

## **Recommendations of the meeting of the European Platform for Biodiversity Research Strategy**

held under the Italian presidency of the EU

Florence, Italy 21-24 November 2003

*concerning*

### **GENETIC BIODIVERSITY IN NATURAL, AGRICULTURAL AND OTHER ECONOMICALLY USED SYSTEMS: MEASUREMENT, UNDERSTANDING AND MANAGEMENT**

*“In all things of nature there is something of the marvelous”*

ARISTOTLE

***To gain knowledge necessary to halt biodiversity loss by 2010, the participants of this meeting agreed that the following research action points have high priority:***

1. develop methodologies to better understand the evolutionary and demographic relationships and trajectories of species, the adaptive variation within them and methods to analyse the data produced;
2. understand and mitigate loss of genetic diversity by studying evolutionary processes in natural populations;
3. develop new approaches for the valuation of genetic biodiversity;
4. investigate policy-making and the impacts of policy on genetic diversity in agriculture, forestry and fisheries;
5. improve risk and impact assessment of genetic loss and decision support methods capable of taking into account cultural values and impacts on future generations;
6. address conservation priority issues such as maintaining genetic diversity, understanding the genetic effects of climate change, studying invasive and genetically modified organisms and population fragmentation;
7. investigate interactions within and among biodiversity components of natural, agricultural and other economically used ecosystems with regard to different agriculture practices (traditional, conventional, organic, GMOs);
8. analyse and develop methods for conservation and sustainable use of genetic biodiversity through area-approaches in management (e.g. Natura 2000);
9. integrate genetic information with landscape, seascape and community ecology and socio-economic variables to achieve effective sectorial and cross-sectorial management of biodiversity;
10. develop indicators to monitor the effect of geneflow and breeding systems in the maintenance of genetic diversity, and assess the risk of these processes to the sustainability of natural, agricultural and other ecosystems;
11. develop relevant indicators to provide a basis for monitoring changes in factors that strongly affect genetic variability;

12. explore the role of genetic diversity in the productivity, stability and resilience of agroecosystems and their resistance under changing climatic, environmental, social, and economic conditions;
13. develop genetic markers that are more predictive of adaptive or productive value so as to improve the capacity to identify species, populations, varieties and breeds that require special conservation action;
14. understand the spatial and temporal scales of natural dynamics and disturbance regimes and their relationship to genetic processes;
15. understand the roles of public attitudes, community structure and traditional knowledge in determining local resource use and its impact on genetic biodiversity;
16. interdisciplinary research on impacts of different land tenure and intellectual property right regimes on the conservation and sustainable use of genetic resources;
17. investigate the implications of access regimes for benefit sharing and the protection of local knowledge

***To develop high quality and policy relevant research on these priority areas, particular attention should be paid to:***

- basic research in taxonomy, systematics, evolution, and population and community ecology, including the genetic variability of populations;
- the establishment of networks of national and regional biodiversity observatories;
- development of cost-effective molecular tools;
- extension of basic research on genetic variability including genetic variability of populations;
- broad scientific training and scientific excellence;
- communication of research results on the importance of biodiversity to the public, e.g. by promoting information about best agricultural practices for specific target groups;
- involvement and empowerment of local communities for conservation;
- co-evolutionary studies looking into species interaction in a changing environment at the gene, population and ecosystem level;
- new approaches for measuring the impacts of social and economic drivers on biodiversity and exploiting socio-economic incentives to enhance biodiversity;
- estimation of long-term effects of managing natural resources on natural communities and , socio-economic systems.

***The above research priorities stemmed in particular from the following considerations:***

- Genetic information will become a major predictive tool to assess losses of biodiversity and a basis for sound political decisions;
- The resilience of ecosystems and their functions is dependent on genetic biodiversity, which reduces the impact of possible shocks, and enables adaptation to changing environmental conditions;
- Human activities have major impacts on genetic biodiversity, through selective breeding and genetic modification, selective harvesting, introduction of species, and by altering habitats on land and at sea;
- Preservation and restoration of landraces requires local involvement and support;
- Assessing genetic diversity in agroecosystems includes assessing local knowledge of this diversity and the processes that manage and maintain this diversity;
- Better understanding of the ways in which genetic diversity is influenced by human attitudes, behaviour and institutions is essential to improve the management of genetic resources;
- A significant part of the value of genetic variability is a public good not captured by market prices.