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Conference paper

THE FAO GLOBAL NEW PROGRAMME FOR MANAGEMENT OF FARM ANIMAL GENETIC RESOURCES

K. Hammond

In recognition of the importance of domestic animal genetic resources, and of the sizable proportion which are currently at risk of loss, and in keeping with FAO's mandate under the Convention on Biological Diversity (CBD), FAO's governing bodies sought the development of a programme for the global management of these resources. This report addresses the basic design and early introduction of FAO's Global Programme for the Management of Farm Animal Genetic Resources. Activities underway, the range of opportunities for involvement and priorities are also outlined.

Conservation Imperatives for Animal Genetic Resources

With the projection of around 1000 of the possibly 4500 breeds of Earth's domestic animal species are currently at risk of extinction, with two-thirds of these in Europe (see Tab.1) and with so little known about most, scarce international funds cannot at this point be concentrated on a small number of breed rescue projects. Emphasis must be on implementing a sound global management infrastructure and a broad technical programme which has the potential to help many countries design and implement national action strategies, as required under the CBD. With these considerations firmly in mind, the imperatives for conservation of domestic animal genetic diversity can be stated:

1. Identify and understand those unique genetic resources which collectively comprise the global gene pools for each of the important animal species domesticated and used to provide food and agriculture.

2. Develop and properly utilise the associated diversity, to increase production and productivity, achieve sustainable agricultural systems and meet demands for specific product types. Hence, the effective use of breeds is also an essential component of conservation, and perhaps the most cost cost-effective; a further reason for enabling the development and use of more breeds.

3. Monitor particularly those resources which are currently represented by small populations of animals; or which are otherwise bing displaced by one or other breed replacement strategies.

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Keith Hammond, Animal Genetic Resources Group, Food and Agriculture Organization of the United Nations Rome, Italy

Table1. - BREEDS OF DOMESTIC ANIMALS AT HIGH RISK[1] BY SPECIES FOR THE EUROPEAN REGION

Species	Total No. Breeds on File	No. Breeds with Population Data& % of Total	No. of Breeds Categorized as Critical or Endangered and % of which are Maintained	No. of Breeds at High Risk of Loss (%)[1]
MAMMALIAN				
Ass	16	10 (63%)	7 (0%)	7 (70%)
Buffalo	2	2 (100)	0	0
Cattle	305	283 (93)	94 (55)	42 (15)
Goat	113	108 (96)	33 (21)	26 (24)
Horse	185	169 (91)	85 (28)	61 (36)
Pig	129	117 (91)	40 (43)	23 (20)
Speep	422	350 (83)	82 (40)	49 (14)
Total	1172	1039 (89%)	341 (39%)	208 (20%)
AVIAN				
Chicken	406	363 (89)	236 (56)	104 (29)
Turkey	14	14 (100)	7 (14)	6 (43)
Domestic Duck	33	30 (91)	25 (36)	16 (53)
Muscovy Duck	2	1 (50)	0	0
Domestic Goose	40	35 (88)	23 (4)	22 (63)
Guinea Fowl	1	1 (100)	0	0
Quail	8	8 (100)	4 (100)	0
Pigeon	6	4 (67)	2 (0)	2 (50)
Pheasant	2	2 (100)	0	0
Partridge	2	2 (100)	0	0
Ostrich	2	2 (100)	0	0
Total	516	462 (90%)	297 (50%)	150 (33%)
Regional Total	1688	1501 (89%)	638 (42%)	358 (24%)
Global total all 28 species	3882	2924 (75%)	881 (36%)	559 (19%)

[1] At risk determined based on breeds with population data having < 1000 breeding females or < 20 breeding males and for which there is no conservation program in place.
Source: Adapted from Scherf (1995).

4. Preserve the unique resources for which sufficient current demand cannot be engendered.

5. Train and involve people in management of these resources, including their best use and development, and in the maintenance of diversity.

6. Communicate to the world community the imprtance of our domestic animal genetic resources and of the associated diversity, its current exposure to loss and its ireplaceability.

Note particularly that development and use of genetic resources must be integral to an effective conservation effort for the domestic animal species.

Table 2. - LIST OF CAUSES FOR RISK OF LOSS OR EXTINCTION OF BREEDS

Reason	Description
Aid	Lack of incentive to develop and use breeds, giving preference to those few developed for use in high-input, high-output relatively benign enironments.
Product	Undue research and development emphasis placed on a specific product or trait leading to the rapid dissemination of one breed of animal to exclusion and loss of others.
Cross-breedin	Indiscriminate cross-breeding which can quickly lead to the loss of original breeds.
Storage	Failure of the cryopreservation equipment and inadequate supply of liquid nitrogen to store samples of semen, ova or embryos; or inadequate maintenance of animal populations for breeds not currently in use.
Technology	Introduction of new machinery to replace animal draught and transport resulting in permenent change of farming system.
Biotechnology	Poorly interpreted international genetic evaluation.
Violence	Mis-use of artificial insemination and embryo transfer leading to rapid replacement of indigenous breeds.
Disaster	Wars and other forms of socio-political instability. Natural disasters such as floods, drought or famine.

Working Definitions. Clear terminology is necessary in the conservation effort, to advance understanding, facilitate education and training, communicate successfully with the wider public and realise a common purpose in application. Terms must accommodate all practical situations. In the case of domestic animals, these need include all genetic resources and diversity associated with each species, both resources currently in use and those not in use, the common and the rare, the long developed and the new, the commercial lines and the research stocks. The conservation literature includes a number of terms that are not well understood in the domestic animal context. Interpretation of these terms to form working definitions for domestic animal diversity (DAD) is required if meaningful involvement in conservation of DAD by the necessary range of people is to be realized. A minimum set of working definitions is presented in Tab 3.

FAO's Blobal Management Programme: Structure and Work Elements

Based on the conservation imperatives, and in accordance with the resolutions of its governing body, FAO has designed the Global Programme for the Management of Farm Animal Genetic Resources. The Programme is now ready for launch.

The planned Global Strategy, recently supported by the FAO Council, involves 4 interdependent components:

1. An intergovernmental support mechanism for enabling direct government involvement and ensuring continuity of policy advice and support;

2. A geographically distributed and contry-based global structure, to assist and coordinate national actions throughout the world;

3. A techincal programme of activities grouped under seven elements; and

4. A cadre of experts to guide the Programme and maximize its costeffectiveness.

Table 3. - WORKING DEFINITIONS PROPOSED FOR MANAGEMENT OF ANIMAL GENETIC RESOURCES

Animal Genetic Resources (AnGR) - At the breed level, the genetically unique breed populations formed throughout all domestication processes within each animal species of interest to the production of food and agriculture, together with the immediate wild relatives of the species. Breed is accepted as a cultural rather than a technical term, i.e. to emphasize ownership, and also includes strains and resarch lines.
Domestic Animal Diversity (DAD) - The genetic variation or genetic diversity existing among the species, breeds and individuals, for all animal species which have been domesticated and their immediate wild relatives.
Conservation (of domestic animal diversity) - The sum total of all operations involved in the management of animal genetic resources, such that these resources are best used and developed to meet immediate and short term requirements for food and agriculture, and to ensure the diversity they harbour remeins available to meet possible longer term needs.
Conservation (in general) - The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration and enhancement of the natural enviroment (IUCN-UNEP-WWF and FAO-UNESCO, 1980).
In-situ Conservation - Primarily the active breeding of animal populations for food production and agriculture, such that diversity is both best utilized in the short term and maintained for the longer term. Operations pertaining to in-situ conservation include performance recording schemes, and development (breeding) programmes. In-situ conservation also includes ecosystem management and use for the sustainable production of food and agriculture. For wild relatives in-situ conservation - generally called in-situ preservation - is the maintenance of live populations of animals in their adaptive environment or as close to it as practically possible.
Ec-situ Conservation - In the context of conservation of domestic animal diversity, ex-situ conservation means storage. It involves the preservation as animals of a sample of a breed in a situation removed from its normal production environment or habitat, and/or the collection and cryopreservation of resources in the form of living semen, ova, embryos or tissues, which can be used to regenerate animals. While other methods of genetic manipulation, such as the use of various recombinant DNA techniques, may represent useful means of studying or improving breeds, but do not constitue ex-situ conservation, and may not serve conservation objectives. At present the technical capacity to regenerate whole organisms from isolated DNA does not exist.

Source: FAO, 1995.

The Country-Based Global Structure. The Convention on Biological Diversity clearly accepts each country's sovereignty over its genetic resources, and this alone means that the structure for a global programme of management must focus at the country level. The need for such a focus is further underscored by the fact that counttries possess different subsets of the global total of breeds forming esch domestic animal species. Additionally, countries are likely to become increasingly interdependent in seeking to access unique animal genetic resources from elsewhere. Hence, effective

conservation programmes by nations must provide the foundation for a successful global programme of management for each species.

Table 4.- PRINCIPLE DIFFERENCES OF SECTORS INVOLVED IN UTILIZATION AND CONSERVATION OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Aspect	Terrestrial Animals	Plants		Fish	
		Cropc	Forest	Fisheries	Aquaculture
No of species used for food	Less than 15 incl. poultry supply most	>100 but 4 supply about 60% and 10-12 about 75%	Several hundred for food and thousands for other uses	More than 1000	200-400
Mobility of organism	Mobile	Immobile	Immobile	Mobile	Mobile
Potential of many diseases to spread and impact within and over spacies	High	Low	Moderate	Low	Low
Fecundity	Low Medium with Biotechnologies	High	High	High	High
Cost of producing unit	High	Low	Medium to Low	Low	Low
Level of domestication	High	High	Medium to Low	None	Low
No of varieties and breeds in each species	Few to moderate	Many	Few	Very few	Few/moderate
State of knowledge about genetic resources	Medium/low	High	Medium to Low	Low	Medium
Location of resource	Farms pastures some nature	Farms	Nature some farms	Nature	Farms and nature
Common/Private property resource	Private	Private	Private and some public	Common	Private
Wild Relatives exist	Few	Some	All	All	All
Dispersal ability Impact biotechnologies on dispersal ability	Low High	Medium Low	Low High	High Low	Medium to high Low
Ease to storage/trasnport of live material	Moderate to difficult	Very easy	Easy to difficult	Moderate	Moderate
Biosafety record (genetically modified organisms)	Limited but appears good	Extensive and good	Moderate and good	Non-existent	Extremely limited and inconclusive
Genebanking-seed	Sperm and embryos possible not oocytes; Continuous freezing and strict hygiene essential	Storage of seeds and embryos easy to difficult. Freezing not required		Sperm only Continuous freezing and strict hygiene essential	

Source: FAO, 1995.

The Global FAO Programme provides the structure for achieving country-based emphasis combined with the necessary regional and global coordination of policy and effort. This primary level in the global infrastructure will provide for the early implementation of the necessary within-country management networks and enebale

countries to design, implement and maintain comprehensive national strategies for the management of their animal genetic resources. Scarce financial resources are concentrated on initiating the key infrastructure required. Some aspects of the Programme are already beging implemented although complete implementation will take some years and will depend on strong collaborative support for the Programme.

National Focal Point for each country, comprising a coordinating institution and a country technical contact nominated by, and strongly linked to, the government and to the regional focal point. The government must be responsible for the within-country component and can contribute internationally through the intergovernmental mechanism. This coordinator will be the point of contact for the countrys involvement in the FAO AnGR Programme and will assist in establishing and maintaining the essential incountry network. To date, 49 countries have established focal points: 37 in Europe (Table 5 for list) and 12 in Asia.

Table 5. - SUMMARY OF STATE-OF-THE-ART IN CRYOPRESERVATION FOR THE MOST IMPORTANT DOMESTIC SPECIES. STATUS OF TECHNOLOGY IDENTIFIED AS: ROUTINE TECHNIQUE AVAILABLE (RT), TECHNIQUE NEEDS FURTHER DEVELOPMENT PRIOR TO COMMERCIAL USE (PND), NO TECHNIQUE YET AVAILABLE (NP), OR CURRENT STATUS OF TECHNOLOGY UNKNOWN (SU).

Species	Semen	Ova	Embryos
Cattle	RT	PND	RT
Buffalo	RT	SU	PND
Goats	RT	SU	RT
Sheep	RT	SU	RT
Pigs	PND	SU	NP
Horses	RT	SU	RT
Asses	RT	SU	SU
Lamoids	RT	SU	SU
Camels	RT	SU	SU
Chickens	PND[1,2]	NP	PND[3]
Turkeys	PND[1,2]	NP	NP
Ducks	SU	NP	NP
Goose	SU	NP	NP

Source: Thibier et al. (1995); [1] Etches et al. (1995); [2] Reedy et al. (1995) and [3] Kino et al. (1995)

Regional Focus in each major genetic storehouse region of the world, to help develop effective national coordinators, design and implement effective regional networks as integral components of the global structure, help achieve early and wide introduction of national strategies, and trigger a range of most effective projects covering the conservation complex for domestic animals. The regional focuses will need to be established with the assistance of ecxra-budgetary funds. Regional focal points are planned for Asia and the Pacific; Europe; the Americas; Africa; and, the Near East and Mediterranean. The regional focal point for Asia and the Pacific has

now been initiated in Bangkok through funding from Japan, and has qauickly demonstrated the great value, at least early on, of this level of focus.

Global Focus for the Programme is being established at FAO headquarters to facilitate, communicate and coordinatze the global effort. This includes developing the necessary modalities for countries and assisting them in establishing their management strategies for AnGR; developing, implementing and maintaining the Domestic Animal Diversity Information System (DAD-IS); communicating the issues globally; maintaining the Early Warning System for AnGR; involving the range of governmental, non-governmental and intergovernmental parties essential for the Programme's success; servicing the intergovernmental mechanism; and seeking the essential extrabudgetary funding for the Programme.

Work Elements- The structure must be accompanied by a cost-effective programme of work if the global management is to be effective in achieving the imperatives over time.

I) Domestic Animal Diversity Information System. A key feature in supporting the global operational structure is the Domestic Animal Diversity Information System (DAD-IS). DAD-IS, currently under development, will form the information axis for all aspects of the Programme, and will utilize the Internet to enable low-cost, effective, ongoing communication and information transfer. A prototype of the first stage of DAD-IS will be field tested in late 1995. DAD-IS will serve:

To accommodate the range of essential and unique databases for the Programme covering the global inventory and description and monitoring of resources for both breeds in use and genebanks, and for Project MoDAD (see below); and to link in other specific genetic databases under development elsewhere;

To provide The Global Early Warning System for AnGR and to facilitate continuous updating and ongoing access to this;

To lower the cost and increase the amount and effectiveness of training and education in animal conservation genetics and procedures, through a system of shared expertise, information and computer assisted learning packages;

To serve as a central and reliable source of aids for experimental design and data analysis, in order to increase cost-effectiveness of, and capacity for, research;

To provide the global bibliography for AnGR;

To assist in Programme management at the country, regional and global levels, and execution of activities including the effective networking in project development and management; and,

To facilitate active involvement of the world community in the Global Programme.

II) Characterization. Establishing the magnitude of existing animal genetic diversity, and reliable rates of loss are corner stones for the Programme. The enormity of this task is highlighted by the fact that globally, there are some 4,500 uniqaue breeds, comprising the 40 + species with some in most countries and largely no systematic monitoring in place and very limited baseline information available. FAO's Global Databank for AnGR now includes basic descriptive dat on roughly 85 % of these known breeds representing 28 spacies. The population data provided through surveys enables the monitoring of breeds at risk of extinction. This information was first summarized in the FAO/UNEP World Watch List for DAD (Loftur and Scherf,

1993). Via DAD-IS countries will both maintain and utilize information in the Databank, with this being regularly updated to incorporate missing data and used as a mechanism to monitor breed genetic resources at risk and rates of loss.

Characterizing Animal Genetic Diversity - Comprehensive genetic evaluation at the breed level to cover all breeds for both current and future production potential for all primary production environments is not feasible nor required. Human and financial resources devoted to the management process in each country will continue to be at a premium over time. To help overcome this continuing difficulty, knowledge of the amount of breed-level variation in each species and of the size of each breeds unique contribution to this will assist priority setting for overall AnGR management. To better understand this relative uniqueness of animal genetic resources, a global research project in genetic distancing is planned as a critical characterization activity (Barker et al., 1993). This activity is entitled the Global Project for the Maintenance of Domestic Animal Genetic Diversity (Project MoDAD). Project MoDAD will utilize microsatellite technology and initially focus on the analysis of genetic variation within some 14 species accounting for above 90 % of food and agriculture production globally. The primary objective of Project MoDAD is to substantially increase the costeffectiveness of the total Global Programme by establishing the comparative uniqueness of genetic resources in each species to aid rationalization of the total management task for countries and globally. This will be achieved primarily by directly utilizing MoDAD's results to objectively reduce the number of breeds that will need to be maintained. Secondary objectives of Project MoDAD are to establish global repositories for both AnGR microsatellite data and DNA, for enabling more effective research and use in capacity building; and to identify breed combinations having highest potential for heterosis for improvement in traits related to adaptation. Project MoDAD will benefit all nations. A detailed formulation document for the project, for use in assisting countries to be involved is available from FAO.

Mechanisms for Conserving Animal Genetic Resources - Conservation is not an end in itself but a means of ensuring that animal genetic resources are better understood and available and more effectively used and developed by present and future generations. Once genetic resources have been identified and characterized, there are 2 basic conservation activities which may then be defined as either in-situ or ex-situ.

III) In-situ Conservation. Generation and loss of alleles (alternative forms of each of the 100,000 or so genes carried by each animal) is a dynamic process which sould be maintained at about equilibrium through sound management. The strategy for the global *in-situ* activity emphasizes "wise use" of indigenous animal genetic resources by establishing and implement breeding goals and strategies for sustainable production systems. Effective development of more of these adapted resources to meet the requirements is all important and will form the focus of FAO's *in-situ* emphasis. Because *in-situ* conservation involves the maintenance of live populations of animals in their adaptive environment, animal populations continue to evolve and be developed for more effective use. Infrastructure for animal recording and breeding is well established for developed countries. But infrastructure which is appropriate to developing country systems remains scarce. Modalities for the simplified animal recording,

genetic development and dissemination are needed for each species for a range of national livestock structures of developing countries.

IV) Ex-situ Conservation. Includes cryogenic preservation and the maintenance as animal populations of breeds of domesticated species in farm parks, zoos and locations away from the environment in which they are being developed; in effect this is storage of AnGR for which farmers in a country are not currently interested in using. The biggest shortcoming of cryogenic *ex-situ* genebanks is that, once stored, animal genetic resources are removed from the evolutionary process they undergo in nature; and unless a concerted effort is made, the level of knowledge about them is also frozen. Most *ex-situ* conservation is likely to utilize cryopreservation at least for the larger species. However, with long generation intervals of some domestic species regeneration of live animal populations of adequate size from cryopreserved material can be a time consuming and otherwise costly process. Cryopreservation is technologically demanding and not yet developed for storing both male and female gametes of all species of interest. Table 5 provides a summary of the current state of the art for cryopreservation of semen, ova and embryos for several livestock species. Additionally, a range of quarantine issues must be overcome before much international storege of and access to such material can be effective for the domestic animal species.

The Global Programmes's *ex-situ* conservation strategy is still being developed but is based on the use of live animal populations wherever possible, becked up by cryopreservation where practical technology exists or can be developed, combining with-in country genebanks with global repositories of last resort. This strategy is in keeping with the Convention on Biological Diversity. Interested governments, NGOs, research institutions, and private enterprises would also be encouraged to maintain *in vivo* samples of breeds at risk, with national inventories of these being established and maintained current, so that the genetic resources are directly available for use and study.

In-situ and *ex-situ* conservation are complementary, not mutually exclusive; their application for a particular AnGR depending on farmers current use of it and comparative uniqueness. Further, frozen germplasm can play an important role in the support of *in-situ* breeding strategies. For example, the use of artificial insemination (AI) in *in-situ* conservation of populations may enable much greater male selection differentials and dissemination than would be practical via natural mating using live adult males. The use of AI in beck-crossing breeding systems may enable efficient regeneration of a population and alternate use of male breeds in reciprocal crossbreeding systems may also help achieve more productive and sustainable systems.

V) Action Plans and Guidelines. The Global Programme provides assistance to countries in the development and implementation of comprehensive and practical guidelines for designing National Action Strategies for the management of animal genetic resources, to also harmonize with the provisions of the CBD. The Global Action Strategy will be further developed by integrating all national action plans, and will be continually updated as knowledge, technology, the negotiation of the CBD by member countries and implementation of policies progress.

Human and financial resources must be used within and across countries to best effect. To help carefully target all available resources early in the Programme, a further activity is already underway in some parts of the world involving the conduct of Project

Identification Missions. These missions will establish a global portfolio of the most effective conservation activities, ready for formulation, funding and execution, to build on the basic framework now being implemented. The specially designed missions are being trust funded by various donors and focus on the following regions: 1) China, 2) and 3) Sub-Saharan Africa (francophone and anglophone), 4) Central and Estern Europe, 5) former USSR, 6) and 7) Latin America and the Caribbean (split into 2 sub-regions), 8) Near East and the Mediterranean, and 9) the Indian sub-continent. The first four of the intended nine missions are underway, with the remainder still to be funded. At this meeting, Mr Boyazoglu will discuss the Mission Report for Central and Eastern Europe.

VI) International Instruments. The global activity for conservation and use of plant genetic resources operates with technical input from FAO's intergovernmental Commission on Plant Genetic Resources. No such mechanism is in place to facilitate intergovernmental input to the menagement of AnGR. As some of the technical logistics, and the policy and legal issues, are fundamentally similar for both plants and animals, and because of the need to promote the development and maintenance of more sustainable agriculture systems, and of the need for governments to review the progress of this Global Programme, plans are underway to expand the Commission on Plant Genetic Resources to include domestic animals under the title of the Commission on Genetic Resources on Food and Agriculture.

Implications

The outcomes being sought by FAO's Global Programme for Management of Farm Animal Genetic Resources are inventory control and early warning; comparative description of breeds; rationalization of the total longterm management activity; more effective development and sustainable use of a greater range of unique resources; a much higher level of public awareness of the range of issues; major reduction in the numbe of breeds at high risk of loss; maintenace of and ready acces to the more unique AnGR; an increase in and more effective training and capacity building; and helping countries to meet their obligations under the CBD. DAD represents a resource that is critical for achieving food security for the rapidly growing human population, not only with respect to the local or national situation, but also because of countries increasing interdependence for unique animal genetic resources. The country-based global structure of The Programme is designed to recognise and emphasise responsibility and activities within countries, to involve countries and other essential parties, to maximize opportunities for conservation action, including development and use, and to fully align with the CBD.

The Programme introduces some changes of emphasis to and a broadening of our long-accepted approach to animal breeding principles and practice, to harmonize with the decisions of a large section of the world community. Much remains to be done to better utilize indigenous resources in particular, and to ensure that the vast majority of the largely unique genetic resources in developing countries in particular are not to be lost under the increasingly intense pressures now being applied.

Activities Underway by FAO

The following activities are being undertaken to provide the essential core support to the Programme and help ensure that it incorporates as much continuity as possible from the outset.

- Obtaining acceptance from FAO's governance of the Global Strategy and Framework for the Programme, and establish the Global Focus.
- Commencing preparation of the guidelines for each area of management, to assist countries.
- Initiating sub-regional project identification missions, to prepare a portfolio of most effective activities for funding and introduction over the medium term, and to better understand each region's needs.
- Inviting countries to identify and support National Focal Points for the Programme, the invitations being sequenced by region.
- Implementing a pilot Regional Focus to gain experience in the requirements and effectiveness of the regional leval in the Programme's global stucture.
- Introducing the global surveys for breeds and for *ex-situ* preserved materijal, establishing the Global Databank for Animal Genetic Resources, and developing the World Watch List for Domestic Animal Diversity, as key components of The Global Early Warning System for Animal Genetic Resources.
- Developing the communications strategy for the Programme, and commencing to involve other parties - international agencies, NGOs, etc.
- Developing the first phase of the Domestic Animal Diversity Information System (DAD-IS), ready for implementation in early 1996.
- Preparing to launch the global management entity, and the first major donor's meeting.
- Preparing to introduce an intergovernmental mechanism for animal genetic rersources.
- Commencing training workshops at the regional leval for the National Focal Points.
- Assisting with implementation of specific areas of the Strategy; for example, characterisation, particularly surveying and MoDAD; genebanking; and indigenous breed development.

The European Region Responding

Accepting the need to address the imperatives for the beeter management of animal genetic resources; recognising the responsibilities of countries to effectively respond to the CBD, and that some countries in the region have recently begun to develop and expand such management activities; and appreciating that a number of subregional structures already exists, but that both human and financial resources are currently seriously constrained; how might the European Region and its countries best capitalize on the global initiative by FAO and design and implement cost-effective management plans for their range of animal genetic resources?

The above list of activities underway by FAO suggest some answers to this question. FAO has taken the position that an essential basic infrastructure and a comprehensive approach to management of these resources is required to be effective. This basic infrastructure provides the framework for documenting and better understanding those remaining resources, better using and developing them, whilst also ensuring that unique genetic resources which have low current interest amongst farmers, and are therefore most likely to be at risk of loss, are properly maintained for possible future use. This is considered a vastly superior approach to one which focuses on a small number of breed rescue projects within each species.

To fully utilize the FAO Programme active and capable National Technical Focuses play a key role . In addition, countries should work together with FAO to obtain the necessary financial support for establishing at the earliest possible date at least one effective Regional Focus. This Regional Focus should be based at a relatively central point which already possesses solid infrastructure and expertise in management of genetic resources. Once the country networks and regional focus are in place the projects identified through the project identification mission in Central and Eastern Europe may be effectively coordinated and cost-effective implementation of the necessary activities better facilitated. Of course, countries in the region ara already involved in a number of the other activities which FAO is implementing within the Global Strategy. Continued involvement would be greatly assisted by early implementation of all of the above-mentioned basic operations. Donor countries and international agencies will be encouraged to be involved and support the Programme via multilateral and bilateral funded activities of high priority.

The EAAP, a non-governmental orgnization with long-held observer status on the FAO governing bodies, continues to make a range of important contributions to the Global Programmes development. A few examples of EAAP involvement include: initiating the Genetics Commission Working Group on Animal Genetic Resources and the joint FAO/EAAP Working Group on AnGR; instigating the orginal surveys and databank for the key mammalian species and assisting FAO with original software; conducting special symposia and assisting FAO arange meetings of expert groups.

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