

ANIMAL GENETIC RESOURCES CONSERVATION AND DEVELOPMENT: THE ROLE OF FAO

CONSERVACIÓN Y DESARROLLO DE LOS RECURSOS GENÉTICOS ANIMALES:
EL PAPEL DE LA FAO

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SUMMARY

Livestock is an important component of food security in most developing countries, accounting for more than 40 percent of overall agricultural output, and serving as source of food, shelter and protection, energy, fuel, fertilizer and cash, and to maintain cultural values. FAO has estimated that demand for meat will double by 2030 (2000 basis) and demand for milk will more than double in this 30-year period. Animal genetic resources are disappearing rapidly worldwide: over the past 15 years, 300 out of 6000 breeds identified (www.fao.org/DAD-IS) have become extinct, and one to two breeds disappear every week. FAO has been requested by its member countries to develop and implement a global strategy for the management of farm animal genetic resources, to serve as a strategic framework to guide international efforts in animal genetic resources conservation and development, enhancing awareness of the multiple roles and values of animal genetic resources, and providing a basis for establishing national, regional and global policies, strategies and actions. The Commission on Genetic Resources for Food and Agriculture

(www.fao.org/ag) provides government guidance to FAO in the area of animal genetic resources, aided by the Intergovernmental Technical Working Group on Animal Genetic Resources. As part of the Global Strategy for the management of farm animal genetic resources FAO has invited 188 countries to participate in the First report on the state of the world's animal genetic resources, to be completed before 2006. To date 142 countries have accepted to participate in this global assessment and reporting effort, and submit country reports.

RESUMEN

Los recursos ganaderos son un componente importante de la seguridad alimentaria en la mayor parte de los países en desarrollo, correspondiendo a más de 40 p.100 del producto agrícola y sirviendo como fuente de alimentos, abrigo y protección, energía, combustible, fertilizantes, ahorros y valor cultural. FAO ha estimado que la demanda por carne se duplicará en 2030 (base

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2000) y que la demanda por leche será más del doble en este período de 30 años. Los recursos zoogenéticos están desapareciendo rápidamente en todo el mundo: en los últimos 15 años, 300 de 6000 razas identificadas (www.fao.org/DAD-IS) se han extinguido, y entre una y dos razas desaparecen por semana. Los países miembros de FAO han solicitado que ésta desarrolle e implemente una estrategia mundial para la gestión de los recursos zoogenéticos, que sirva de marco estratégico que guíe los esfuerzos internacionales para la conservación y el desarrollo de los recursos zoogenéticos, crear conciencia de los muchos roles y valores de los recursos zoogenéticos, y proveer una base para establecer políticas y acciones nacionales, regionales y mundiales. La Comisión sobre los Recursos Genéticos para la Alimentación y la Agricultura (www.fao.org/ag) provee las directrices de los gobiernos a FAO sobre recursos zoogenéticos, con la ayuda del Grupo de Trabajo Intergubernamental Técnico sobre los Recursos Zoogenéticos. Como parte de la estrategia mundial FAO ha invitado a 188 países a participar del Primer informe mundial sobre el estado de los recursos zoogenéticos, que se completará antes de 2006. Hasta la fecha 142 países han aceptado participar de este relevamiento e informe mundial, y preparar informes de país.

INTRODUCTION

The Food and Agriculture Organization of the United Nations (FAO, 2003a) (www.fao.org) is an intergovernmental organization founded in 1945 to fight hunger and poverty (www.fao.org). The poorest regions of the world, where malnutrition is a serious problem, are located primarily in Africa, Asia, Latin America and Eastern Europe. All of these regions are heavily dependent on livestock for the survival of their people, especially in low-income rural and peri-

urban communities.

FAO coordinates the Global strategy for the management of farm animal genetic resources at the request of its member countries. The main motivation for this international effort is the important erosion of animal genetic resources world-wide, and the increasing demand for animal products, especially in developing countries. Many communities in those countries depend on their local livestock for food security and sustainable livelihoods. An initial step in the context of the global strategy is the completion of the First report on the state of the world's animal genetic resources. This is a global assessment process starting with the preparation of national reports by participating countries, followed by regional syntheses, regional priority actions reports and a global priority actions report. It will guide actions, at national and regional levels, to conserve and develop farm animal genetic resources.

DOMESTIC ANIMAL DIVERSITY AT RISK

It has been estimated by FAO (2003a) (www.fao.org) that demand for meat will double by 2030 (2000 basis) and demand for milk will more than double in this 30-year period. The livestock sector in developing countries accounts for more than 40 percent of overall agricultural output, serving as source of food, such as milk, meat and eggs; shelter and protection based on fiber and hides; energy in the form of animal draught and transport; fuel and fertilizer utilizing animal manure;

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savings based on the cash value of animals; and as part of cultural and traditional values. Local communities manage and utilize local breeds for their survival. The disappearance or reduction of these locally adapted animal populations will force rural populations to migrate to already overcrowded urban areas, increasing food insecurity and provoking irreversible social disintegration of rural communities. Since there is a large interdependence between the livestock and the crop components in low-input production systems, the loss of local breeds will also have negative effects on the yield of local crops.

The locally adapted indigenous breeds in developing countries have low absolute production figures but often productivity turns out to be high if the production environment and the level of input are taken into consideration. Indigenous breeds produce and reproduce despite the sometimes very harsh environmental conditions, and are considered an important asset since they have developed over time valuable adaptive traits. This productivity in harsh environments is critically important since the vast majority of the world cannot sustain high input-high output systems.

The main cause of genetic erosion is the growing trend of global reliance on a very limited number of modern breeds suited for the high input-high output needs of industrial agriculture. Since about 50 percent of the total variation at the quantitative level is between breeds, utilizing just a few breeds would eliminate a considerable amount of variation in the species, in addition to the loss of unique gene

combinations existing in those breeds. The trend towards fewer breeds has been facilitated by the biotechnologies that make possible worldwide access to germplasm, and the improvement and easy movement of highly selected breeds. The result to date is that a large number of breeds and strains which were highly adapted to very specific environmental and feeding conditions are now threatened or extinct. During the history of domestic livestock breeding, all over the world, a very large number of breeds have been created, and many breeds have disappeared. For the past 100 years there has been a high increase in the rate of extinction of breeds and varieties which has been larger than the rate of formation of new breeds.

There are several primary factors responsible for diminishing animal genetic diversity, in particular in developing countries, but many of these factors apply to developed countries as well.

- The introduction of exotic germplasm of non-adapted breeds followed by rapid spread through indiscriminate crossbreeding. This has frequently arisen through wrong advice, based in many cases on biased and misleading comparisons between the indigenous breed and the exotic breed. The result has been that some indigenous breeds or local varieties have been lost or have their numbers greatly diminished.

- Changes in preferences to other breeds have occurred because of short-term social and economic influences. These may arise from agricultural policies promoting rapid solutions that are not sustainable in the long term, or from changes in the market requi-

rements for the products.

- The ecosystem in which the breed is producing may be under threat and the decline is a symptom of some wider forces at work. Traditional production systems may disappear and agricultural communities change activities or migrate. Natural disasters such as drought and diseases, and wars and other forms of political unrest and instability reduce livestock numbers. In many cases re-stocking policies rely on breeds that are not adapted to the environment.

An example of a local breed is the Meishan pig. This breed originates from China and is renowned for its high litter size. The breed has been used to produce commercial lines with high reproductive rates by international pig breeding companies. These developments have also uncovered a gene that has a large effect on litter size. There is a little doubt that the developing countries host the majority of the world's animal genetic resources, many of which will be of interest to other countries, in the short or long term. Ready access to this gene pool will also benefit developed countries.

THE GLOBAL STRATEGY FOR THE MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES

FAO has been engaged in the preparation of the Global Strategy for the management of farm animal genetic resources since 1993. It is intended to serve as a strategic framework to guide international efforts in animal genetic resources conservation and development, enhancing awareness of the

multiple roles and values of animal genetic resources, and providing a basis for establishing national, regional and global policies, strategies and actions. The Global Strategy can serve to facilitate and co-ordinate the activities of many independent organizations that have an interest in animal genetic resources within the broader context of sustainable agricultural and rural development. Its most important role is to assist countries in developing capacity to manage their animal genetic resources for food and agriculture. In this respect, countries need to plan, design and implement sound livestock production systems that are sustainable and cost-effective over time.

The Global Strategy will promote the establishment of cost-effective approaches to conserving animal genetic resources, which might not be of interest to farmers at present. The large number of currently threatened animal genetic resources requires an international effort to implement conservation, since the magnitude of this critical loss of domestic animal diversity cannot be solved by one or a few nations acting independently. It will provide the forum and focal point to discuss and debate policies and programmes and provide the mechanism for global reporting on the state of the world's animal genetic resources. This focal point is necessary to coordinate activities required to manage animal genetic resources, and to mobilize financial and human resources needed to build capacity in livestock management in developing countries. It will function to ensure that the required range of animal genetic resources is improved and maintained

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to contribute to the further development of new foods and food products, new medicines and manufactured goods, and other important goods and services. Conservation of these resources ensures their continued contribution to human development and well-being.

The Global Strategy has been designed to provide a comprehensive framework for the management of farm animal genetic resources. It consists of four inter-related components, each of them composed of several elements. The major components are:

- *Intergovernmental mechanism* to ensure direct government involvement and continuity of policy advice and support.

- *Planning and implementation infrastructure*, providing the enabling framework for country action, and regional and global support.

- *Technical programme of work*, aimed at supporting the effective management of animal genetic resources at country level.

- *Reporting and evaluation component*, to provide the critical data and information required for guidance, cost-effective planning and action, and progress evaluation in implementation of the Global Strategy.

The first component, the intergovernmental mechanism, is essential to ensure FAO member government and stakeholder involvement in the development, implementation and monitoring of the Global Strategy. The Commission on Genetic Resources for Food and Agriculture (www.fao.org/ag) has such a role, being responsible for providing government guidance to the FAO Secretariat in the area of animal genetic resources. The preparatory

work and the conduct of the Commission's activities are aided by the Intergovernmental Technical Working Group on Animal Genetic Resources (FAO, 2003b).

The second and key component of the Global Strategy is the country-based planning and implementation infrastructure with five structural elements:

- The Global Focal Point at FAO Headquarters leads the planning, development and implementation of the overall strategy, develops and maintains the information and communication systems, oversees preparation of guidelines, co-ordinates the activity in the regions, prepares reports and meeting documents, facilitates policy discussions, identifies training, education and technology transfer needs, develops programme and project proposals, and looks for donor resources.

- Regional Focal Points facilitate regional communications, provide technical assistance and leadership, coordinate training, research and planning activities in the countries, initiate development of regional policies, assist in identifying project priorities and proposals, and interact with government agencies, donors, research institutions and non-governmental organizations.

- National Focal Points lead, facilitate and coordinate country activities, identify capacity-building needs, develop project proposals, assist with the development and implementation of country policy, and interface with the range of country stakeholders, including the country focus for biological diversity, and with the Regional Focal Point and the Global Focal Point.

- The donor and stakeholder involvement mechanism is meant to mobilize the range of stakeholders, providing broad-based support for the Global Strategy. The Global Focal Point seeks to ensure stakeholder involvement in all major aspects of the Global Strategy, using a variety of communication means. The Stakeholder mechanism provides additional opportunity for non-governmental contribution.

- The Domestic Animal Diversity Information System (www.fao.org/dad-is) functions as the communications mechanism for the Global Strategy. It is a widely available and easily accessible global data and information system. Development and use of such a global facility makes it possible to effectively share data and information among countries. DAD-IS is an advanced communication and information tool that allows a rapid and cost effective distribution of guidelines, reports and meeting documents; and provides a mechanism to exchange views and address specific information requests, by linking breeders, scientists and policy makers. A key feature is the DAD-IS breeds database, which provides the basis of the Early Warning System for Animal Genetic Resources, and makes it possible to produce the World Watch List for Domestic Animal Diversity, the third edition of which was released in December 2000.

A *technical programme of work* covers several elements: national management plans for animal genetic resources, sustainable intensification, characterization, conservation, communication and emergency plans and response. To support the implementation of the technical programme of

work at country level, FAO has developed a series of guidelines, which provide an effective means to identify various technical issues and offer options for their solutions. Beyond primary guidelines, focused on the development of national farm animal genetic resources management plans, there are several secondary guidelines, addressing various aspects of animal genetic resources management, like measurement of domestic animal diversity (MoDAD), sustainable intensification of animal genetic resources, including animal recording and improvement in low- and medium-input production systems, breeding strategies development, and management of small populations at risk.

The final component provides for *reporting on the status of animal genetic resources* as well as monitoring and evaluation of progress in the implementation of the Global Strategy. The most important element of this component is the First report on the state of the world's animal genetic resources of which the findings will guide the further development of the Global Strategy and the follow-up actions.

FIRST REPORT ON THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES

As part of the Global Strategy for the management of farm animal genetic resources, FAO has invited 188 countries to participate in the First report on the state of the world's animal genetic resources, to be completed before 2006. To date 142 countries

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have accepted to participate of this global assessment and reporting effort, and submit country reports. Among items of the reports are the actual measures, if any, carried out for conservation of animal genetic resources. In Animal Genetic Resources Information Bulletin (FAO 2003a) number 30, available in www.fao.org/DAD-IS, the Guidelines for preparation of country reports can be found. These Guidelines are for use in assisting the development of country reports as strategic policy documentation covering the state of animal genetic resources, of the art and capacity to manage these resources, and of country needs and priorities.

The first step in the preparation of the First report on the state of the world's animal genetic resources will be the preparation of country reports. The objective of the country and global assessments is to provide a comprehensive analysis of the status and trends of the world's animal biodiversity and of their underlying causes, as well as of local knowledge of its management. The task is to go beyond description of the resources: to analyze and report on the state of these resources and capacities to manage them, to draw lessons from past experiences and identify problems and priorities. It also provides an important opportunity to look ahead and identify potential and likely needs, demands, trends, and national capacity building requirements in all aspects of the management of animal genetic resources. They must also assess the underlying policies that affect both the resources and the existing capacity to manage them. The strategic priority actions report and the

global report will be based on country reports, thematic studies and reports from international non-governmental organizations.

Country reports will be strategic policy documents covering the three strategic questions: Where are we? Where do we need to be? How do we get to where we need to be? The country reports will be used in planning and implementing priority country action. In addition, they will serve as documentation for developing regional and global strategic priority actions reports and subsequently, the first global report. Country reports should follow the agreed guidelines for the development of country reports and should consider the state of all important farm animal genetic resources in the country, the state of the art and the national capacity to manage these resources, as well as country priorities and needs for action.

Country reports provide an assessment in three major areas:

- *State of diversity*, an assessment of the state of conservation, erosion and utilization of farm animal agricultural biodiversity, and an analysis of the underlying processes.

- *State of country capacity* to manage animal genetic resources including existing policies, management plans, institutional infrastructures, human resources and equipment.

- *State of the art* and the available methodologies and technologies to assist farmers, breeders, scientists to better understand, use, develop, and conserve animal genetic resources, and thereby contribute to global food security and rural development.

In each country, the preparation of

the country report will also facilitate the development of a comprehensive national databank for use in planning and implementing follow up action, and in training and further capacity building. Countries were asked to nominate a National Focal Point designating their National Coordinator. The National Coordinator oversees the development of the country network and overall management of animal genetic resources, and is the official contact for communication with the Global Focal Point. Keeping in mind that the process involves both scientific and policy matters, the establishment of a National Consultative Committee is recommended to identify the primary areas and issues that need to be addressed in

the preparation of the country report, give it the recommended structure and scope, and coordinate its preparation. It is essential that the National Consultative Committee has diverse representation, and also develops a broader network to ensure opportunities for the full range of stakeholders to contribute to the country report. International Organizations are also being invited to contribute to the state of the world's animal genetic resources preparatory process in the form of reports. The long-term aim of this assessment and reporting process is for countries and regions to build on the analyses contained in the country reports to plan and implement appropriate national and regional animal genetic resources management strategies.

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