منظمة الأغذية والزراعة للأمم المتحدة
联合国粮食及农业组织
Food and Agriculture Organization of the United Nations
Organisation des Nations Unies pour l'alimentation et l'agriculture
Продовольственная и сельскохозяйственная организация Объединенных Наций
Organización de las Naciones Unidas para la Alimentación y la Agricultura

Progress report on the implementation of

the *Global Plan of Action for Animal Genetic Resources* - 2007 to 2013

Regional Focal Point for Latin America and the Caribbean

Strategic Priority Area 1: Characterization, Inventory and Monitoring of Trends and Associated Risks

Most relevant strategic priorities and actions:

Strategic Priority 1, Action 6: *"Strengthen global and **regional information systems** ..."*

Strategic Priority 1, Action 7: *"Establish or strengthen existing breed endangerment early-warning and response systems, through the further development of national, **regional** and global **risk monitoring mechanisms**..."*

General Information
The countries of Latin America and the Caribbean can be classified into three different groups in relation to their advances in AnGR: a first group formed by countries that started the conservation and characterization of their locally adapted livestock breeds long before the adoption of the GPA; a second group, formed by countries that have started some work for a limited number of species; and a third and largest group, formed by countries that recognize the need to start this work, but lack not only funding but also capacity of their human resources to do the job. Even though there are many cases of similar locally adapted breeds in neighbouring countries, they have a different name in each country. Phenotypically, the Casanare cattle from Colombia are very similar to the Pantaneiro cattle from Brazil; Criollo cattle from Argentina have many similarities to the Criollo Lageano from Brazil. Even with these similarities there are not many cases of exchange of locally adapted breeds. One exception is the Romosinuano cattle, originally from Colombia, which can be also found in Venezuela. in Costa Rica and in the US. This is not the case for commercial breeds. Zebu cattle from Brazil, mainly Nellore and Gyr can be found in the majority of Latin American countries, and even in the United States.

Inventories
A complaint common to almost all countries where there are agricultural censuses is that in the questionnaires being used, there is no breakdown by breed within a given species. With so much money invested in the agricultural census of each country, it is necessary to increase the awareness of governments about the importance of classifying the species by breed. It is known, however, that the high number of crossbred animals is always a complicating factor that has to be faced by the people doing the census.

Phenotypic Characterization
In the majority of the countries of the region, some phenotypic characterization is being done. Mostly on cattle breeds, followed by sheep, pigs and horses. Unfortunately, only in some countries this phenotypic characterization includes locally adapted breeds, since most of the characterization work is being done for commercial or recently imported breeds, with the work being carried out by Breeders' Associations. As expected, in the Andean countries, the emphasis on phenotypic characterization is on camelids and guinea pigs.

Molecular characterization
Only two countries of the region are involved in molecular characterization of their AnGR that covers all livestock species of

economic importance (Argentina and Brazil). Another five countries are genetically characterizing some livestock species, while in the other countries there is no work on genetic characterization whatsoever.

Criteria for assessing risk status
Most of the countries of the region are using FAO's criteria for assessing the risk status of their AnGR.

Emergency response
One of the biggest problems in the region is the complete inexistence of emergency response systems that could provide for immediate action to safeguard breeds at risk in all important livestock species within the countries. Only Mexico mentioned that this safeguarding is being done by the Environment and Natural Resources Ministry. Perhaps the way to address the lack of this mechanism in most countries would be to organize a training course in the region, in order to trigger this type of action in each country. This could be an action of FAO, using as instructors NCs of European countries where such a mechanism is already in place. The outcome of such training would be to allow the development of national risk monitoring mechanisms, which could lead to the development of a Regional Risk Monitoring Mechanism.

Barriers
Many barriers and obstacles to enhance inventory, characterization and monitoring programs are current in the countries of the region. Number one barrier is the lack of funds for these activities. The second barrier is the need for capacity building that would allow a larger number of people to get involved in these activities. Another important barrier in many countries of the region is the need to increase the awareness of the population about the importance of AnGR for food security.

Development of a Regional Information System
In a joint effort, USA, Brazil and Canada are developing an Information System for their AnGR. These three countries established a framework for cooperation and coordination for the joint development and operation of a robust Information System/Database that will be used to store information on in situ and ex situ conservation efforts in the three countries. Such a database will support the execution of conservation activities and facilitate, where desirable, the exchange of information about genetic resources and their use. In addition, the resulting database will be a valuable tool for breeders as they address food security issues involving AnGR. In the future, when this information system is fully developed, it will be offered to other countries of the region. Mexico has already showed interest in starting to use it as soon as possible. The Information System is on the last validation stage and should be launched on the first semester of 2014.

Strategic Priority Area 2: Sustainable Use and Development

Adequate national policies in place to promote the sustainable use of AnGR
Again there is a great difference in the situation of countries in relation to national policies in place to promote the sustainable use of AnGR. In Argentina, for instance, the policies in this area are first implemented through INTA (National Institute of Agricultural Technology) and later endorsed by the Ministry of Agriculture. The latter has a National Commission on Genetic Resources, CONARGEN, which acts in an advisory capacity. Brazil has a long story of utilization and conservation of its AnGR. The country created its AnGR Conservation Program in 1983. The first decade was devoted to the identification of the locally adapted breeds, as well as to quantifying their population size and determining their geographic location. A good example of one such breed is the Caracu cattle, which was threatened when the conservation program started, but today, due to the efforts of different research institutions and to a very strong Breeders' Association, is being used in a sustainable way, and numbers have increased to a total of almost 70,000 head.

In Colombia, the government established, in 1994, a policy of conservation of endangered breeds and species, creating a national system of conservation of AnGR, which includes only locally adapted breeds. A second effort started in 2005, when the Ministry of Agriculture, together with related institutions, developed a strategy of development and multiplication of these locally adapted breeds, in conjunction with producers, which aims to promote the sustainable use of AnGR.
In Ecuador, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries, is implementing the National Livestock Development (NLD), which among its components includes a system of animal identification and traceability, genetic improvement, animal health and silvo-pastoral management. The NLD will provide the rescue, conservation and sustainable use of AnGR, maintaining continuous monitoring, and thus optimizing resources and achieving efficient production of livestock.

In Mexico, the Federal Government has a national policy that considers the care of livestock genetic resources, and has implemented actions through livestock development programs.

In Uruguay, policies are set up by different institutions, depending on the species. For commercial breeds and locally adapted breeds (Criollo horses and Merilin sheep), the policies are set by Breeders' Associations. For the Pampa Rocha pig, policies are set up by the CERPAMPA (Faculty of Agronomy), while for the Criollo cattle, policies are established jointly by Faculty of

Veterinary Medicine and the General Command of the Army, which is responsible for the maintenance of the herd, in an old fortress, located in the border with Brazil.

Integration of agro-ecosystem approaches into the management of animal genetic resources
In the majority of the countries of the region, is not common an integration of the agro-ecosystem with the management of AnGR. However, in Mexico, the Federal Government, through its Sustainable Natural Resources Program, has implemented the Concept of Sustainable Production and Management of Livestock and Honeybees (PROGAN) with an agro-ecosystem approach, which aims to increase productivity, through the induction of technology for sustainable production practices, technical assistance, training and livestock insurance funds. Ecuador is creating an agro-ecosystem approach, reinforcing one of the policies of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries, which is the Sustainable Livestock Production, a national program being executed that aims to promote a friendly productive environment, allowing the participatory and inclusive development.

In Uruguay there are two experiences involving the development of the agro-ecosystem approach and meeting some of its principles: the locally adapted breed known as pig Pampa Rocha, integrating CERPAMPA, from Rocha, with the Southern Regional Center FAGRO, located in Canelones; and the Jersey breed linking the University of the Republic (UDELAR) from Montevideo and the Experimental Station of FAGRO, located in Salto. Under the scope of the newly approved Forest Code, the Brazilian Ministry of Agriculture is stimulating the adoption of an integration of Crop-Livestock-Forest (iLPF, in Portuguese), which consists of the implementation of different production systems of grains, fiber, meat, milk, and other agro-energy, in the same area, with sequential or rotational periods, leveraging synergies among them. Technical cooperation agreements have been signed with agencies, organizations and public and private institutions as a strategy for staff training and as a way to encourage the practice of iLPF.

Revision of breed development program for all major species and breeds
In many countries, breed development programs have been reviewed, but with differences in emphasis among species. In countries where active Breeders' Associations exist, breed development programs are one of their main roles. Countries such as Argentina, Brazil and Colombia have strong partnerships between their national agricultural research institutions and Breeders' Associations, with the involvement of researchers in analyses of data and in breed development programs.

Adaptive Traits
These are the most important "feature" of the locally adapted breeds. In Brazil, after a long period showing no interest at all in these breeds, there has been a change in the behavior of many breeders, towards their utilization in a sustainable way. They are re-inserting locally adapted breeds into their production systems. A recent research study showed the improvement in beef tenderness achieved by crossbreeding Curraleiro-Pe Duro with Nellore cattle, the breed that has by far the largest population in Brazil. Another example is the utilization of Caracu bulls in crossbreeding, with either European or zebu breeds.

Strategic Priority Area 3: Conservation

Most relevant strategic priorities and actions:

Strategic Priority 8, Action 2: *“Encourage the development and implementation of national and **regional in situ conservation programmes** for breeds and populations that are at risk ...”*

Strategic Priority 10: *"Develop and implement **regional** and global **long-term conservation strategies"***

Strategic Priority 9, Action 2: *“Establish or strengthen national and **regional facilities for ex situ conservation**, in particular cryogenic storage. Support the efforts of countries within a region that have opted to establish a regional facility.”*

Conservation policies and programs to protect breeds at risk in all important livestock species
Only few countries of the region had comprehensive policies and programs in place since before the adoption of the GPA. Some of them have programs only for some species and breeds, but the coverage has been expanded since the adoption of the GPA. In general, the countries that do not have such programs, are looking for funds to establish them.

In situ conservation
Six countries have in situ conservation programs to avoid the extinction of their locally adapted breeds. Argentina has a Network of Animal Gene Banks financed by INTA that includes six animal species: cattle, goats, camelids, poultry, sheep and honeybees. In Bolivia, some measures for in situ conservation have been implemented before the adoption of the GPA, with the participation of communities, and based on productive traits that these partners consider to be the important. Starting in the

1980s, the Brazilian Network of AnGR established Conservation Nuclei for the majority of locally adapted breeds, in order to prevent their extinction. These Nuclei are being kept in the habitats where the breeds developed. Besides collecting samples for cryopreservation and for genetic characterization, the program serves to increase awareness of society about the importance of AnGR. In Colombia, since 1994 the Ministry of Agriculture promoted the creation of national germplasm banks, and currently six breeds have been included in the program. Since then, the population of locally adapted cattle breeds have doubled in numbers, as well as in the number of breeders. In Mexico, the in situ conservation is coordinated by the Ministry of Environment and Natural Resources. In Paraguay, the Multidisciplinary Center for Scientific Research and Technology is identifying where the breeds are located, and describing their production environments.

Ex situ in vivo conservation
In Argentina, there is a Network of Animal Gene Banks financed by INTA, which includes six animal species. In Bolivia, these measures are being used exclusively for camelids, and began after the adoption of the GPA. (www.bancamel.org.bo). In Colombia, the Ministry of Agriculture began the conservation of Criollo cattle breeds in 1936 in different regions of the country. Later, similar conservation programs were initiated for sheep and pigs, and just recently, some state universities have started the conservation of poultry breeds. In Guatemala, some populations of locally adapted breeds are being maintained in private farms. The conservation of the Pampa Rocha pig, in Uruguay, is developed in the CERPAMPA, located in the Southern Regional Center FAGRO, located in Canelones. The conservation of Criollo cattle and Criollo sheep is being done in the National Park of San Miguel, by the Uruguayan Army.

Ex situ in vitro conservation
At the beginning of the 1990s, FAO decided to facilitate the creation of Regional Gene Banks. Training courses were organized in all regions, involving two people from each participant country: one geneticist and one veterinarian working in animal reproduction. In the introduction to the Training Manual of the course held by FAO in China, it was explained why the Gene Banks should be Regional: “From a genetic point of view, breeds found in different neighboring countries under different names may only be varieties of one breed. Characterization of the different populations and estimation of genetic distances between them will permit to limit the programs to really different breeds. New DNA technologies are powerful tools for this screening. From an economic point of view, preservation activities are costly, without immediate economic repercussions. It is absolutely necessary to share the costs between countries. On the other side, the implementation of Regional Gene Banks raises difficult problems, mostly as regards differences in health status and health regulations between countries: it may be difficult to import samples (semen, oocytes or embryos) from a given originator country to the country hosting the Regional Gene Bank, as well as to export back the samples to the originator country, or to any other willing to re-create the breed.” This last sentence proved to be so true that it was impossible to create, at that time, the Regional Gene Banks. Differences in health legislations among countries did not allow their creation. To start this process again, it would be necessary to discuss health legislation specific for genetic material that would only be stored in countries hosting Regional Gene Banks. The utilization of stored genetic material by other countries would only occur with permission of the owner country, and only if there were no risks associated. Even though the Regional Bank for LAC (duplicates would be stored in Argentina and in Brazil), has not been established, since then many countries have created their own National Gene Banks. Argentina has a cryobank that stores semen from threatened or rare cattle breeds, at the Balcarce Experimental Station (INTA). In Bolivia, there is some cryopreservation research for camelids, under development. The Brazilian Animal Gene Bank (AGB) for locally adapted breeds was created in 1983. At the beginning, only semen of cattle was collected and stored. Later, semen of sheep, goats, horses, donkeys and pigs were included. Presently, the Brazilian AGB has over 70,000 semen doses and 450 embryos of the majority of these species. The Colombian Ministry of Agriculture, through affiliated organizations such as the Colombian Agricultural Institute, and later by the Colombian Agricultural Research Corporation, since 1994, maintains a cryobank, comprising over 46,500 straws of semen from more than 480 sires of ten Colombian Criollo cattle breeds.

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

Most relevant strategic priorities and actions:

Strategic Priority 13 Action 3: *"Establish or strengthen, in partnership with other countries, as appropriate, relevant research, training and extension institutions, including national and **regional agricultural research systems**, to support efforts to characterize, inventory and monitor trends and associated risks, sustainably use and develop, and conserve animal genetic resources."*

Strategic Priority 17: *"**Establish Regional Focal Points and strengthen international networks"***

Strategic Priority 19 Action 1: *"**Support regional** and international **campaigns to raise awareness of the status of animal genetic resources for food and agriculture**, and seek to develop wide support at the government and institutional levels, as well as among the general public."*

Strategic Priority 23, Action 1: *"Assist all stakeholders to strengthen capacity-building, including by exchange of experience, by enhancing research and educational activities, and by providing **training opportunities, technology transfer and financial resources**, at national, **regional** and international **levels** ... "*

Implementation and financing (paragraph 57): *"The international networks for animal genetic resources should be encouraged and strengthened through implementation of the Global Plan of Action for Animal Genetic Resources, noting the **important role of Regional Focal Points and regional networking to build collaborative partnerships, to coordinate regional management efforts in animal genetic resources, to further develop information sharing, and for technical cooperation, training and research**."*

Creation of the Regional Focal Point for Latin America and the Caribbean (RFP-LAC) - The creation of the RFP-LAC in 2007 was the result of several driving forces. When the Global Focal Point first invited countries to appoint their NCs, many countries of the region used to send a different person for each meeting of the ITWG-AnGR or to the Regular Sessions of the CGRFA. Fortunately, this situation has changed, and the majority of the countries is now sending NCs to international meetings related to AnGR. This has increased the integration within the region, even before the creation of the RFP-LAC. We could say that the creation of the RFP-LAC was a result of the determination of the NCs, who understood that the region could be stronger and be heard as one voice during the FAO meetings. Another driving force was the interest in hosting the Regional Focal Point. Four institutions, from three different countries, offered their candidacy showing the importance of the RFP-LAC for the region. The help given by the FAO Regional Office for Latin America and the Caribbean in the creation of the interim Steering Committee (SC) should not be forgotten. The SC was responsible for establishing the rules for the election of the first RFP for the region, and later, for the election itself. The RFP-LAC is a reality, but there are many steps to be covered. Seeking financial support in order to organize training courses and regional and/or bilateral collaboration is the most important step to be covered.

First Call for Proposals under the Funding Strategy - LAC countries have been stimulated to submit projects to the First Call for Proposals under the Funding Strategy. Two Regional Projects: Peru and Bolivia (camelids); Argentina, Brazil and Costa Rica (goats), and two National Projects: Uruguay (sheep) and Chile (cattle and goats) have been approved.

Regional Conferences on AnGR
Several conferences are held in the region:
(1) Ibero American Network for Conservation and Utilization of AnGR (Combiand) which from 2009 to 2013, had Conferences in Ecuador, Brazil, Panama, Paraguay and Chile;
(2) Latin American and Caribbean Conference for Genetic Resources - SIRGEALC, which contemplates AnGR as well as Plants and Microbial GR (last four Conferences were held in Mexico, Chile, Ecuador and El Salvador); and
(3) Latin American Association of Animal Production (ALPA), with last meetings held in Peru, Puerto Rico, Uruguay and Cuba.
The last one, held in Havana, hosted a Symposium on Conservation of AnGR, organized by the Cuban NC for AnGR. In 2008, Brazil created its Brazilian Society of Genetic Resources with conferences held every two years, alternating with SIRGEALC. The last one, held in 2012 in Belém do Pará (Amazon Region), congregated more than 800 participants, with many of them from neighboring countries, showing the interest for this topic. Next Conference will be held in Santos, SP, in November 2014.

Regional Workshops for National Coordinators
The main opportunities for integrating NCs have been the Workshops for NCs that have been held in the region. The first one was held in May 2007, in Santiago, Chile, with the purpose of first discussing the election of the Regional Focal Point. It was attended by 10 NCs, two members of the Global Focal Point, and the Temporary SC. The opening speech was made by Dr. Jose Graziano da Silva, presently FAO's Director General, who was at the time the Director of FAO's Regional Office for LAC. Besides approving the rules for the election of the RFP-LAC, NCs discussed all available documents for the 11th Regular Session of CGRFA. During the discussion, emphasis was given to the proposed GPA, and the NCs of Jamaica and Brazil

reported the outcomes of the Friends of the Chair Meeting that had been held in Fribourg, Switzerland, in March of that same year. They stressed the importance of having a GPA for approval during the CGRFA Meeting, in order to have it presented for adoption by participant countries, during the International Conference on AnGR that would be held that same year in Interlaken, Switzerland. The second Regional Workshop was held in Brasilia, Brazil, in April 2008. It was the first one held after the election of Embrapa's National Center for Genetic Resources and Biotechnology as the RFP for LAC. The main issues discussed were the Rules of the RFP, and the election of its first Permanent SC. The Workshop was attended by 12 NCs, one officer of FAO's Regional Office, and two members of the Global Focal Point. The new version of DAD-IS was presented by the Global Focal Point and tested by the National Coordinators. Other four Regional Workshops occurred in Lima, Peru, in December 2008; in Pucón, Chile, in October 2009; in Puntarenas, Costa Rica, in November 2010; and in Santiago, Chile, in December 2011. At the last meeting, it was decided to extend the mandate of Embrapa Genetic Resources and Biotechnology as the RFP until 2012. During the 7th Meeeting of the ITWG-AnGR, NCs decided to postpone it, due to the election of the RFP as Chair of the ITWG.

IICAS's Sub Regional Network on Genetic Resources
REGENSUR: At a Sub-Regional level, actions have been initiated within the scope of a new platform created by the PROCISUR of the Inter-American Institute for Cooperation on Agriculture (IICA) of the Organizations of American States (OAS). The REGENSUR Platform was originally devoted to Plant Genetic Resources, but in 2010 it was extended to animals and microorganisms. REGENSUR includes the six countries of the Southern Cone of South America: Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay. Since then, many meetings have been organized and it is expected that common activities will reinforce the national plan of action for genetic resources of each one of the participating countries. The areas in which interaction among countries is envisaged are sustainable use, conservation, as well as policies and capacity building.

Implementation and financing of the Global Plan of Action for Animal Genetic Resources

Most relevant paragraph:

Implementation and financing (paragraph 50): *"... implementation of the Global Plan of Action for Animal Genetic Resources will require substantial and additional financial resources and long-term support for national, regional and international animal genetic resources programmes and priority activities, provided such incentives are consistent with relevant international agreements. The process should encourage and support the participation of governments and all relevant stakeholders.* ***Regional and international collaboration will be crucial****."*

Unfortunately, the majority of countries of the region do not count with financial resources for conservation of their locally adapted breeds, and very few international collaboration programs have been established. Among the projects submitted by countries of the region to the Funding Strategy, four have been approved: two regional projects: Peru and Bolivia (camelids); Argentina, Brazil and Costa Rica (goats), and two national projects: Uruguay (sheep) and Chile (cattle and goats).

In relation to collaboration on the conservation of breeds at risk, the establishment of a Regional Gene Bank would be extremely important for countries that do not have the infrastructure or the expertise to do so. However, it is important to remember that by the end of the 1980s, FAO initiated a concerted effort to establish Regional Gene Banks. Two countries of LAC region had been chosen to host duplicates of the Regional Gene Bank: Argentina and Brazil. Training Courses were offered in the different regions of the globe. The one held in Latin America, for Latin America and the Caribbean, involved 15 countries, which were trained on topics related to ex situ conservation. Two participants were invited from each country: one geneticist and one veterinarian working on reproduction. Even though these courses were considered a success, at the end of them all, it was concluded that huge differences in the animal health legislation of the participating countries would create enormous difficulties on the movement of the genetic material among countries. There would be cases in which the samples collected from one specific country could reach the Regional Gene Bank, be stored for some years, but could not get back to the original country because of its own restrictive legislation. To start this discussion again, it would be necessary to discuss health legislation specific for genetic material that would only be stored in a host country for conservation purposes, without permission to utilize it, unless negotiated and only if there were no risks associated.
The only national NGOs working on the conservation of breeds at risk, are Breeders' Associations, while the only international NGOs are WWF and IUCN, but that they only contemplate wildlife, and disregard locally adapted breeds of livestock, no matter how endangered they may be.

Argentina and Brazil established international research and education programs to assist developing countries to better manage their AnGR before the adoption of the GPA and that they have been strengthened since then. The Brazilian Agricultural Research Corporation created an international research program, that at the beginning was directed to African countries only, called "Africa Brazil Agricultural Innovation Marketplace" (www.africa-brazil.org), funded by Embrapa, Bill & Melinda Gates

Foundation and the World Bank. Due to its success, the program has been extended to Latin American and Caribbean countries. So, presently, the MKTPlace is an international initiative aiming to enhance agricultural innovation for development in Africa and LAC through the establishment and strengthening of partnerships between African and Latin American and Caribbean research-oriented organizations and Embrapa. It is composed of three basic pillars:

(1) a policy dialogue between the main authorities from Africa, LAC and Brazil supporting institutions focused on the development of a mutually agreed framework for collaboration;

(2) a forum for presentation and discussion of research for development ideas, including proposal selection, that is competitively supported; and

(3) support and implementation of joint agricultural research for development projects

The expected benefits of the MKTPlace are: promote knowledge exchange among African, Brazilian and LAC countries; promote investments in agricultural research and development; and last, mutually contribute to the achievement of the United Nations Millennium Development Goals.

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