issues for the Netherlands are: the role of farm animals in multifunctional agriculture, including their cultural-historical, recreational and educational significance; and the relationship between genetic erosion and animal diseases. In the latter case, the issue is how to make animals more resistant to disease, and determining the scale of the effect of genetic diversity/uniformity in animal populations. However, increasing animal resistance cannot prevent the outbreak of highly contagious diseases, such as foot and mouth disease.

The policy considered the development of the Global Strategy for Farm Animal Genetic Resources, under FAO coordination, with the objective of obtaining a global overview and prompting the conservation and management of diversity in farm animals. The Netherlands will continue to contribute to this effort in various ways, such as through international cooperation and adopting a strategic national approach.

The policy also specifies that a gene bank for farm animals is under development. Animal genetic resources are collected mainly within the private sector. Consequently, conservation and management of farm animals can only succeed if the agriculture and food production sector assumes its responsibilities. As in the case of microbial and plant genetic resources, the government exhorts the sector to apply the basic principles of this document in the form of Codes of Conduct and Material Transfer Agreements. Conservation of animals *in situ* is preferable, particularly in cases where specific breeds are threatened. Animals are easier to manage in their natural habitat and the breed can continue to develop. In the case of small populations, intervention is necessary to avoid inbreeding.

When conservation of the agricultural situation is no longer feasible, the possibility of *ex-situ* conservation elsewhere must be examined. The method of preference is *ex-situ* management in the field. The Dutch government will continue to promote the use of rare breeds of domestic animals in nature management. Hobby breeders and urban farms also contribute to the conservation of many rare farm animals, and their activities are highly significant in a cultural–historical and educational context.

Other examples of national policy relevant for AnGR management are the Rural Development Programmes developed by all EU countries according to Regulation (EC) No. 1257/1999. Article 41 of Council Regulation states that rural development plans shall be drawn up at the geographical level deemed to

be the most appropriate. They shall be prepared by the competent authorities designated by the member state and submitted by that member state to the commission after competent authorities and organizations have been consulted at the appropriate territorial level. Rural development plans shall cover a period of seven years from 1 January 2000, and shall include, among other things, a quantified description of the current situation, showing disparities, gaps and potential for development, the financial resources deployed and the main results of operations undertaken in the previous programming period; a description of the strategy proposed, its quantified objectives, and rural development priorities selected, and the geographical area covered. In their plans, member states shall provide for agri-environment measures throughout their territories, and in accordance with their specific needs, and ensure that the necessary balance is kept between the different support measures.

Respondents to the questionnaire indicated that human health is one of the major concerns with respect to animal production. Forty-nine countries reported the existence of policies that provide directions for national health care, and also address issues of zoonosis related to the prevention of disease and the safety of animal products. Forty-five respondents indicated that such policies are being actively implemented and 44 indicated that the results are being monitored.

Rules on organizational matters, especially with regard to the establishment and activities of self-governing and vocational organizations, provide an important framework for the development of farmers' organizations and breeders' societies. In most of the responding countries, policies have been developed that regulate and encourage the participation of self-governing organizations and strengthen their position. Such policies were reported by 44 countries, while seven other countries indicated that these policies were being developed. Implementation and monitoring of policy on civil society organizations' has been reported by 35 countries.

## 6.    ASSESSMENT OF NATIONAL LEGISLATION IN PLACE

### 6.1    General assessment and recommendations

According to the results of the questionnaire, there are significant area-related differences in the state of national regulatory frameworks. The most extensive legislation worldwide is in the area of animal health and prevention of animal-

borne diseases. The impact of such legislation on import/export and market access has been greatest for those countries, especially in the developing world, whose infrastructure and legislative framework was not sufficiently developed to face the challenge. Many developing countries have also suffered from rapid changes in the legislative framework of trading partners (mainly the EU). National legislation is relatively well developed to address specific aspects of animal breeding strategies and production, and certain aspects of land and farm management. Consumer-oriented legislation is still at a very initial state of development.

On the other hand, institutional arrangements do not seem to be adequate in a number of cases where technical legislation is not complemented by institutional developments. Consequently, there is not enough support to the effective implementation of the overall legislative framework. Efforts to improve this area should be undertaken by countries. It is advisable to make this effort in the context of developing national plans/strategies with the support of adequate funding for the subsequent implementation and, in particular, the establishment of a management infrastructure, able to halt the erosion and ensure the development and sustainable use of AnGR.

The analysis has also indicated significant differences in the state of national legislation, identifying animal health legislation as the most developed, worldwide, animal breeding as being relatively well developed, and conservation and institutional arrangements legislation as being insufficiently developed to face the various challenges involved. Adequate legislation regarding the management of AnGR for use and conservation should address all issues involved and achieve a better balance of development in the different areas, to respond to country needs.

There are substantial differences between developed and developing countries with regard to the state of legal and regulatory framework on the management of animal genetic resources. Developing countries often point to lack of capacity as a major obstacle to the development of legislation. In many instances, the implementation and monitoring of legislation does not rapidly follow enactment. This is mainly due to the lack of capacity in developing countries, where implementation procedures are slowed by the absence of adequate human and financial resources, as well as weak institutional and infrastructure development. Other reasons relate to conflict and lack of communication and cooperation between different sectors. The latter generally occurs between the ministries of environment, agriculture and forest (such as

in the case of India, where camel breeds and animals that used savannah areas are banned by the Forestry Department of the Ministry responsible for Agriculture).

Growing recognition of the roles and values of animal genetic resources over the past couple of decades has led to the initiation of conservation efforts. Many countries have attempted, or are attempting, to conserve some of their most important breeds, using both *in-situ* and *ex-situ* conservation measures. Nevertheless, conservation efforts for animal genetic resources lag far behind those for plant genetic resources and the national legislative framework in place does not properly address all the requirements for the effective management of conservation needs at the country level. The theoretical premise of this study is that the concept of AnGR management mixes and harmonizes conservation with sustainable use. Thus, conservation becomes part of a broader strategy that looks not only at preservation but at the overall dynamics of agricultural production, both industrial and traditional. In this vision, an enabling regulatory framework for AnGR management is to be extensive and systematic. Some of the elements that an upgraded regulatory framework should include are the following.

With regard to AnGR conservation and improvement, aspects to be prioritized are:

- the definition of breeding objectives;
- the identification and listing of breeds; their description and characterization, in order to understand their unique qualities and potential contributions, and to identify those breeds that have the greatest potential to contribute to necessary diversity in the future;
- the monitoring of population statistics for each breed and regular reporting to FAO particularly those breed populations currently risking extinction;
- facilitating the use of as many breeds as possible – the wise use of a breed is likely to be the most cost-effective way of conserving its gene pool for the future;
- the enhancing of productivity and maintaining of local adaptation;
- the storing of adequate samples of as many of the unique breeds as possible, in the form of live animals, if feasible, and preferably supplemented by managed banks of frozen semen, ova and embryos, to enable the future regeneration of a lost population of animals;

- development of an efficient and sustainable system of *ex-situ* conservation, taking into account the need for adequate documentation and characterization.

Other measures should look at general support to rural livestock communities through the following instruments:

- financial incentives for breeding and raising local, traditional livestock;
- support to the marketing of products from local traditional livestock production;
- promotion of in-*situ* conservation by farmers and indigenous communities;
- acknowledgement and documentation of community-based conservation systems and breeding strategies;
- support to the active participation of individual farming and breed societies in conservation efforts;
- development of infrastructures that facilitate local livestock production for the market;
- education and training programmes in conservation genetics and effective field techniques, especially for farmers and indigenous communities
- awareness-raising and information exchange, especially for farmers and local communities.

Conservation is often seen as simply preserving or storing samples of semen and/or embryos. This should be taken into account when developing effective national legislation and programmes for maintaining and making the best use of animal genetic diversity. Whilst the basic operations of identification and characterization of genetic resources are universally required and an information system and management entity are essential for the facilitation and coordination of the conservation effort, a variety of activities and technologies is needed in order to include all the processes required to best conserve a particular breed. Factors such as the breed's current use, the climatic, social and political stability of the area in which it is located, the number of animals in the existing breed population and the extent and type of performance recording and cross-breeding employed, should all be considered. National policies and local attitudes, culture and, of course, available finance are also important factors. The means of conservation is also dependent upon the species involved, the financial and human resource capacity, the establishment of policy concerning incentives for conserving breeds at risk and availability of reliable long-term cryo-preservation storage.

## 6.2 Conclusions

AnGR play an important role in contributing to food and agricultural production globally for the present and the future, and in sustaining most production systems and community livelihoods. Their value encompasses social, cultural and economic aspects. Better management of these resources is crucial in meeting the demand for food, and in enabling future generations to respond to the challenges of disease, climatic change, and other threats.

It is against this background that the present study has tried to draw renewed attention to the importance of a regulatory framework for AnGR management and assess the status of national legislation in place, with a view to paving the way for legislative upgrading.

The following remarks can be made based on the review of the international framework and the assessment of national legislation in place.

### 6.2.1 The complexity of the livestock sector

There is hardly an ideal way of managing genetic resources. It is certainly appropriate to point out, however, that genetic resources encompass not only plants but animals as well, and that there are some intrinsic differences between plant and animal resources and the way they can be managed. Such differences relate to reproduction, storage and transport, ownership, and costs associated with genetic improvement programmes.

Problems of productivity and diversity in the livestock sector are no less complex than in the crop sector. If anything, they are more challenging. Unlike in the case of crops, where germplasm diversity can generally be captured in a few kilograms of seeds, with animals one has to maintain a very large gene pool in order to manage and maintain a reasonable order of diversity. Furthermore, the adaptation of animals to their habitat may be far stronger than in the case of seeds. In addition, animals, unlike plants, have feelings, moods and preferences. The relationship between animal keepers – men, women, children and their communities – and animals is somehow different from the relationship between farmers and crops or soil. Livestock is 'multifunctional' in scope, providing food (meat, milk, eggs), fibre (wool, hides and skins), draught power, manure and fuel. Since, in most regions, animals are an integral part of farming systems, the conservation of animal germplasm is not totally independent from the conservation of habitat, sociocultural and

ecological knowledge systems and interaction between different species – and even ecosystems – in the case of transhumant livestock.

In addition, with regard to AnGR there is not the same magnitude of investment in the public sector as that in existence for plants. Gene banks are considered useful tools for *ex-situ* conservation of plants, but less so for animals. There is no equivalent of a global genetic repository system for AnGR – such as the Consultative Group on International Agricultural Research – nor is there any indication that such *ex-situ* global conservation efforts will be implemented in the near future. These differences mean that action aimed at maintaining farm animal and farm plant biodiversity will also differ, but this must not undermine the need for legislation in both fields.

At the national level, the development of adequate AnGR legislation is not an easy task, especially for developing countries since, ideally, it should strike a balance between conservation and sustainable use, on the one hand, and maximization of national export potential, on the other. The assessment of national legislation has also highlighted the complex interaction of several areas of regulation that have an impact on AnGR management.

### 6.2.2    Limited international attention on AnGR

The international agenda seems to reflect limited attention on AnGR, and in particular, AnGR for food and agriculture. The importance of the management of AnGR has been neglected, to date, by the international community and governments. As a consequence, AnGR lag behind plant genetic resources at the international level. Conservation of animal germplasm has not received as much attention in recent years as that of crop germplasm. The same is true for utilization and breed improvement, particularly in low external input systems.

Although domestic animal diversity was recognized internationally as an important component of global biodiversity by the UN Conference on Environment and Development (UNCED, 1992), the CBD, and Agenda 21, formal international activities on the sustainable use and conservation of AnGR for food and agriculture are still very limited, compared to those on plant genetic resources. The recent adoption of the ITPGRFA is a self-explanatory example of the international debate and interest focusing mainly on plant genetic resources.

With the exception of the CBD, which refers to animal genetic material in its definitions of genetic resources, no specific reference to AnGR exists in international agreements and conventions.

The WTO SPS Agreement is the only agreement whose implementation at national level seems to be covered by the extended zoosanitary legislation. This is in response to the SPS Agreement's requirement to establish national SPS measures consistent with international standards, guidelines and recommendations. It is to be borne in mind that if national requirements result in a greater restriction of trade, a country may be asked to provide scientific justification demonstrating that the international standard in question would not provide the same level of health protection considered appropriate by that country.

The Biosafety Protocol to the CBD is being implemented through national legislation. While most of the attention has focused on GM crops, biotechnology is also relevant to both livestock breeding and feed. The peculiarities of livestock will require greater specific attention, as the regulatory framework for biotechnology develops.

TRIPS and IPR are not a major concern, at present, in maintaining farm animal genetic diversity. In the animal sector, technological resources and contractual practices, rather than formal IPR strategies have been the norm, to date. The majority of countries worldwide have explicitly excluded patents for animals. It will be interesting, in the future, to see whether IPR protection will, nevertheless, be sought and obtained in countries that exclude patents for animals, under forms other than patents or through patenting of single isolated animal genes.

### 6.2.3 The way forward

The discussion on access and benefit-sharing between the providers and the users of plant genetic resources is quite intense. Access and benefit-sharing, which is regulated by the CBD, the Bonn Guidelines, and, as it relates to plant genetic resources for food and agriculture, the ITPGRFA, is not yet a major issue in the discussion of farm AnGR but may become so in the future. It should be recalled, in fact, that conservation, sustainable use, access and equitable sharing are among the concepts developed under the CBD, which recognizes the sovereign rights of states over their natural resources and their authority to determine access conditions to such resources. It is the

responsibility of states to develop general legislation with regard to the requirements of the Convention, which also requests the development of national strategies and development plans. Such strategies and plans should not only focus on plants but also consider the peculiarities of AnGR with regard to both conservation and utilization, as well as access and benefit sharing.

Some factors are putting pressure on the international community and national governments to develop regulatory systems or implement the existing ones, giving particular attention to AnGR. Conservation incorporates all operations involved in the management of genetic resources, including the establishment of better access to a wider variety of these resources, particularly for research and development. Countries possess different subsets of the total breeds found throughout the world, forming each domestic animal species. Additionally, countries are likely to become increasingly interdependent in seeking access to unique AnGR from elsewhere. In this case, it may be worth considering the need to have facilitated multilateral access regulations, as are provided by ITPGRFA. Moreover, it should be highlighted that most breeds undergoing active genetic improvement reside in developed countries whereas the majority of farm animals are located in developing countries.

Following recognition by the international community of the special nature of agricultural biodiversity, of the special characteristics of AnGR and the challenges to be faced in halting the increasing erosion of AnGR, an appropriate regulatory system for its successful management may be discussed. FAO, in cooperation with the CBD, seems to be the appropriate organization to undertake this exercise at the level of the international community and to offer advice to governments on the development of regulatory systems.

Once again, the involvement of different stakeholders is crucial in the AnGR sector. Governments and non-governmental organizations, including intergovernmental and other research and development agencies, as well as local research and animal production groups – particularly animal geneticists and veterinarians who generally provide much advice to industry and government – and the private sector are all key players in the scenario. As custodians of genetic resources, farmers shall also have a role to play in the development of policy and legislative frameworks.

## Annex I
## COUNTRIES MEMBERSHIP TO INTERNATIONAL
## INSTRUMENTS RELEVANT TO AnGR

M = member  P = party  S = signatory

| Countries | CBD[1] | NBSAPS[6] | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| Afghanistan | P (09/02) | | | | | M | | |
| Albania | P (01/94) | | | M (09/00) | M (09/00) | M | M | M |
| Algeria | P (08/95) | * | S (04/2000) | | | M | M | M |
| Andorra | | | | | | | | M |
| Angola | P (04/98) | | | M (11/96) | M (11/96) | M | M | M |
| Antigua e Barbuda | P (03/ 93) | | P (12/03) | M (01/95) | M (01/95) | | M | M |
| Argentina | P (11/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Armenia | P (05/93) | * | | M (02/03) | M (02/03) | M | M | M |
| Australia | P (06/93) | * | | M (01/95) | M (01/95) | M | M | M |
| Austria | P (08/94) | * | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Azerbaijan | P (08/00) | | | | | M | | M |
| Bahamas | P (09/93) | * | S (05/2000) | | | | M | M |

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[1]  Updated 17 September 2003. Source: www.biodiv.org/world/parties.asp
[2]  WTO SPS and WTO TRIPs. Updated 10 September 2003. Source: www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm
[3]  Updated 10 September 2003. Source: wwwoie.int/eng/OIE/PM/en_PM.htm
[4]  Updated 10 September 2003. Source: http://codexalimentarius.net/member_countries.stm
[5]  Updated 10 September 2003. Source: www.wipo.org/members/members/index.html
[6]  National Biodiversity Strategies and Action Plans, updated 11 December 2003

| Countries | CBD[1] | NBSAPS[6] | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| Bahrain | P (08/96) | | | M (01/95) | M (01/95) | M | M | M |
| Bangladesh | P (05/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Barbados | P (12/93) | * | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Belarus | P (09/93) | | P (09/03) | | | M | | M |
| Belgium | P (11/96) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Belize | P (12/93) | | | M (01/95) | M (01/95) | M | M | M |
| Benin | P (06/94) | | S (05/2000) | M (02/96) | M (02/96) | M | M | M |
| Bhutan | P (08/95) | * | P (09/03) | | | M | M | M |
| Bolivia | P (10/94) | * | P (09/03) | M (09/95) | M (09/95) | M | M | M |
| Bosnia and Herzegovina | P (08/02) | | | | | M | | M |
| Botswana | P (10/95) | | P (09/03) | M (04/95) | M (04/95) | M | M | M |
| Brazil | P (02/94) | * | | M (01/95) | M (01/95) | M | M | M |
| Brunei Darussalam | | | | M (01/95) | M (01/95) | | M | M |
| Bulgaria | P (04/96) | | P (09/03) | M (12/96) | M (12/96) | M | M | M |
| Burkina Faso | P (09/93) | * | P (11/03) | M (06/95) | M (06/95) | M | M | M |
| Burundi | P (04/97) | * | | M (07/95) | M (07/95) | M | M | M |
| Cambodia | P (02/05) | * | | | | M | M | M |
| Cameroon | P (10/94) | * | P (09/03) | M (12/95) | M (12/95) | M | M | M |
| Canada | P (12/92) | * | S (04/01) | M (01/95) | M (01/95) | M | M | M |
| Cape Verde | P (03/95) | | | | | | M | M |
| Central African Rep. | P (03/95) | | S (05/2000) | M (04/95) | M (04/95) | M | M | M |
| Chad | P (06/94) | * | S (05/2000) | M (10/96) | M (10/96) | M | M | M |

| Countries | CBD[1] | NBSAPS[6] | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE[3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| Chile | P (09/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| China | P (01/93) | * | S (08/2000) | M (12/01) | M (12/01) | M | M | M |
| Colombia | P (11/94) | * | P (09/03) | M (04/95) | M (04/95) | M | M | M |
| Comoros | P (09/94) | * | | | | M | | M |
| Congo (Rep. of) | P (08/96) | | S (11/2000) | M (03/97) | M (03/97) | M | M | M |
| Congo (Dem. Rep.) | P (12/94) | * | | M (01/97) | M (01/97) | M | M | M |
| Cook Islands | P (04/93) | | S (05/02) | | | | M | |
| Costa Rica | P (08/94) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Côte d'Ivoire | P (11/94) | | | M (01/95) | M (01/95) | M | M | M |
| Croatia | P (10/96) | | P (09/03) | M (11/00) | M (11/00) | M | M | M |
| Cuba | P (03/94) | * | P (09/03) | M (04/95) | M (04/95) | M | M | M |
| Cyprus | P (07/96) | | | M (07/95) | M (07/95) | M | M | M |
| Czech Republic | P (12/93) | * | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Denmark | P (12/03) | * | P 09/03 | M (01/95) | M (01/95) | M | M | M |
| Djibouti | P (09/94) | * | P (09/03) | M (04/95) | M (04/95) | M | | M |
| Dominica | P (04/94) | * | | M (01/95) | M (01/95) | | M | M |
| Dominican Republic | P (11/96) | | | M (03/95) | M (03/95) | M | M | M |
| Ecuador | P (02/93) | * | P (09/03) | M (01/96) | M (01/96) | M | M | M |
| Egypt | P (06/94) | * | S (12/2000) | M (06/95) | M (06/95) | M | M | M |
| El Salvador | P (09/94) | | S (05/2000) | M (04/95) | M (04/95) | M | M | M |
| Equatorial Guinea | P (12/94) | | | | | M | M | M |
| Eritrea | P (03/96) | | | | | M | M | M |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| Estonia | P (07/94) | * | S (09/2000) | M (11/99) | M (11/99) | M | M | M |
| Ethiopia | P (04/94) | | S (05/2000) | | | M | M | M |
| European Community | P (12/93) | * | P (09/03) | M (01/95) | M (01/95) | | | |
| Fiji | P (02/93) | | P (09/03) | M (01/96) | M (01/96) | | M | M |
| Finland | P (07/94) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| France | P (07/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Gabon | P (03/97) | | | M (01/95) | M (01/95) | M | M | M |
| Gambia | P (06/94) | | S (05/2000) | M (10/96) | M (10/96) | | M | M |
| Georgia | P (06/94) | * | | M (06/00) | M (06/00) | M | M | M |
| Germany | P ((12/93) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Ghana | P (08/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Greece | P (08/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Grenada | P ((08/94) | * | S ((05/2000) | M (02/96) | M (02/96) | | M | M |
| Guatemala | P (07/95) | * | | M (07/95) | M (07/95) | M | M | M |
| Guinea | P (05/93) | * | S (05/2000) | M (10/95) | M (10/95) | M | M | M |
| Guinea-Bissau | P (10/95) | | | M (04/95) | M (04/95) | | M | M |
| Guyana | P (08/94) | * | | M (01/95) | M (01/95) | M | M | M |
| Haiti | P (09/96) | | S (05/2000) | M (01/96) | M (01/96) | M | M | M |
| Holy See | | | | | | | | M |
| Honduras | P (07/95) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Hong Kong (China) | | | | M (01/95) | M (01/95) | | | |
| Hungary | P (02/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Iceland | P (09/94) | | S (06/01) | M (01/95) | M (01/95) | M | M | M |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| India | P (02/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Indonesia | P (08/94) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Iran (Islamic Rep. of) | P (08/96) | * | S (04/01) | | | M | M | M |
| Iraq | | | | | | M | M | M |
| Ireland | P (03/96) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Israel | P (08/95) | | | M (04/95) | M (04/95) | M | M | M |
| Italy | P ((04/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Jamaica | P ((01/95) | | S ((06/01) | M (03/95) | M (03/95) | M | M | M |
| Japan | P (05/93) | * | | M (01/95) | M (01/95) | M | M | M |
| Jordan | P (11/93) | | S (10/2000) | M (04/00) | M (04/00) | M | M | M |
| Kazakhstan | P (09/94) | * | | | | M | M | M |
| Kenya | P (07/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Kiribati | P (08/94) | | S (09/2000) | | | | | M |
| Korea (Democratic People's Rep. of ) | P (10/94) | | P (10/03) | | | M | M | M |
| Korea (Rep of) | P (10/94) | * | S (09/2000) | M (01/95) | M (01/95) | M | M | M |
| Kuwait | P (08/02) | | | M (01/95) | M (01/95) | M | M | M |
| Kyrgyzstan | P (08/96) | * | | M (12/98) | M (12/98) | M | M | M |
| Lao People's Dem. Rep. | P (09/96) | | | | | M | M | M |
| Latvia | P (12/95) | * | | M (02/99) | M (02/99) | M | M | M |
| Lebanon | P (12/94) | * | | | | M | M | M |
| Lesotho | P (01/95) | | P (09/03) | M (04/95) | M (04/95) | M | M | M |
| Liberia | P | | P | | | | M | M |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| | 11/2000 | | (09/03) | | | | | |
| **Libyan Arab Jamahiriya** | P (07/01) | | | | | M | M | M |
| **Liechtenstein** | P (11/97) | | | M (09/95) | M (09/95) | | | M |
| **Lithuania** | P (02/96) | * | S (05/2000) | M (04/01) | M (04/01) | M | M | M |
| **Luxembourg** | P ((05/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| **Macao (China)** | | | | M (01/95) | M (01/95) | | | |
| **Madagascar** | P (03/96) | | S (09/2000) | M (11/95) | M (11/95) | M | M | M |
| **Malawi** | P ((02/94) | | S (05/2000) | M (04/95) | M (04/95) | M | M | M |
| **Malaysia** | P (06/94) | * | P (12/03) | M (01/95) | M (01/95) | M | M | M |
| **Maldives** | P (11/92) | * | P (09/03) | M (04/95) | M (04/95) | | | M |
| **Mali** | P (03/95) | | P (09/03) | M (04/95) | M (04/95) | M | M | M |
| **Malta** | P 12/2000 | | | M (01/95) | M (01/95) | M | M | M |
| **Marshall Islands** | P (10/92) | * | P (09/03) | | | | | |
| **Mauritania** | P (08/96) | * | | M (04/95) | M (04/95) | M | M | M |
| **Mauritius** | P (09/92) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| **Mexico** | P (03/93) | * | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| **Micronesia (Federates States of)** | P (06/94) | * | | | | | M | |
| **Moldova (Rep. of)** | P (10/95) | | P (09/03) | M (07/01) | M (07/01) | M | M | M |
| **Monaco** | P (11/92) | | S (05/2000) | | | | | M |
| **Mongolia** | P (09/93) | | P (10/03) | M (01/97) | M (01/97) | M | M | M |
| **Morocco** | P (08/95) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| **Mozambique** | P (08/95) | | P (09/03) | M (08/95) | M (08/95) | M | M | M |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| Myanmar | P (11/94) | | S (05/01) | M (01/95) | M (01/95) | M | M | M |
| Namibia | P (05/97) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Nauru | P (11/93) | | P (09/03) | | | | | |
| Nepal | P (11/93) | * | S (03/01) | | | M | M | M |
| Netherlands | P (07/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| New Caledonia | | | | | | M | | |
| New Zealand | P (09/93) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Nicaragua | P (11/95) | | P (09/03) | M (09/95) | M (09/95) | M | M | M |
| Niger | P (07/95) | * | S (05/2000) | M (12/96) | M (12/96) | M | M | M |
| Nigeria | P (08/94) | | P (10/03) | M (01/95) | M (01/95) | M | M | M |
| Niue | P (02/96) | * | P (09/03) | | | M | | |
| Norway | P (07/93) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Oman | P (02/95) | | P (09/03) | M (11/00) | M (11/00) | M | M | M |
| Pakistan | P (07/94) | * | S ((06/01) | M (01/95) | M (01/95) | M | M | M |
| Palau | P (01/99) | | P (09/03) | | | | | |
| Panama | P (01/95) | * | P (09/03) | M (09/97) | M (09/97) | M | M | M |
| Papua New Guinea | P (03/93) | | | M (06/96) | M (06/96) | | M | M |
| Paraguay | P (02/94) | | S (05/01) | M (01/95) | M (01/95) | M | M | M |
| Peru | P (06/93) | * | S ((05/2000) | M (01/95) | M (01/95) | M | M | M |
| Philippines | P (10/93) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Poland | P (01/96) | | S (05/2000) | M (07/95) | M (07/95) | M | M | M |
| Portugal | P (12/93) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| Qatar | P (08/96) | | | M (01/96) | M (01/96) | M | M | M |
| Romania | P (08/94) | * | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Russian Federation | P (04/95) | * | | | | M | M | M |
| Rwanda | P (05/96) | * | S (05/2000) | M (04/96) | M (04/96) | M | M | M |
| Saint Kitts and Nevis | P (01/93) | | P (09/03) | M (02/96) | M (02/96) | | M | M |
| Saint Lucia | P (07/93) | * | | M (01/95) | M (01/95) | | M | M |
| Saint Vincent and the Grenadines | P (06/96) | | P (11/03) | M (01/95) | M (01/95) | | | M |
| Samoa | P (02/94) | * | P (09/03) | | | | M | M |
| San Marino | P (10/94) | | | | | | | M |
| Sao Tome and Principe | P (09/99) | | | | | M | | M |
| Saudi Arabia | P (10/01) | | | | | M | M | M |
| Senegal | P (10/94) | * | S (10/2000) | M (01/95) | M (01/95) | M | M | M |
| Serbia and Montenegro | P (03/02) | | | | | M | M | M |
| Seychelles | P (09/92) | * | S (01/01) | | | | M | M |
| Sierra Leone | P (12/94) | | | M (07/95) | M (07/95) | M | M | M |
| Singapore | P (12/95) | | | M (01/95) | M (01/95) | M | M | M |
| Slovak Rep. | P (08/94) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Slovenia | P (07/96) | * | P (09/03) | M (07/95) | M (07/95) | M | M | M |
| Solomon Islands | P (10/95) | | | M (07/96) | M (07/96) | | M | |
| Somalia | | | | | | M | | M |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| South Africa | P (06/93) | | P (11/03) | M (01/95) | M (01/95) | M | M | M |
| Spain | P (12/93) | * | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Sri Lanka | P (03/94) | | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| Sudan | P (10/95) | | | | | M | M | M |
| Suriname | P (01/96) | | | M (01/95) | M (01/95) | M | M | M |
| Swaziland | P (11/94) | * | | M (01/95) | M (01/95) | M | M | M |
| Sweden | P (12/93) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Switzerland | P (11/94) | | P (09/03) | M (07/95) | M (07/95) | M | M | M |
| Syrian Arab Republic | P (01/96) | | | | | M | M | |
| Tajikistan | P (10/97) | | | | | M | | M |
| Chinese Taipei | | | | M (01/02) | M (01/02) | M | | |
| Tanzania (United Rep. of) | P (03/96) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Thailand | S (06/92) | | | M (01/95) | M (01/95) | M | M | M |
| The Former Yugoslav Rep. of Macedonia | P (12/97) | | S (07/2000) | M (04/03) | M (04/03) | M | M | M |
| Togo | P (10/95) | | S (05/2000) | M (04/95) | M (04/95) | M | M | M |
| Tonga | P (05/98) | | | | | | M | M |
| Trinidad and Tobago | P (08/96) | | P (09/03) | M (03/95) | M (03/95) | M | M | M |
| Tunisia | P (07/93) | * | P (09/03) | M (03/95) | M (03/95) | M | M | M |
| Turkey | P (02/97) | | S (05/2000) | M (03/95) | M (03/95) | M | M | M |
| Turkmenistan | P (09/96) | * | | | | M | | M |
| Tuvalu | P (12/02) | | | | | | | |

| Countries | CBD[1] | | CBD Biosafety Protocol | WTO[2] SPS | WTO TRIPs | OIE [3] | Codex Alimentarius[4] | WIPO[5] |
|---|---|---|---|---|---|---|---|---|
| | | NBSAPS[6] | | | | | | |
| Uganda | P (09/93) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Ukraine | P (02/95) | * | P (09/03) | | | M | | M |
| United Arab Emirates | P (02/2000) | | | M (04/96) | M (04/96) | M | M | M |
| United Kingdom | P (06/94) | * | S (05/2000) | M (01/95) | M (01/95) | M | M | M |
| United States of America | S (06/93) | | | M (01/95) | M (01/95) | M | M | M |
| Uruguay | P (11/93) | * | S (06/2001) | M (01/95) | M (01/95) | M | M | M |
| Uzbekistan | P (07/95) | * | | | | M | | M |
| Vanuatu | P (03/93) | | | | | M | M | |
| Venezuela | P (09/94) | | P (09/03) | M (01/95) | M (01/95) | M | M | M |
| Viet Nam | P (11/94) | * | | | | M | M | M |
| Yemen | P (02/96) | * | | | | M | M | M |
| Zambia | P (05/93) | | | M (01/95) | M (01/95) | M | M | M |
| Zimbabwe | P (11/94) | * | S (06/02) | M (03/95) | M (03/95) | M | M | M |

Explanatory note for the terms 'Signatory' (S) and 'Party' (P) and means of expressing state's consent to be bound by a treaty:

**Signatory**: Based on the provisions of the Vienna Convention on the Law of the Treaties (Articles 11-16), international treaties may provide for means of expressing consent to be bound by the treaty through signature, exchange of instruments constituting a treaty, ratification, acceptance, approval, accession or by any other means if so agreed. In cases where a treaty does not provide for signature to express the consent of a State to be bound by it, signature does not imply any legal obligation for the S State. On the contrary, signature expresses

the State's consent to the text of the treaty or, in another words, represents the method for the authentication of the treaty's text. For example, a State that has signed a treaty, which is subject to ratification, is not obliged to ratify.

**Party**: Except for cases where signature is a valid means of expressing consent to be bound by a treaty, the State can express such consent and thus become a P to the treaty by ratification, acceptance, approval or accession, based on the single treaty's provisions.

Ratification at the international level is effected by those organs which exercise the treaty-making power of the States. These organs, regularly the Head of States or their Governments (Heads of Government or Ministers for Foreign Affairs)7, sign an instrument of ratification to be delivered to the Depositary. An instrument of ratification, acceptance or approval becomes effective only when it is deposited with the Depositary.

Acceptance or approval. The State's consent to be bound by a treaty may be expressed by acceptance or approval under conditions similar to those which apply to ratification, therefore with the same legal effect (unless the treaty provides otherwise).

Accession or adherence or adhesion, as it is sometimes defined, is the means whereby a State may express its consent to be bound by a treaty which it has not signed. Accession has the same legal effect of ratification, acceptance or approval. However, unlike ratification it requires only the deposit of the instrument of accession without being preceded by signature.

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7 Or any other person acting in such a position for the time being or with full powers for that purpose issued by one of the above authorities.

# Annex II
## NATIONAL LEGISLATIVE FRAMEWORK
## RELEVANT TO ANGR MANAGEMENT – SOURCES

### Africa

● Text available in English       Δ National coordinator appointed
○ Text available in original language       ■ questionnaire provided
* Title or abstract are available

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | | |
|---|---|---|---|---|---|---|---|
| Angola | | | | | | | |
| Benin | | | * | * | country report | Δ | ■ |
| Botswana | | | | ● | FAOLEX | Δ | ■ |
| Burkina Faso | | | | | | Δ | |
| Burundi | | | | | | Δ | ■ |
| Cameroon | * | | | | country report FAOLEX | Δ | ■ |
| Cape Verde | | | | | | Δ | |
| Central African Republic | * | | | | country report FAOLEX | Δ | ■ |
| Chad | | | | | | Δ | |
| Comoros | | | | | | Δ | |
| Congo, Democratic Republic of | | | | | | Δ | ■ |
| Congo, Republic of | * | * | | * | country report | Δ | ■ |
| Côte d'Ivoire | | * | | | country report | Δ | ■ |
| Equatorial Guinea | * | | | * | questionnaire | Δ | |
| Eritrea | | | | | | | |
| Ethiopia | | | | | | Δ | |
| Gabon | | | | | | Δ | ■ |
| Gambia | | | | | | Δ | ■ |
| Ghana | | | | | | Δ | ■ |
| Guinea | | * | | * | questionnaire | Δ | |
| Guinea-Bissau | | | | | | Δ | ■ |
| Kenya | | | | ● | FAOLEX | Δ | ■ |
| Lesotho | | * | | * | questionnaire | Δ | ■ |
| Liberia | | | | | | | |
| Madagascar | | ○ | | | country report | Δ | ■ |

- ● Text available in English
- ○ Text available in original language
- * Title or abstract are available

Δ National coordinator appointed
■ Questionnaire provided

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | | |
|---|---|---|---|---|---|---|---|
| Malawi | | | ● | * | http://sdnp.org.mw/enviro/act/contents.html<br>web | Δ | ■ |
| Mali | | * | ○ | ○ | FAOLEX<br>country report | Δ | |
| Mauritius | ● | * | * | ● | http://cooperatives.gov.mu/actc o-op.htm<br>http://ncb.intnet.mu/moh/food act98/foodact.htm<br>questionnaire | Δ | |
| Mozambique | | ○ | ○ | ○ | FAOLEX | Δ | ■ |
| Namibia | | ● | | ● | FAOLEX | Δ | |
| Niger | | | | * | country report | Δ | ■ |
| Nigeria | | | | | | Δ | ■ |
| Sao Tome and Principe | | | * | * | country report | Δ | ■ |
| Senegal | | * | | | FAOLEX<br>questionnaire | Δ | ■ |
| Seychelles | | | | ● | FAOLEX | | |
| Sierra Leone | | | | | | Δ | |
| South Africa | | ● | ● | ● | http://agriculture.kzntl.gov.za/le gislation/agric_legislation.asp<br>FAOLEX | | |
| Swaziland | | | | | | Δ | |
| Tanzania | | | | | | Δ | ■ |
| Togo | | | | * | country report | | |
| Uganda | | ● | | | country report | Δ | ■ |
| Western Sahara | | | | | | | |
| Zambia | | | ● | ● | FAOLEX | Δ | ■ |
| Zimbabwe | | | | ● | FAOLEX | Δ | ■ |

● Text available in English       Δ National coordinator appointed
○ Text available in original language     ■ Questionnaire provided
 * Title or abstract are available

## Asia and the Pacific

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | | |
|---|---|---|---|---|---|---|---|
| Australia | | ● | | ● | FAOLEX | Δ | ■ |
| Bangladesh | | * | | | FAOLEX | Δ | ■ |
| Bhutan | | * | | | www.kuenselonline.com; News: 12 August 2003 | | ■ |
| Brunei Darussalam | | | | | | | |
| Cambodia | | | | | | Δ | ■ |
| Canton and Enderbury Islands | | | | | | | |
| China (incl. Hong Kong, Macau & Taiwan) | | * | * | ○ | FAOLEX country report | Δ | ■ |
| Cook Islands | | | | * | country report | | |
| East Timor | | | | | | | |
| Fiji | | | | | | Δ | |
| India | | ● | ● | ● | www.forests.tn.nic.in/biodiversity_act.htm text of 1972 version http://indiacode.nic.in/ | Δ | ■ |
| Indonesia | | | | * | country report | | |
| Japan | * | ● | * | | FAOLEX country report | Δ | ■ |
| Kiribati | | | | | | Δ | ■ |
| Korea, People's Democratic Republic | | | | | | | |
| Korea, Republic of | | * | * | * | www.loc.gov/law/glin/index.html | | |
| Laos | | | | | | Δ | ■ |
| Malaysia | * | * | ● | ● | questionnaire FAOLEX | Δ | ■ |
| Maldives | | | | | | | |
| Marshall Islands | | | | | | | |
| Micronesia, Federated States of | | | | | | | |
| Midway Islands | | | | | | | |

● Text available in English          Δ National coordinator appointed
○ Text available in original language   ■ Questionnaire provided
 * Title or abstract are available

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | | |
|---------|:---:|:---:|:---:|:---:|---|:---:|:---:|
| Mongolia | ● | * | ● | ● | www.investmongolia.com/ legislation.htm country report | Δ | ■ |
| Myanmar | | | | | | Δ | ■ |
| Nauru | | | | | | | |
| Nepal | | | | | | Δ | |
| New Zealand | | | | ● | FAOLEX | | |
| Niue | | | | | | | |
| Northern Mariana Islands | | | | | | | |
| Pakistan | | | | | | Δ | ■ |
| Palau | | | | | | | |
| Papua New Guinea | | | | | | Δ | ■ |
| Philippines | * | ● | ● | | www.psdn.org.ph/chmbio/ Philippines Environment Laws (The Chan Nobles Group) country report | Δ | |
| Samoa | | | | | | Δ | |
| Singapore | | | | | | | |
| Solomon Islands | | | | | | Δ | |
| Sri Lanka | * | * | * | * | country report | Δ | ■ |
| Thailand | | | | | | Δ | |
| Tonga | | | | | | | |
| Tuvalu | | | | | | | |
| Vanuatu | | | | | | Δ | |
| Viet Nam | | | | | | Δ | |

● Text available in English        Δ National coordinator appointed
○ Text available in original language     ■ Questionnaire provided
 * Title or abstract are available

## Europe

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---|---|---|---|---|---|---|
| Albania | * | * | * | * | country report<br>FAOLEX<br>questionnaire | Δ |
| Andorra | | | | | | |
| Armenia | | | | | | |
| Austria | | | | | questionnaire<br>www.ris.bka.gv.at/auswahl/<br>www.gentechnik.gv.at/gentechnik/B1_orientierung/B1_einfuehr_10514_set.html<br>www.europa.eu.int/comm/agriculture/rur/countries/au/index_en.htm | |
| Azerbaijan | | | | | | Δ<br>■ |
| Belarus | | | | | | Δ |
| Belgium | | | * | | www.afsca.fgov.be/indexfr.htm | Δ<br>■ |
| Bosnia and Herzegovina | | | | | | Δ |
| Bulgaria | | | | | | Δ |
| Croatia | | | | | FAOLEX | Δ<br>■ |
| Cyprus | | | | | | Δ<br>■ |
| Czech Republic | | * | | * | country report<br>questionnaire | Δ<br>■ |
| Denmark | | ● | | | FAOLEX | Δ<br>■ |
| Estonia | ● | ● | ● | ● | questionnaire | Δ<br>■ |
| Finland | | | | | | Δ |
| France | | | | | FAOLEX | Δ |
| Georgia | | | | | | |
| Germany | | | | | FAOLEX | Δ<br>■ |
| Greece | | | | | | Δ<br>■ |

● Text available in English                    Δ National coordinator appointed
○ Text available in original language          ■ Questionnaire provided
 * Title or abstract are available

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---|---|---|---|---|---|---|
| Holy See | | | | | | |
| Hungary | | | | | FAOLEX | Δ ■ |
| Iceland | | | | | | Δ |
| Ireland | | | | | | Δ ■ |
| Israel | | | | | FAOLEX | Δ |
| Italy | | | | | www.senato.it/parlam/leggi/elelemat.htm FAOLEX | |
| Latvia | | | | | | |
| Liechtenstein | | | | | | |
| Lithuania | | | | | | Δ ■ |
| Luxembourg | | | | | FAOLEX | |
| Macedonia, The Former Yugoslav Republic of | | | | | | |
| Malta | | | | | | Δ |
| Moldova, Republic of | | | | | | Δ |
| Monaco | | | | | | |
| Netherlands | | | | | FAOLEX | Δ ■ |
| Norway | | ● | | * | FAOLEX country report | Δ ■ |
| Poland | | | | | questionnaire | Δ ■ |
| Portugal | | | | | FAOLEX | Δ |
| Romania | | | | | | Δ |
| Russian Federation | | | | | FAOLEX | Δ ■ |
| San Marino | | | | | | |
| Serbia and Montenegro | | | | | country report | Δ ■ |
| Slovak Republic | * | * | * | * | country report | Δ ■ |
| Slovenia | | | | | questionnaire | Δ ■ |

● Text available in English      Δ National coordinator appointed
○ Text available in original language      ■ Questionnaire provided
 * Title or abstract are available

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---------|:---:|:---:|:---:|:---:|------|:---:|
| Spain | | | | | Ministerio de Administraciones Pùblicas - base de datos<br>Library of Congress-GLIN (Global Legal Information Network) | Δ |
| Sweden | * | | | * | country report | ■ |
| Switzerland | | | | | www.admin.ch/ch/f/rs/rs.html | Δ<br>■ |
| Turkey | | | | | FAOLEX | Δ<br>■ |
| Ukraine | | ● | | | FAOLEX | Δ |
| United Kingdom | | ● | ● | ● | FAOLEX<br>country report | Δ<br>■ |

## North America

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---------|:---:|:---:|:---:|:---:|------|:---:|
| Canada | | | | | | Δ<br>■ |
| United States of America | | * | * | ● | FAOLEX<br>www.loc.gov/law/glin/index.html<br>country report | Δ |

● Text available in English
○ Text available in original language
 * Title or abstract are available

Δ National coordinator appointed
■ Questionnaire provided

## Latin America and the Caribbean

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---|---|---|---|---|---|---|
| Antigua and Barbuda | | | | | | |
| Argentina | | | * | | FAOLEX<br>www.loc.gov/law/glin/index.html | Δ<br>■ |
| Bahamas | | | | | | Δ<br>■ |
| Barbados | | | | | | Δ |
| Belize | | ● | | | FAOLEX | Δ |
| Bolivia | * | * | * | * | country report | Δ<br>■ |
| Brazil | | | | | www.loc.gov/law/glin/index.html<br>FAOLEX | Δ<br>■ |
| Chile | | | | | www.loc.gov/law/glin/index.htm<br>FAOLEX | Δ<br>■ |
| Colombia | | | | * | www.loc.gov/law/glin/index.htm | Δ<br>■ |
| Costa Rica | | | | | | ■ |
| Cuba | | | | | FAOLEX | Δ |
| Dominica | | | | | | Δ |
| Dominican Republic | | | | | | |
| Ecuador | * | * | * | * | country report | Δ<br>■ |
| El Salvador | | | | | | Δ |
| Grenada | | | | | | |
| Guatemala | | | | | | Δ |
| Guyana | | | | | | |
| Haiti | | | | | | Δ<br>■ |
| Honduras | | | | * | www.loc.gov/law/glin/index.htm | |
| Jamaica | | | | | | Δ |
| Mexico | | | | | www.cddhcu.gob.mx/leyinfo/<br>country report | Δ<br>■ |
| Nicaragua | | | | | | Δ |
| Panama | | | | | | Δ |
| Paraguay | | | | | | Δ |

● Text available in English      Δ National coordinator appointed
○ Text available in original language      ■ Questionnaire provided
 * Title or abstract are available

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---|---|---|---|---|---|---|
| Peru | | | | | FAOLEX | Δ ■ |
| Saint Kitts and Nevis | | | | | | |
| Saint Lucia | | | | | | Δ |
| Saint Vincent and The Grenadines | | | | | | |
| Suriname | | | | | | |
| Trinidad and Tobago | | | | | | |
| Uruguay | | | | * | www.loc.gov/law/glin/index.htm | Δ ■ |
| Venezuela | | * | | | www.loc.gov/law/glin/index.htm | Δ ■ |

## Near East

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---|---|---|---|---|---|---|
| Afghanistan | | | | | | |
| Algeria | | | | | | |
| Bahrain | | | | | | |
| Djibouti | | | | | | Δ |
| Egypt | | | | | | Δ ■ |
| Iran, Islamic Republic of | | | | | | Δ |
| Iraq | | | | | | ■ |
| Jordan | | | | | | Δ ■ |
| Kazakhstan | | | | | | Δ |

● Text available in English      Δ National coordinator appointed
○ Text available in original language      ■ Questionnaire provided
 * Title or abstract are available

| COUNTRY | Institutions | Improvement | Conservation | Health | SOURCE | |
|---|---|---|---|---|---|---|
| Kuwait | | | | | FAOLEX | |
| Kyrgyzstan | | | | | | |
| Lebanon | | | | | | Δ |
| Libyan Arab Jamahiriya | | | | | | Δ |
| Mauritania | | | | | FAOLEX www.loc.gov/law/glin/index.html | Δ |
| Morocco | | | | | | |
| Oman | | | | | | Δ ■ |
| Palestine | | | | | | |
| Qatar | | | | | | |
| Saudi Arabia, Kingdom of | | | | | | |
| Somalia | | | | | | |
| Sudan | | | | | | Δ |
| Syria | | | | | | Δ ■ |
| Tajikistan | | ● | | | FAOLEX | Δ ■ |
| Tunisia | | | | | | Δ |
| Turkmenistan | | | | | | Δ ■ |
| United Arab Emirates | | | | | | |
| Uzbekistan | | | | | | Δ |
| Yemen | | | | | | Δ |

**QUESTIONNAIRE**
**ON THE STATE OF DEVELOPMENT**
**AND IMPLEMENTATION OF**
**LEGAL AND REGULATORY FRAMEWORK FOR**
**MANAGEMENT OF ANIMAL GENETIC RESOURCES**


**COUNTRY**          _____
**RESPONDENT**     _____

(please, feel free to provide any additional comments to the questionnaire)

**POLICIES and STRATEGIES**

**1. Does your country have a land use policy that influences agriculture sector?**

No                                                                              ☐
Currently being developed                                          ☐
Yes                                                                            ☐

     If yes, please provide coordinates (website address, or attach word
     file, if available):
     If developed, is it implemented?          No     ☐
                                                               Yes    ☐

     If not implemented what are the reasons?
     If implemented is it monitored?              No     ☐
                                                               Yes    ☐


**2. Does you country have a long-term agricultural policy/strategy which provides a vision for the future development and a role of agriculture sector in the national economy?**

No                                                                              ☐
Currently being developed                                          ☐
Yes                                                                            ☐

     If yes, please provide coordinates (website address, or attach word
     file, if available):
     If developed, is it implemented?          No     ☐
                                                               Yes    ☐

     If not implemented what are the reasons?
     If implemented is it monitored?              No     ☐
                                                               Yes    ☐

**3. Does your country have a separate strategy for livestock sector development?**

No                                                                    ☐
Currently being developed                                             ☐
Yes                                                                   ☐

    If yes, please provide coordinates (website address,
    or attach word file, if available):

    If developed, is it implemented?          No            ☐
                                               Yes           ☐

    If not implemented what are the reasons?

    If implemented is it monitored?            No            ☐
                                               Yes           ☐

**4. Has your country developed, in response to the Article 6 of the Convention on Biological Diversity, a National Biodiversity Strategy that addresses agro-biodiversity and animal genetic resources conservation and sustainable use?**

No                                                                    ☐
Currently being developed                                             ☐
Yes                                                                   ☐

    If yes, please provide coordinates (website address, or attach word
    file, if available):

    If developed, is it implemented?          No            ☐
                                               Yes           ☐

    If not implemented what are the reasons?

    If implemented is it monitored?            No            ☐
                                               Yes           ☐

**5. Does your country have policy on human health that addresses also issues of zoonosis prevention and safety of animal products?**

No                                                                    ☐
Currently being developed                                             ☐
Yes                                                                   ☐

    If yes, please provide coordinates (website address, or attach word
    file, if available):

    If developed, is it implemented?          No            ☐
                                               Yes           ☐

    If not implemented what are the reasons?

    If implemented is it monitored?            No            ☐
                                               Yes           ☐

**6. Does your country have a policy that supports development of civil society organizations and self-governing organizations that may play a vital role in agricultural/livestock sector, like farmers' unions and breeders' associations?**

No ☐
Currently being developed ☐
Yes ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?     No ☐
                                       Yes ☐

    If not implemented what are the reasons?
    If implemented is it monitored?     No ☐
                                         Yes ☐

## LEGAL FRAMEWORK (LAWS AND REGULATIONS)

**I.      National laws in compliance with international agreements**

**1. Has your country developed legislation on Sanitary and Phytosanitary Measures (SPS) in line with the World Trade Organisation SPS Agreement that provides national standards for domestically produced food and imported food products in harmony with *Codex Alimentarius* standards?**

No ☐
Currently being developed ☐
Yes ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?     No ☐
                                         Yes ☐

    If not implemented what are the reasons?
    If implemented is it monitored?     No ☐
                                         Yes ☐

**2. Has your country developed legislation on Sanitary and Phytosanitary Measures in line with the World Trade Organisations SPS Agreement that provides control over animal health in harmony with the Office International des Epizooties (OIE )standards?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):

| | | |
|---|---|---|
| If developed, is it implemented? | No | ☐ |
| | Yes | ☐ |

If not implemented what are the reasons?

| | | |
|---|---|---|
| If implemented is it monitored? | No | ☐ |
| | Yes | ☐ |

**3. Has your country developed legislation in line with the World Trade Organisation Trade Related Intellectual Property Rights (TRIPs) Agreement establishes various forms of intellectual property to be applied to animal genetic resources (such as *sui generis* systems of protection, trade marks, labelling or patenting, etc.)?**

| | |
|---|---|
| No | ☐ |
| Currently being developed | ☐ |
| Yes | ☐ |

If yes, please provide coordinates (website address, or attach word file, if available):

| | | |
|---|---|---|
| If developed, is it implemented? | No | ☐ |
| | Yes | ☐ |

If not implemented what are the reasons?

| | | |
|---|---|---|
| If implemented is it monitored? | No | ☐ |
| | Yes | ☐ |

**4. Does your country have law or regulations addressing Genetically Modified Organisms -related issues under the Biosafety Protocol of the Convention on Biological Diversity?**

| | |
|---|---|
| No | ☐ |
| Currently being developed | ☐ |
| Yes | ☐ |

If yes, please provide coordinates (website address, or attach word file, if available):

| | | |
|---|---|---|
| If developed, is it implemented? | No | ☐ |
| | Yes | ☐ |

If not implemented what are the reasons?

| | | |
|---|---|---|
| If implemented is it monitored? | No | ☐ |
| | Yes | ☐ |

II.      **National Laws and Regulations and Codes of Conduct**

A.      Land and Farm Management

**1. Does your country have law or regulations setting rules on access to agricultural land, establishment of farms, and requirements to conduct agricultural activities?**

No                                                      ☐
Currently being developed                               ☐
Yes                                                     ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?          No     ☐
                                          Yes    ☐

If not implemented what are the reasons?

If implemented is it monitored?           No     ☐
                                          Yes    ☐

**2.      Does your country have law or regulations on agricultural practices/ farm management to prevent negative effects of agriculture on environment (e.g. use of fertilizers and pest control, manure/waste products management etc.)?**

No                                                      ☐
Currently being developed                               ☐
Yes                                                     ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?          No     ☐
                                          Yes    ☐

If not implemented what are the reasons?

If implemented is it monitored?           No     ☐
                                          Yes    ☐

**3. Does your country have special law or regulations regarding establishment and management of industrial animal production enterprises?**

No                                                      ☐
Currently being developed                               ☐
Yes                                                     ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?              No      ☐
                                              Yes     ☐
If not implemented what are the reasons?
If implemented is it monitored?               No      ☐
                                              Yes     ☐

**4. Does your country have law or regulations supporting agricultural farms in difficult production systems (such as subsidies for less-favourite areas, e.g. mountainous areas)?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?          No      ☐
                                              Yes     ☐
    If not implemented what are the reasons?
    If implemented is it monitored?           No      ☐
                                              Yes     ☐

**5. Has your country implemented any incentive measures to promote given production systems/agricultural practices (such as subsidies, credit access, and infrastructure development support)?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?          No      ☐
                                              Yes     ☐
    If not implemented what are the reasons?
    If implemented is it monitored?           No      ☐
                                              Yes     ☐

B.          Animal Breeding and Production

**1. Does your country have law or regulations on animal breeding, that addresses various elements of breeding process: identification, herd books keeping, performance recording, breeding value evaluation and selection/crossbreeding programmes?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented? No ☐
Yes ☐

If not implemented what are the reasons?
If implemented is it monitored? No ☐
Yes ☐

**2. Does your country have law or regulations on animal reproduction including artificial insemination?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented? No ☐
Yes ☐

If not implemented what are the reasons?
If implemented is it monitored? No ☐
Yes ☐

**3.        Has your country implemented any incentive measures to promote given breeding systems or breeding material (such as subsidies for exotic material or breeding material from improvement schemes)?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented? No ☐
Yes ☐

If not implemented what are the reasons?

If implemented is it monitored?              No        ☐
                                             Yes       ☐

**4. Does your country have law or regulations setting rules for exchange of breeding stock and breeding material within the country (such as live animals, semen, ova, embryos)?**

No                                                     ☐
Currently being developed                              ☐
Yes                                                    ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?         No        ☐
                                                       Yes       ☐

    If not implemented what are the reasons?

    If implemented is it monitored?          No        ☐
                                                       Yes       ☐

**5. Does your country have law or regulations regarding import of breeding stock and breeding material?**

No                                                     ☐
Currently being developed                              ☐
Yes                                                    ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?         No        ☐
                                                       Yes       ☐

    If not implemented what are the reasons?

    If implemented is it monitored?          No        ☐
                                                       Yes       ☐

**6. Does your country have law or regulations regarding export of breeding stock and breeding material?**

No                                                     ☐
Currently being developed                              ☐
Yes                                                    ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?         No        ☐
                                                       Yes       ☐

    If not implemented what are the reasons?

    If implemented is it monitored?          No        ☐

Yes ☐

**7. Does your country have law or regulations providing rules or requirements for individuals/organizations, which are involved in animal breeding and improvement?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):
If developed, is it implemented?   No ☐
                                    Yes ☐

If not implemented what are the reasons?
If implemented is it monitored?    No ☐
                                    Yes ☐

**8. Does your country have law or regulations regarding animal welfare?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):
If developed, is it implemented?   No ☐
                                    Yes ☐

If not implemented what are the reasons?
If implemented is it monitored?    No ☐
                                    Yes ☐

**9. Does your country have law or regulations regarding marketing of animal products?**

No ☐
Currently being developed ☐
Yes ☐

If yes, please provide coordinates (website address, or attach word file, if available):
If developed, is it implemented?   No ☐
                                    Yes ☐

If not implemented what are the reasons?
If implemented is it monitored?    No ☐
                                    Yes ☐

**10. Does your country have law or regulations supporting agricultural research, including characterization and valuation of animal genetic resources?**

No                                                                  ☐
Currently being developed                                            ☐
Yes                                                                  ☐

     If yes, please provide coordinates (website address, or attach word file, if available):

     If developed, is it implemented?                    No      ☐
                                            Yes     ☐

     If not implemented what are the reasons?
     If implemented is it monitored?                     No      ☐
                                            Yes     ☐

C.          Biotechnology

**1. Does your country have law or regulations addressing biotechnology development and utilization relevant to agriculture and animal production?**

No                                                                  ☐
Currently being developed                                            ☐
Yes                                                                  ☐

     If yes, please provide coordinates (website address, or attach word file, if available):
     If developed, is it implemented?                    No      ☐
                                            Yes     ☐

     If not implemented what are the reasons?
     If implemented is it monitored?                     No      ☐
                                            Yes     ☐

D.          Conservation of Agro-biodiversity and Animal Genetic Resources

**1.          Does your country have law or regulations supporting conservation of agro-ecosystems and associated wildlife (such as agro-environmental programmes)?**

No                                                                  ☐
Currently being developed                                            ☐
Yes                                                                  ☐

     If yes, please provide coordinates (website address, or attach word file, if available):
     If developed, is it implemented?                    No      ☐
                                            Yes     ☐

If not implemented what are the reasons?

If implemented is it monitored?    No    ☐
                                   Yes   ☐

## 2. Does your country have law or regulations supporting conservation of animal genetic resources?

### a. *In-situ*

No                                        ☐
Currently being developed                 ☐
Yes                                       ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?    No    ☐
                                    Yes   ☐

If not implemented what are the reasons?

If implemented is it monitored?     No    ☐
                                    Yes   ☐

### b. *Ex-situ*

No                                        ☐
Currently being developed                 ☐
Yes                                       ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?    No    ☐
                                    Yes   ☐

If not implemented what are the reasons?

If implemented is it monitored?     No    ☐
                                    Yes   ☐

## E.        Animal Health

## 1. Does your country have law or regulations that introduce measures to prevent and control animal diseases?

No                                        ☐
Currently being developed                 ☐
Yes                                       ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?              No      ☐
                                              Yes     ☐
If not implemented what are the reasons?
If implemented is it monitored?               No      ☐
                                              Yes     ☐

**2. Does your country have law or regulations setting rules for stock movement?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?       No      ☐
                                                      Yes     ☐
    If not implemented what are the reasons?
    If implemented is it monitored?        No      ☐
                                                      Yes     ☐

**3. Does your country have law or regulations setting quarantine standards in case of importation of livestock on disease outbreaks?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

    If developed, is it implemented?       No      ☐
                                                      Yes     ☐
    If not implemented what are the reasons?
    If implemented is it monitored?        No      ☐
                                                      Yes     ☐

F.        Food Safety and Food Quality

**1. Does your country have law or regulations that set minimum quality standards for animal products?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

    If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?    No ☐
   Yes ☐

If not implemented what are the reasons?

If implemented is it monitored?    No ☐
   Yes ☐

**2. Does your country have law or regulations that provide for traceability of animal origin products in order to control animal–origin diseases?**

No    ☐
Currently being developed    ☐
Yes    ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?    No ☐
   Yes ☐

If not implemented what are the reasons?

If implemented is it monitored?    No ☐
   Yes ☐

**3. Does your country have law or regulations that introduce quality assurance schemes that ensure high quality and identify production chains?**

No    ☐
Currently being developed    ☐
Yes    ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?    No ☐
   Yes ☐

If not implemented what are the reasons?

If implemented is it monitored?    No ☐
   Yes ☐

**4. Does your country have law or regulations governing geographical, and breed and processing- related labelling of animal origin products (products of geographical identification, breed-origin products, organically produced products, traditional processing etc.)?**

No    ☐
Currently being developed    ☐
Yes    ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?            No        ☐
                                            Yes       ☐

If not implemented what are the reasons?
If implemented is it monitored?             No        ☐
                                            Yes       ☐


**5. Does your country have law or regulations supporting and enabling consumers' organizations to influence food market?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?            No        ☐
                                            Yes       ☐

If not implemented what are the reasons?
If implemented is it monitored?             No        ☐
                                            Yes       ☐


G.         Civil Society Organizations

**1. Does your country have law or regulations supporting establishment of breeders' societies and farmers' organizations and other civil society organizations that are stakeholders in animal production and breeding?**

No                                                    ☐
Currently being developed                             ☐
Yes                                                   ☐

If yes, please provide coordinates (website address, or attach word file, if available):

If developed, is it implemented?            No        ☐
                                            Yes       ☐

If not implemented what are the reasons?
If implemented is it monitored?             No        ☐
                                            Yes       ☐

**2. Does your country have law or regulations supporting development of local communities and establishing rights of local communities?**

No ☐
Currently being developed ☐
Yes ☐

      If yes, please provide coordinates (website address, or attach word file, if available):

      If developed, is it implemented?      No ☐
                                             Yes ☐

      If not implemented what are the reasons?

      If implemented is it monitored?      No ☐
                                             Yes ☐

**CUSTOMARY LAWS**

**Please identify areas relevant to animal genetic resources conservation and utilization that are regulated at local community level by customary laws**

**Please provide example of a chosen customary law, which has strong implications in animal breeding or production**

For purpose of this exercise a set of working definitions is provided, as follows:

**Policy: (not legally binding)**
Strategic directions for development within particular sectors of *inter alia*: economy, in compliance with obligations coming from relevant international agreements.

**Legal framework (legally binding)**
Set of laws to implement policy directions and regulate various activities within given sector

**Regulations (legally binding)**
Specific instruments, which are setting rules for practical implementation of the law.

**Customary law**
Involves patterns of usage as legal practice that became law through appropriately consistent application over time.

**Annex IV**
# DEFINITION TERMS RELATED TO THE
# MANAGEMENT OF ANIMAL GENETIC RESOURCES

**FARM ANIMAL GENETIC RESOURCES (ANGR):** those animal species that are used, or may be used, for the production of food and agriculture, and the populations within each of them. These populations within each species can be classified as wild and feral populations, landraces and primary populations, standardized breeds, selected lines, varieties, strains and any conserved genetic material; all of which are currently categorized as Breeds.

**BREED**: either a sub-specific group of domestic livestock with definable and identifiable external characteristics that enable it to be separated by visual appraisal from other similarly defined groups within the same species, or a group for which geographical and/or cultural separation from phenotypically similar groups has led to acceptance of its separate identity.

**LOCALLY ADAPTED BREEDS:** which have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country, **INDIGENOUS BREEDS,** also termed autochthonous or native breeds and originating from, adapted to and utilized in a particular geographical region, form a subset of the Locally Adapted Breeds;

**RECENTLY INTRODUCED BREEDS:** whose importation was within the last 5 or so generations for the species concerned, and which were imported over a relatively short period of time. These would include breeds that were imported in the recent past but that have not been reintroduced since that time; and

**CONTINUALLY IMPORTED BREEDS:** whose local gene pool is regularly replenished from one or more sources outside your country. Many of the breeds used in intensive production systems or marketed by international breeding companies would be in this category.

**EXOTIC BREEDS:** which are maintained in a different area from the one they were developed and including breeds that are not locally adapted. Exotic breeds comprise both **RECENTLY INTRODUCED BREEDS** and **CONTINUALLY IMPORTED BREEDS**.

**BREED AT RISK:** any breed that may become extinct if the factors causing its decline in numbers are not eliminated or mitigated. Breeds may be in danger of becoming extinct for a variety of reasons. Risk of extinction may result from, *inter alia*, low population size; direct and indirect impacts of policy at the farm, country or international levels; lack of proper breed organization; lack of adaptation to market demands or perceived as of lower performance. Breeds are categorized as to their risk status on the basis of, *inter alia*, the actual numbers of male and/or female breeding individuals and the percentage of pure-bred females.

**EXTINCT BREED:** when it is no longer possible to recreate the breed population. This situation becomes absolute when there are no breeding males or breeding females remaining. In reality extinction may be realized well before the loss of the last animal, gamete or embryo.

**POPULATION:** a generic term but when used in a genetic sense it defines an interbreeding group, and may refer to all the animals within a breed. The genetics of the population is concerned with the genetic of all individuals it comprises, and with the transmission from generation to generation of samples of the genetic variability associated with this population.

**INDIGENOUS SPECIES:** which belongs to an area where it has evolved; also called **NATIVE SPECIES**.

**DOMESTIC ANIMAL DIVERSITY (DAD):** the spectrum of genetic differences within each breed, and across all breeds within each domestic animal species, together with the species differences of interest for food and agriculture production.

**ASSESSMENT:** all activities associated with the description, analysis and reporting of DAD status and trends and their underlying causes, including the state of the art and capacity to manage this diversity, as well as country needs and priorities for effective management.

**ADAPTIVE MANAGEMENT:** management practices, technologies and policies that promote the positive and mitigate the negative impacts on the broad spectrum of biological diversity of animal production and its AnGR, whilst responding to the need to realize food security and sustainable agriculture and rural development; by expanding knowledge, understanding and awareness of the multiple goods and services provided by these resources.

**CAPACITY BUILDING:** strengthening the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage sustainably DAD so as to increase its benefits, and to promote awareness and responsible action. Capacity building involves education and training, technology transfer, organizational infrastructure, development of policy and of financial mechanisms.

**MAINSTREAMING:** in relation to action required for effective AnGR management, the main tasks for government, in the area of policy development and implementation. More formally: supporting the development of national plans and strategies for the conservation and sustainable use of DAD, including their integration in sectoral and cross-sectoral plans and programmes.

**CLEARING HOUSE MECHANISM (CHM):** an information exchange platform for AnGR management that reflects the recognition that co-operation and sharing of knowledge, expertise and other benefits among communities is necessary for effective characterization, utilization and conservation of DAD. CHM is based on a concept of voluntary contribution and unrestricted access to information.

**LOCAL KNOWLEDGE:** the unique knowledge existing within and developed by local communities, including but not limited to gender specific knowledge, that relates to AnGR management in a particular geographic area. Local Knowledge also encompasses 'Indigenous Knowledge' and 'Traditional Knowledge'.

**DOMESTIC(ATED) ANIMALS:** whose breeding and husbandry are controlled by human communities to obtain benefits or services from them. The process of domestication may take many generations of the species to be completed.

**MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES:** encompasses all technical, policy, and logistical operations involved in understanding (characterization), using and developing (utilization), maintaining (conservation), accessing, and sharing the benefits of animal genetic resources.

**CHARACTERIZATION OF ANIMAL GENETIC RESOURCES:** all activities associated with the description of AnGR aimed at better knowledge of these resources and their state. Characterization by a country of its AnGR

will incorporate development of necessary descriptors for use, identification of the country's sovereign AnGR; baseline and advanced surveying of these populations including their enumeration and visual description, their comparative genetic description in one or more production environments and of these environments, the valuation of AnGR, and ongoing monitoring of those at risk.

**BASE-LINE BREEDS SURVEY:** summary data describing the identification and observable characteristics, location, uses and general husbandry of the AnGR for each species used in the country for food and agriculture production.

## FIRST REPORT ON THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES - WORKING DEFINITIONS

**ADAPTIVE FITNESS:** a genetically determined complex of characteristics which enhance a breed's ability to reproduce and survive in a particular production environment. Also referred to as **ADAPTATION**.

**EVALUATION:** measurement of the characteristics that are important for production and adaptation, either of individual animals or of populations, most commonly in the context of comparative evaluation of the traits of animals or of populations.

**MODAD:** measurement of DAD within domestic animal species and identification of relationships, expressed as genetic distances among breeds, within each species.

**VALUATION:** description of the extent to which market values of AnGR reflect their 'real' or 'fair' value, accounting for all goods and services they may provide to current and future generations of humankind. In the case of market failures, market prices will differ from the value that society attaches to AnGR. The primary motivation for valuing AnGRs is to assist policy development and management decisions.

**CONSERVATION OF FARM ANIMAL GENETIC RESOURCES:** refers to all human activities including strategies, plans, policies and actions undertaken to ensure that the diversity of farm animal genetic resources is being maintained to contribute to food and agricultural production and productivity, now and in the future.

***In situ* CONSERVATION OF FARM ANIMAL GENETIC DIVERSITY:** all measures to maintain live animal breeding populations, including those involved in active breeding programmes in the agro-ecosystem where they either developed or are now normally found, together with husbandry activities that are undertaken to ensure the continued contribution of these resources to sustainable food and agricultural production, now and in the future.

***Ex situ* CONSERVATION OF FARM ANIMAL GENETIC DIVERSITY:** conservation of genetic material within living animals but out of the environment in which it developed (*Ex situ in vivo*), or external to the living animal in an artificial environment, usually under cryogenic conditions including, *inter alia*, the cryoconservation of semen, oocytes, embryos, cells or tissues (*Ex situ in vitro*). Note that *ex situ* conservation and *ex situ* preservation are considered here to be synonymous.

**GENEBANK:** the physical location for conservation of collections of well identified genetic material in the form of live animals, *in situ* or *ex situ (as conservation herds or flocks)*, or *ex situ* stored semen, oocytes, embryos, cells or tissues. Also referred to as Genomebank.

**FIRST REPORT ON THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES - WORKING DEFINITIONS**

**GENE POOL:** the total genetic information in all the genes in a breeding population at a given time.

**UTILIZATION OF FARM ANIMAL GENETIC RESOURCES:** the use and development of animal genetic resources for the production of food and agriculture. The use in production systems of AnGRs that already possess high levels of adaptive fitness to the environment concerned, and the deployment of sound genetic principles, will facilitate sustainable development of the AnGRs and the sustainable intensification of the production systems themselves. The wise use of AnGRs is possible without depleting domestic animal diversity. Development of AnGRs includes a broad mix of ongoing activities that must be well planned and executed for success, and compounded over time, hence with high value. It requires careful definition of breeding objectives, and the planning, establishment and maintenance of effective and efficient animal recording and breeding strategies.

**BREEDING STRATEGY:** all policy, technical and operational facets of the genetic improvement activity for a breed or for several breeds where crossing is involved; from the identification and planning of the total activity within the development objective for the animal population, through its implementation and further development phases, including, *inter alia*, ongoing animal recording and evaluation, dissemination of the improved genetic material, reviewing effectiveness and the progress being achieved as well as the socioeconomic dimensions of breeding strategy. The term **BREEDING PROGRAMME** should be taken as synonymous.

**BREEDING STRUCTURE:** the structure of the mating system for a population of one (straightbreeding) or more (crossbreeding) breeds. The term **MATING SYSTEM** should be taken as synonymous.

**GENETICALLY MODIFIED ORGANISMS (GMOS):** an organism that has been modified by the application of recombinant DNA technology also termed Living Modified organisms (LMOs).

**FARMING SYSTEM:** a contiguous population of farms that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Farming systems include all activities, both agricultural (cropping, pasture, livestock, as well as any horticultural, silvicultural and aquacultural elements, providing also for processing and marketing of commodities,) and non-agricultural, under the control of farm household units. Generally, consideration of farming systems should account for all inputs and outputs of each element of the system.

**SIZE OF FARMS:**

**SUBSISTENCE:** less than 50 percent of production is marketed.

**SMALLHOLDER:** small family farms with more than 50 percent of production marketed.

**SMALL-SCALE-COMMERCIAL:** medium family farms with more than 50 percent of production marketed.

**LARGE-SCALE-COMMERCIAL:** large farms or companies with all production marketed.

**SERVICES:** in relation to food and agricultural production, and particularly to AnGR management those supporting activities facilitating and enabling this production and management to succeed; such as: education, training, research and extension, animal recording and evaluation, artificial breeding, transport and marketing and so on. The term is also used in relation to the various contributions beyond food production provided by animals to humankind, such as employment generation, risk management, draught power, fibre, fuel fertilizer and landscape management.

**INFRASTRUCTURE:** The physical and organizational set up of the transportation network, communications system, financial institutions, and other public and private services necessary for economic activity.

**PRODUCTION SYSTEM:** all input-output relationships, over time, at a particular location. The relationships will include biological, climatic, economic, social, cultural and political factors, which combine to determine the production of a particular livestock enterprise. Also termed **PRODUCTION ENVIRONMENT**. Production systems range from areas where there is very little husbandry or human modification of the environment, to very intensive management systems where feed, climate, disease and other factors are controlled or managed by farmers. The level of animal husbandry or intervention varies enormously from region to region and from farm to farm. Thus, a common way to classify production environments is to group them according to the level of human intervention as:

**HIGH-INPUT PRODUCTION SYSTEM:** a production system where all rate-limiting inputs to animal production can be managed to ensure high levels of animal survival, reproduction and output. Output is constrained primarily by managerial decisions.

**MEDIUM-INPUT PRODUCTION SYSTEM:** a production system where management of the available resources has the scope to overcome the negative effects of the environment, although it is common for one or more factors to limit output, survival or reproduction in a serious fashion.

## FIRST REPORT ON THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES - WORKING DEFINITIONS

**LOW-INPUT PRODUCTION SYSTEM:** a production system where one or more rate-limiting inputs impose continuous or variable severe pressure on livestock, resulting in low survival, reproductive rate or output. Output and production risks are exposed to major influences, which may go beyond human management capacity.

**PRODUCTIVITY:** the ratio of output per unit of input. This ratio can then be applied at different levels, such as animal, unit of grazing area, or production enterprise. An equivalent term is **PRODUCTION EFFICIENCY**.

**SUSTAINABLE INTENSIFICATION OF PRODUCTION SYSTEMS:** the manipulation of inputs to, and outputs from, livestock production systems aimed at increasing production and/or productivity and/or changing product quality, while maintaining the longterm integrity of the systems and their surrounding environment, so as to meet the needs of both present and future human generations. Sustainable agricultural intensification respects the needs and aspirations of local and indigenous people, takes into account the roles and values of their locally adapted genetic resources, and considers the need to achieve long-term environmental sustainability within and beyond the agro-ecosystem.

**FOOD AND AGRICULTURAL PRODUCTION:** the outputs of food, fiber, fertilizer, draught and transportation, and other services such as employment generation and risk management that can be obtained from farm animal genetic resources.

**FOOD SECURITY:** exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Achieving food security means ensuring that sufficient food is available, that supplies are relatively stable and that those in need of food can obtain it.

**NATIONAL CO-ORDINATOR (NC):** the government-identified technical contact person for country development of the Global Strategy for the Management of Farm AnGR. He or she is responsible for assisting with the development of an effective country network and within-country co-

ordination of activities concerning the management of AnGR. The NC should be a member of or closely associated with the NCI.

**NATIONAL CO-ORDINATING INSTITUTION (NCI):** the government identified national institution that is responsible for implementing and maintaining an incountry network for country development of the Global Strategy for the Management of Farm AnGR.

**NATIONAL FOCAL POINT FOR THE MANAGEMENT OF ANGR (NFP):** includes both the National Co-ordinator (NC) and the National Co-ordinating Institution (NCI).

**STAKEHOLDER:** those affected by the outcome, negatively or positively, or those who can affect the outcome of a proposed intervention.

**REGIONAL FOCAL POINT (RFP):** desirably a country-driven regional institution facilitating regional communications, providing technical assistance and leadership, co-ordinating training, research and planning activities among countries, initiating development of regional policies, assisting with the identification priorities for action and project proposals for international collaboration, and interacting with government agencies, donors, research institutions and non-governmental organizations, and with the FAO Global Focus for the Management of AnGR.

**GLOBAL FOCAL POINT (GFP):** established at FAO headquarters in Rome, to develop and detail the framework for the Global Strategy for the Management of Farm Animal Genetic Resources, for country use, and to assist countries and regions to develop and implement AnGR management.

# ANNEX V
# LEGAL TERMINOLOGY

For a better understanding of the various national laws analysed in the present study, this annex provides an explanatory overview on the legal terminology.

The term **"legislation"** refers broadly to all legal texts which are promulgated by the legislative arm of the State exercising its legislative powers under the Constitution (see paragraph A below) or by the executive arm of the State exercising either its delegated power from the legislative branch (see paragraph B below) or its executive powers under the Constitution (see paragraph C below).

A.  The term **"laws"** (enabling, principal, basic, framework, authorising legislation) refers only to those texts adopted by the legislative branch. This term includes a **Law**, **Statute**, **Decree**, **Ordinance** or **Act** adopted by the national legislature or its equivalent (Parliament, Congress, National Assembly, or military ruling council). National laws usually take precedence over legal instruments, such as Municipal Ordinances or By-laws, which are adopted by the legislative branches of the country's political subdivisions or local authorities.

B.  The term **"subordinate legislation"** (subsidiary, enacting, implementing or delegated legislation) refers to all legal instruments promulgated by the executive branch exercising delegated legislative power (regulations, orders, notices, rules, schemes, bye laws, notifications, ordinances, instruments, directions, proclamations, determinations).

The responsible executive body or its subordinate may also, under specified Statutory authority, issue detailed statements such as a code of practice or a code of guidance. The legislation which authorises such a code determines the legal effect of the code (advisory or limited binding effect, admissibility in evidence, criterion in judicial or administrative review) and the consequences of its breach. In addition, procedural safeguards are usually included such as public participation or inquiry and review by the national legislature or responsible approving authority.

Other administrative legal texts (Rulings, Circulars, Guidelines, Administrative Notes, Decisions) are non-binding and not strictly speaking subordinate legislation. However, these non-binding legal texts assist the public entities involved to achieve the aims of the legislation and provide private entities with guidelines on how the competent authorities will act in enforcing and implementing the relevant legislation. These texts also contribute to the body of administrative law because courts and tribunals may rely upon such texts in reviewing administrative decision-making.

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