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and Sabine Täuber

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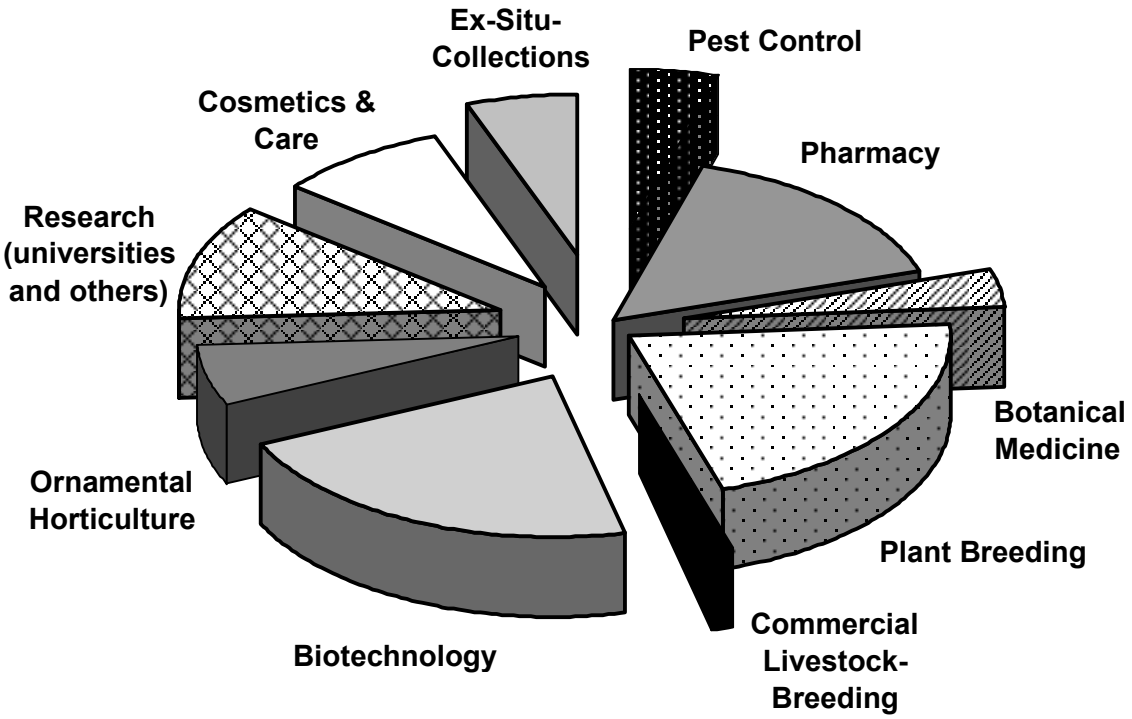
Awareness, Participation and Positions regarding the Convention on Biological Diversity



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ABBREVIATIONS

ABS	Access and benefit-sharing
BCCM	Belgian Co-ordinated Collections of Micro-organisms
BDP	Association of German Plant Breeders
BfN	Federal Agency for Nature Conservation
BMBF	Federal Ministry for Education and Research
BMU	Federal Ministry of Environment, Nature Conservation and Nuclear Safety
CBD	Convention on Biological Diversity
CHM	Clearing-house mechanism
CO	Country of origin
COP	Conference of the Parties
EC	European Community
EC-CHM	European Community Biodiversity Clearing House Mechanism
FAO	International Food and Agriculture Organisation
IPR	Intellectual property rights
ISO	International Organization for Standardization
IT-PGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MAT	Mutually agreed terms
MOSAICC	Micro-organisms Sustainable Use and Access Regulation International Code of Conduct
MTA	Material Transfer Agreement
PIC	Prior informed consent
Potent.	Potential
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
Repro.	Reproduction
R&D	Research and development

TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNU	United Nations University
VBG	Association of Botanical Gardens
WIPO	World Intellectual Property Organization
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation
ZADI	Centre for Agricultural Documentation

1 INTRODUCTION

Since the adoption of the Convention on Biological Diversity of the United Nations (CBD), the development and the implementation of national and regional access and benefit-sharing laws in biodiversity providing countries have been widely discussed and promoted.

In the last years demands on user countries have been expressed more explicitly, urging them to stand up for the implementation of the CBD regulations on ABS. In their Cancun Declaration, the so-called Like- Minded Megadiverse Countries emphasized the fact, that they do not consider themselves capable of enforcing ABS without the support of the user countries. Therefore they call for the creation of an international regime, which induces user countries to also take adequate measures for the realization of ABS according to the CBD (Like- Minded Megadiverse Countries 2002).

The idea to develop an international regime was accepted at the World Summit on Sustainable Development (WSSD), held 2002 in Johannesburg, and subsequently included as an objective in the final report. The CBD members are requested to negotiate an international regime to promote and safeguard the fair and equitable sharing of the benefits arising from the utilization of genetic resources (WSSD 2002, 44o). This means that today users of genetic resources have to be considered and involved even more as important actors in the development of comprehensive international conservation concepts.

In order to adequately and efficiently integrate the users into the process, policy makers need a more differentiated knowledge of the structure of the user sector with respect to level of information, ways of procurement and possible difficulties with the procurement and use of genetic resources (TEN KATE & LAIRD 1999, p. 325).

1.1 OBJECTIVE OF THE STUDY

The study focuses on German companies and research institutions which use genetic resources. The objective of the study is to identify German users and their level of awareness, experience and positions regarding the regulations associated with the agreement and to inform them on the CBD process concerning ABS.

This study is based on a study completed in 1999 by ten Kate & Laird on behalf of the European Commission. They come to the conclusion that there exists on the side of the users of genetic resources a significant deficit of information about international regulations on ABS (TEN KATE & LAIRD 1999, p. 294). According to this the implementation of ABS-rules under the CBD in co-operation with and towards a certain target

group is difficult and inefficient when the target group (i.e. user of genetic resources) is not or only insufficiently informed about legal regulations and adequate procedures.

As main part of this study we conducted a survey which analyzes the actual involvement of different sectors and the users' level of information and awareness. The second purpose of the survey was the distribution of information among the several sectors. Furthermore the survey should study the channels by which the different user groups receive their information, as well as the methods which German users choose to obtain genetic material.

From the user perspective the survey offers the opportunity to communicate experiences and problems with the institutional framework, to indicate levels of information and information deficits and to offer suggestions for the improvement of the implementation. Users' perspectives and experiences should be considered in the development of negotiating positions. Thus the survey makes it possible for users to actively participate in the CBD process.

The identification and contacting of actual and potential users by the survey should help to build the base for a future exchange between the responsible authorities (the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) and the users, thus strengthening the flow of information.

Another objective of the study is to analyze instruments (so-called "user measures") which aim at an increased integration of users into the CBD process and a stronger user committment to CBD goals. Most of them are discussed in the CBD process and in parts already being applied. These instruments are to be tested for their acceptance among the users in order to derive recommendations for the development of future user participation concepts.

Thus, the study should provide an informative basis for German and European policy makers in further CBD negotiations and in the implementation of international obligations at national level. Additionally it could establish a basis for a stronger integration of users in the CBD process.

1.2 METHODOLOGICAL APPROACH

The main part of the study is an empirical analysis based on a written survey of actual and potential German users of genetic resources. For this purpose a total of 560 companies and research institutions were chosen from selected target sectors (Health and Personal Care, Agriculture, Horticulture, Biotechnology, as well as research institutions and ex-situ collections). The survey took place in a period of four weeks.

The questionnaire is subdivided into five sections. First users are classified in groups due to their user activities. Secondly we address users' experiences in the context of provision and use of genetic resources, while the third section deals with the respondents' level of information on the CBD process. The fourth part of the questionnaire allows companies and institutions to define their position on various aspects of the CBD process. In the final section we ask users for their assessment of the previous and future developments in the use of genetic resources, as well as for the company and institutional data, which is relevant for the evaluation.

We evaluate the completed questionnaires with respect to the goals of the study and the relevant questions using different statistical techniques of analysis.

2 RELEVANT BACKGROUND

2.1 INTERNATIONAL INSTITUTIONAL BACKGROUND

The growing loss of biological diversity during the eighties led to an increased perception in the developed countries that it was necessary to implement measures for the conservation of biological diversity. In 1987 a discussion was started within the scope of the United Nations Environment Programme (UNEP) on the elaboration of an international agreement on the conservation of biodiversity.

Mostly developing countries which are rich in biodiversity also showed interest in the conservation of genetic resources; they called, however, upon the developed countries to take a share in the resulting costs. Those countries with potentially commercial genetic resources indicated that they would not be willing to provide any more genetic resources for commercial use without some kind of reward (TEN KATE & LAIRD 1999, p. 3). These demands and the understanding of the developed countries that the conservation and provision of biological diversity requires compensation for the countries of origin, resulted - after four years of negotiations - in the adoption of the CBD at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. It came into force in December 1993 as an international agreement. To date, the convention counts 188 contracting parties.

The main objectives of the CBD concern the conservation of biological diversity, the sustainable use of its components, and a fair and equitable sharing of benefits arising out of the utilisation of genetic resources against the background of sustainable development (CBD Art. 1). The CBD is not a static entity but rather an agreement which constantly advances through regular general meetings (Conference of the Parties (COP)) and expert meetings (e.g. Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and Working Groups). At the same time it is influenced by the different groups involved. For this reason it is generally referred to as the CBD process.

The entry into force of the convention resulted in a new legal framework for the contracting parties of the CBD regarding the provision and use of genetic resources. The governments of the user countries are also facing new challenges due to the CBD regulations. As an international agreement the CBD essentially affirms and secures the sovereignty of the national states over their genetic resources (CBD, Art. 3). Every country of origin of genetic resources has to enforce its own legal regulations on access to and handling of its genetic resources within the framework of the CBD.

Article 15 of the CBD contains the general conditions concerning ABS. The following obligations of the users (companies and institutions which utilize genetic resources) result from the CBD articles 15.3 to 15.7. The users have to acknowledge the sovereign rights of the countries of origin in conjunction with their genetic resources. Extraction and use of genetic resources may only take place after previous approval, which is based on factual knowledge ("prior informed consent") and takes place on "mutually agreed terms" (MAT). Furthermore, scientific research should be conducted to the greatest extent possible in the country of origin of the genetic resource and with the participation of the Contracting Party. The benefits resulting from any use of genetic resources should be shared with the country of origin on MAT and in a fair and equitable way (CBD Art. 15).

The responsibility of the governments of user countries to take part in the implementation of the ABS concept derives primarily from the formulation of Article 15.7 of the CBD. Governments are requested to establish adequate administrative, legal, and political measures, in order to guarantee the implementation of ABS according to the CBD. The CBD articles do not contain precise suggestions or guidelines for the implementation of the ABS, either at the level of the governments or at the user level.

The Bonn Guidelines on access to genetic resources and the fair and equitable sharing of the benefits arising from their utilization, which were agreed by the Conference of the Parties in 2002, specify the CBD regulations of Article 15 about ABS of genetic resources as recommendations for action. However, the Bonn Guidelines are not legally binding.

The Bonn Guidelines are to offer support and recommendations to all groups involved in handling access and use of genetic resources. They can support governments in developing and establishing legislative, administrative, or policy measures on ABS by providing the users with recommendations on procedures consistent with the CBD. The list of recommendations includes suggestions for the procedure of achieving prior informed consent (PIC), as well as information on the development of MAT, both intended to contain components of Material Transfer Agreements (MTA's). It is explicitly recommended to include all groups concerned, including the users, into the development and implementation of ABS measures (Bonn Guidelines, III/17).

One instrument especially important for the enforcement of CBD objectives in the field of agro-biodiversity is the International Treaty on Plant Genetic Resources for Food and Agriculture (IT- PGRFA) which came into force in 2004. As a legally binding agreement it replaced the non-binding International Undertaking on Plant Genetic Re-

sources, which had been adopted in 1983 within the scope of the International Food and Agriculture Organisation (FAO). The purpose of the agreement is to ensure the conservation and free availability of plant genetic resources in the field of food and agriculture (EUROPEAN COMMISSION 2003, p. 8) as well as the compliance with CBD benefit-sharing regulations.

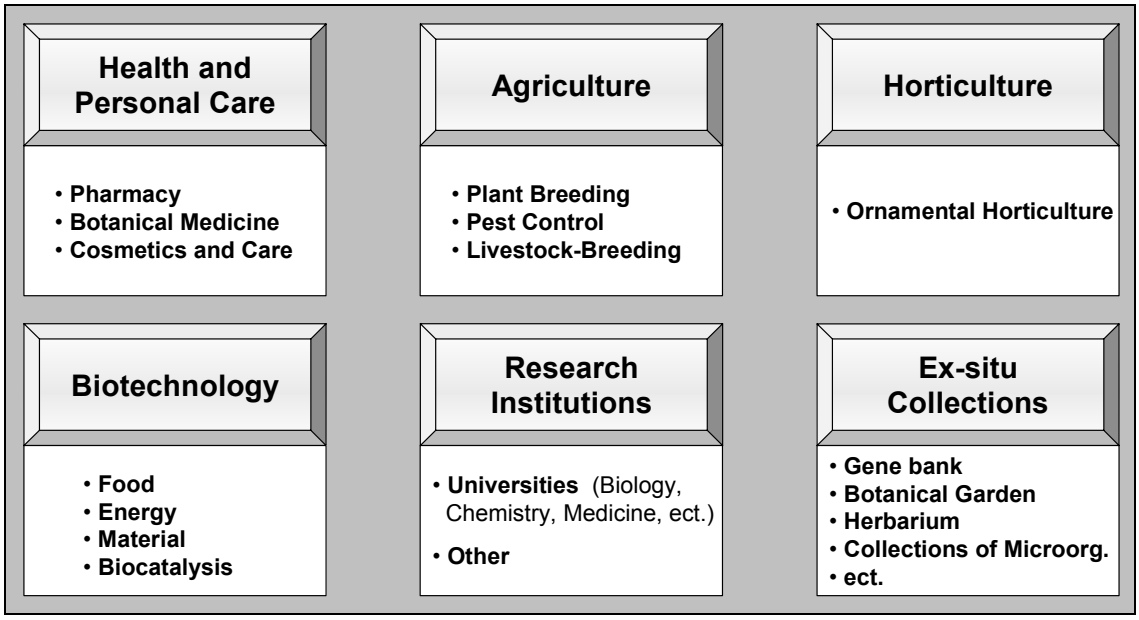
2.2 ACTUAL AND POTENTIAL USERS

In previous studies and reports (TEN KATE & LAIRD 1999; EUROPEAN COMMISSION 2003) the following sectors have been identified as the main users of genetic resources in Germany and Europe: pharmaceutic industry, botanical medicine, plant breeding, pest control, horticulture, cosmetics and personal care, and the branch of biotechnology within several other sectors. Botanical gardens, herbariums, and gene banks are important institutions as well, obtaining genetic resources from all over the world. They collect and preserve genetic material and act as so-called intermediaries by circulating resources for further use, e.g. to private companies. Public and semi-public institutions which use genetic resources as research material for scientific research, e.g. in the fields of agriculture, pharmaceutic industry, biotechnology, are other important groups concerned by CBD regulations.

In order to clarify if these sectors are still the ones concerned and if additional sectors have to be included, we conducted expert interviews with representatives of different sectors (plant breeding, horticulture, biotechnology in food sector). They could give a first assessment for their sector in relation to some of the questions.

Based on these results we identified the sectors which are illustrated in Figure 1 as actual and potential users of genetic resources in Germany and thus considered them as relevant addressees for the survey.

Figure 1: Actual and potential users of genetic resources in Germany



Source: Own illustration.

Monetary benefit-sharing is not possible in cases where the use of genetic resources does not create commercial benefit. Therefore public, non-commercial users are concerned by the CBD regulations on benefit-sharing to a lesser extend. Yet this user group was also included in the survey. Despite of their non-commercial benefits, public institutions are still subject to CBD procedures when acquiring genetic resources. Moreover, as intermediaries they play an important role as a connecting link between the provider country and the commercial user and are therefore vitally important for the implementation of CBD regulations. First, they collect genetic and biological material and often keep a large variety of genetic resources ready for further use, partly already processed and refined during different steps of research. Secondly, in many sectors they are the source for commercial users to purchase genetic material, e.g. from gene banks. For these reasons also non-commercial users are significantly involved in the commercial use of the resource "biodiversity".

2.3 KNOWLEDGE ON THE USERS' LEVELS OF INFORMATION, POSITIONS AND PROCEDURES

In the following section, the knowledge on the users' levels of information, experiences, and positions regarding international CBD regulations will be described. Basic trends and differences within the user sector, identified for European users in a survey by ten Kate & Laird in 1999, are summarized in order to create a basis for the evaluation of results of the new survey. In chapter four of this study the new user survey and expert interviews will be evaluated in order to examine whether trends, identified five years ago at European level, still apply to the German user sector of today.

An important result of the study by ten Kate and Laird is that the majority of users concerned are insufficiently informed about the CBD and its associated legal framework regarding the use of genetic resources. Some of the companies do not know whether CBD regulations are relevant to them or not (TEN KATE & LAIRD 1999, pp. 322-324).

Positive attitudes towards the CBD are most common among those companies which are already participating in the political process. Among other things the following expectations from the CBD are being expressed: the improvement of legal security for issues of access and use of genetic resources, and more clearness in questions of property rights to genetic resources. From some users' point of view the CBD can assist in developing guidelines for best practice in the use of genetic resources, thereby tackling image problems of the user sector (TEN KATE & LAIRD 1999, p. 296).

The users' experiences with the impact of the CBD in 1999 led to a more critical attitude towards the CBD. The problems and disadvantages users mentioned are the insufficient level of information, inconsistent implementation of access regulations by the different countries of origin, excessive bureaucratic expenses, unrealistic expectations on part of the countries of origin regarding the sharing of benefits, negative incentives for research and development and in general the disadvantage of high transaction costs due to complicated regulations (TEN KATE & LAIRD 1999, pp. 296-300).

As to the CBD regulations on benefit-sharing, the users tend to hold the opinion that the actual value of a genetic resource arises only from the users' capital expenditure in the context of research and development. Therefore users are inclined to offer transfer of knowledge and technology in exchange for access rights, rather than consider themselves capable of and willing to practice monetary benefit-sharing. Besides the industry always argue that they have alternative approaches to product discovery other than using genetic resources and the demand for access to genetic resources will decrease in the future (TEN KATE & LAIRD 1999, pp. 6-7).

During their survey ten Kate and Laird noticed considerable differences between the various user sectors when comparing their most important supplying sources of genetic resources or their handling of benefit-sharing. In the following section these differences are summarized briefly for the most important private sectors. The sector animal breeding is not included. So far there has not been conducted a survey regarding the users' activities in this sector.

2.3.1 Health and Personal Care

2.3.1.1 Pharmacy

Estimations for the pharmaceutical sector indicate an increasingly significant role of genetic resources due to the application of biotechnological procedures for the development of pharmaceuticals. The provision of genetic material in this sector is mainly carried out via intermediaries. Few companies, mostly larger ones, collect their raw material themselves in the countries of origin. Users from the pharmaceutical sector practice different forms of benefit-sharing. They apply participatory approaches, meaning both monetary and non-monetary benefit-sharing with the involvement of local groups. Ten Kate and Laird conclude that the users of this sector are relatively familiar with the CBD and will adopt progressive procedures of ABS. (TEN KATE & LAIRD 1999, pp. 57-77).

2.3.1.2 Botanical Medicine

In 1997 the German population accounted for approximately 30 percent of their consumption of non-prescription pharmaceuticals with botanical medicine. From 1992 to 1996 the German sector imported an average of 45,400 tons of plant genetic raw material (medicinal plants) with an annual value of 107,100 US$. After Hong Kong, Japan and the USA, Germany ranks forth in the list of international importers.

The sector of botanical medicine uses mainly whole plants or parts of them as product components. In 1999 the major share of genetic raw material was supplied by in-situ sources. The supply of the sector with raw material requires shipments constant in quality and quantity. This leads to the assumption that providers who can cultivate and sell the needed plants on a larger scale will play an increasingly important role as source of supply in addition to in-situ sources.

In this sector benefit-sharing is mainly practiced by payments per weight unit of raw material (TEN KATE & LAIRD 1999, pp. 78-116).

2.3.1.3 Cosmetics and Personal Care

The users of this sector show a rather minor demand for new genetic resources. One reason can be found in the large variety of plants already used, another one in the highly cost-intensive and time-consuming introduction of new ingredients. Yet, companies of this sector as well include the use of new genetic material in their research and development strategy.

In 1999 the CBD regulations on ABS were quite unknown within this sector, along with a low awareness of the need for benefit-sharing with the countries of origin. (TEN KATE & LAIRD 1999, pp. 276-292).

2.3.2 Agriculture

2.3.2.1 Plant Breeding

The sector of plant breeding includes breeders of agricultural crops. They procure their genetic material almost entirely from ex-situ collections, e.g. gene banks, university collections, botanical gardens, herbariums. Plant breeders mainly use improved, commercially released varieties. Still, in the survey of 1999 they stated that wild species are essential for their sector as well. The guarantee of a wide gene pool is important for the breeding to adapt to future challenges of a changing environment.

The benefit-sharing for the use by private companies is generally arranged through payments of licence fees for the use of germplasm. Monetary benefit-sharing is not common among public institutions; they generally arrange their access to genetic resources on a mutual basis, additionally promoting capacity building through the transfer of knowledge and technology to the countries of origin (TEN KATE & LAIRD 1999, pp. 131-157).

During the realization of the study about six years ago, the International Treaty on Plant Genetic Resources for Agriculture (IT- PGRFA) was still being discussed at international level. Today the use of genetic resources in the plant breeding sector is widely regulated by this agreement. Yet the concrete form of benefit-sharing in cases of using genetic resources for agricultural and food purposes is still being negotiated.

2.3.2.2 Pest Control

It is assumed, that the demand for access to genetic resources in the sector of pest control will increase in the future. All companies and institutions which work in this sector depend on the access to new genetic resources. The users procure the material by their own collecting activities in the countries of origin and via intermediaries. Often a genetic resource is needed for a single screening, thus the extraction takes place only once. On the other hand some methods of pest control require a regular large supply of genetic material because it constitutes a direct component of the end product.

Public institutions, universities and research institutions continue the traditional mutual exchange of genetic material, implementing research in co-operation with the countries of origin. Private companies mainly practice monetary benefit-sharing in form of single access fees or up-front payments. Additionally transfer of knowledge is carried out as well (TEN KATE & LAIRD 1999, pp. 210-227).

Pest control is also performed in the sector of horticulture and thus could also be assigned to this sector. Since its application in the field of agriculture takes place at a significantly higher level and to simplify matters, this study restricts the assignment of

pest control to the agricultural sector.

2.3.3 Horticulture

In contrast to agricultural plant breeding, the sector of horticulture concerns above all the breeding of ornamental and herbal plants.

Regarding the use of genetic resources, the sector of horticulture is divided into two groups. One group mainly uses breeding material in the form of genetic material already being used commercially. The use of wild plants as source of new genetic material is of rather minor interest for these breeders. The second group consists of those breeders who depend on the access to new genetic resources. Their sources include botanical gardens, national collections, or commercial providers.

Benefit-sharing is relatively uncommon in this sector. Traditionally plant material was exchanged free of charge between breeders. Including today, the mutual guarantee of access to plant material constitutes an essential form of non-monetary benefit-sharing. There remain some cases where so-called royalty fees are paid for benefit-sharing. (TEN KATE & LAIRD 1999, pp. 172-187).

2.3.4 Biotechnology

The sector of biotechnology includes e.g. activities in the fields of energy, material, bio catalysis, functional food (novel food) and diagnostics. Its most important genetic resource are micro organisms.

This sector also comprises both users who collect their genetic material themselves in the respective countries of origin, and companies and research institutions which procure their genetic resources mainly from intermediaries or crop collections.

In the sector of biotechnology various monetary and non-monetary benefits are provided in exchange for rights to use genetic resources. These measures can be described as benefit-sharing, even though the users rather consider them as expenditures for important input factors (TEN KATE & LAIRD 1999, pp. 242-261).

2.4 PARTICIPATION OF USERS THROUGH USER MEASURES

Having illustrated the different sectors of users of genetic resources, the level of awareness, the positions and the procedures in these sectors, now we explain the instruments which are used to integrate users more into the CBD process, the so-called “user measures”.

“User measures” are understood as a package of legislative, administrative, and policy measures designed to promote compliance among the users of genetic resources and traditional knowledge with the regulations on PIC, MAT, and benefit-sharing. These

measures can be applied by either the private or public sector and may be mandatory or voluntary (CBD 2002, p. 17). But they also play an important role for the participation of users in the ABS process, which is so far dominated by providers' activities.

In this chapter we investigate different user measures: policies and codes of conduct, voluntary certification schemes, promotion of co-operation and standardized contracts, clearing house mechanisms and national focal points, monitoring of intellectual property rights (IPR's) applications, and import controls for genetic resources. The list of user measures which we consider in this study is not exhaustive. Still it contains user measures which are intensely discussed in the international arena, seem to be highly relevant for the increased participation of users in the CBD implementation process, and are addressed in this study. In the survey we have questioned the users about their attitudes towards the following user measures.

2.4.1 Corporate and institutional policies and codes of conduct

In the past, it was observed that some users of genetic resources have developed their own ABS policies, either individually or jointly, including whole sectors (TEN KATE & LAIRD 1999, p. 309). These users operate in the private sector (companies) or in the public sector as non-profit research institutions (e.g. botanical gardens). Corporate and institutional policies and codes of conduct developed in the framework of the Bonn Guidelines are measures which can assist in the development and implementation of ABS arrangements.

Usually corporate and institutional policies and codes of conduct are voluntary measures initiated by the users or their representatives. The interventions in the activities of a research institution or a company caused by such measures are relatively small. Once such policies or codes of conduct have been developed and successfully applied in an institution or company, they can be disseminated at low transaction costs in the entire sector concerned. They can provide sufficient flexibility to respond to the circumstances of specific research sectors and users of genetic resources if their design is appropriately adjusted. Both users and providers can benefit from their establishment. The application of corporate policies and codes of conduct increases user transparency and therefore the provider countries' trust in their partners. The use of codes of conduct can facilitate access to genetic resources for the members and reduce the need of other compliance procedures (UNU 2003, p. 22). Control mechanisms which apply to the early stages of research and development can be established at lower costs than those which take effect in later phases. Corporate policies and codes of conduct have the potential to alleviate uncertainty and decrease the transaction costs for users and providers, which might arise from the asymmetric distribution of information between

them (RICHERZHAGEN & VIRCHOW 2003, p. 16).

In the EU and in Germany some stakeholders' initiatives exist in order to develop and implement policies and codes of conduct which comply with the CBD and national ABS legislation in provider countries. Scientific research institutions and networks of ex-situ collections in the EU have developed institutional policies and codes of conduct on ABS to facilitate the acquisition and exchange of genetic resources in accordance with applicable national and international law. Important initiatives have been taken by European botanical gardens, microbial culture collections, and germplasm collections (EUROPEAN COMMISSION 2003, p. 10).

The International Plant Exchange Network (IPEN) is an important example. IPEN is an exchange system for botanic gardens according to the CBD and has been developed by the Verband Botanischer Garten (an association of gardens in German speaking countries) on behalf of the Federal Ministry of Environment, Nature Conservation and Nuclear Safety. Gardens that wish to join the network must sign and abide by a Code of Conduct (see Appendix III) that sets out gardens' responsibilities for acquisition, maintenance and supply of living plant material and associated benefit-sharing. The botanical gardens themselves impose the control of admission, conservation, and dissemination of genetic resources. The objective of this initiative is to promote the conservation and sustainable use of biodiversity, to comprehensibly document living plant material in order to secure the rights of the countries of origin in accordance with the CBD, and to strengthen the mutual trust with the countries of origin so that the access to genetic resources and its use are guaranteed for the future.

The EU financed project "Micro-organisms Sustainable Use and Access Regulation International Code of Conduct" (MOSAICC), developed by the Belgian Co-ordinated Collections of Micro-organisms (BCCM) conjointly with 16 international organizations, is also a prominent example of a stakeholder initiative. MOSAICC is a code of conduct developed to facilitate access to microbial resources and to help partners in developing practical agreements when transferring microbial resources (BCCM 2000). MOSAICC provides a system based on the identification of the in-situ origin of microbial resources via PIC and on monitoring the transfer of the resources via material transfer agreements defined by provider and user (BCCM 2000). It is frequently used by institutions working with microbial resources. A future MOSAICC project (called MOSAICS) aims to develop an integrated system to manage ABS issues related to microbial resources. The German Collection of Micro organisms and Cell Cultures is one of the fourteen participants in MOSAICS.

2.4.2 Voluntary certification schemes

Certification systems voluntarily verify practices of organizations. They might be self-implemented or implemented by a second party with an interest in the organization's practices. Alternatively, the operations of the concerned private or public organization are assessed against a standard set of criteria by an independent third party. The use of the certification by an independent third party has become the norm because of the importance of credibility of the certifiers (KANOWSKI et al. 1999, p. 14). Important aspects for the implementation of a certification system are the creation of an independent standard-setting body, an assessor organization and an agreed procedure for the certification assessment, the issuance of a written certificate which confirms the compliance with the standards, and the establishment of an appeal possibility for certification decisions (UNU 2003, p. 23). Voluntary certification schemes are widely and successfully used, for example under the International Organization for Standardization (ISO). The organization's work program ranges from standards for traditional activities, such as agriculture and construction, to mechanical engineering, to medical devices, or even the newest information technology developments. Alternative specialized schemes have been implemented for timber products extracted from sustainable managed forests, fisheries, organic food, and other environmental and social sectors (UNU 2003, p. 23).

The application of an international voluntary certification scheme to the ABS process seems to be appropriate. The companies' compliance with the principles formulated in the CBD and the Bonn Guidelines can be ensured through the participation in such a certification system. In addition, it can improve the user's reputation and provide the basis for provider countries to feel more confident about their potential partners.

In the EU and in Germany a general environmental certification system (EU Eco-Management and Audit Scheme, EMAS) exists, but no specific certification scheme for organizations complying with the CBD, Bonn Guidelines and national ABS regulations is applied.

2.4.3 Promotion of co-operation and standardized contracts

The Bonn Guidelines identify high transaction costs and legal uncertainty as major problems in ABS negotiations and regard the development of standardized material transfer agreements and benefit-sharing arrangements for similar resources and similar uses as important instrument to address these problems (Bonn Guidelines 42, b iv).

Governments of user countries can support the development and execution of projects aiming at the promotion of co-operation between users and providers and the devel-

opment of standardized material transfer agreements. Governmental institutions monitor these projects and can ensure that users comply with the CBD. Provider will be more confident about their partners if the ABS negotiations take place in the framework of such a project and facilitate access. By participating in such projects users can gain reputation and constitute a positive example.

The Federal German Ministry for Education and Research (BMBF) finances the project ProBenefit (Process-oriented development of a model for equitable benefit-sharing for the use of biological resources in the Amazon Lowlands of Ecuador). The main participants in the project are German institutions (Institute of Biodiversity, University of Göttingen), the Association of German Engineers and a German company, one of the leading manufacturers of phytomedicines world-wide. The objectives of ProBenefit are to develop a model agreement on equitable benefit-sharing in Ecuador's Amazon region, to explore the potential for using medicinal plants and develop possibilities for sustainable use of these plants. ProBenefit started in June 2003 and has a planned term of about 5 years. Therefore until now no results are available (http://www.probenefit.de/).

2.4.4 National focal points and the clearing house mechanism

The objectives of the Bonn Guidelines give high importance to the provision of information in the ABS process for both providers and users. National focal points and the clearing house mechanism are important for the collection, provision, and dissemination of information - they play an essential role in raising awareness in user countries.

According to the Bonn Guidelines each party of the CBD should designate one national focal point for ABS. The national focal point should provide users with information regarding the CBD and the Bonn Guidelines, as well as national ABS laws and regulations in provider countries. In this way applicants for access to genetic resources can acquire information on procedures for achieving PIC and MAT (including benefit-sharing) and on competent national authorities and relevant stakeholders (Bonn Guidelines IIa/13).

National focal points in user countries can support the exchange of information and experiences in ABS issues. They also can establish contacts to focal points and authorities in provider countries and therefore facilitate the establishment of contacts among the users. Through the initial work of the focal points in user countries, the competent authorities in provider countries who are often overburdened with the complex ABS issues can be relieved. To date, 42 parties of the CBD have nominated ABS national focal points (CBD, 2004). Germany has established a national focal point at

the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The institution intends to fulfil its function as an intermediary between users, providers, and the CBD. On behalf of the ministry, many studies have been undertaken related to important CBD issues, partly enabling stakeholders to participate in the CBD process. The German focal point has initiated a meeting with representatives of users in Germany to disseminate information and gain an impression of the users' situation in Germany. To raise awareness about the CBD and the Bonn Guidelines, the original documents have been translated into German.

The German national focal point uses a clearing-house mechanism (CHM) to disseminate information (http://www.biodiv-chm.de/). The CHM is an internet-based communication platform edited by the German Federal Agency for Nature Conservation. It enables the national focal point to provide information to users and support the co-operation among parties. Just like the CBD's mechanism, it provides access to the Convention's official records, informs users about the implementation of the CBD in Germany, and posts news, events, and meetings related to biodiversity issues. Additionally a list of experts, contacts, and co-operation is available.

The European Community (EC) has also established a CHM (http://biodiversity-chm.eea.eu.int/), the EC Biodiversity Clearing House Mechanism (EC-CHM). The EC-CHM provides access to some but not complete information on policies, legislation, funding opportunities, data bases, sources of expertise, etc. held by European Community institutions. It publishes links to other European institutions and organisations (private, governmental and non-governmental organizations) which hold useful information. It also links to the web sites of global organisations such as the CBD Secretariat's web site. The genetic diversity and resources section of the EC-CHM provides an overview of international activities in the field of ABS and information regarding the implementation of the Bonn Guidelines by the EC.

2.4.5 Monitoring of intellectual property rights applications

The ABS process can be monitored at different stages: the access phase (in the field or from ex-situ collections), the import of the genetic resources, the research and development phase, the application for IPR's, and the final product approval (EU Commission 2003, p. 17). Except for the access phase, these activities usually take place in user countries. But in reality these monitoring possibilities are poorly applied. The missing implementation of monitoring elements in the ABS process – e.g. the risk of non-compliance with PIC and the equitable and fair benefit-sharing condition - is a major vulnerability of the entire concept.

The disclosure of the country of origin of genetic resources in IPR's applications is considered as a possible instrument to increase the synergies between the creation of IPR's and the objectives of the CBD. The additional provision of evidence as to whether PIC has been obtained is also under discussion (Tobin 1997). The disclosure of origin can fill the information gap in provider countries, increase their confidence in users, and preventing the loss of potential benefits by its functioning as a control mechanism. Moreover, it can balance the distribution of property rights. By being mentioned as the origin of genetic resources in IPR's applications, the providers do not become holders of such rights; but at least they are cited in the IPR's and therefore have the legal basis for demanding benefit-sharing. Considering that the verifying of international property rights (IPR) application places additional burdens on the patent offices, the importance of other control systems (e.g. a certificate of origin) becomes evident.

The disclosure of the origin can control the compliance with the CBD in a late phase of the research and development process. But in case the user commercializes the product without applying for an IPR the approach is not applicable and other instruments are necessary.

The EC Directive 98/44/EC on the legal protection of biotechnological inventions specifically takes into consideration ABS. The Directive encourages patent applications to include information on the geographical origin of biological material; it is non-binding, however, because of its voluntary nature (Recital 27 Directive 98/44/EC). This provision supports compliance with national legislation in the country of origin of biological material and with contractual arrangements governing the acquisition and use of that material. It is without prejudice to the processing of patent applications or the validity of rights arising from granted patents (Straus 2001, p. 161). In Germany the directive has not been implemented yet. The Parliament is still discussing a draft law which would implement the directive almost one-to-one.

2.4.6 Import control of genetic resources

A system that documents the exchange and transfer of genetic resources could be an appropriate instrument to monitor trade and movement of genetic resources and therefore helps to prevent the inappropriate use of genetic resources. Three different forms of permits for trade and transfer of genetic resources are under discussion in the CBD: a certificate of (1) origin, (2) source or (3) legal provenance with detailed information about providers, users, approved use, and imposed restrictions. A certificate of origin states the country of origin of the material. Today the identification of the origin of certain species might be impossible due to the history of international crop migration. The use of a certificate of source seems to be easier, but in cases where the source country

differs from the country of origin, the objectives of the ABS concept are missed. The latest international discussions favour a certificate of legal provenance which provides evidence that the ABS laws of the country of origin or source have been complied with (UNU 2003, p. 38).

A certificate can play an important role in the entire ABS process. Like a passport it could accompany the genetic resources from the collection phase through to the marketing phase of the product and give information about the origin of the material. It can be monitored and verified at different stages of access and use as well as across different jurisdictions beyond that of the providing country (RUIZ et al. 2003, p. 5). In the field of intellectual property application, such a document can also be useful and provide evidence about whether the genetic resources were legitimately obtained (including PIC and MAT). Patent applications which require the presentation of a certificate of legal provenance not only disclose the origin of genetic resources, but also provide evidence whether the material has been obtained in compliance with the regulations of the country of origin. The use of the certificate of origin can also play an important role in the monitoring process of IPR's applications. For example patent offices can be relieved of some work if they only have to control the existence of a certificate of origin, source or legal provenance and not the compliance with the CBD.

3 QUESTIONNAIRE, METHODOLOGY

3.1 OBJECTIVES FOR THE CONCEPTUAL DESIGN OF THE SURVEY

One objective of the survey is to analyze the German user sectors of genetic resources. As many sectors as possible have been contacted in order to receive insights in the different user groups. We assume that regarding to the state of knowledge, experience and participation the user group of genetic resources in Germany is extremely heterogeneous. This heterogeneity of the target group had to be considered during the conceptual design of the questionnaire. Thus, first it is necessary to contact a great variety of users and ask them to participate. Due to its being a written survey, the shape of the questions has to be as unambiguous and self-explanatory as possible. Still the respondents should have sufficient possibilities to give additional information, which has not been explicitly asked for.

The heterogeneity of the target group, as well as qualitative differences between the answers has also to be taken into account when selecting the evaluation methodology.

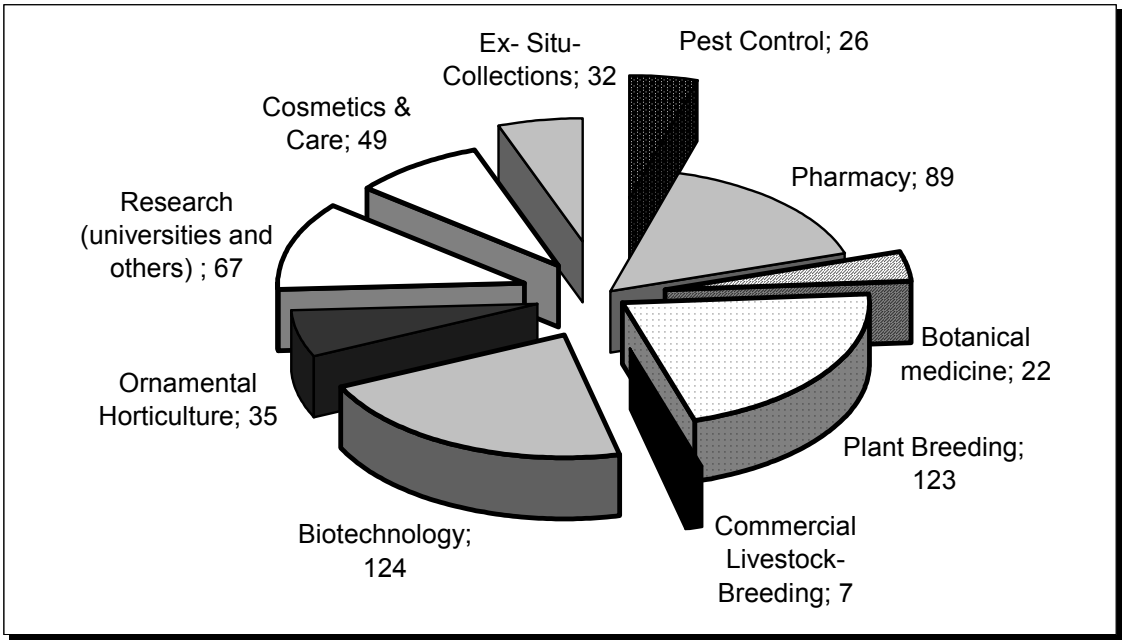
3.2 IDENTIFICATION OF THE ADDRESSEES

Following the prior identification of actual and potential user sectors we primarily selected members of the main sector associations in order to determine adequate addressees for the survey. Based on the presentation of companies and institutions through Internet websites we checked if company and research activities indicate the use of genetic resources. The questionnaire finally determines whether an addressee actually belongs to the target group of genetic resources, as defined in the CBD.

The addressees are guaranteed anonymity for the evaluation of the completed questionnaires in order to increase their motivation to participate. The identification of participants and the attribution of answers to a particular company or institution are not of importance for the evaluation of the results. In contrast, it is important to consider, which sector uses genetic resources, whether the participant is a private company or a public institution and what size it has compared to the other users of its sector (Question A1).

We tried to identify the total number of German users of genetic resources. Figure 2 shows how many companies and institutions of the different user sectors could be identified and addressed as potential survey participants (574 in total).

Figure 2: Number of addressees by sector



Source: Own illustration.

3.3 CONCEPTUAL DESIGN AND OPERATIONALIZATION OF THE QUESTIONNAIRE

Through the cover letter the addressees are informed about the institutions which are responsible for the study, the framework, in which the survey will be conducted and the reason for the study. In order to increase the incentive to participate in the survey, the cover letter describes the background of the study. Among other things it is explained that the survey is to strengthen the users' representation in the CBD process.

In case of further questions on the part of the addressees, the e-mail addresses and telephone numbers of the responsible authority and the responsible contact person at the executive institute are given.

The questionnaire only contains essential information on the CBD and its regulations, so that the influence on the answers is kept as small as possible. In order to still provide immediate information to interested companies and institutions, a German translation of the Bonn Guidelines is enclosed.

The pretest showed that the completion of the questionnaire with a total of 30 questions takes about 30-40 minutes. Depending on the topic, the questions are open, partly open or closed. The questionnaire is divided into five thematically sections, whose content, objectives and structure will be explained below. The sequence of the individual question blocks was arranged by aspects of content. The questionnaire is attached in the Appendix I.

The questionnaire contains some filter questions, which means that depending on a couple of basic criteria the process of questioning can differ. This approach is necessary in order to meet the expected heterogeneity of the group of addressees. At the beginning of the survey, e.g. users and non-users are separated immediately. Participants who in the third question block state, that they don't know the CBD, are not further questioned neither about its regulations and institutions, nor about their positions and participation regarding the CBD process.

3.3.1 Question block A: Identification of different groups of users

The survey begins with the classification of the participating company or institution. Questions concern the sector affiliation, the kind of use, as well as the origin and type of genetic material (Questions A1-A3). Moreover, we ask for the results of the utilization of genetic resources in terms of product development and applications of patent and plant protection rights based on genetic resources (Question A4).

This information is to be consulted to analyze the user sector. Furthermore it serves as a base for the evaluation of the following question blocks.

3.3.2 Question block B: Experience with provision and use of genetic material

The second part of the survey focuses on the users' experience with the provision and use of genetic resources.

The survey participants, which in question block B are identified as non-users or potential users (the latter don't use genetic resources at present, but might in the future), are asked to give their reason for not having used genetic resources so far. (Question B1).

In this part of the questionnaire the de facto users are asked about their sources of supply and their procedure for obtaining genetic resources (Question B3). Besides we request them to make a statement about their last use and the associated agreements on ABS, as well as to describe their difficulties regarding the institutional framework for the use of genetic resources (Questions B4/5).

The objective of this question block is to identify the procedures used by companies and institutions to provide themselves with genetic resources. The question about difficulties with the institutional framework should clarify the issues which require the most urgent intermediation between users and institutions.

3.3.3 Question block C: User level of information regarding the current international basic conditions for the use of genetic resources

This question block deals with the users' levels and channels of information concerning the CBD and the associated regulations and institutions (Questions C1-3). The users are requested to estimate whether they consider themselves sufficiently informed about the context or rather in need for more information (Questions C4).

The objective of this section of the questionnaire is to assess how much German users in fact know about the CBD process and by which channels they can be provided with information. These insights can be used for the development of more efficient information and participation concepts.

3.3.4 Question block D: User participation and positions on the CBD

The penultimate section of the survey addresses the users' positions on the CBD process. The users are asked how they would assess the influence of the CBD on the access to genetic resources. How did the CBD affect the extent of use of genetic resources in the respective company or institution?

In addition the questions concern the users' participation in the CBD process. Do the users consider their interests as adequately represented in the CBD negotiations (Question D3)? Do they have suggestions how to increase the involvement of the user side into the process (Question D4)? How do they estimate the prospect of success of the "user measures" (see chapter 2.4) in their aim to increasingly oblige the users to the CBD regulations on ABS (Question D5)?

The results of this section can be considered as the users' assessment of their participation in the CBD process. The information helps to develop strategies to increase the users' involvement in the CBD process.

3.3.5 Question block E: Evaluations, perspectives and company data

In the last part of the questionnaire the participant is requested to indicate his position in the company or institution (Question E1). Since the survey only concerns company or institution relevant issues and data, one can assume that the position of the responding person in his or her company or institution affects the quality of the answers and therefore has to be considered in their evaluation.

We request the respondent to assess how the use of genetic resources has developed in its extent over the past five years and how it will develop in the future (Question E2).

The final questions address the company and institutional data which are relevant for the evaluation of the questionnaire, such as turnover, number of employees and

budget for research and development, calculated for the whole company or institution and for the field of genetic resources respectively (Questions E3-9).

4 RESULTS OF THE SURVEY

Chapter four summarizes and evaluates the results of the questionnaire regarding user identification, experiences, information, awareness, participation and developments in the context of the use of genetic resources.

4.1 IDENTIFICATION OF DIFFERENT USER GROUPS

136 out of 574 addressed companies and institutions responded to the survey, which gives a return rate of almost 24 percent. Of these, 67 respondents (or nearly 50 percent) consider themselves as users of genetic resources in terms of the CBD.

The survey period (15/08/04-10/09/04) was rather short. Only one quarter of the addressees included an employee identified as a person responsible for procurement and use of genetic resources. Many addressees contacted us via email or phone in order to find out if they belong to the target group of the survey. Some of the addressees, who claim not to carry out any activities regarding the use of genetic resources, might misunderstand the definitions of “use” and “genetic resource” in terms of the CBD and therefore, possibly by mistake, do not consider themselves part of the target group. Nevertheless the return rate in written surveys can be expected to range between five and 20 percent. Hence we consider the return rate of 24 percent as satisfactory (DIECKMANN 1996, p. 441).

In the following we briefly illustrate the most significant results regarding return rate and share of actual users in connection with the respective sectors. More detailed information can be found in Table A .1, Appendix II.

4.1.1 Sector affiliation

Due to the anonymity of the study we cannot trace if the supposed sector affiliations (addressees) are consistent with the actual ones (respondents). Hence the exact calculation of the return rate within the individual sectors is not possible. Moreover in the context of sector affiliation multiple entries were possible. Thus, return rate means the comparison of the frequencies of the individual sectors at mailing and on return.

The most frequent multiple entries of sector affiliations occur among the user groups of ex-situ conservation institutions, universities and other research institutions.

The biotechnology sector is the largest sector of this survey with 124 addresses. 18 of the survey participants belong to this sector, leading to a return rate of 14 percent. A third of them are users of genetic resources.

We sent 123 questionnaires to companies in the plant breeding sector. Yet 15 of the 19 participants classified themselves as users. With a return rate of 15 percent the sectors of plant breeding and biotechnology show the lowest participation of all target sectors. An interview with representatives of the Association of German Plant Breeders (BDP) showed that the major part of genetic material used by plant breeders originates from national gene banks, while the users themselves are hardly at all involved in the procuring of wild plants. The BDP further communicated, that as representative of its members it actively participates in the CBD process acting in the interest of its members. According to the association's spokesperson, since more than 90 percent of them are members of the BDP, German plant breeders leave the political discussion on the CBD to a great extent to their association.

We addressed 89 companies in the pharmaceutical sector. 26 participants assign themselves to this sector, which makes a return rate of approximately 29 percent. Again 27 percent of these are actual users of genetic material.

Additionally, we addressed 67 universities and other research institutions. With 30 responses the return rate of 45 percent is above average. The user share among the respondents amounts to 47 percent.

Also the sectors of horticulture (23 responses) and animal breeding (four responses) respectively show relatively high return rates and user shares.

We contacted 32 ex-situ conservation institutions, which include botanical gardens, herbariums, gene banks and collections of micro-organisms. The return rate is 66 percent (21 entries). 95 percent of them actually use genetic resources.

4.1.2 Company data

In addition to sector affiliations and types of use, we requested different kinds of company data for the classification of user groups. One aspect is the size of the company or institution, measured by the number of research and development (R&D) employees, R&D budget and turnover. A second aspect concerns the importance of genetic resources for the work of the company or institution. Questions addressed the share of employees in R&D, as well as the shares of budget and turnover, in the field of genetic resources.

4.1.2.1 Size of companies and institutions which use genetic resources

The user group covered by the survey is dominated by small and medium companies and institutions, even though some large users are included as well (see Table 1). Some of the large and well-known users of genetic resources are already noted for intensively discussing the topic and disposing of sufficient information. Smaller compa-

nies and institutions are of greater interest, because so far their levels of knowledge or their positions are rather unknown.

Table 1: Users' company and institution data

Number of employees in R&D		
	Frequency	Valid Percent
Less than 10	25	42
10-100	26	43
100 – 1,000	7	12
1,000 – 10,000	2	3
Total	60	100
No statement	2	
Total	62	
Research and Development		
	Frequency	Valid Percent
less than 0.1 million €	13	27
0.1-1 million €	20	41
1- 500 million €	13	27
500- 1,000 million €	2	4
More than 1,000 million €	1	2
Total	49	100
No statement	13	
Total	62	
Company turnover 2003		
	Frequency	Valid Percent
Less than 1 million €	10	21
1 - 50 million €	19	57
50 – 1,000 million €	5	14
1,000 – 10,000 million €	2	5
More than 10,000 million €	1	3
Total	37	100
No statement	24	
Total	61	

Source: Own survey.

60 users answered the question about the number of R&D employees. Companies and institutions in the categories of less than 10 and 10 up to 100 employees account for 25 and 26, respectively. However seven companies and institutions have between 100 and 1,000 employees, two even between 1,000 and 10,000 employees in R&D. No company or institution chose the category of more than 10,000.

49 users gave information on research budgets. The answers in this context are spread more widely than in the case of employees in R&D. There are several companies in

each of the first three categories, which estimate their research budget for 2003 to be less than €100,000, between €100,000 and €1 million or between €1 million and €500 million. The research activities are likely to differ significantly between companies from categories one and three. Two users manage research budget of between €500 million and €1 billion, with one having a budget of more than €1 billion in 2003.

The company turnover was given by 37 users. 19 users (57 percent) reported a turnover of between €1 million and €50 million in 2003. Again the second highest category of between €1 billion and €10 billion is represented twice, while one respondent belongs to the highest one with more than €10 billion.

It must be mentioned, however, that the users with the highest turnover do not correspond to those having the highest research budget. More detailed information about company and institutional data on sector level is illustrated in Figures A. 1.1 to 1.3, Appendix II.

4.1.2.2 Importance of genetic resources for the companies or institutions

The major part of the respondent users does not consider activities in the field of genetic resources as the most important area of their company or institution. However the users which produced the largest share in their turnover with genetic resources also have a large number of R&D employees working with genetic resources and/or use a great share of their research budget in the field of genetic resources (see Table 2).

As expected, companies or institutions which spend a larger share of their research budget in the field of genetic resources, also have a relatively high number of R&D employees in this field. Users with a significantly low or high share of research budget spent in the field of genetic resources accordingly range in the lowest or highest category, respectively, regarding the turnover by use of genetic resources.

In 35 out of 57 companies and institutions (61 percent) the share of R&D employees working with genetic resources is less than 10 percent. Yet the two highest categories of between 50 and 75 percent and more than 75 percent are represented as well, by a total of nine users (about 16 percent).

More than half of the users report to spend less than 10 percent of their R&D budget in the field of genetic resources. Yet in some of the companies and institutions the share of R&D budget in the field of genetic resources exceeds 50 percent (two users) or even 75 percent (four users).

Most respondents (61 percent) estimate the share of turnover by use of genetic resources to be less than 10 percent. Six users produced between 10 and 25 percent of their turnover by the use of genetic resources and another six users even more than 75

percent.

Table 2: Importance of genetic resources for the companies or institutions

Share of R&D employees working with genetic resources		
	Frequency	Valid Percent
Less than 10 percent	35	61
Less than 25 percent	7	12
Less than 50 percent	6	11
Less than 75 percent	4	7
More than 75 percent	5	9
Total	57	100
No statement	5	
Total	62	
Share of R&D budget in the field of genetic resources		
	Frequency	Valid Percent
Less than 10 percent	23	53
Less than 25 percent	8	19
Less than 50 percent	6	14
Less than 75 percent	2	5
More than 75 percent	4	9
Total	43	100
No statement	19	
Total	62	
Share of turnover by use of genetic resources		
	Frequency	Valid Percent
Less than 10 percent	20	61
Less than 25 percent	6	18
Less than 50 percent	1	3
Less than 75 percent	0	0
More than 75 percent	6	18
Total	33	100
No statement	28	
Total	61	

Source: Own survey.

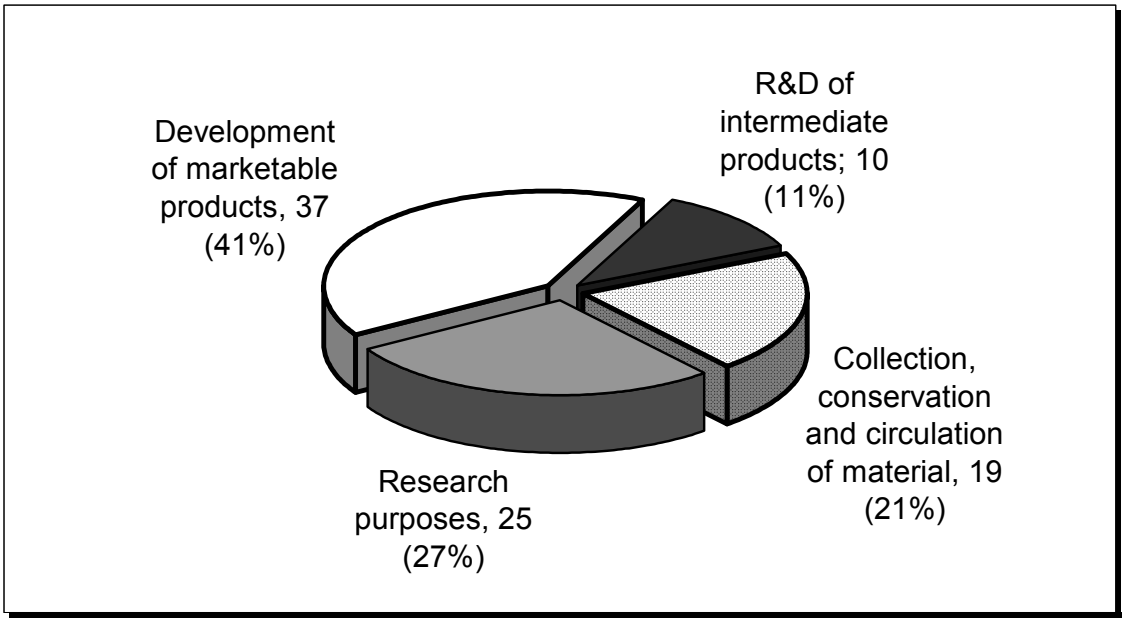
More detailed information about the importance of genetic resources for companies and institutions on sector level is illustrated in Figures A. 2.1 to 2.3, Appendix II.

4.1.3 Ways and results of using genetic resources

In order to identify different user groups we asked the companies and institutions for their ways of using genetic resources. Figure 3 shows how frequently the four possible answers were given (multiple entries were allowed).

Regarding the use of genetic resources the total group of respondents is rather heterogeneous. The largest group representing 37 users applies genetic resources in the development of marketable products. More detailed information about the sector specific distribution of statements is illustrated in Figure A. 3, Appendix II.

Figure 3: Frequencies of the different ways of using genetic resources reported by the respondents (Question A2)



Source: Own survey.

Most users were willing to disclose the results achieved by the use of genetic resources. Still, two of the three users with the highest turnovers did not give statements in this context, while the third company reported not to have achieved any results in terms of product development, patents and/or plant protection rights.

Approximately half of all users have already developed products by using genetic resources, and/or applying for patents and/or plant protection rights. Four additional users are currently in the process of doing so.

For a more differentiated view of the sectoral distribution of statements about the results see Figures A. 4.1 to 4.10, Appendix II, but it has to be recognized that the number of participants varies considerably from sector to sector. Still, it can be mentioned that as expected the application of plant protection rights occurs above all in the sector of plant breeding and agriculture, as well as in the sector of horticulture. Also with regard to product development the participants of these two sectors report more results than the users in other sectors. Patents were mainly applied by biotechnological companies and ex-situ conservation institutions.

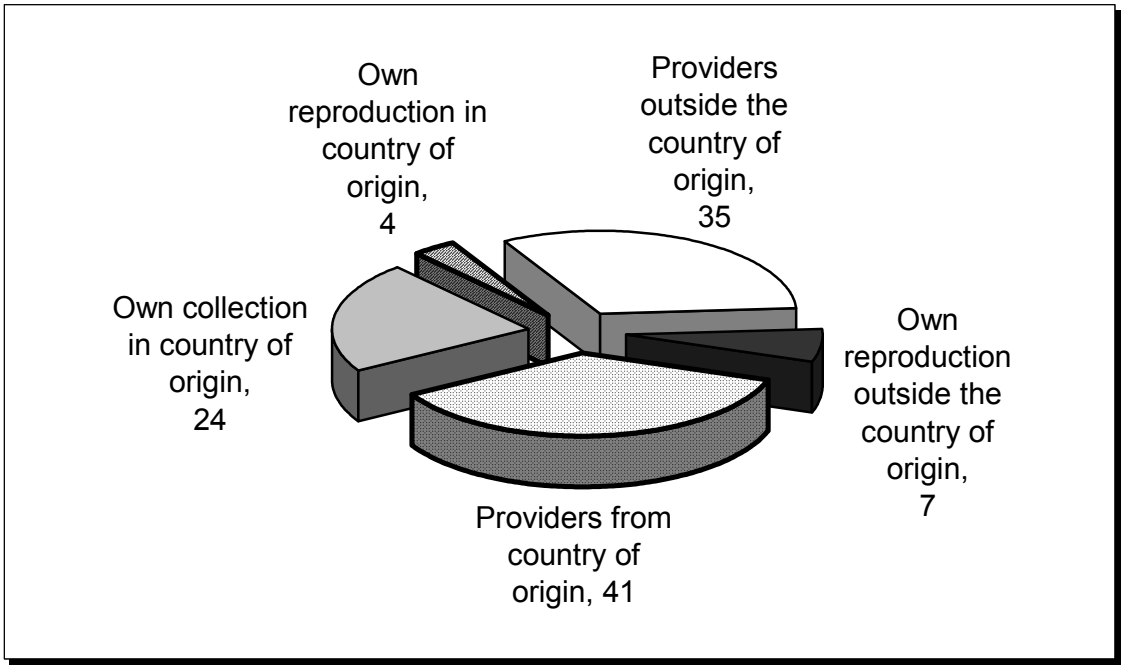
4.2 EXPERIENCES WITH ACQUISITION AND USE OF GENETIC MATERIAL

4.2.1 Obtaining of genetic resources

In the questionnaire users were asked for their ways of obtaining genetic resources; multiple entries were possible. Most of the users receive their material from trade partners rather than collect or reproduce it themselves, while collecting is reported significantly more often than the reproduction of genetic material.

Figure 4 illustrates the weighting of different ways of obtaining material according to the users' responses. Out of 60 users who answered the question, 41 receive genetic resources from trade partners in the country of origin. In 35 cases trade partners from other countries than those of origin were mentioned as source of supply.

Figure 4: Frequencies of supply sources reported by the users (Question B2)

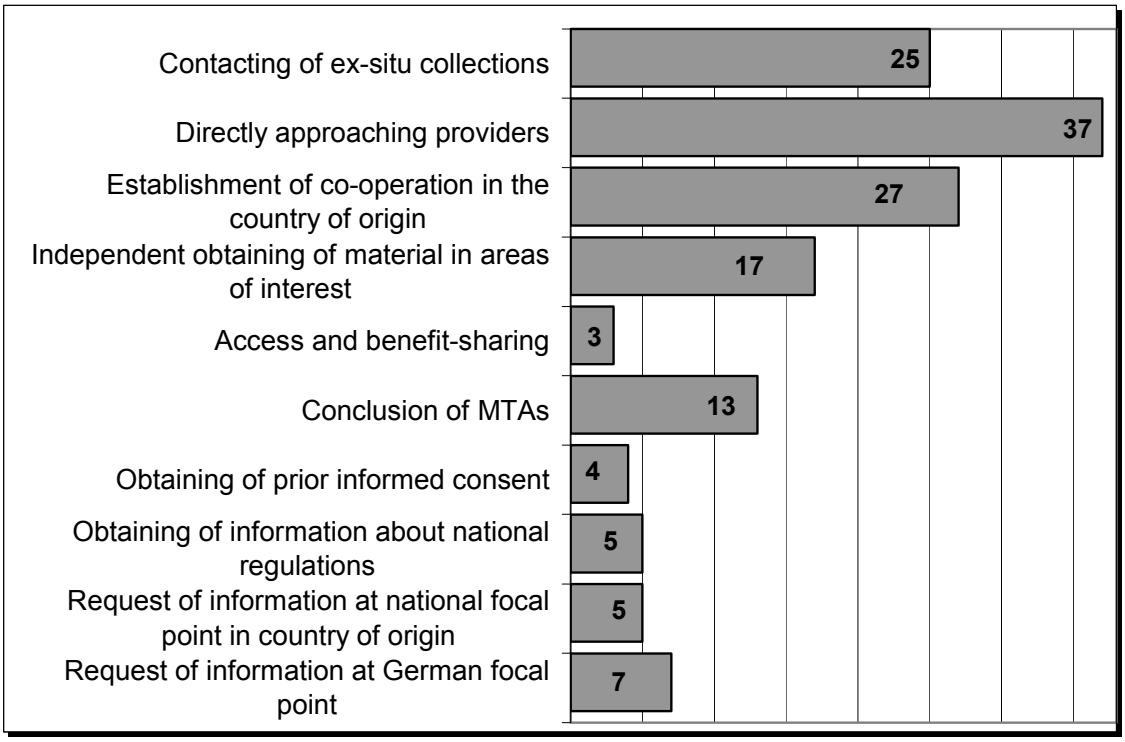


Source: Own survey.

Figures A. 5.1 to 5.10, Appendix II show that providers from the countries of origin and from other countries constitute the most important supply sources for all sectors. "Own collecting" activities are carried out above all by users at universities and other research institutions, as well as ex-situ collections and users from the field of biotechnology.

The following question examines which procedures are used by companies and institutions to obtain genetic resources. Figure 5 indicates how often the participants agreed to the individual response options.

Figure 5: Frequencies of user procedures for the provision of genetic resources (Question B3)



Source: Own survey.

Most users directly approach providers in the countries of origin, establish co-operation in the countries of origin and/or contact ex-situ collections. In comparison with other sectors, users from the horticultural sector most frequently approach providers in the country of origin directly (85 percent) and establish co-operation with partners from the country of origin (see Table A. 2 and Figure A. 5.5, Appendix II). This was confirmed in an expert interview with a representative from this sector. For example the horticultural breeders' directly obtain their material from countries of origin.

Only few users obtain PIC before using of genetic resources or conclude MTA's with the country of origin. Still, this does not mean that the genetic material is procured on an illegal basis. The extent to which CBD criteria are relevant for the use of genetic resources depends on several aspects. The procedures stipulated by the CBD for the use of genetic resources are only relevant for access and use of material from CBD member countries, who have implemented the ABS provisions of the CBD. Whether or not the respondents actually obtain genetic resources from these countries could not be clearly determined within the scope of this survey because most answers in this context were not explicit.

Furthermore, the way of acquisition plays an important role. Only users who collect or reproduce their genetic resources themselves can obtain PIC because they directly

negotiate with the providing country. This applies to four of the respondents. The largest number of users, those who collect their material themselves in the country of origin, can be found in the sectors of ex-situ collections, universities and other research institutions, and horticultural breeding (see Table A. 2, Appendix II). Seven (25 percent) of the users who collect and reproduce their material themselves conclude MTA's. Most of them also establish co-operation with partners in the country of origin. Typically, the users who seek PIC do not correlate with those concluding MTA's. Out of 29 users who collect and reproduce their material themselves, only one (who collects) reports ABS experience. Users who acquire the material through a third party have to trust that the material was obtained in compliance with the CBD. Users who obtain genetic resources through trade partners arrange MTA's. Two users who provide their genetic resources through trade partners also negotiate and arrange ABS.

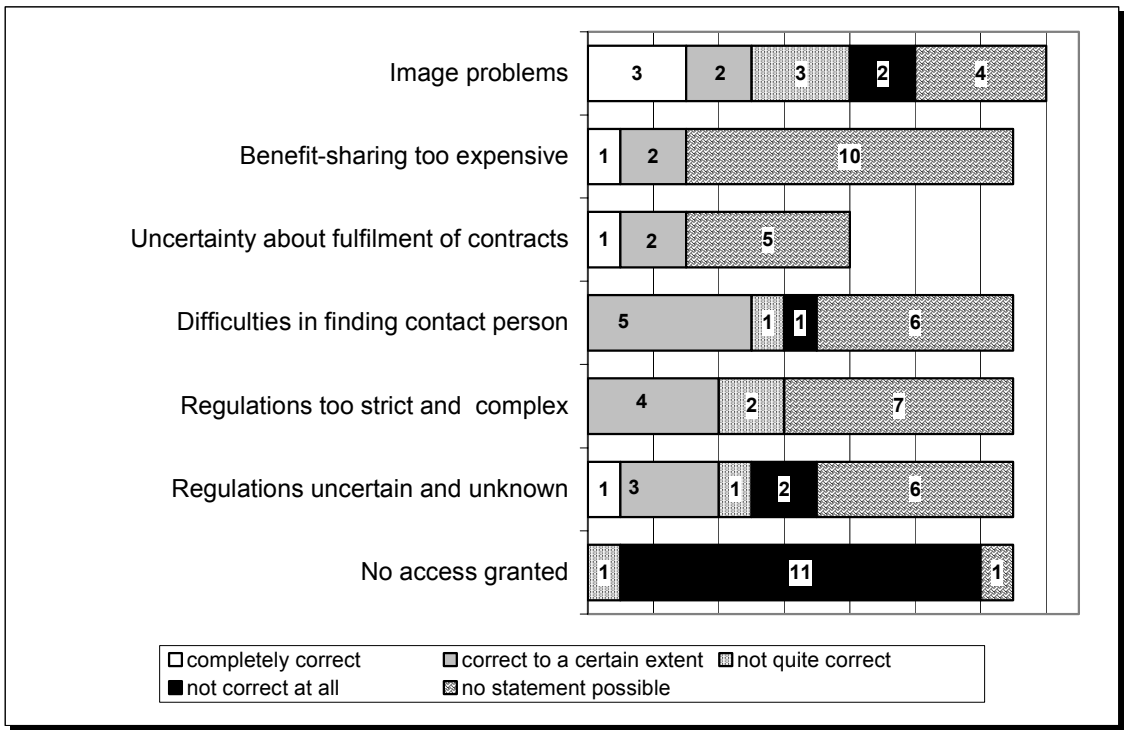
Detailed information about users' procedures for the acquisition of genetic resources on sector level is illustrated in Table A. 2, Appendix II.

4.2.2 Difficulties in the context of access and use of genetic resources

The main reason for the survey participants, who classified themselves as non-users, to not work with genetic is that they have no use for them. The respondents who completely agree to this answering option were not asked any additional questions and therefore do not form part of the following evaluation. The remaining group of non-users will be further on addressed as such.

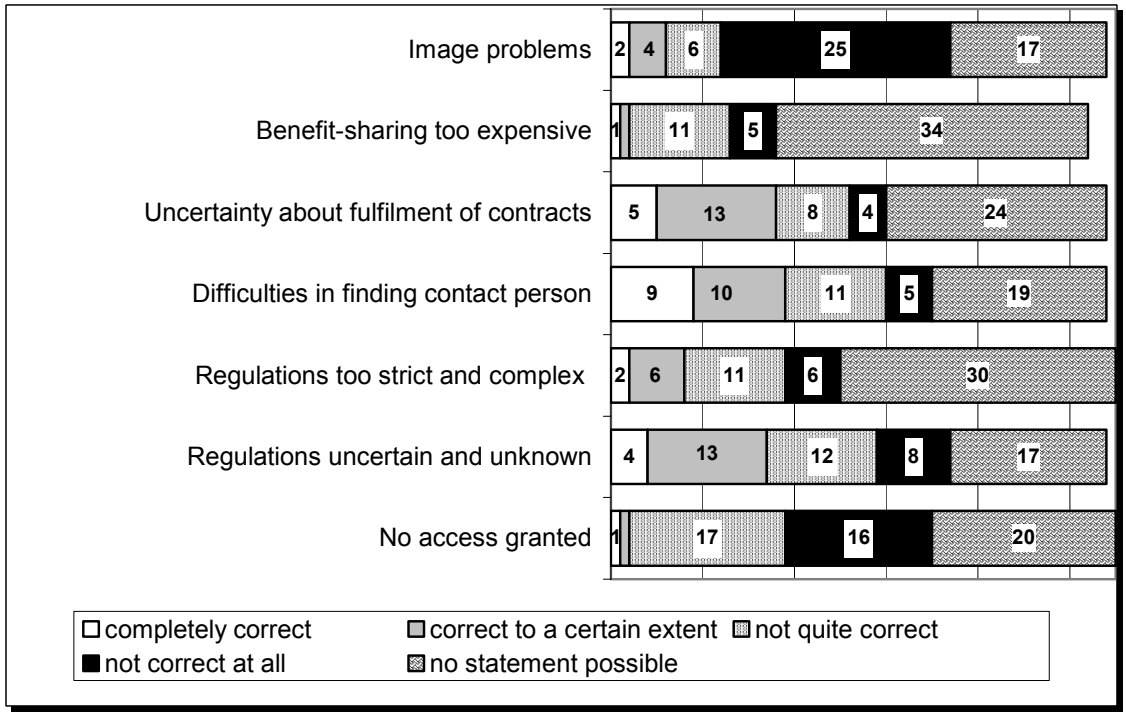
Figure 6 and Figure 7 illustrate the detailed evaluation of questions B1 and B5. All answering options are presented in level and frequency of approval by the respondents. Information about the distribution of statements on sector level is illustrated in Figures A. 6.1 to A 6.10 and A. 7.1 to A. 7.10, Appendix II.

Figure 6: Non- users: Level and frequencies of reasons given for the non-use of genetic resources (Question B1)



Source: Own survey.

Figure 7: Users: Level and frequencies of difficulties reported in the context of acquisition and use of genetic resources (Question B5)



Source: Own survey.

None of the answering options is clearly identified by a majority of users as the problem in the context of acquisition and use of genetic resources. In no case does the share of

users who agree to a problem exceed the share of those who either do not see any problem or cannot make a statement.

The relatively biggest problem reported by users and non-users is the difficulty to find an appropriate responsible contact person for the arrangement of access modalities in the country of origin.

Compared with the users a higher share of non-users states image problems as one reason for not using genetic resources. In the past, incidents where genetic resources were illegally obtained led to a negative impact on the image of using such material, as well as on the image of the users themselves. Whether or not image influences will cause further problems for users and keep them from using genetic resources, depends on the users' behaviour when obtaining material and public perception, as wells as the public attitude towards the commercial use of genetic material. Users, who set a positive example by revealing their activities and experiences, thus creating transparency, can contribute to the improvement of their image. The way of communicating possible effects of use to the public will determine the attitude of the latter and thus the overall image of users. In this context, user measures can play a decisive role (cf. chapter 4.4)

Except for two individual cases in the sectors of horticulture and pest control, the respondents of both groups - users and non-users - have not had difficulties in gaining access to the genetic resources of their interest, and therefore do not consider it as substantial problem (see Figures A. 6.1 to A. 6.10 and A. 7.1 to A. 7.10, Appendix II). This result contrasts the information obtained in an expert interview that users in the field of ornamental plant breeding face considerable problems when seeking access to genetic resources.

Only few respondents are able to give a statement on the problem of excessive costs resulting from benefit-sharing. This seems rather unexpected, since especially commercial users often complain about disproportionate expectations of monetary benefit-sharing. The expert interviews, however, revealed that users support the idea of non-monetary benefit-sharing. The survey result can be explained by the evaluation of the question about the users' awareness of the CBD, which reveals that only 14 percent of the users actually know the CBD and the meaning of benefit-sharing.

The same holds for the answers regarding problems which result from the strictness and complexity of international regulations on ABS, as well as from insufficient knowledge about these regulations. A large share of users and non-users does not make a statement in this context.

Still this is not surprising since so few (only nine users know exactly and 16 approximately) know what is meant by the term “ABS”. It is not supposed that non-users would be significantly better informed.

4.3 USER AWARENESS OF CURRENT INTERNATIONAL FRAMEWORK OF THE USE OF GENETIC RESOURCES

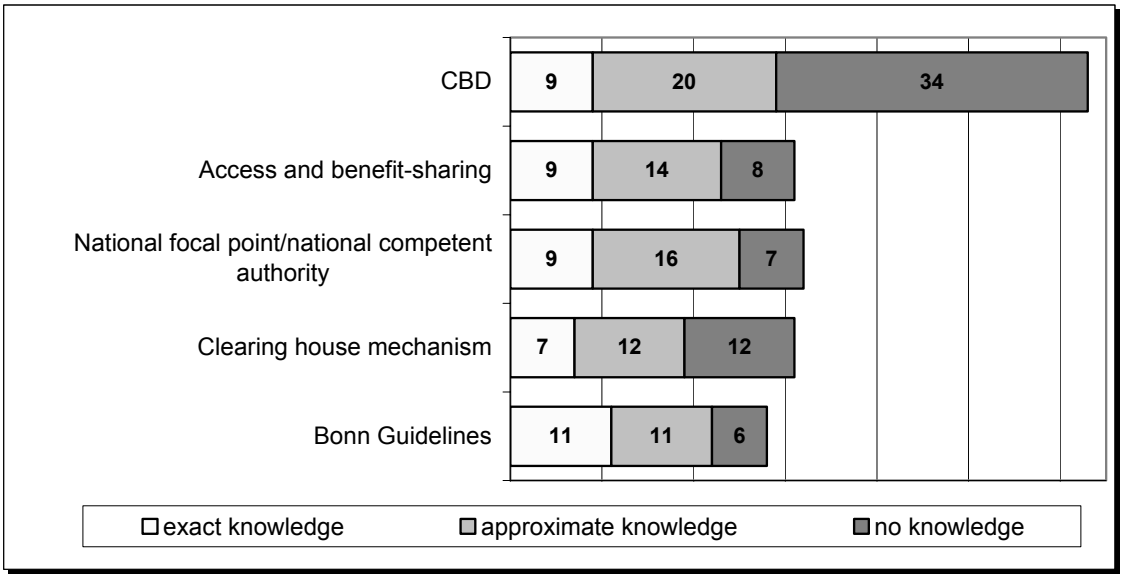
4.3.1 User levels of information

The first question of the survey section C addresses the users’ level of information on the international institutional framework for the acquisition and use of genetic resources.

The most relevant result of this section is that many users do not know the CBD exactly and consider themselves insufficiently informed about international regulations about ABS. More than half of the respondent users do not know the CBD at all. 20 users (32 percent) approximately know it and only nine (14 percent) exactly know what the CBD is about. Thus, the users are apparently aware of the lack of information.

Figure 8 illustrates how many users of the survey participants know the CBD, as well as the meaning of the related terms “access and benefit-sharing”, “national focal point and national competent authority”, “clearing house mechanisms” and “Bonn Guidelines”.

Figure 8: User level of information in the context of the CBD (Question C1/C2)



Source: Own survey.

The level of knowledge about related terms in the CBD context (ABS, National Focal Point, National Competent Authority, CHM’s) was only requested from those 29 users, who claim to know the CBD. Of the given terms, “clearing house mechanisms” is the least known.

According to the study from ten Kate and Laird it was assumed that larger companies and institutions tend to be better informed. The survey was not able not confirm the assumption. Groups of users which have a similar size and structure do not automatically have the same level of information.

This result was obtained by comparing the levels of knowledge about CBD terms (know exactly, know approximately, don't know) with the size and structure of the respective companies and institutions (R&D employees, research budget, and turnover). In all groups classified by these aspects, the majority of users are not informed about the CBD. The number of survey participants from each category of size, however, was not large enough to support the conclusion that in Germany the company and institution size generally do not correlate with the information level.

The examination of information level by sector results in more explicit findings (see Figures A. 4.1 to A. 4.5, Appendix II). Ex- situ collections are most familiar with the CBD, followed by universities and other research institutions. It could be expected that users from these groups are relatively well informed. As mentioned in chapter 2.4, botanical gardens in Germany have their own codes of conduct according to the Bonn Guidelines, and therefore have already been dealing with CBD issues.

The awareness of survey participants from the private sector turns out to be considerably lower. The CBD, as well as associated regulations and instruments for ABS are mostly unknown. It even can be supposed that the total awareness of all users including those who did not participate in the survey is even lower, since companies and institutions which participate in a survey about the use of genetic resources are probably more actively involved in these issues.

The answers regarding further need for information give a clear impression. More than half of the users familiar with CBD do not consider themselves sufficiently informed about the convention and its associated regulations on provision and use of genetic resources. Users at universities and other research institutions, as well as ex-situ collections on average feel more informed than users from other sectors. It is likely that the share of users considering themselves insufficiently informed would have turned out even larger, if the question had not addressed only the users already familiar with the CBD.

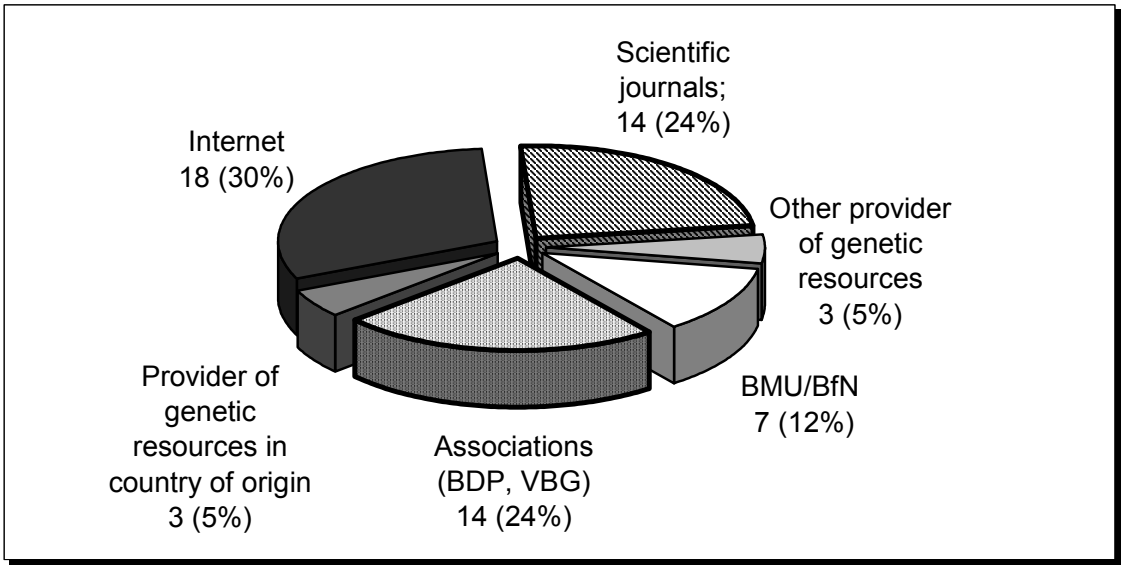
4.3.2 Channels of information

The most important sources of information about the CBD include, in descending order, the internet, associations and scientific journals. Firsthand information from German authorities which act as National Focal Point and are involved in the international CBD

process is only consulted by seven users (12 percent). This confirms the result observed by ten Kate and Laird that users are often informed about the CBD through secondary sources.

Figure 9 shows which channels of information are used by how many users; multiple entries were possible.

Figure 9: Users` channels of information in the context of the CBD and the use of genetic resources (Question C3; multiple entries possible)



Source: Own survey.

The Association of German Plant Breeders (BDP) and the Association of Botanical Gardens (VBG) are mentioned as associations which provide information on the CBD process. Providers of genetic resources play a minor role as sources of information. Only six users report having received information on the CBD from them, e.g. from gene banks or the Centre for Agricultural Documentation (ZADI). Detailed, sector specific information about users' information channels is illustrated in Table A.3, Appendix II.

Users which claim to be in contact with official national points, such as National Focal Points or National Competent Authorities, are found in the sectors of ex-situ collections (two users with contacts in South Africa, the USA and Mexico), universities (one user with contacts in South Africa) and animal breeding (two users with contacts in Germany and the EU).

4.4 USER PARTICIPATION

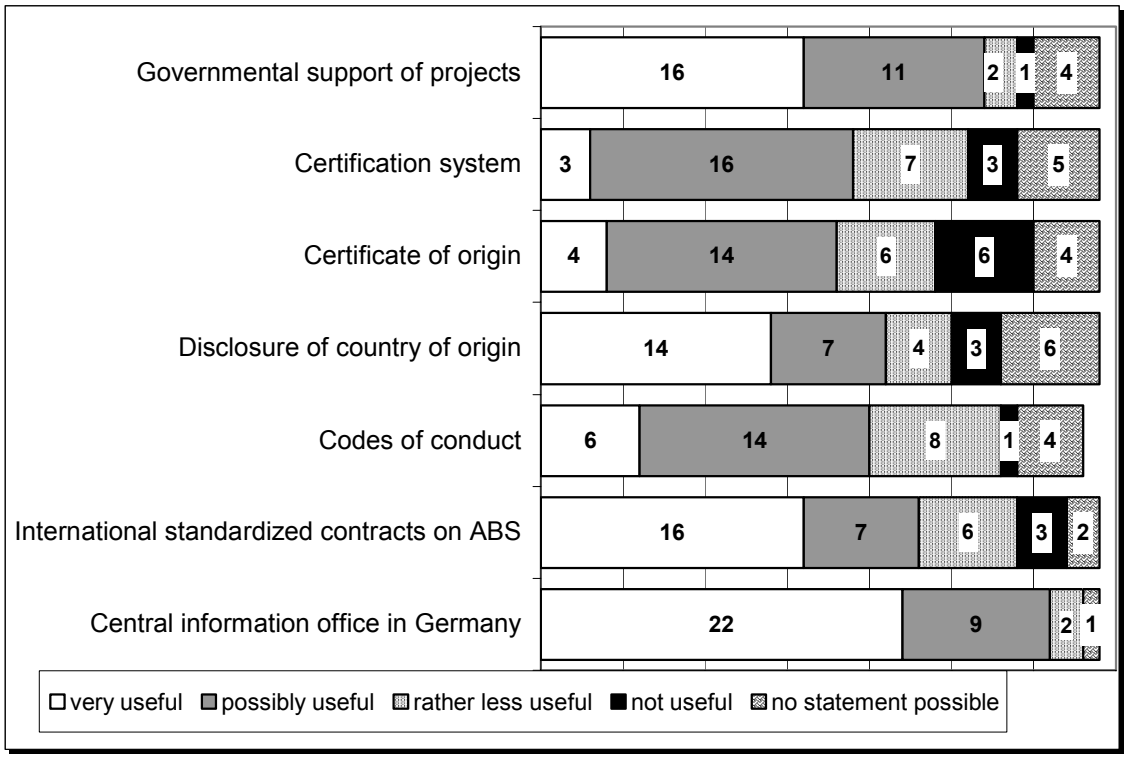
The following analysis concerns the users' attitudes towards the actual and desirable participation in the CBD process. We asked the 29 users who stated to be familiar with the CBD, how their own activities in the field of genetic resources are influenced by it

and to what extent they are involved in the whole process. To the question whether or not the users so far consider their interests to be represented in international negotiations on the design of the CBD, the answers differ. Eight users consider their interests to be insufficiently accounted for, while ten users feel well represented at international level. Other eleven users do not give any statement. There are no evident differences between the answers analyzed by sectors.

Only three users give suggestions on how to improve their participation in the CBD process. They propose more decentralized information strategies, e.g. the integration of many local contact points, such as botanical gardens and an increased involvement of associations, representing user sectors.

At international level those user measures are currently being discussed, which promote the users' participation in the field of ABS, thus encouraging compliance with the CBD criteria (cf. chapter 2.4). In general the users support all of these suggestions. Figure 10 illustrates how they rate the usefulness of different user measures.

Figure 10: Acceptance of different user measures (Question D5)



Source: Own survey.

The users consider instruments in form of services as more useful than measures regulating their handling of genetic resources. The intensity with which user measures interfere in their activities is also of importance. Interferences of minor intensity are preferred to those of high intensity. Detailed, sector specific information are illustrated

in Figures A. 9.1 to A. 9.10, Appendix II.

The suggestion to establish a central information point in Germany, which actively informs about access possibilities and conditions in provider countries and assists in approaching the latter, is considered the most useful instrument, with an approval of 90 percent. Most users also support the idea of governmental assistance in the development and realization of projects promoting co-operation between users and countries of origin. These two measures do not put limits on the user activities, but are services to users.

Many users also support other suggestions, particularly the introduction of internationally standardized agreements on ABS, which reduce uncertainty and transaction costs for both, users and providers, similar to co-operations in countries of origin. The disclosure of the country of origin when applying for a patent developed by the use of genetic resources is considered very useful by 40 percent of the users and possibly useful by another 20 percent. The user is required to disclose his source of supply only in case of patent application, during the last stage of development. Thus the interference in user activities is rather small. Only seven users object to the introduction of disclosure. This is especially interesting since the proposal for its implementation in accordance with the EU-Directive on the Legal Protection of Biotechnological Inventions is already being discussed in the German Bundestag (Lower House of German Parliament) and will soon be decided.

At first sight the positive acceptance of a certification system is rather remarkable. Only one user reports image problems in the context of the use of genetic resources. Moreover this measure exerts a considerable influence on the users' activities by involving an independent entity which judges them according to objective criteria. Nevertheless, the participation in certification systems is voluntary and users are already familiar with certification systems (see EMAS in chapter 2.4.2). Therefore the users probably evaluate this measure rather good.

The certification of origin, source and legal provenance is probably the most unknown instrument and considered more critically than other instruments, yet the number of approval still outweighs the refusals.

Apart from estimating certain instruments, some users give their own suggestions on how to increase the users' commitment to CBD regulations. These suggestions, which overlap with those mentioned in the context of improving participation, concern the further involvement of associations and sector initiatives (e.g. botanical gardens).

Nine users actively take part in sector initiatives which deal with the handling of genetic

resources. One of the initiatives reported by the users is the initiative of the Association of Botanical Gardens already mentioned in chapter 2.4. Users at botanical gardens further refer to the International Plant Exchange Network as user initiative in the field of use of genetic resources, as well as to the compliance with guidelines on the transfer of genetic resources established by CITES and CBD. The head of the working group on ex-situ conservation at the gene bank of the Institute of Plant Genetics and Crop Plant Research (IPK) in Gatersleben informed us, that the management of the gene bank adheres to the CBD by concluding MTA's before passing on genetic material. One institute which conducts research in the field of livestock breeding concludes MTA's according to FAO rules.

Whether or not the participation in such initiatives is taken into consideration for reasons of image improvement, is answered positively by eight out of 21 respondent users. Five of them are ex-situ collections which already participate in initiatives. Private companies express a rather critical attitude.

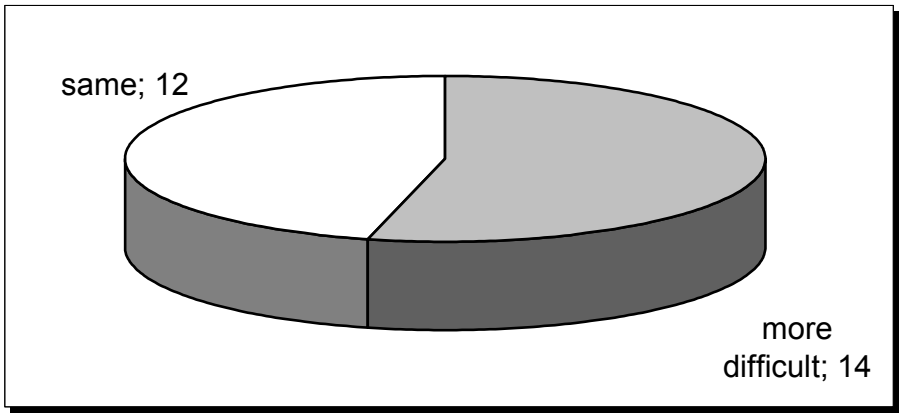
4.5 DEVELOPMENT OF USE OF GENETIC RESOURCES

60 users, including those who are not familiar with the CBD, gave statements about the development of their activities in the field of genetic resources.

According to the respondents, changes in the use of genetic resources have been taking place since the CBD was concluded in 1993. Access has become more regulated, while using activities have remained mostly constant or increased. In the future the use of genetic resources is likely to become even more important.

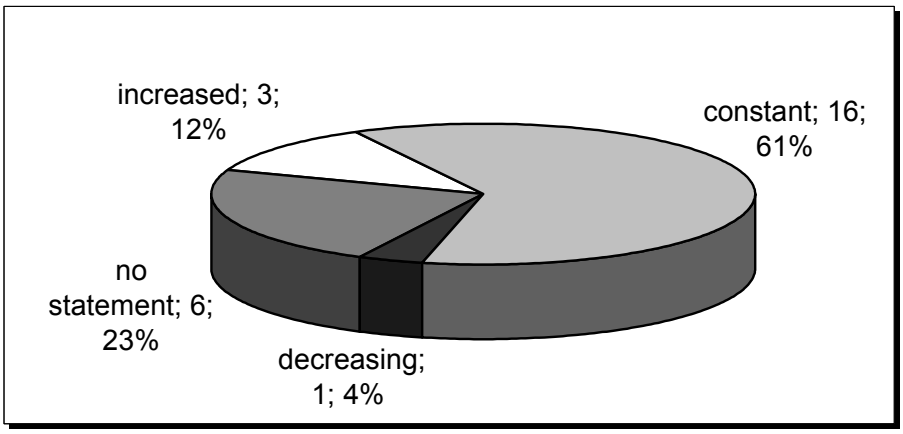
Half of these companies and institutions believe that it has become more difficult for German users to gain access to genetic resources, since the CBD entered into force (see Figure 11). Especially users at ex-situ collections, universities and other research institutions, and the horticultural sector judge the developments accordingly.

Figure 11: Development of access to genetic resources since CBD entry into force (Question D1)



Source: Own survey.

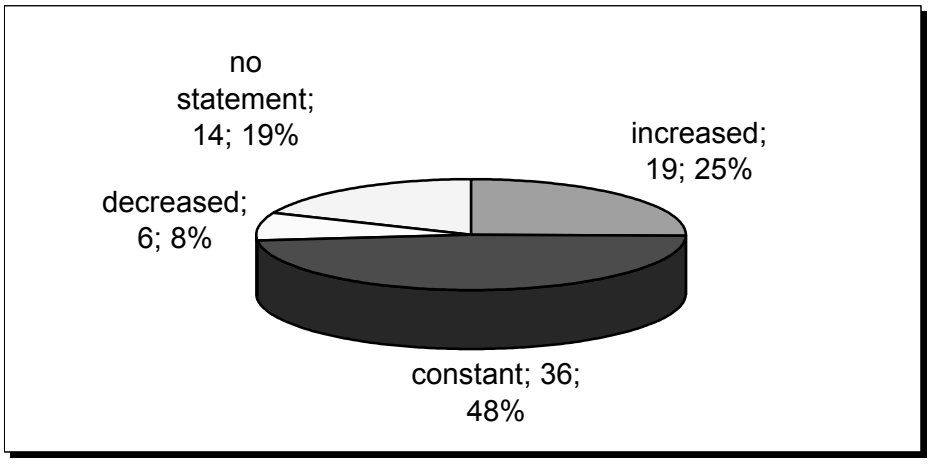
Figure 12: Development of use of genetic resources since CBD entry into force (Question D2)



Source: Own survey.

The majority of the users report an approximately constant use of genetic resources since the CBD entered into force. The number of respondents who have extended their use is three times that of the users who indicate a declining trend (see Figure 12). Despite of a large number of users consider that gaining access has become more difficult since the entry into force of the CBD, only one out of 26 respondents actually restricted its use. When additionally considering users who are not familiar with the CBD, we obtain a similar result. In most of the companies and institutions the extent of use of genetic resources has not changed significantly during the past five years. Only six users restricted their use, while again three times as many even extended their use (see Figure 13)

Figure 13: Users` statement about development of activities of the companies regarding genetic resources compared with the past five years (Question E2)

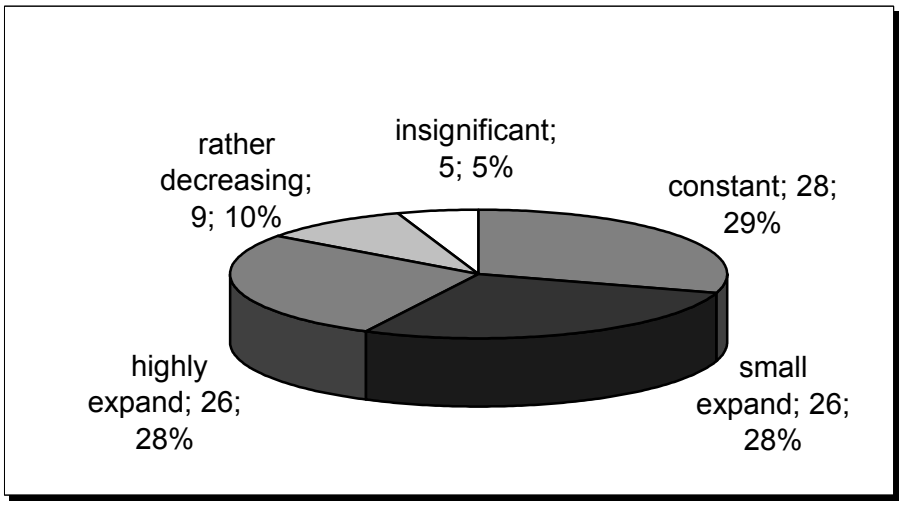


Source: Own survey.

In addition to the estimation of how the use of genetic resources developed in the past, its future prospects are of interest as well.

Genetic resources will continue to play an important role in the future. Figure 14 compares the users' answers regarding potential scenarios for future use of genetic resources (significantly expanding; slightly expanding; constant; declining; insignificant). The results are based on a summary of the categories "completely correct" and "correct to a certain extent".

Figure 14: Users` estimation about the development of activities in the field of genetic resources (Question E3)



Source: Own survey.

Half of the users are likely to expand their use in the future, and another 31 percent will at least continue at a constant level. Nine users estimate their activities in the field of

genetic resources to decline, but still to continue at a lower level. Five users predict a rather insignificant need for genetic material in the future. Only one of the latter mentions difficulties with the provision of material. This user indicates image problems due to the use of genetic resources.

The restriction or dropping of the utilization of genetic resources can be due to difficulties regarding the acquisition of genetic material. In this context three of the users who report a declining use, indicate insufficient knowledge about ABS regulations, difficulties in finding a contact person in the country of origin, and problems with the enforcement of contracts of ABS. The other six users which are likely to restrict their use do not mention any problems concerning provision and use of genetic resources.

The following trends regarding future use have been identified for the different sectors.

Users in the sectors of botanical medicine, cosmetics and care, horticulture, and livestock breeding show consistent results by predicting increasing activities in the field of genetic resources.

Users in the sectors of pest control and plant breeding will use genetic resources at a constant or higher level. Only one plant breeder and none of the users in the field of pest control, assumes to reduce or quit this use in the future.

Answers made by users in the sectors of pharmacy, universities and other research institutions, as well as ex-situ collection do not reveal clear trends. Few of them expect genetic resources to become insignificant. Compared to other sectors, the share of users who might not use genetic material in the future turns out largest within this last group.

5 DETERMINANTS AND OPPORTUNITIES FOR USER INTEGRATION

In the following we will interpret the results of the survey, described in chapter four. The heterogeneity of the users' composition, the level of information, awareness and participation, and the users' perspectives and concerns can be identified as the major determinants which have to be considered by policy makers when developing strategies to promote the integration of users into the CBD process. The integration of users has to be increased particularly in order to place the CBD process on a large and informed basis and support the users' compliance with the CBD on part of the users.

Integration strategies should include user measures which aim at an increased participation of users in the CBD implementation process and a stronger user obligation to the CBD goals. They should be accepted and positively assessed by the respondents of the survey. A priori promising user measures include the improvement of national focal points and clearing house mechanisms, the promotion of co-operation and provision of standardized contracts, the monitoring of intellectual property rights applications, the development of corporate policies and codes of conduct, the initiation of a voluntary certification system, and the import control of genetic resources.

5.1 DETERMINATS FOR USER INTEGRATION

5.1.1 Heterogeneity

The German user sector is heterogeneous. Ten different sectors participated in the survey. Almost all of the predetermined categories regarding R&D employees, research budgets and turnovers are represented, but proportionally small and medium institutions and companies are represented by a larger number (see Figures A. 1.1 to 2.3, Appendix II).

Some general trends can be observed. Most users obtain genetic material through intermediaries located in the country of origin of the resources or in a country outside of the country of origin. Half of all respondents have already developed products or applied patents and plant protection rights. The future development of the use of genetic resources is positively assessed. The majority of users expect to expand their use in the future. Nevertheless, the heterogeneity of the user sector is also obvious. The users differ by sectors in current use of genetic resources and other aspects. The following remarkable aspects of sector differentiation can be derived from the survey.

Table 3: Heterogeneity by sectors

	Reasons for non-use by potent. users	Difficulties of users	Intention of use/ results (patent, etc.)	Source and level of information	Endorsed User measures
Biotechnology	Image problems	Image problems	Products		Information office
Pharmacy		Image problems	Development of marketable products		
Cosmetic and Personal Care					
Botanical Medicine	Lack of contacts	Image problems			Information office Promotion of cooperation
Ornamental Horticulture		Image problems Access Problem	Development of marketable products Products	Scientific Journals Associations Poorly informed	Information office Promotion of cooperation Disclosure of origin
Plant Breeding	Uncertainty - fulfilment of contracts Lack of contacts	Image problems Access Problem	Development of marketable products Products	Associations Poorly informed	
Pest Control	High costs of benefit-sharing Uncertainty - ABS regulations Lack of contacts		No results		Information office
Universities/ Research Institutions	High costs of benefit-sharing		Research, collection, conservation and circulation	Well informed	Information office Promotion of cooperation Disclosure of origin
Ex-situ Collections			Research, collection, conservation and circulation	Well informed	Information office Promotion of cooperation Disclosure of origin
Livestock Breeding	Lack of contacts		Research No results		Not useful

Note: The unmarked sections indicate that no remarkable attribute could be identified for the specific sector and the specific aspect.

Source: Own illustration.

“Reasons for non-use by potential users”, “difficulties of users”, “intention and results (patents, products, etc.) of use”, “source and level of information” and “attitude towards user measures” are evaluated differently by each sector. For example in the sectors of horticulture and plant breeding associations play an important role for the acquisition of information. In other sectors different media are the main source of information. Therefore the involvement of associations is important in order to successfully reach and integrate users. The sectors which use genetic resources only for research require other measures than those who develop marketable products. The same applies to intermediaries (universities and ex-situ collections) who collect and circulate genetic material.

This heterogeneity of the sectors has to be considered when formulating strategies which aim at a stronger integration of users in the CBD process. Not all of the user measures can be applied to all sectors. It is necessary to develop sector specific instruments which consider the specific problems and situations within the sector.

5.1.2 Information and awareness

An important result of the survey is that German users of genetic resources are poorly informed about the international legal framework of access to and use of genetic resources and not familiar with CBD terms. Many users, regardless of the size of their company or institution, do not know the Convention and the meaning of the terms “Access and benefit-sharing”, “National Focal Point/National Competent Authority”, “Clearing House Mechanism”. Users are aware of this situation. More than half of the users who know of the CBD consider themselves not sufficiently informed. The lack of knowledge and information is differently distributed among the sectors. Public institutions (ex-situ collections, universities and other research institutions) are more familiar with the terms and feel better informed than private institutions and companies.

The main channels through which users obtain information are secondary sources: the internet, associations and scientific journals. National authorities in Germany or in the countries of origin are of minor significance as source of information.

The main problems for users in the context of acquisition and use of genetic resources are the lack of information and uncertainty. Many users have difficulties in finding contact persons and seeking information about regulations. Non-users also mention these problems as reasons for not using genetic resources. Uncertainty is also relevant in the context of contract fulfilment. Many users are concerned about the fulfilment of contract obligations on part of the providers and about the complexity of regulations.

When developing strategies to include users into the CBD process, the consideration of

information deficiencies is of prime importance. Users have to be informed about the basic regulations, terms and responsible institutions in the context of the use of genetic resources. The information should be passed on through the channels which are primarily used in the different sectors. Besides, user measures to alleviate the uncertainty need to be implemented. Contact points should be established or redefined and made known to the users. Support has to be provided for the fulfilment of contracts. Only if the information deficiencies can be reduced users can be integrated in the CBD process and fulfil the CBD obligations.

5.1.3 Willingness to participate

Until now the user participation in the CBD process is very low, especially in the private sector. However some public institutions, organized in sector initiatives, have developed policies and codes of conducts with governmental support (e.g. botanic gardens). One private company is involved in an ABS project which aims at the development of model agreements. This project receives financial support by the German government.

The level of awareness regarding the low participation is not clear. Some users feel already well represented by the German government at international level, others do not and many do not comment on this question. In order to increase participation users suggest the initiation of decentralized information strategies (e.g. establishment of local contact points, involvement of associations) and therefore emphasize the information problem.

In general, suggested user measures are positively assessed by the users. They consider measures in form of services more useful than measures which interfere in the users' activities. The establishment of an active and central information office is the most accepted measure. Users are willing to participate if the measures address and alleviate their information problem and do not restrict their activities. Probably there is no urgent need for a stronger participation from their point of view.

First, the questioned users – except for two individual cases in the sectors horticulture and pest control – report no difficulties in gaining access to genetic resources. But expert interviews cannot support this unexpected result. Experts from different sectors consider restricted access still as a major problem.

Secondly, the respondents report that the public attitude towards users' activities and image problems, resulting from published cases of illegal acquisition of genetic material in the past, is of minor significance. Only few users and non-users mention image problems as reasons for non-use of genetic resources or as difficulties in the context of obtaining and using genetic resources. Some users, who are already involved in public

sector initiatives, explain their participation by image improvement, whereas private companies express a rather critical attitude towards user measures as instruments of image improvement. The image problem is probably more relevant for large companies who work in different sectors (life science companies). They poorly participated in this survey. A decreased reputation has effects on other branches and therefore from an economic perspective, large life sciences companies might suffer considerably from the consequences of a bad image. Hence, even if image problems do not play a significant role in the survey, they have to be considered as a reason for restricted access and low collecting activities on part of the users.

The actual level of participation and the willingness to participate should be taken into account when aiming at stronger user integration. Both depend on the sector affiliation of the users. Some sectors are already more involved in initiatives or more willing to participate than others. For example user measures, which are voluntary and have to be self-initiated, require a high level of willingness to participate. The importance of associations in the sectors (e.g. plant breeding) in which they represent the users in political discussions has to be considered. In order to increase user integration policy makers should especially involve these groups.

5.1.4 Perspectives, expectations and concerns

Even if hardly any user reports access problems users who collect their material directly in the countries of origin (ex-situ collections, universities, horticulture) have the impression that access to genetic resources has become more difficult since the CBD's entry into force, whereas the private sector who mainly obtains the genetic material through intermediaries considers the situation as unchanged. Nevertheless, the total use of genetic resources in Germany has remained constant or increased since the CBD's entry into force. Genetic resources will continue to play an important role in the future. 85 percent of the users intend to expand or constantly retain the use of genetic resources in future. Some of the remaining users indicate problems of information and uncertainty regarding contact persons, ABS regulations etc. in the context of a declining use of genetic resources.

In general, the respondents appear to be very open to CBD issues and the possible results of the CBD process. The concerns regarding the introduction of user measures and the associated establishment of an international ABS regime seem to be small. Users positively judge the user measures which are under discussion at international level. They consider instruments in form of services as more useful than measures interfering in and regulating their activities. But surprisingly the disclosure of origin is considered as one of the three most useful measures. Since this instrument is estab-

lished as non-binding by an EC directive and about to be implemented in Germany users seem to be well informed and not concerned about it.

The continuing importance of genetic resources requires the introduction of measures which impose responsibilities on the users. Users do not seem to be concerned regarding these developments as long as the problems of information and uncertainty are addressed and do not aggravate. Furthermore they appear to be very open regarding these issues. Policy makers should take up this positive attitude and use it as a basis for further initiatives.

5.2 OPPORTUNITIES FOR USER INTEGRATION

In the following chapter the user measures are discussed under consideration of the determinants of user integration. The order indicates the degree of acceptance (descending) by the respondents.

5.2.1 Improvement of national focal points and the clearing house mechanism

German users are poorly informed about the CBD, its regulations and institutional settings, but only informed users can comply with the CBD's obligations and participate in the process. Users have the responsibility to inform themselves, but competent authorities can facilitate access to information through certain measures. The survey shows that the respondents are aware of their information deficiencies and would like to alleviate them.

A central information office plays the most important role for dissemination of information since users are not informed about the fundamental framework of the CBD and the ABS concept. Even the existence of national focal points and national competent authorities is unknown among many users. The German national focal point is determined and established but it needs to gain stronger recognition and its responsibilities should be extended not only to fulfil the CBD obligations but also to create incentives for user participation.

Many respondents report to have difficulties in finding contact persons and seeking information about access regulations in provider countries. The national focal point could inform about international regional and national ABS laws – as far as they are available - and help to establish contacts to national competent authorities in provider countries. The threshold of entrance for first time users would be lowered and both users and providers would have access to better information about and more confidence in their partners.

The work of the German national focal point can be improved by the collaboration between different national focal points. The cooperation decreases costs and facilitates

transboundary information exchange. So far the focal points of the EU member states coexist independently. Especially large companies and institutions which use genetic resources have research and development departments in different countries. The establishment of a network of national focal points can address this situation.

The national focal point should apply the channels of information which are already used by the different sectors. Users indicate the internet, scientific journals and information circulated by associations as the main channels of information.

The CHM which is unknown to most of the users offers national focal points a possibility to disseminate information and to reach a large group of users, but it is necessary that the CHM is made known to the users before. Furthermore the CHM has to be improved. The German CHM should provide a specific section on ABS which could inform users regarding their rights and obligations under the CBD and other regulations and guidelines on biodiversity. A first step here could be a checklist for users to identify whether they are concerned by any ABS obligation. On behalf of the Federal Ministry of Environment, Nature Conservation and Nuclear Safety a specific CHM-section on ABS is currently under construction.

The EU Commission suggests using the CHM for user registration. The register can improve the reputation of users since the registration of a fully-fledged ABS policy in compliance with the CBD would be evidence of a good sense of corporate social responsibility (EU COMMISSION, 2003, p. 4). Additionally the CHM can be used to increase the effectiveness of other user measures. Corporate policies, codes of conduct or standardized contracts can be publicized through the CHM and can be provided for other users and providers. At the same time the national focal point should use scientific journals which are read by many users to publish information about existing and planned regulations and institutional settings (e.g. CHM).

When disseminating information the national focal point has to consider the heterogeneity of the user sector. The national focal point should work closer with the associations to develop information strategies. Some respondents proposed a stronger involvement of the relevant sector association to increase user participation. Usually associations are well informed about the activities and difficulties of their members regarding the use of genetic resources and can forward the data to the national focal point. Users might be more likely to enter the discussion if they see their own interests being represented. Information from the national focal point to the users can also be transferred through associations. Users have confidence in the associations' work and consult them already on different matters. Associations can summarize, filter and pre-

pare the information for the members. The national focal point should regularly initiate workshops with association to enable the exchange of information and support participation on part of the users.

5.2.2 Promotion of co-operation and provision of standardized contracts

Major problems for users in the context of acquisition and use of genetic resources are the complexity and intransparency of the regulations, the identification of contact partners and the uncertainty about fulfilment of contracts. In order to alleviate these problems governments of user countries should support projects which aim at a stronger co-operation between users and providers. For example the initiation of workshops bringing together German users, provider from certain regions and competent authorities or the support of research projects, aiming at the conservation and sustainable use of biological diversity should be considered. By participating in such projects guaranteeing CBD compliance users can improve their reputation and receive facilitated access to potential partners in provider countries. The projects' framework (description, objectives, participants, activities, etc.) should be published via the CHM.

Besides, the national focal point could provide international standardized contracts which create transparency and certainty. The Bonn Guidelines offer a list of elements which should be included in MTA's. Model agreements should be in line with these. The model contracts can be developed in co-operation projects by users, providers and competent authorities or they are provided by users who already have experiences in ABS. The CHM could be used to publish these model contracts and provide them to users and providers. The respondents of the survey judge these measures favourably.

5.2.3 Monitoring of intellectual property rights applications

The missing implementation of monitoring elements in the ABS process – e.g. the compliance with the PIC and the equitable and fair benefit sharing condition – is reason for the mistrust which providers and partly the public show users. The disclosure of origin in intellectual property rights applications can alleviate this problem and control the compliance with the CBD in a late phase of the research and development process. The control is facilitated because users have the burden of proof where they obtained the material. Therefore users assume control responsibilities and are integrated in the in the CBD process. The measure is probably widely accepted among the users due to its non-binding nature. The disclosure requirement is without prejudice to the processing of patent applications or the validity of rights arising from granted patents.

Nevertheless, the EC directive on the legal protection of biotechnological inventions should immediately be implemented in Germany to create legal certainty and fulfil the

obligations arising out of the EU membership. Actually, the EC directive should have been implemented by 30 July 2000. Users and their representative (e.g. associations) participate in the implementation process for example through public hearings.

5.2.4 Development of corporate or institutional policies and codes of conduct

Institutional policies and codes of conduct as known in Germany and the EU are voluntary measures which are initiated by the stakeholders themselves, but their initiation has been financially supported by the German government or the EU. The measure is widely supported by the respondents, though only few have participated. Consequently the knowledge of this group is larger.

Both users and providers can benefit from their establishment. The application of corporate policies and codes of conduct increases user transparency and therefore provider countries' trust in partners. The use of codes of conduct can increase users' reputation and facilitate access to genetic resources for their members. There may be less need of other compliance procedures.

The examples of MOSAICC or the initiative of the Botanical gardens in Germany (IPEN, see p.13) show that once policies or codes of conduct are developed and successfully applied in an institution they can be disseminated in the entire concerned sector at low transaction costs. They can provide sufficient flexibility to respond to the circumstances of specific research sectors and users of genetic resources if their design is appropriately adjusted. Therefore they address the heterogeneity of the sectors and users. But the examples also illustrate that these initiatives have only been realized with financial support by governments. Supporting the establishment of corporate policies and codes of conduct can be an important measure for CBD user parties to enhance participation of users. If examples of such initiatives are made public the additional costs for an adaptation to the specific needs of user groups decreases. A process can already get started with financing and initiating workshops, bringing together experienced users and users who are willing to develop corporate policies and codes of conduct for their sector.

5.2.5 Voluntary certification system

Users can increase their reputation by guaranteeing CBD compliance when accessing and using genetic resources. Even if the market for genetic resources is dominated by a few companies, a large number of small and medium-sized firms and institutions still exist in there. There is a growing tendency of large, established pharmaceutical, agricultural and other life science companies cooperating with these start-up research companies and smaller institutions (Hill, 1999). These users are new in the market or

stay only a short period and lack the time to gain reputation. The participation in a certification system can improve the user's reputation and provide the basis for provider countries to feel more confident about their potential partners.

In the EU the EC Eco-Management and Audit Scheme (EMAS) offers an interesting example that can be considered for the development of voluntary certification schemes for organizations complying with the CBD, Bonn Guidelines and national ABS regulations. EMAS is a voluntary scheme for organizations and was established for the evaluation and improvement of the environmental performance of organisations, the demonstration of legal compliance with environmental legislation and the provision of relevant information to the public and other interested parties (EC No 761/2001 Art. 1). It is open to any organization in the public and in the private sector in the EU (EC No 761/2001 Art. 3, 1). The participation in EMAS requires the conduction of an environmental review considering all environmental aspects of the organization's activities, products and services, the establishment of an effective environmental management system, the carrying out of an environmental audit, and the provision of an environmental statement (EC No 761/2001 Art. 3, 2). In Germany the federal countries financially support small and medium enterprises in the process of preparing for an EMAS-registration.

The EU Commission suggests applying EMAS in the ABS process. The principles formulated in the CBD and in the Bonn Guidelines could be incorporated in organizations' environmental policies and environmental management system established under EMAS and could then be reflected in their environmental statement. The independent environmental verifiers accredited under EMAS would control the reliability, credibility and correctness of the data and information in the environmental statement. EMAS could support the setting up of an international certification system for genetic resources as it is discussed in the CBD with useful information and experiences. A modified EMAS could be even implemented in other user countries (European Commission, 2003, p. 23). The questions whether EMAS is the appropriate certification system or how an appropriate system has to be specifically designed cannot be answered within the framework of this study. At least EMAS should be taken into account when discussing the introduction of a certification measure.

We recommend for the development and initiation of a certification system to consider the structure of the German user sector. Due to the sector's heterogeneity a certification system has to be designed in such a way that it allows the majority of German users to participate. Users of genetic resources should be involved in the development of the standards of a certification system. Initial external funding is necessary for the de-

sign and implementation of the system.

5.2.6 Import control of genetic resources

Users are uncertain regarding CBD and ABS regulations and the acquisition of material which is in compliance with these regulations. In their opinion the legislative framework is too complex. Due to the fact that many users obtain their material through intermediaries they have to trust that the material has been legally procured.

The introduction of certificates of origin, source or legal provenance issued by the country of origin or source and proving that the material has legally obtained under the national ABS regulations can alleviate this uncertainty and complexity. If users obtain genetic resources and a certificate which proves the legal acquisition they can be certain that the material has been obtained in compliance with the existing ABS regulations and easily avert suspicions of misappropriate acquisition. This measure creates a control system in which the effectiveness does not depend on the applications of IPR's (in contrast to the disclosure of origin).

The introduction of such certificate requires transparent ABS regulations in provider countries, which can facilitate access for the users. But in many countries the national implementation of the CBD's ABS concept varies. If countries design and establish national certification and licensing systems following national requirements, conflicts between these systems can arise and cause failure. An uncomplicated and harmonized, international scheme for certifying access is desirable for the feasibility of a certification and licensing system.

As already indicated the use of the certificate of origin can also play an important role in the monitoring process of IPR's applications. Patent offices can be relieved if they only have to control the existence of a certificate of origin, source or legal provenance and not the compliance with the CBD.

An important convention that has to be considered for the creation of a certification system is the Convention on the International Trade in Endangered Species (CITES) which regulates the transboundary movement of certain specimens, and parts and derivatives of protected species of plant and animal since 1975. CITES is an international conservation treaty adopted by 166 governments to ensure that international trade in specimens of wild animals and plants does not threaten their survival. It accords varying degrees of protection to more than 30,000 species of animals and plants. CITES works by subjecting international trade in specimens of selected species to certain controls. These require that all import, export, re-export and introduction of species covered by the Convention have to be authorized through a licensing system. In the EU

the convention is enforced by the European Union Wildlife Trade Regulation, Council Regulation (EC) No. 338/97. It establishes a comprehensive, standardized and binding regime for import, export and commercial use of certain plants and animal, parts or derivates of them. The concerned species are listed, depending on the degree of endangerment. The CITES system is considered to be effective. For example in 2002 1465 specimens of endangered species were confiscated by customs in Germany.

Besides CITES, many user countries have already implemented customs and transport regulations and institutions that monitor and control the trade and import of plants, animals, micro organisms, including parts or derivates. They are intended to protect public health, livestock, agriculture, and horticultural industries, and the environment from the risk of exotic animal diseases, plant pests and diseases (UNU, 2003, p. 25). One example is the International Plant Protection Convention (IPPC), an international treaty with the purpose of securing a common and effective action to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control (FAO 1997, Art. 1). The IPPC provides a framework and forum for international co-operation, harmonization and technical exchange which could also be used for enforcing ABS regulations. The Convention is recognized by the World Trade Organization in the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) as the source for international standards for the phytosanitary measures affecting trade which demonstrates its outstanding in role in trade issues (WTO, 1994). Most EU member states are already contracting parties. In accordance with the Convention the contracting parties have sovereign authority to regulate the entry of plants and plant products into their territory (FAO, 1997, Art. 7).

Both the CITES and the IPPC provide possibilities to control the import of biological material. The regulations of these conventions could be improved by the introduction of certificates of origin, source or legal provenance issued by the country of origin or source, and then applied to genetic resources. However, if an import controlling system for phytosanitary measures or protection of endangered species is extended to the case of genetic resources, additional training and human capacities are needed for the certificate issuing authorities and officials at checkpoints. In order to decrease costs it is important to use existing authorities already trained and experienced in this field. But for genetic resources border controls as they are used for CITES are not efficient. Sometimes, already the genetic information is sufficient for the commercial utilization of the resources. Therefore the need of additional checkpoints, e.g. patent offices or food and drug administrations, is obvious.

German users are critical to the introduction of certificates of origin, source or legal

provenance although the majority of users obtain the genetic material through intermediaries and legal uncertainty is reported as a major problem. Therefore the implementation of this instrument would require specific preparations, in particular it would be necessary to inform users and initiate stakeholder consultations.

6 CONCLUSIONS

Integration strategies have to be developed to increase the participation of users in the CBD implementation process. The heterogeneity of the user sector, the level of information and awareness, the willingness to participate and the perspectives and concerns are important determinants which should be considered for the design and implementation of these strategies.

The group of users of genetic resources in Germany is characterized by its heterogeneous structure. In all target sectors and all size categories actual and potential users could be identified. The sectors differ especially regarding the reasons for non-use of potential users, the difficulties of users, the intention and the results of use, the source and the level of information and the attitude towards user measures.

Most of the users are poorly informed about CBD and ABS regulations. The fact that many CBD member countries have national focal points and national competent authorities which serve as contact partners in questions of ABS is widely unknown, as well as the existence of CHM's for information exchange.

The user participation in the CBD process is very low, especially in the private sector. However some public institutions, organized in sector initiatives, have developed successfully policies and codes of conducts with governmental support. Nevertheless, users strongly support measures which address and alleviate the problem of information and uncertainty and do not restrict their activities. The actual level of participation and the willingness to participate differs by sectors and should be taken into account while aiming at stronger user integration. Some sectors are already more involved in initiatives or more willing to participate than other.

In some sectors (e.g. plant breeding) associations play an important role regarding information dissemination and participation in the political processes. In these sectors policy makers should especially involve these groups. The respondents appear to be very open to CBD issues and the possible results of the CBD process. The future concerns regarding user measures and an international ABS regime seem to be small. Users positively judge the user measures which are discussed in the international fora because they might contribute to clarify the often uncertain legal and administrative situation in provider countries. They consider instruments in form of services as more useful than measures interfering in and regulating their activities, but all measures are supported by a majority of the respondents.

Awareness training, regarding both scope and content of the CBD, is essential to en-

able users to adequately respond to CBD requirements. The demand for more information – especially concerning clear and transparent ABS regulations - and the relatively high willingness to participate offer an entrance. With respect to this study the responsible authorities should use this favourable atmosphere to contact users and their representatives.

We suggest authorities to integrate those channels of information more efficiently which are already being used predominantly. The internet, scientific journals and in particular sector-specific associations appear to be the most suitable media. The users themselves presented the further involvement of associations as an option to improve participation. An emphasis is to be placed on the co-operation between authorities and associations. It should be considered to inform representatives of user sectors in workshops about the context of the CBD. In turn the responsible authorities can gain insight into the positions of the associations. The transfer of information to the actual user can be arranged by the associations on a decentralized basis. This way the process of information is significantly simplified for the users.

It is essentially important that the German focal point gains further recognition as contact partner regarding the CBD. Actual and potential users report difficulties in identifying responsible contact partners, when trying to find out about access modalities. We are convinced that this problem in the context of implementing ABS regulations can be alleviated by measures on part of the user countries. The users greatly supported the idea of the national focal point as central contact point in Germany, which informs about possibilities and conditions of access in foreign countries, and assists in approaching representatives from the country of origin. Thus, we recommend to review if these suggestions can be included into the tasks of the responsible authority or otherauthorities have to be involved. However, we are aware of limitations in that field. The CHM is still quite unknown, but it could be developed to the major information forum of stakeholders. Therefore it is necessary to inform users about its existence and to broaden its supply of information by e.g. a specific section on ABS issues or by the publication of existing corporate policies and codes of conduct.

Apart from the problem to find appropriate contact partners in the country of origin, the uncertainty about the enforceability of contract contents regarding access conditions has been identified by the respondents as a further institutional problem in the context of ABS. Continuous co-operation between users and their authorities on one side and the countries of origin on the other side, as well as standard international agreements can help to reduce uncertainties of enforcement and complexities in initiating and negotiating, implementing, and controlling the subject matters of contract. Therefore users

support both, the idea of government sponsored projects to develop such co-operation and the introduction of standard international agreements on ABS. In their own interest user countries should support these user measures.

In single cases users report image problems resulting from the provision and use of genetic resources. Whether or not users will continue to face image difficulties which lead to restraints of use depends on the kind of information which shapes the public opinion. The introduction of a certification system which proves CBD-compliant conduct is considered useful by several users. Existing certification system (e.g. EMAS) should be taken into account for its development. Following the example of the botanical garden initiative the government can promote private sector initiatives to develop and establish certification systems or codes of conduct. An objective public debate should be further facilitated by the provision of information through the responsible authorities.

In order to support the compliance with the CBD commitments control and monitoring are necessary. Through the users' participation in certain measures they can facilitate the application and implementation of control instruments. The disclosure of origin in IPR application provides a useful instrument to control the CBD compliance if the user of genetic resources applies for an IPR. The EC directive on the legal protection of biotechnological inventions has to be immediately implemented in Germany in order to create a legal basis for this measure and support its implementation. The import control of genetic resources and a certificate of origin could observe the movement of genetic resources. The suitability of already existing international agreement as for example CITES and IPPC should be examined.

The user countries are challenged to increase their efforts in the implementation of ABS regulations. This requires the realization of measures to improve the information level of the concerned sectors and users, as well as to integrate the latter more into the CBD process. In Germany and most user countries there are already some instruments for the realization of these suggestions. Now it is essential to use the existing institutional environment to an optimum extent.

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8 EXPERT INTERVIEWS

DR. C. BUHLICH (Vice Executive Director) and S. LÜTKE ENTRUP, German Association of Plant Breeders, September 2004.

DR. F. BEGEMANN, The German Centre for Documentation and Information in Agriculture (ZADI), Information centre biological diversity, August 2004.

PROF. DR. J. GRUNEWALDT, Federal Centre for Breeding Research on Cultivated Plants (BAZ), Institute of Ornamental Plant Breeding, September 2004.

PROF. DR. STEHLE, Institute for nutritional science, Rheinische Friedrich-Wilhelms- University Bonn, Juli 2004.

9 APPENDIX

Appendix I: Questionnaire

A: Identification of different user groups

Question A 1: Which group does your company belong to? **(multiple entries possible)**		
A 1.1: Sector health	☐	Pharmacy
	☐	Herbal medicine
	☐	Diagnostics
A 1.2 Sector agriculture	☐	Seeds
	☐	Pest control
	☐	Live-stock breeding
	☐	Other: ……...
A 1.3: Sector horticulture	☐	
A 1.4: Sector biotechnology without health and agriculture	☐	Energy
	☐	Materials
	☐	Biocatalysis
	☐	Food production
	☐	Other: ……...
A 1.5: Comprehensive sector	☐	University - biological research
	☐	University - chemical research
	☐	University - pharmaceutical research
	☐	University - medical research
	☐	Other: ……
A 1.6: Sector care and cosmetic products	☐	
A 1.7: Other research establishments	☐	
A 1.8: Ex-situ collection	☐	Botanical garden
	☐	Herbarium
	☐	Gene bank
	☐	Microorganisms-/cell culture collections
	☐	Other: ……..
A 1.9: Other	☐	In fact: …….....

Continue with question A 2

Within the scope of this study only those genetic resources, whose origin is not the Federal Republic of Germany, are of interest. In this context a genetic resource is any material of vegetable, animal, microbial, or other origin (except for human) which contains functional genes and is of real or potential value; e.g. organisms or parts of them, seed, sets, fungi, bacteria and other protozoons as well as cell cultures, sperms, ova, chromosomes, genes, DNA and RNA. They include resources which were taken from their natural habitat (in-situ) or from ex-situ collections and on-farm cultivation outside the natural habitat.

Question A 2: Does your company use (now or in the past) genetic resources in any way?

☐	Yes, only for research purposes	**Continue with q. A 3**
☐	Yes, for development of marketable products	**Continue with q. A 3**
☐	Yes, for research and development of intermediate products, which are sold to companies for advancement of products	**Continue with q. A 3**
☐	Yes, for collection, conservation, circulation	**Continue with q. A 3**
☐	Other: ……..	**Continue with q. A 3**
☐	No	**Continue with q. B 1**

Question A 3: Please name country/countries of origin and a classification of genetic resources currently being used by you (e. g. genetic information, organisms), as well as their source (e. g. plant class, micro-organisms).

☐ Country/ countries of origin: ……....

☐ Type:……..….....

☐ Source:……

☐ Don't know

☐ No statement

Continue with question A 4

Question A 4: Were you able to bring new products on the market by research activities with genetic resources or announce patents or plant protection rights?

(multiple entries possible)

☐	Yes, products	☐	Patents in process
☐	Yes, patents	☐	Plant protection rights in process
☐	Yes, plant protection rights	☐	No
☐	Products in process	☐	No statement

Continue with question B 2

B: Experience with provision and use of genetic material

Question B 1: Why does your company not use genetic resources (so far)?					
Please mark for every statement to what extent it is applicable to your decision.	**Completely correct**	**Correct to a certain extent**	**Not quite correct**	**Not correct at all**	**No statement possible**
The use of genetic resources is not interesting for our company, because we have no use for it now or in future	☐	☐	☐	☐	☐
If you agree completely to answer B 1.1, the following questions do not concern your company. Nevertheless, please send the questionnaire back to us. Thank you for your time. We confirm once more that your data will be treated absolutely confidentially.					
At the moment we have no use for it, but maybe in the future.	☐	☐	☐	☐	☐
We asked for access to areas or resources, but did not receive it.	☐	☐	☐	☐	☐
The regulations on access and use are uncertain and insufficiently known.	☐	☐	☐	☐	☐
The regulations on access and benefit-sharing in the countries of origin are too strict and complex.	☐	☐	☐	☐	☐
It is difficult to find the appropriate contact person responsible for access modalities to genetic resources in the country of origin.	☐	☐	☐	☐	☐
The uncertainty about the fulfilment and enforceability of contract agreements in the country of origin is high.	☐	☐	☐	☐	☐
The compensation of use to which the country of origin is entitled, is very cost-intensive and makes the use of genetic resources too expensive.	☐	☐	☐	☐	☐
The procurement and use of genetic resources may affect the image of the enterprise negatively.	☐	☐	☐	☐	☐
Please add further reasons: …… ……					

Continue with question C 1

Question B 2: In which way does your company provide the required genetic raw material?

(multiple entries possible)

- ☐ We collect the raw material ourselves from its natural origin
- ☐ We receive the material from trade partners in the country of origin. Please describe which trade partners you have (e. g. ex-situ collections, gene banks, private persons):
  ……
- ☐ We receive the material from providers outside the country of origin. Please describe which providers you have: (e. g. ex-situ collections, gene banks, private persons):
  ……
- ☐ We reproduce the material ourselves in the country of origin
- ☐ We reproduce the material ourselves in other countries than the country of origin
- ☐ Other:……..…….....

Continue with question B 3

Question B 3: Please mark the items which correspond to your general proceeding in the provision of genetic material.

(multiple entries possible)

- ☐ Request of information at the National Focal Point in Germany
- ☐ Request of information at the National Focal Point in the country of origin of the genetic resources
- ☐ Direct approach of providers and purchase from them
- ☐ Independent provision of material in areas of interest
- ☐ Obtaining of previous agreement based on factual knowledge (prior informed consent) (int. agreement according to CBD)
- ☐ Obtaining of information about the national regulations and responsible institutions in the country of origin. Please name the source of information:
  .....
- ☐ Establishment of co-operations with partners in the country of origin
- ☐ Conclusion of a contract: Material Transfer Agreement (MTA) by mutually agreed terms with the owner of the resources (int. agreement according to CBD)
- ☐ Negotiations and arrangements of access and benefit-sharing
- ☐ Contacting of ex-situ collections
- ☐ Other ……
- ☐ No statement

Continue with question B 4

Question B 4: In the last case of using genetic resources, to which extent did you receive rights of access from the country of origin and which kind of benefit-sharing did you agree upon?

Agreed rights of access (e. g. temporal, spatial restriction, or restrictions on certain material):

……

Kind of benefit-sharing: ……

☐ **No statement**

Continue with question B 5

Question B 5: Did any of the following difficulties occur when providing and using genetic resources?

Please mark for every statement to what extent it is applicable for your decision.	**Completely correct**	**Correct to a certain extent**	**Not quite correct**	**Not correct at all**	**No statem. possible**
We asked for access to areas or resources, but did not receive it.	☐	☐	☐	☐	☐
The regulations on access and use are uncertain and insufficiently known.	☐	☐	☐	☐	☐
The regulations on access and benefit-sharing in the countries of origin are too strict and complex.	☐	☐	☐	☐	☐
It is difficult to find the appropriate contact person responsible for access modalities to genetic resources in the country of origin.	☐	☐	☐	☐	☐
The uncertainty about the fulfilment and enforceability of contract agreements in the country of origin is high.	☐	☐	☐	☐	☐
The compensation of the use to which the country of origin is entitled, is very cost-intensive and makes the use of genetic resources too expensive.	☐	☐	☐	☐	☐
The procurement and use of genetic resources may affect the image of the enterprise negatively.	☐	☐	☐	☐	☐

Please add further reasons: ……

Continue with question C 1

C: User level of information regarding the current international basic conditions for the use of genetic resources

Question C 1: Do you know the UN Convention on Biological Diversity (CBD)?

Please mark which statement is applicable to you.

Yes, exactly	Yes, approximately	No
☐	☐	☐
Continue with question C 2	**Continue with question C 2**	**Continue with question E**

Question C 2: Do you know the meaning of the following terms?

Please mark for each term which statement is applicable to you	Yes, exactly Continue with question C 3	Yes, approximately Continue with question C 3	No Continue with question E
Bonn Guidelines	☐	☐	☐
Clearing House Mechanism	☐	☐	☐
National Focal Point/ National Competent Authority	☐	☐	☐
Access and benefit-sharing	☐	☐	☐

Continue with question C 3

Question C 3: Through which important channels does your company/institution inform itself about the CBD and the use of genetic resources?

- ☐ Information meetings of the “Federal Ministry for the Environment, Nature Conservation and Nuclear Safety”/ “The German Federal Agency for Nature Conservation”
- ☐ Report/information meetings of a federation, the following federation: ……
- ☐ Internet
- ☐ Scientific journals
- ☐ Providers from countries of origin ……..…….…….....
- ☐ Other providers, the following:…… ……..…..
- ☐ Other……...
- ☐ No provision of information

Continue with question C 4

Question C 4: Do you feel sufficiently informed about the CBD and the associated regulations?

☐ Yes

☐ No, there is still further need of information

Continue with question C 5

Question C 5: Have you already had contact to a National Focal Point/ National Competent Authority in a country of origin yet?

☐ Yes, in the following country/ countries ……

☐ No, not yet

Continue with question D

D: User participation and positions on the CBD

The Federal Republic of Germany has been a party of the UN Convention on Biological Diversity (CBD) since 1993. Consequently, the use of genetic resources in compliance with CBD regulations and commitments is a political goal. Accordingly, the collection and use of genetic material is to be carried out only after a previous mutual consent with the country of origin concerning access and benefit-sharing. In February, 2005 the third meeting of the CBD work group concerning benefit-sharing and access regulations will take place. The representatives of the German government want to consider the interest of German users in the development of their negotiating position.

Question D 1: Do you have the impression that the access to genetic resources by a foreign country has become more difficult for German users since the existence of the CBD (1993)?

☐ Yes

☐ No

Continue with question D 2

Question D 2: In which way have your activities in using genetic resources developed since the existence of the CBD (1993)?

Increasing	Approximately constant	Declining	No statement
☐	☐	☐	☐

Continue with question D 3

Question D 3: Do you have the impression that the interests of the users have sufficiently been considered in the international negotiations within the CBD so far?

☐ Yes

☐ No

Continue with question D 4

Question D 4: Can you imagine in which way the users could be involved in the process to a greater extent?

Answer: ……

……

Continue with question D 5

Question D 5: At the international level different so-called "User Measures" are currently being discussed. These are measures to involve users into the access and benefit-sharing to a greater extent. How do you, from the view of the users, estimate the sense of the following measures? Do you have any other suggestions?

Please mark for every statement to what extent it corresponds to your opinion.	**Very useful**	**Possibly useful**	**Rather less useful**	**Not useful**	**No statement possible**
Creation of a central information office in Germany, which informs about access possibilities and conditions in other countries and is helpful with the approach	☐	☐	☐	☐	☐
Initiation of internationally standardized contracts about access and benefit-sharing	☐	☐	☐	☐	☐
Development of obligating codes of conduct in user sectors	☐	☐	☐	☐	☐
Disclosure of the country of origin at patent application for products which arise from the use of genetic resources	☐	☐	☐	☐	☐
Initiation of a certificate (certificate of origin/source/legal provenance) for genetic material which is issued by the provider country and required at border crossing. Apart from the border control it could also have to be submitted during patent application for example (e.g. offers legal security for users who purchase their material via intermediaries)	☐	☐	☐	☐	☐
Initiation of certification systems for rule compliant behaviour of the users (e. g. material purchased according to the criteria of the CBD/Bonn guidelines). Aim is the image improvement of users.	☐	☐	☐	☐	☐
Support with the development and execution of projects to promote cooperation between users and countries of origin	☐	☐	☐	☐	☐

Further suggestions from your part:

……..

Continue with question D 6

Question D 6: In some industries users themselves took initiatives regarding handling genetic resources, for e. g. setting up codes of conduct or publication of the experiences with access and benefit-sharing.

Do you know similar measures in your line of business which refer to the use of genetic resources?

☐ Yes, the following:……..……
……..…..... **continue with question D**

☐ No, not known **continue with part E**

Question D 7: Is you company itself active in that field?

☐ Yes, as follows:……..……..……..……..
……..……

☐ No

Continue with question D 8

Question D 8: Can you imagine to participate in such measures for reasons like e. g. the improvement of your image?

☐ Yes

☐ No

Continue with question E

E: Evaluations, perspectives and company data

Finally, for the evaluation of your information it is important to know which company you belong to and what importance the field of genetic resources has within your company. Could you please give your estimation in answer to the following questions?

Please also send back the questionnaire, if you cannot or do not want to fill out the question in part E.

Question E 1: Which position do you have in your company?

Answer:……..……

Continue with question E 2

Question E 2: How have the activities of your company developed in the context of genetic resources compared during the past five years?

Increased	Approximately constant	Declining	No indication
☐	☐	☐	☐

Continue with question E 3

Question E 3: How do you estimate the future development of your company's/institution's activities in the field of genetic resources?

Please mark for every statement to what extent it corresponds to your opinion.	Completely correct	Correct to a certain extent	Not quite correct	Not correct at all	No statement possible
The use of genetic resources will be insignificant for our company in the future.	☐	☐	☐	☐	☐
The activities in the field of genetic resources will decline, but continue to a small extent.	☐	☐	☐	☐	☐
It is supposed that the use of genetic resources remains unchanged.	☐	☐	☐	☐	☐
We will presumably expand the activities in the field of genetic resources a little.	☐	☐	☐	☐	☐
The use of genetic resources will be much more important in the future and the activities in the field of genetic resources will be highly expanded.	☐	☐	☐	☐	☐

Continue with question E 4

Question E 4: Number of employees who your company/institution is employing in the entire field of research and development at the moment:

- ☐ < 10
- ☐ 10 up to 100
- ☐ 100 up to 1,000
- ☐ 1,000 up to 10,000
- ☐ > 10,000
- ☐ no statement

Continue with question E 5

Question E 5: Estimated share of your employees in research and development who work with genetic resources at the moment, based on the total number of employees in research and development (question E4):

- ☐ < 10 %
- ☐ < 25 %
- ☐ < 50 %
- ☐ < 75 %
- ☐ > 75 %
- ☐ no statement

Continue with question E 6

Question E 6: Budget for research and development in the year 2003 (in millions €):

- ☐ < 0,1
- ☐ 0,1 up to 1
- ☐ 1 up to 500
- ☐ 500 up to 1,000
- ☐ > 1.000
- ☐ no statement

Continue with question E 7

Question E 7: Estimated share of the budget for research and development in the field of genetic resources in the year 2003 based on the total budget for research and development in the year 2003 (question E 6):

- ☐ < 10%
- ☐ < 25%
- ☐ < 50 %
- ☐ < 75%
- ☐ > 75 %
- ☐ no statement

Continue with question E 8

Question E 8: Turnover of your company in the year 2003 (in millions €):

- ☐ < 1
- ☐ 1 up to 50
- ☐ 50 up to 1,000
- ☐ 1,000 up to 10,000
- ☐ > 10,000
- ☐ no statement

Continue with question E 9

Question E 9: Estimated share of the turnover which resulted from the use of genetic resources in the year 2003, based on the total company turnover in the year 2003 (question E 8)

- ☐ < 10%
- ☐ < 25%
- ☐ < 50 %
- ☐ < 75%
- ☐ > 75 %
- ☐ no statement

Thank you for taking the time to answer the questionnaire.

We assure you once again that your data will be treated strictly confidentially.

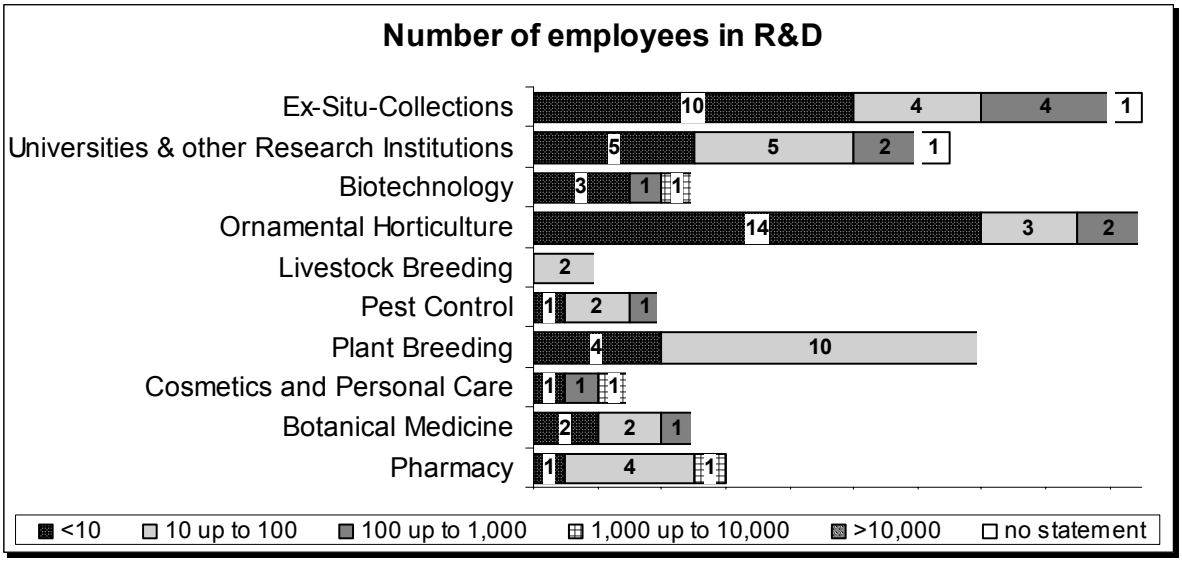
Appendix II: Evaluation

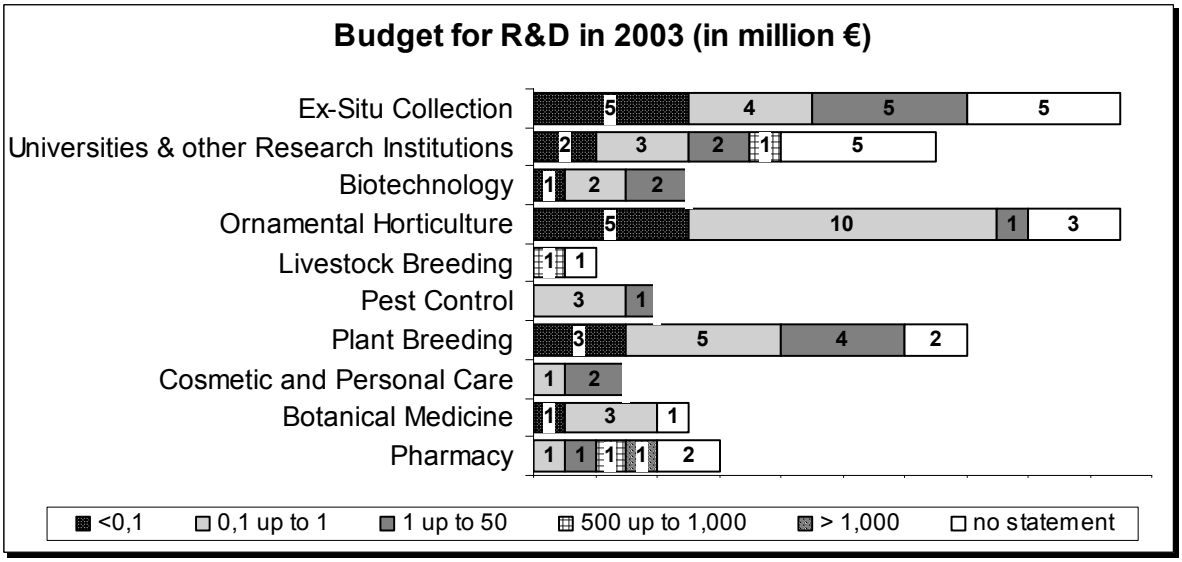
Table A. 1: Addressees and rate of return

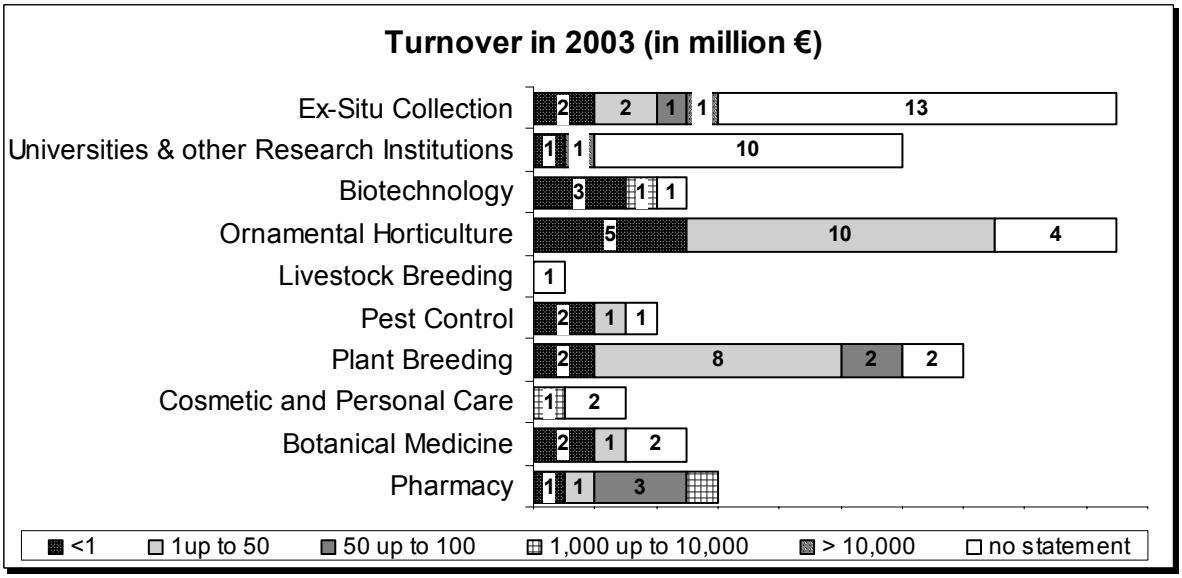
Sector	Number of addressees per sector (only one entry possible)	Number of respondents (multiple entries possible)	Return rate (multiple entries possible)	User among respondents of respective sectors	
				Number	Rate
Plant Breeding	123	19	15%	15	79%
Biotechnology	124	18	15%	5	28%
Pharmacy	89	26	29%	7	27%
Universities & Research Institutions	67	30	45%	14	47%
Cosmetic & Care	49	18	37%	4	22%
Ornamental Horticulture	35	23	66%	20	87%
Ex-Situ-Collections	32	21	66%	20	95%
Pest Control	26	7	27%	4	57%
Botanical Medicine	22	15	68%	5	33%
Commercial Livestock-Breeding	7	4	57%	2	50%

Source: Own survey.

Figures A. 1.1 to 1.3: User company and institution data

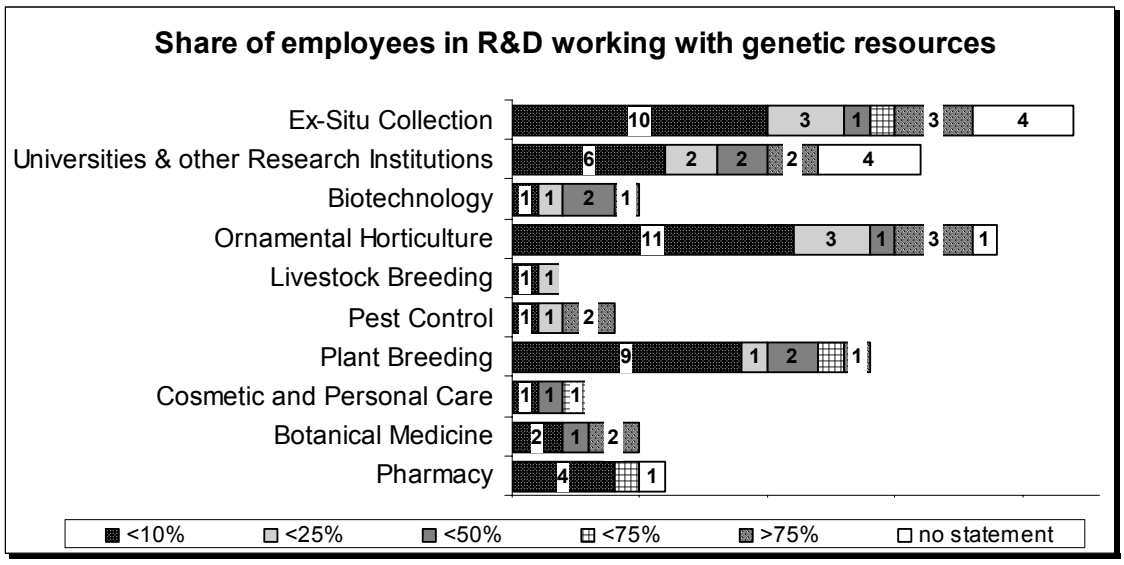


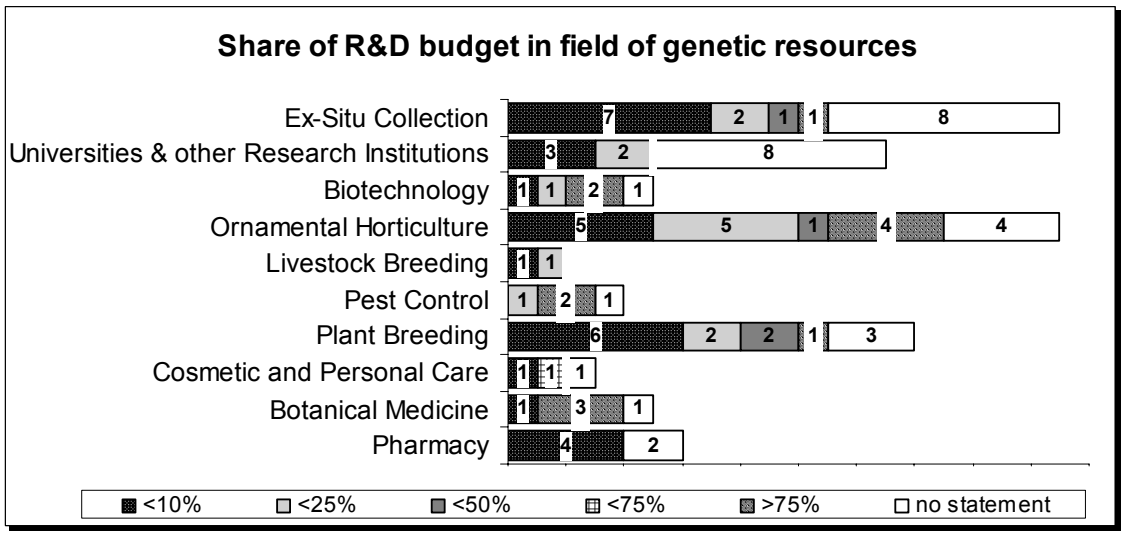


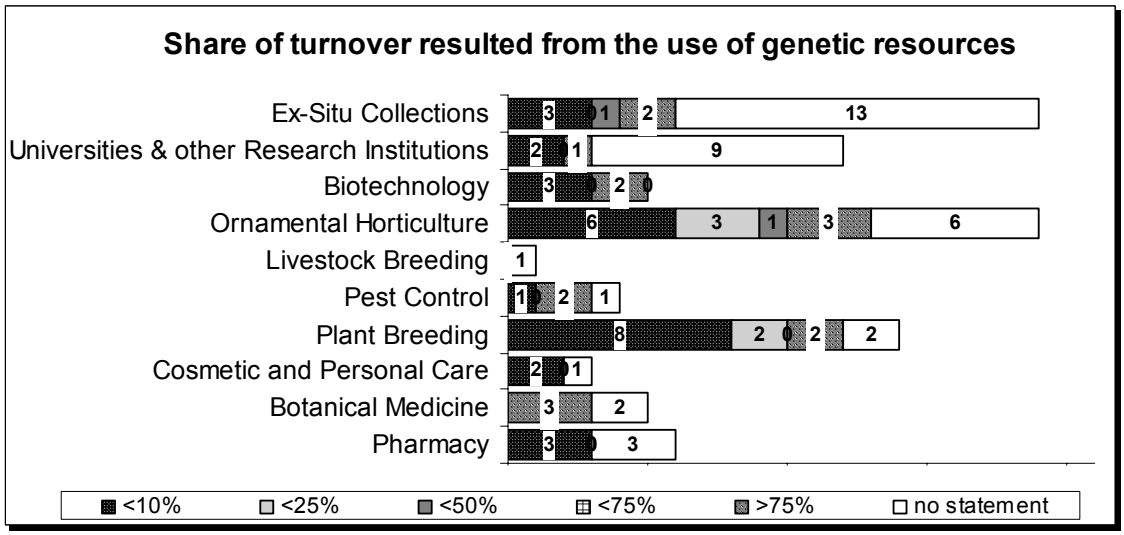


Source: Own survey.

Figures A. 2.1 to 2.3: Importance of genetic resources for companies and institutions

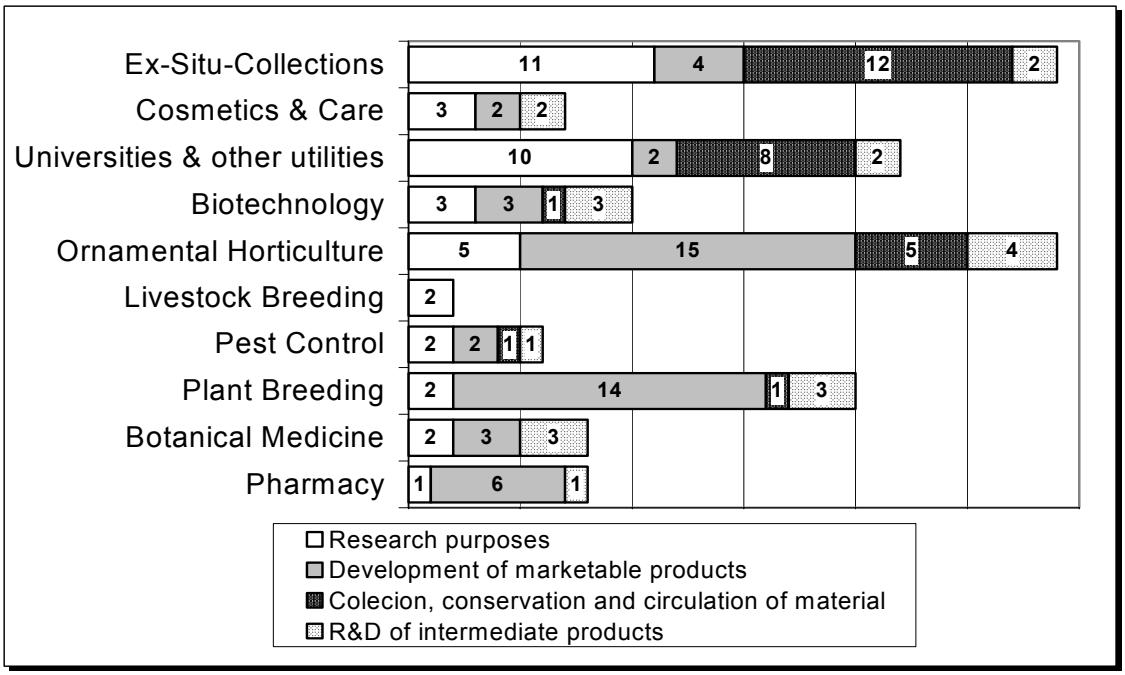






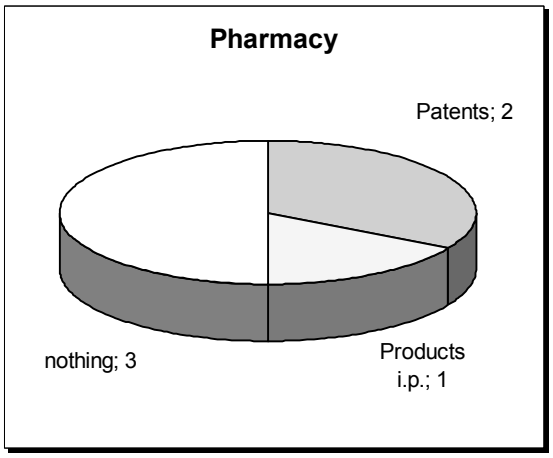
Source: Own survey.

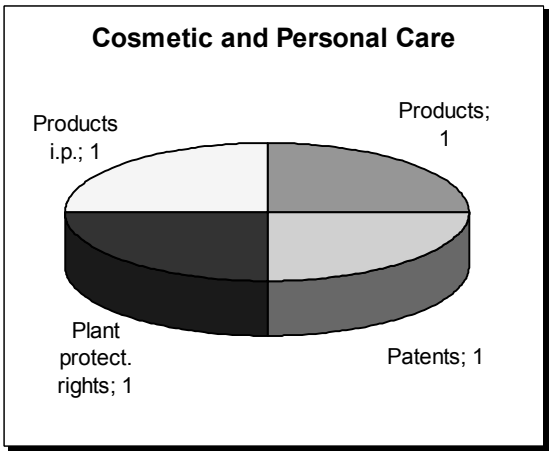
Figure A. 3: Frequencies of the different ways of using genetic resources reported by the respondents on sector level

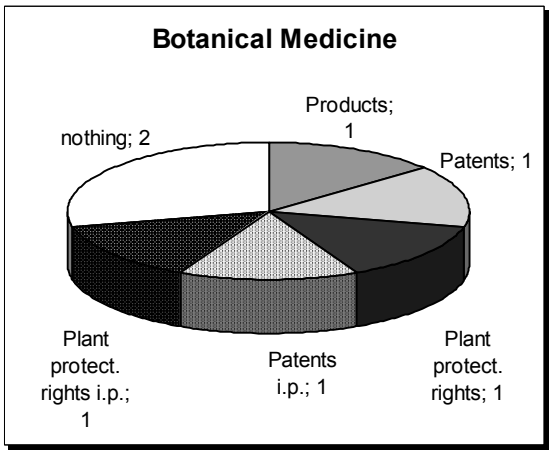


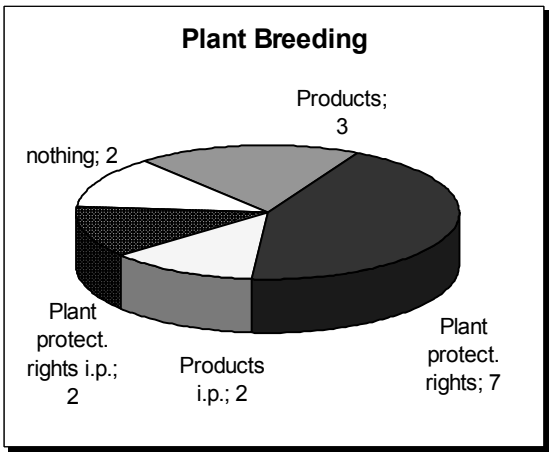
Source: Own survey.

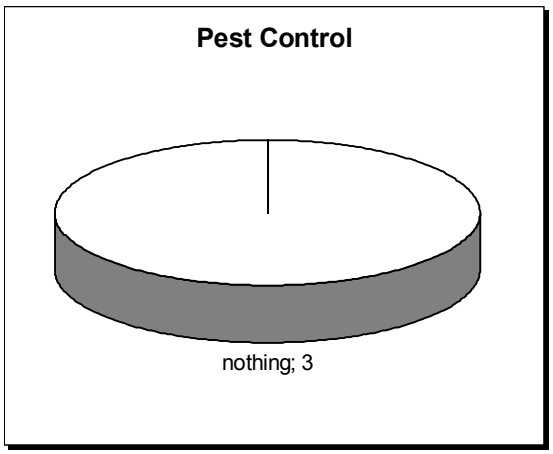
Figures A. 4.1 to 4.10: Results of use of genetic resources on sector level

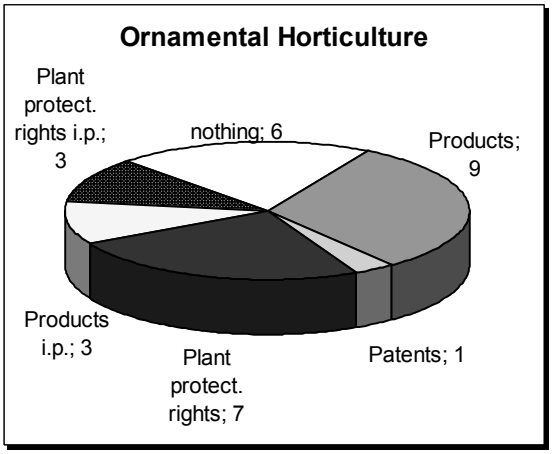


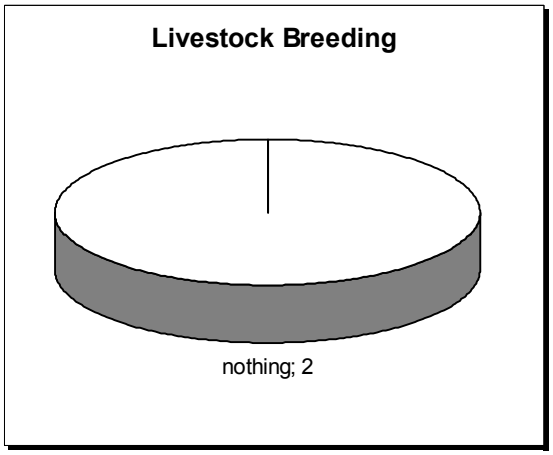


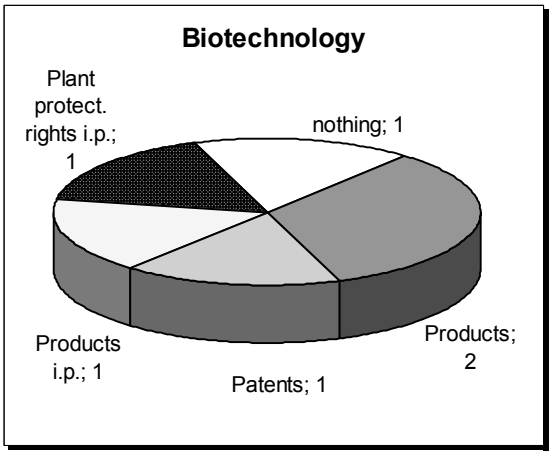


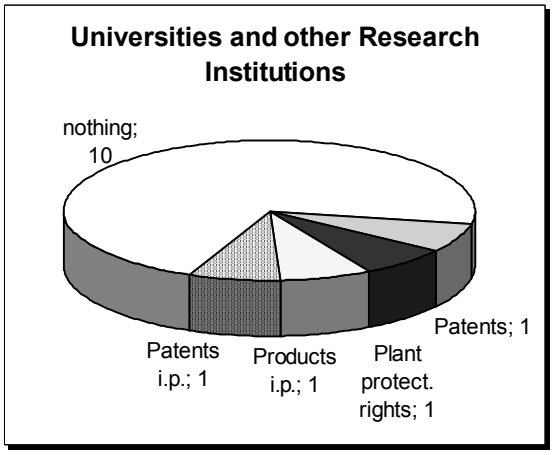


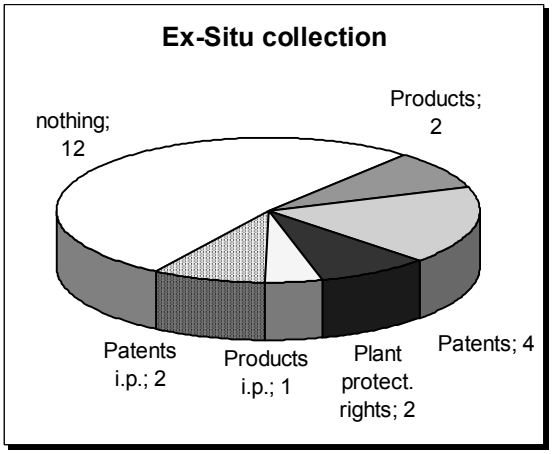








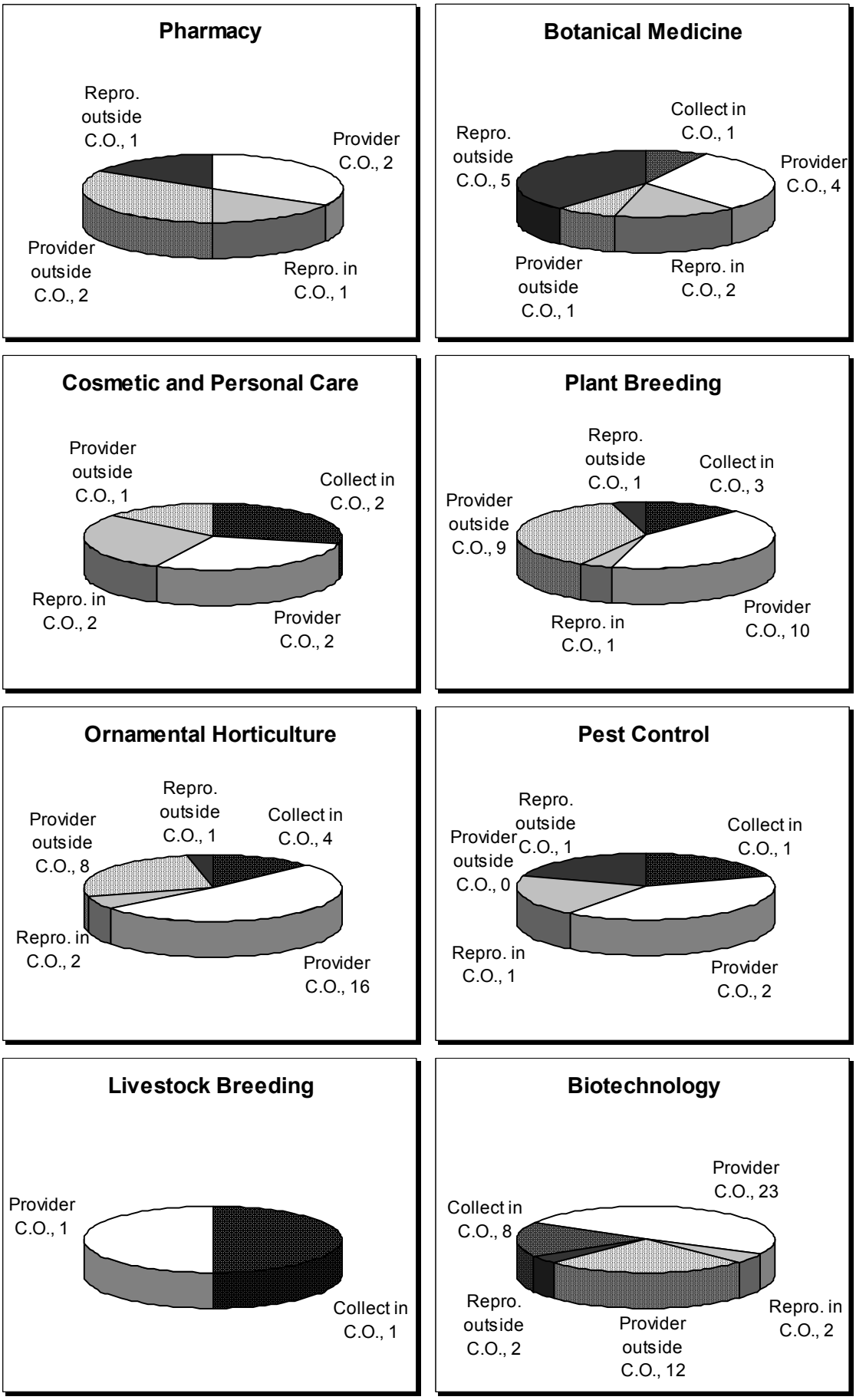


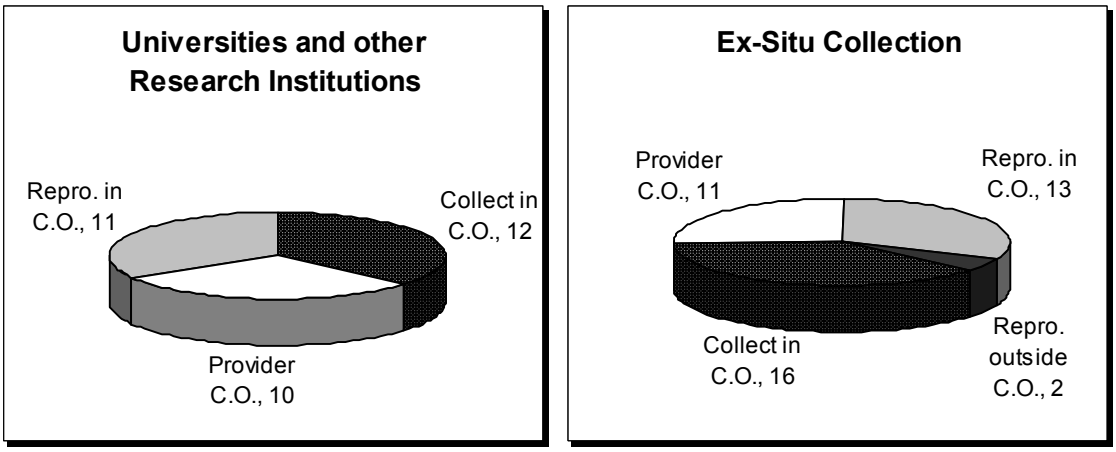


Note: i. p. in process, Plant protect. rights: Plant protection rights

Source: Own survey.

Figures A 5.1-5.10: Sources of supply of genetic resources by different user sectors





Note: C.O.: country of origin, Repro.: Reproduction

Source: Own survey.

Table A. 2: User procedures for the acquisition of genetic resources on sector level (multiple entries possible)

	Request of information at German Focal Point		Request of information at Focal Point in country of origin		Obtaining of information about national regulations	
Sector	entries	% of users	entries	% of users	entries	% of users
Pharmacy						
Botanical Medicine	2	29%	2	40%	1	20%
Plant Breeding	4	27%	2	13%		
Pest Control	2	50%	1	7%		
Livestock Breeding						
Ornamental Horticulture	1	5%	1	5%		
Biotechnology	1	20%	1	20%		
Universities & other Research Institutions	1	7%	1	7%	2	14%
Cosmetics & Personal Care					1	7%
Ex-situ collections	2	10%	2	10%	3	15%

	Obtaining of PIC		Conclusion of MTA's		ABS	
Sector	entries	% of users	entries	% of users	entries	% of users
Pharmacy			2	29%		
Botanical Medicine						
Plant Breeding	1	7%	4	27%	2	13%
Pest Control						
Livestock Breeding						
Ornamental Horticulture			2	10%	1	5%

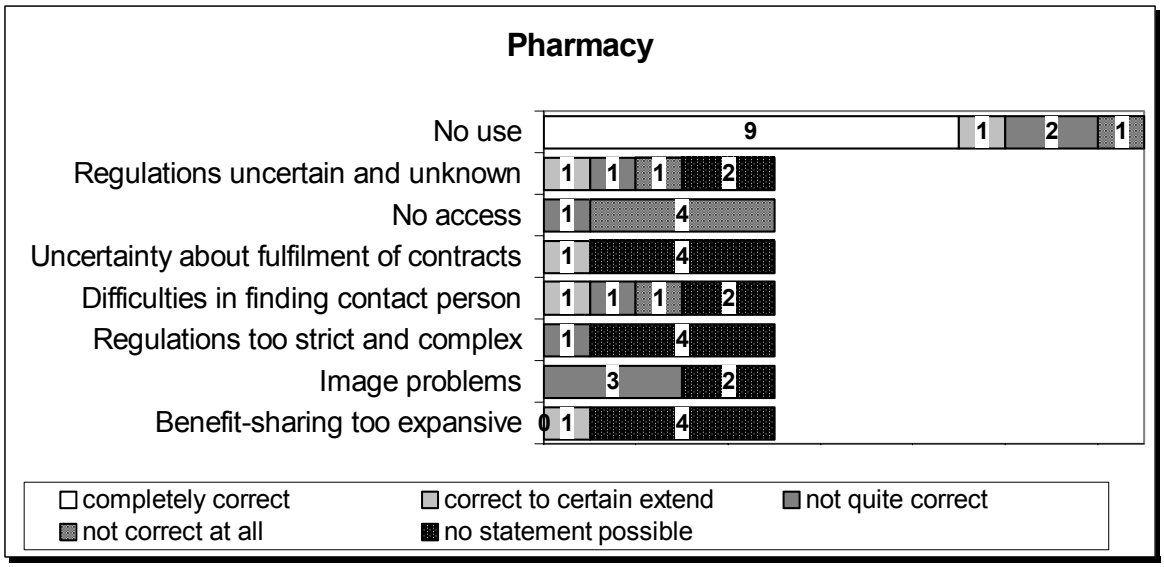
Biotechnology			1	20%	1	20%
Universities & other Research Institutions	1	7%	2	14%	1	7%
Cosmetics & Personal Care	1	25%	2	50%	1	25%
Ex-situ collections	2	10%	3	15%		

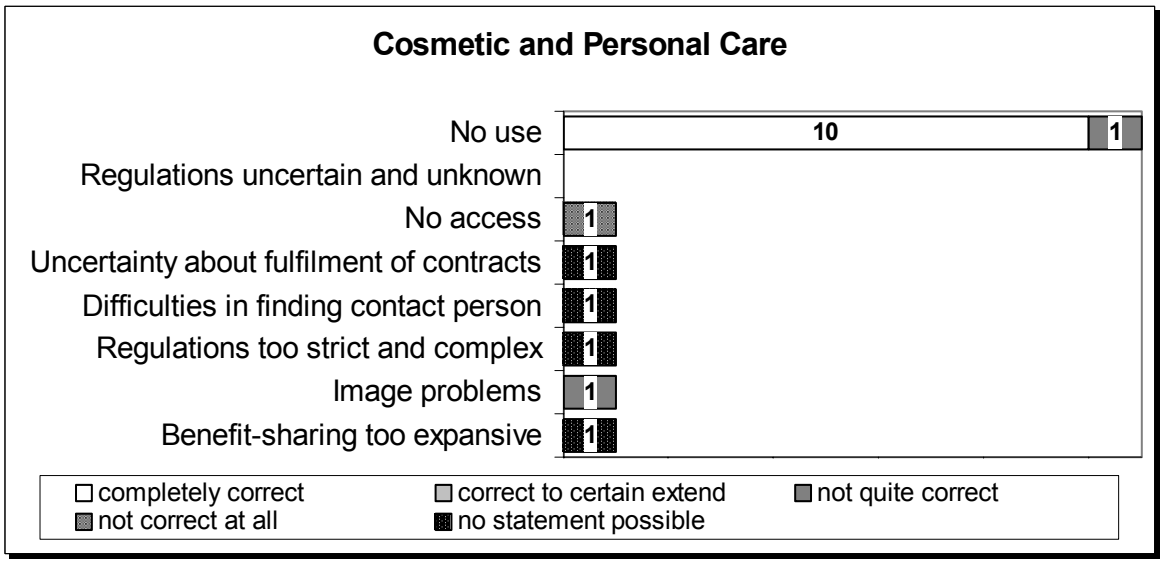
	Independent provision of genetic resources		**Establishment of co-operation in country of origin**	
Sector	entries	% of users	entries	% of users
Pharmacy	1	14%	2	29%
Botanical Medicine	2	40%	3	60%
Plant Breeding	2	13%	6	40%
Pest Control	1	25%	3	75%
Livestock Breeding	1	50%	1	50%
Ornamental Horticulture	6	30%	7	35%
Biotechnology	2	40%	3	60%
Universities & other Research Institutions	5	36%	4	29%
Cosmetics & Personal Care			2	50%
Ex-situ collections	8	40%	7	35%

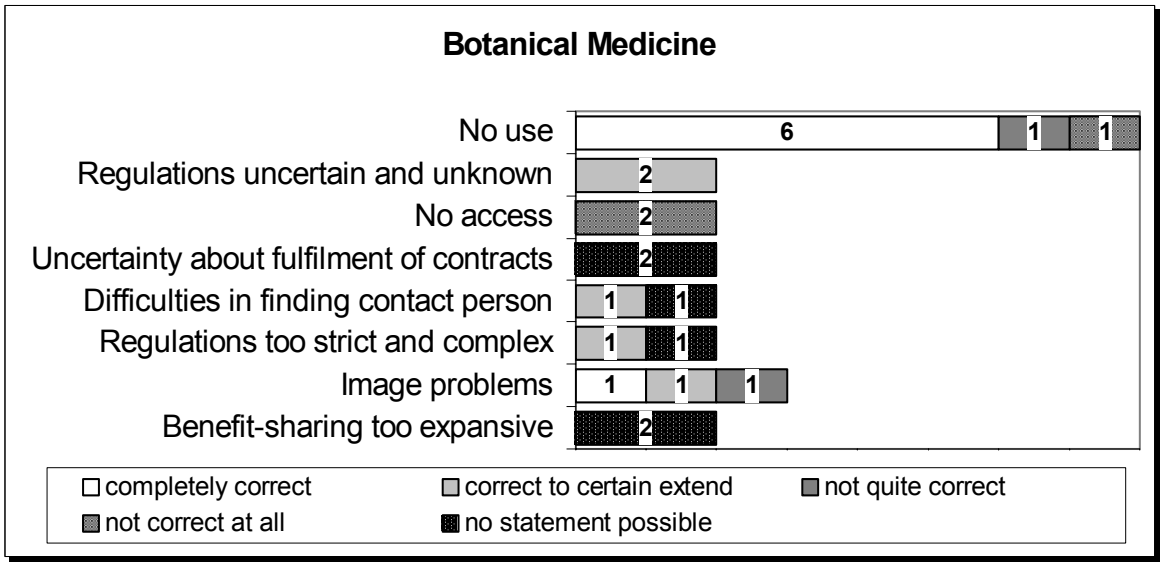
	Directly approaching providers		**Contacting of ex-situ collections**	
Sector	entries	% of users	entries	% of users
Pharmacy	2	29%	1	14%
Botanical Medicine	5	100%	2	40%
Plant Breeding	6	40%	5	33%
Pest Control	3	75%	2	50%
Livestock Breeding				
Ornamental Horticulture	17	85%	6	30%
Biotechnology	4	80%	3	60%
Universities & other Research Institutions	7	50%	7	50%
Cosmetics & Personal Care	3	75%	2	50%
Ex-situ collections	9	45%	12	60%

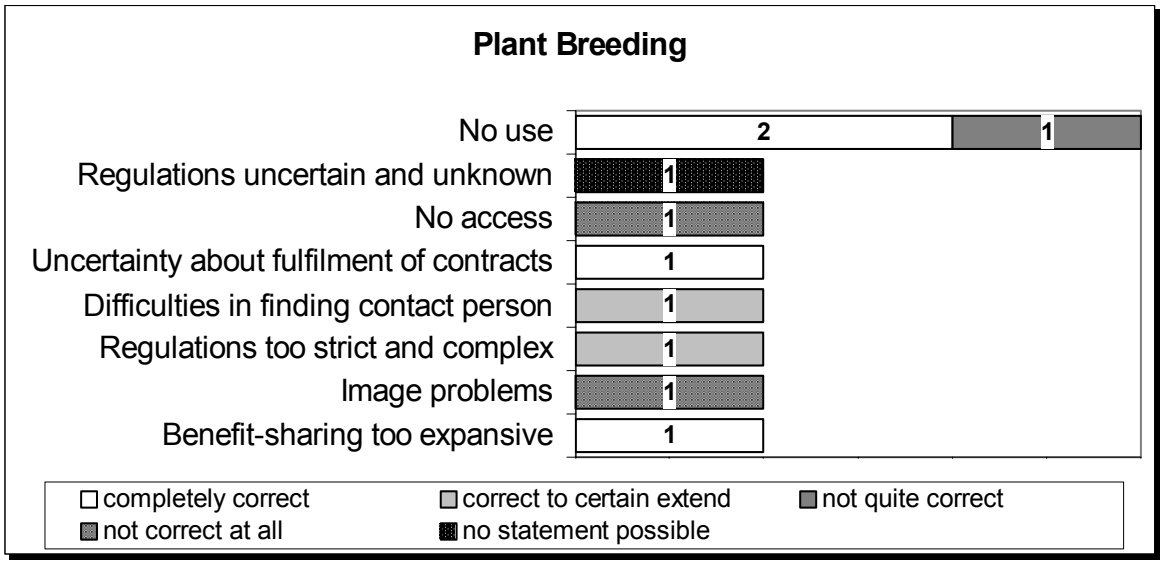
Source: Own survey.

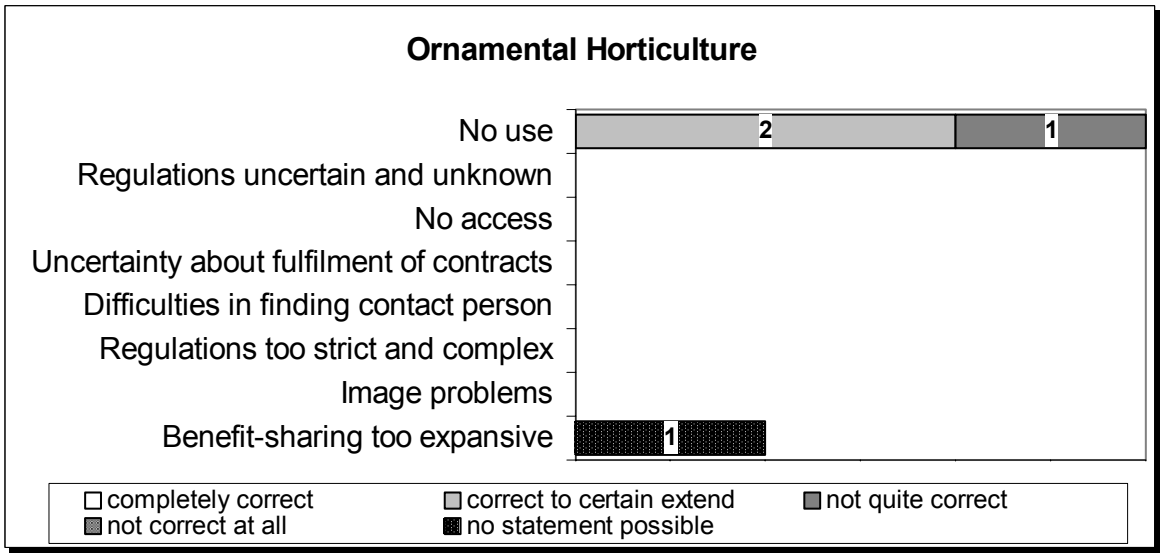
Figures A. 6.1 to 6.10: Non-Users: Level and frequencies o difficulties reported in the context of provision and use of genetic Resources on sector level

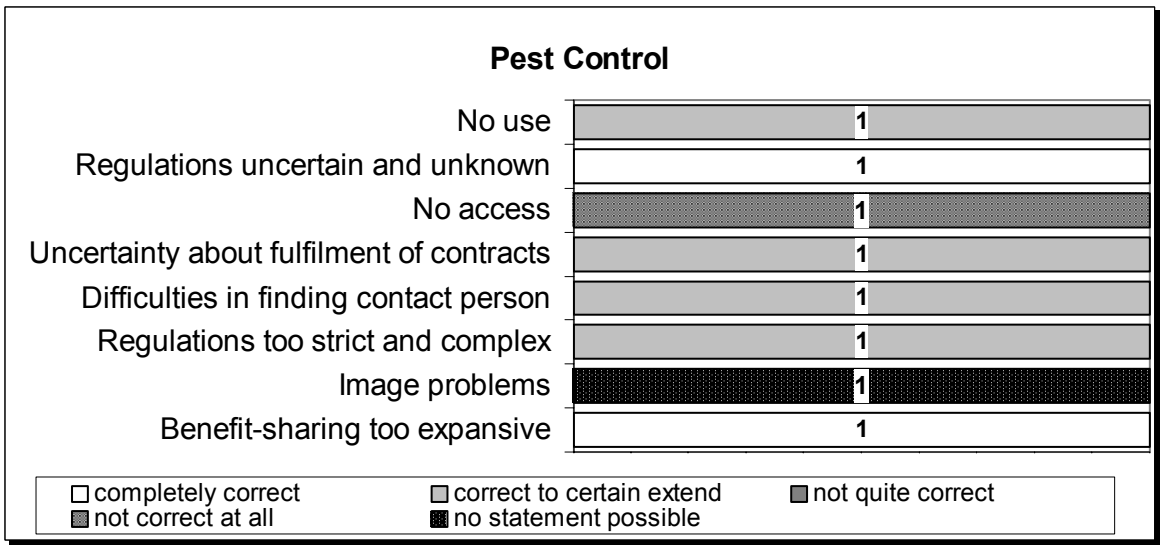


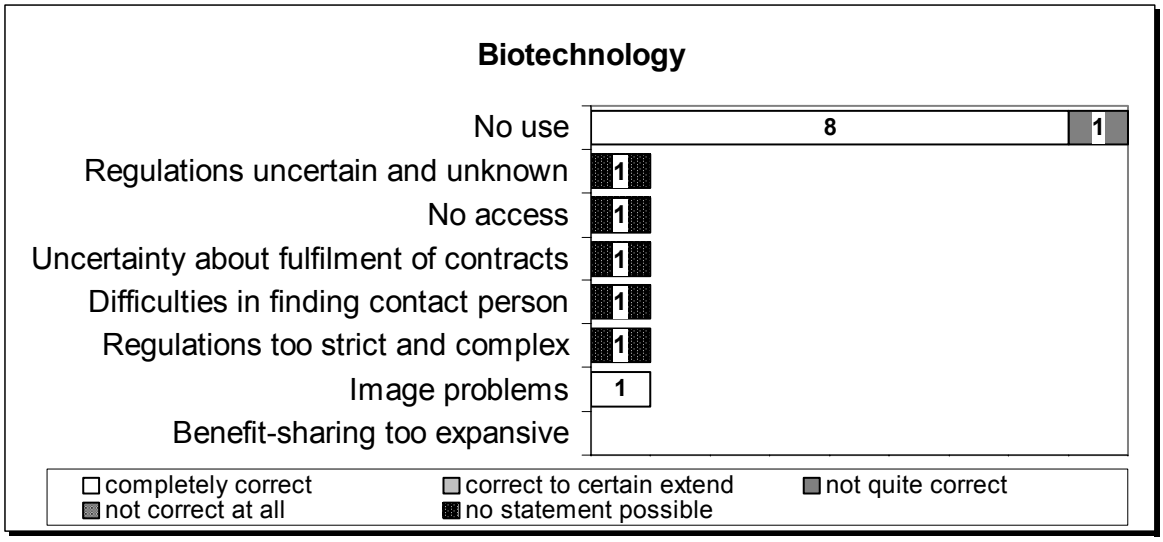


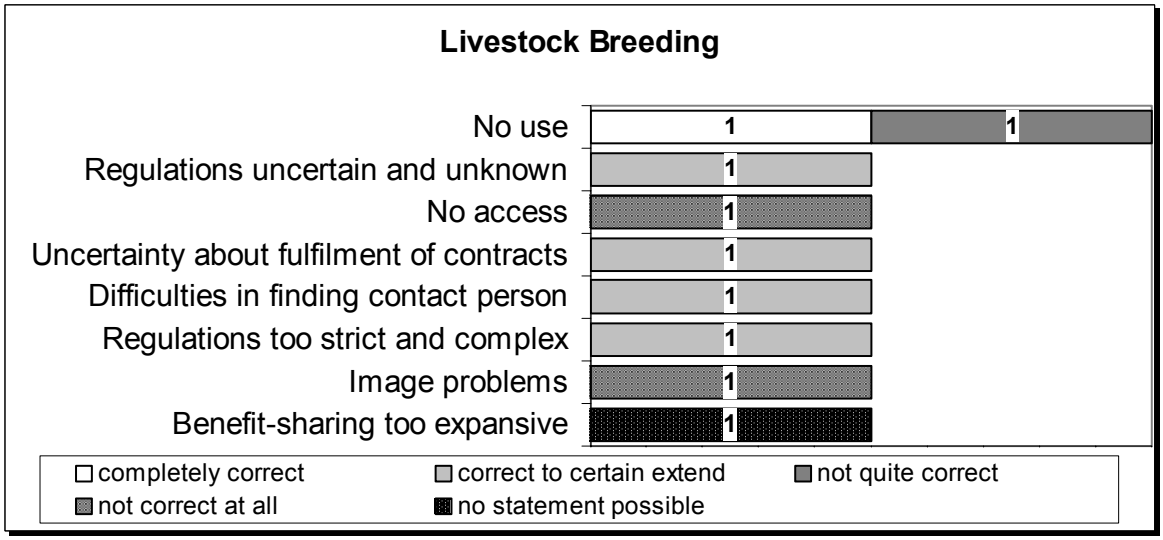


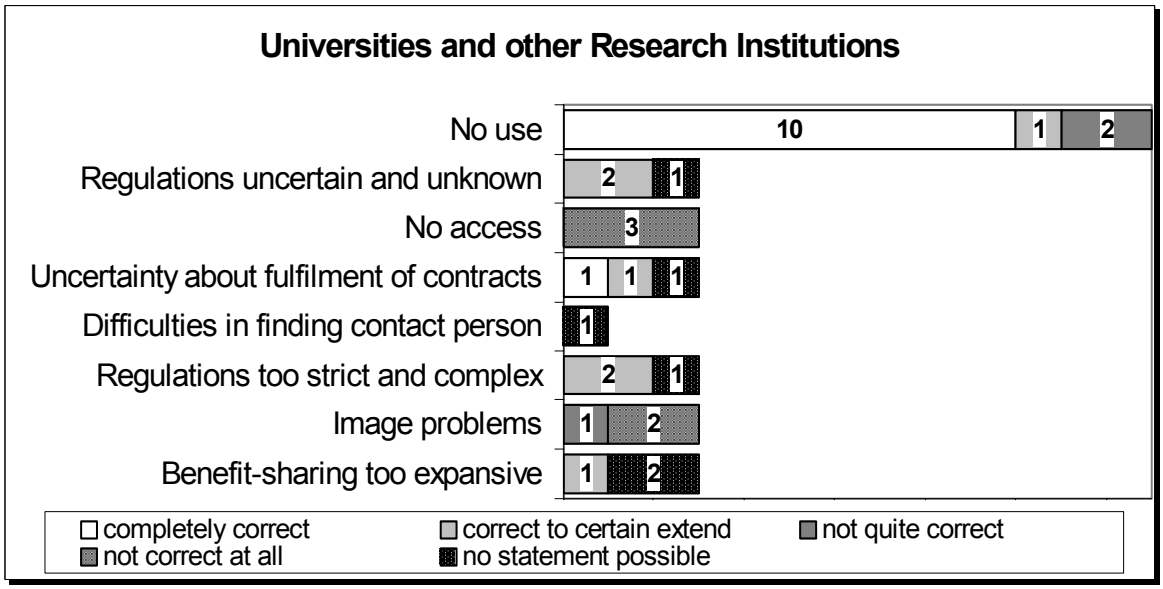

Plant Breeding
No use
Regulations uncertain and unknown
No access
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Image problems
Benefit-sharing too expansive
2
1
1
1
1
1
1
1
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible

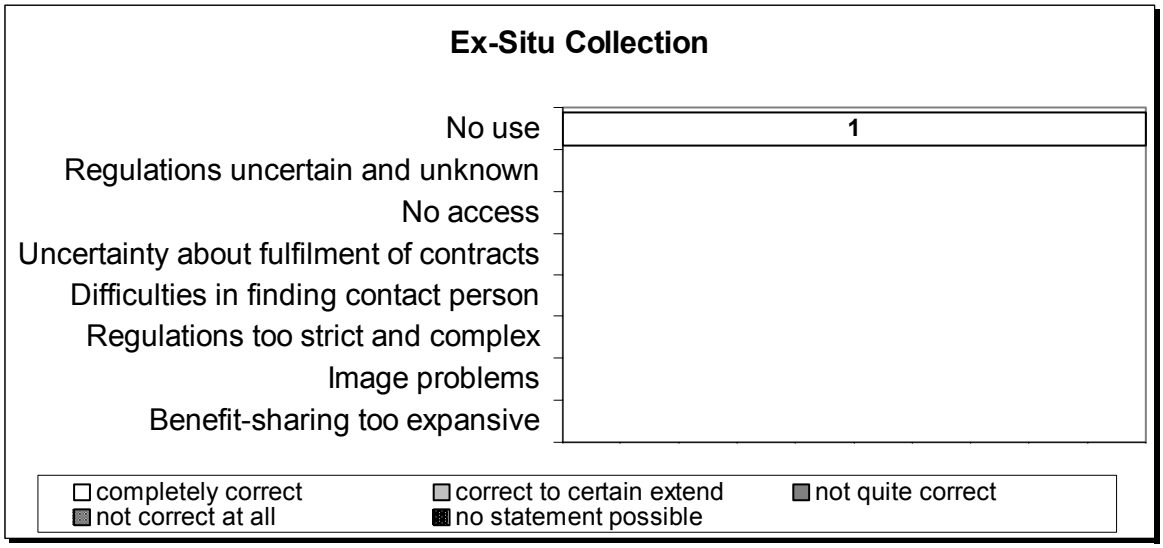

Ornamental Horticulture
No use
Regulations uncertain and unknown
No access
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Image problems
Benefit-sharing too expansive
2
1
1
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible


Pest Control
No use
Regulations uncertain and unknown
No access
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Image problems
Benefit-sharing too expansive
1
1
1
1
1
1
1
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible


Biotechnology
No use
Regulations uncertain and unknown
No access
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Image problems
Benefit-sharing too expansive
8
1
1
1
1
1
1
1
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible

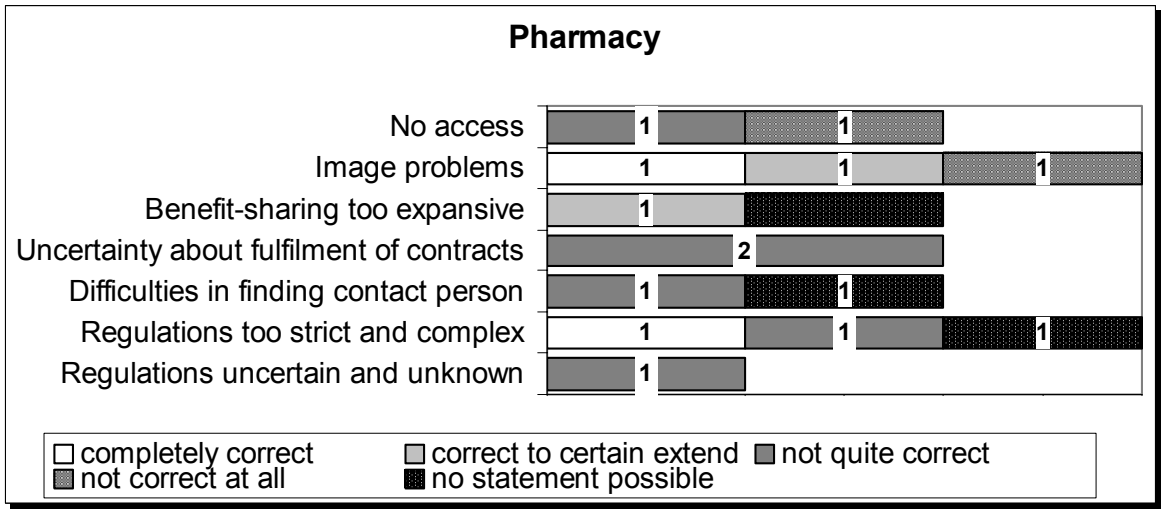

Livestock Breeding
No use
Regulations uncertain and unknown
No access
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Image problems
Benefit-sharing too expansive
1
1
1
1
1
1
1
1
1
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible

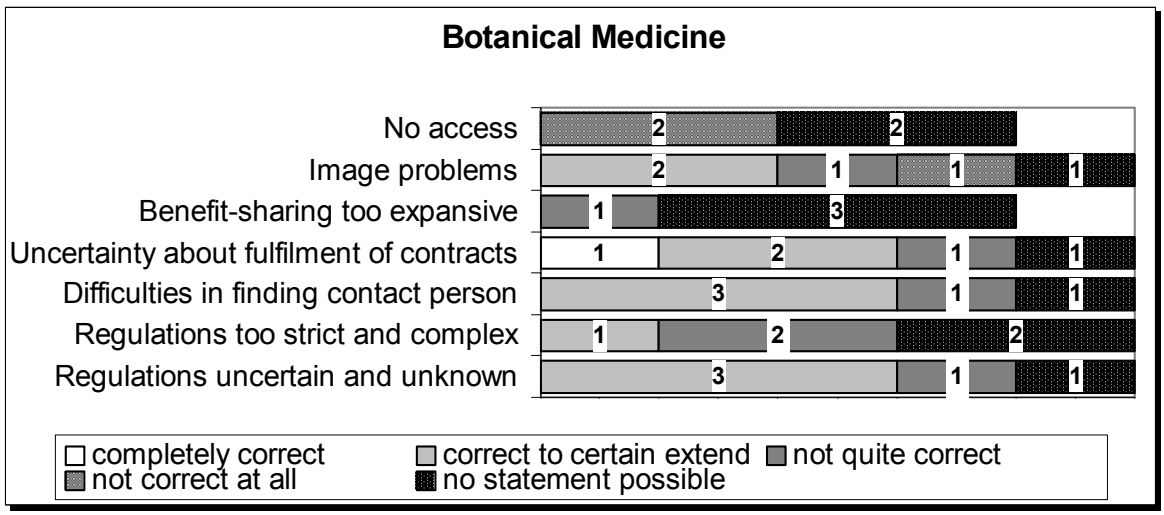

Universities and other Research Institutions
No use
Regulations uncertain and unknown
No access
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Image problems
Benefit-sharing too expansive
10
1
2
2
1
3
1
1
1
1
2
1
1
2
1
2
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible

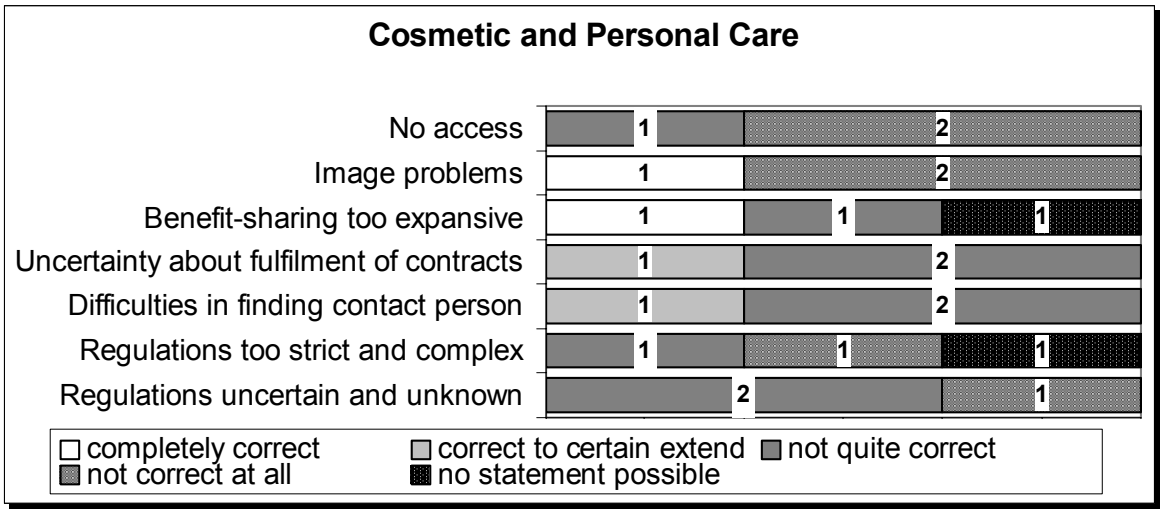


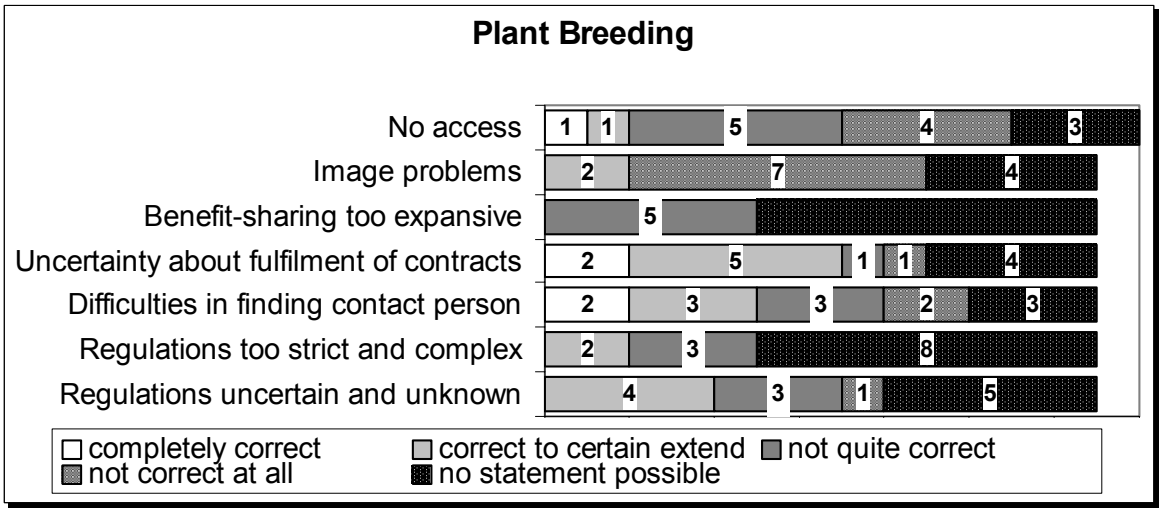
Source: Own survey.

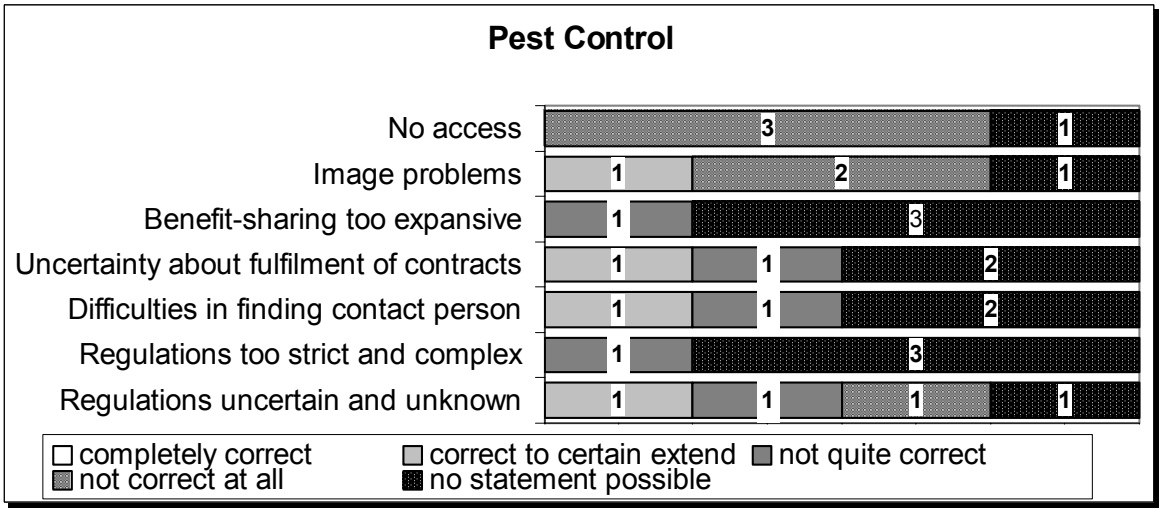
Figures A. 7.1 to 7.10: Users: Level and frequencies of difficulties reported in the context of provision and use of genetic resources






Cosmetic and Personal Care
No access
Image problems
Benefit-sharing too expansive
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Regulations uncertain and unknown
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible


Plant Breeding
No access
Image problems
Benefit-sharing too expansive
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
Regulations uncertain and unknown
completely correct
correct to certain extend
not quite correct
not correct at all
no statement possible


Pest Control
No access
Image problems
Benefit-sharing too expansive
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
Regulations too strict and complex
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not correct at all
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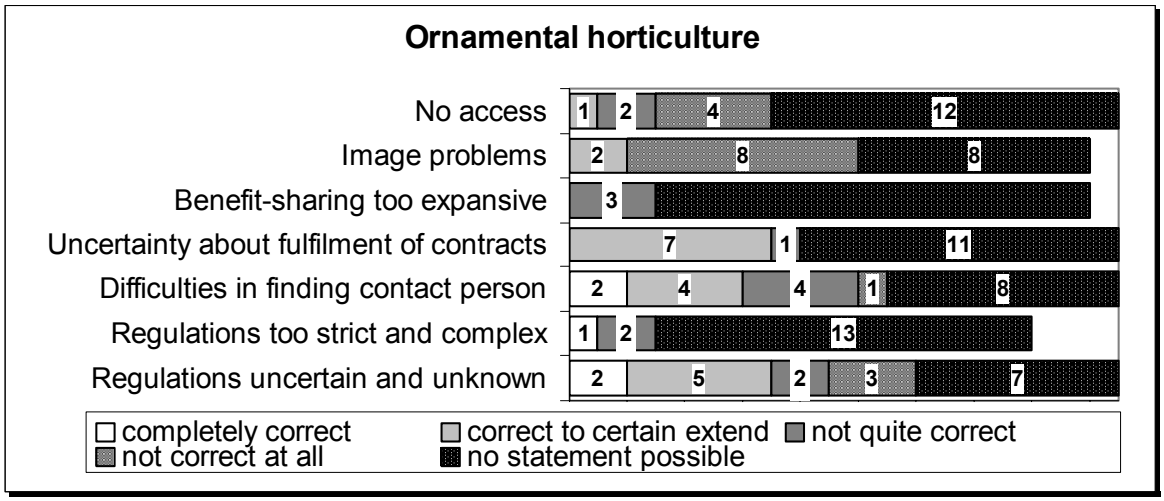
Ornamental horticulture
No access
Image problems
Benefit-sharing too expansive
Uncertainty about fulfilment of contracts
Difficulties in finding contact person
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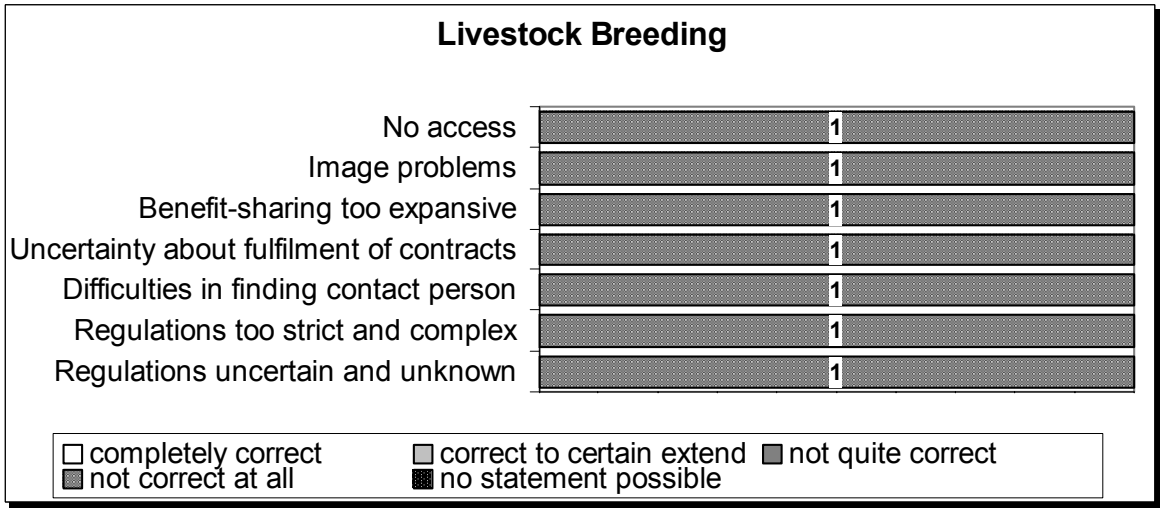
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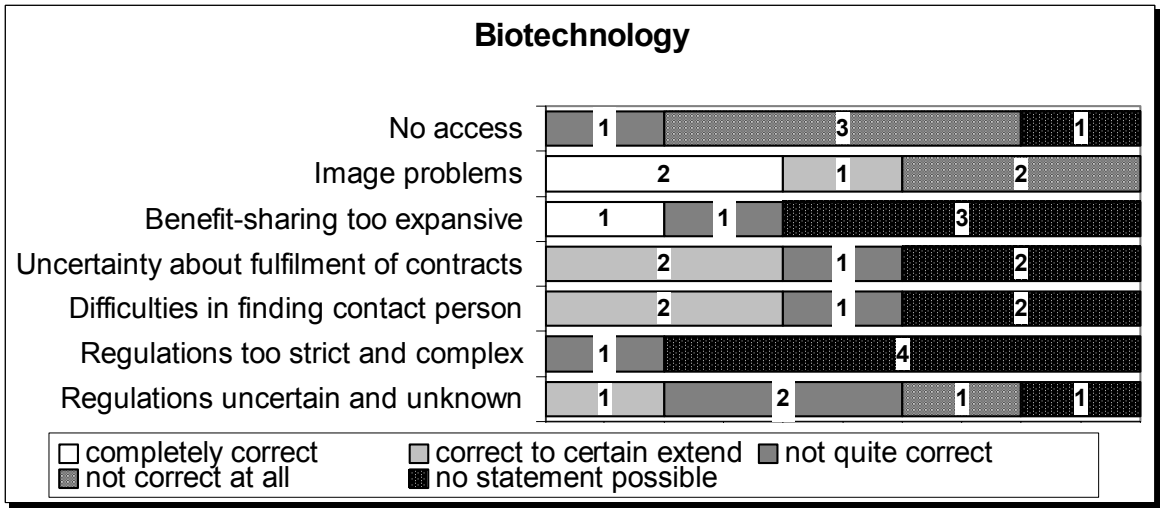
Biotechnology
No access
Image problems
Benefit-sharing too expansive
Uncertainty about fulfilment of contracts
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Regulations too strict and complex
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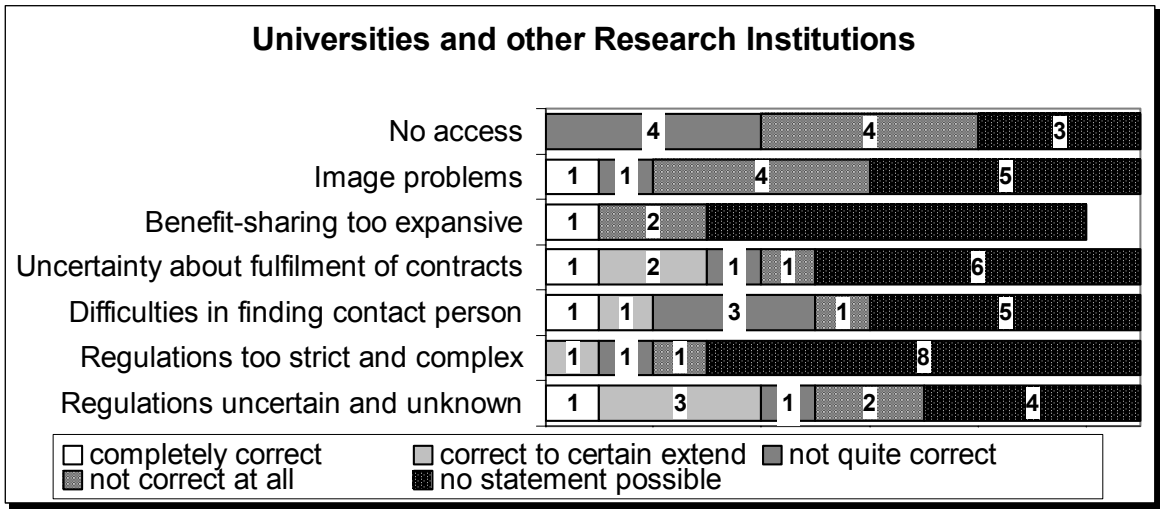
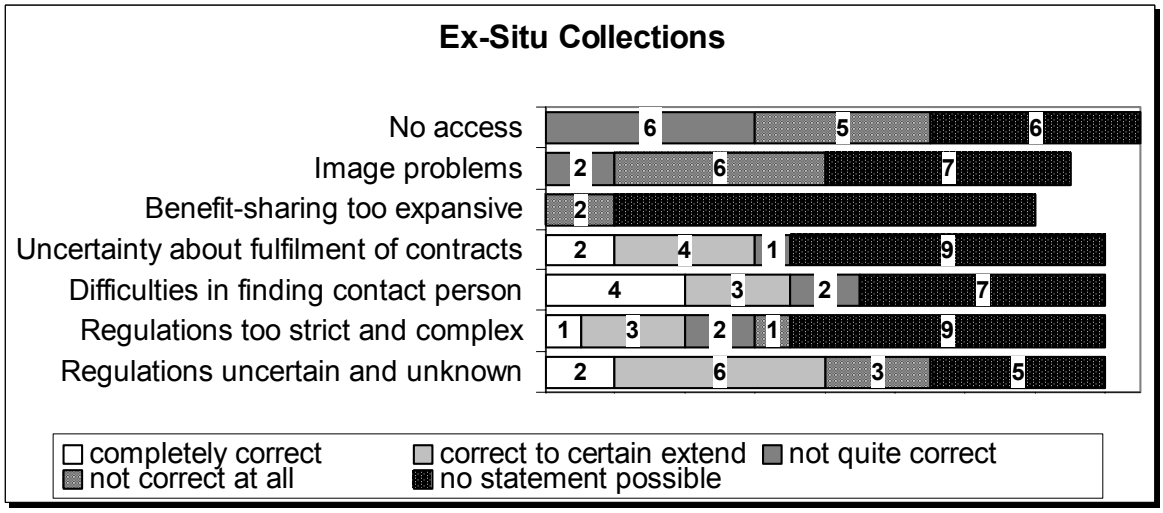
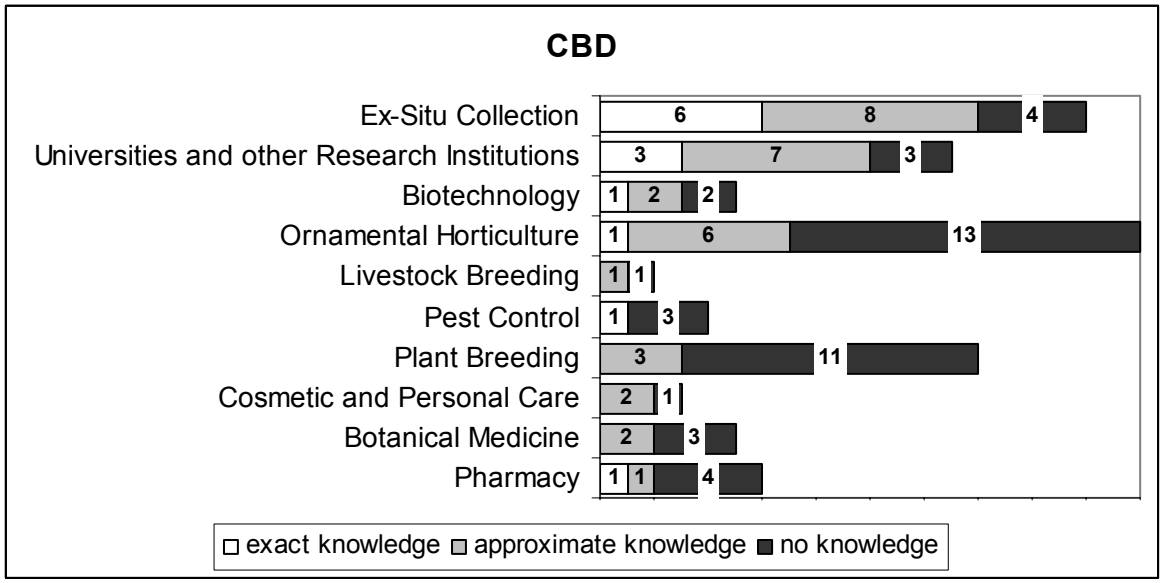
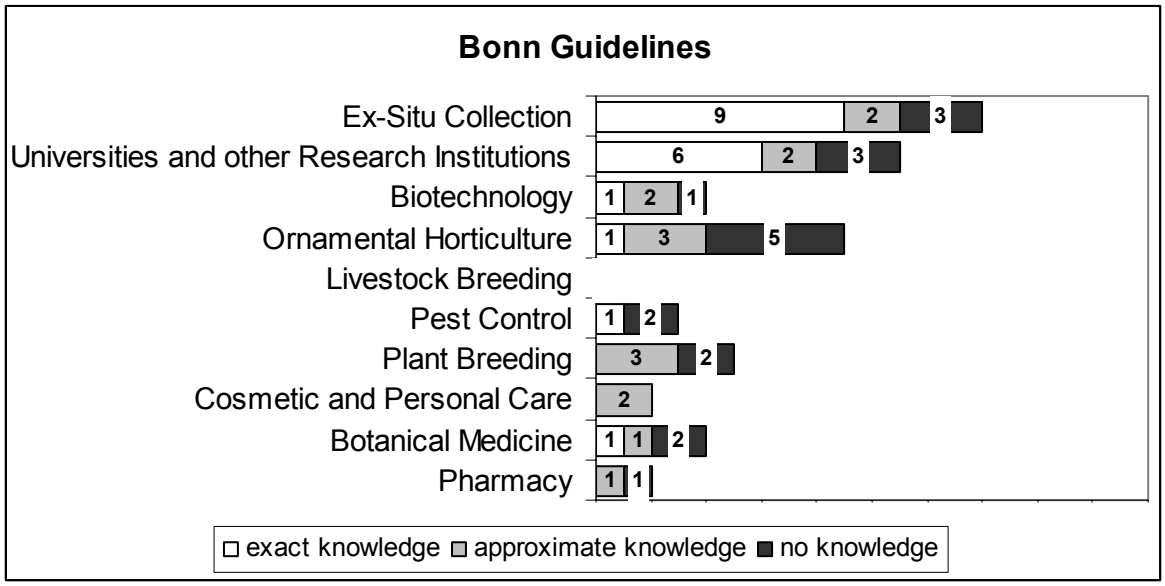


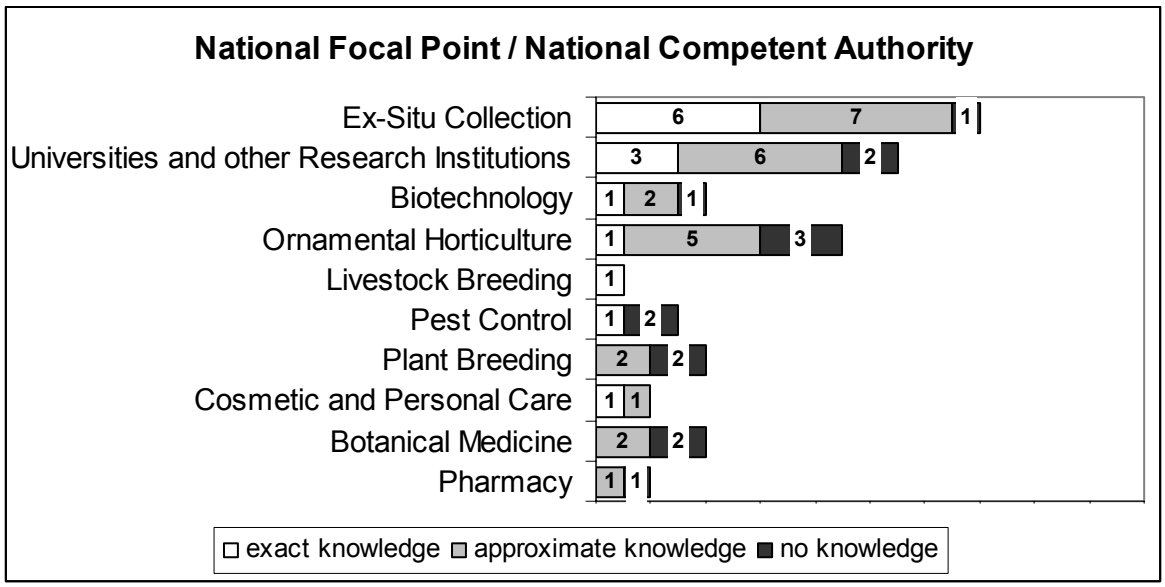


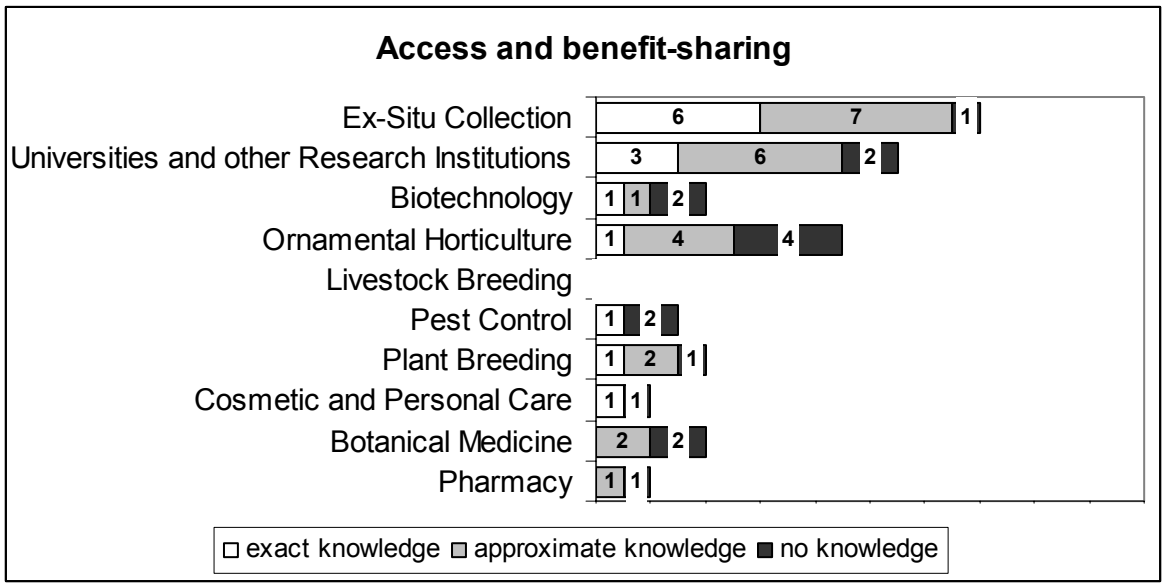
Source: Own survey.

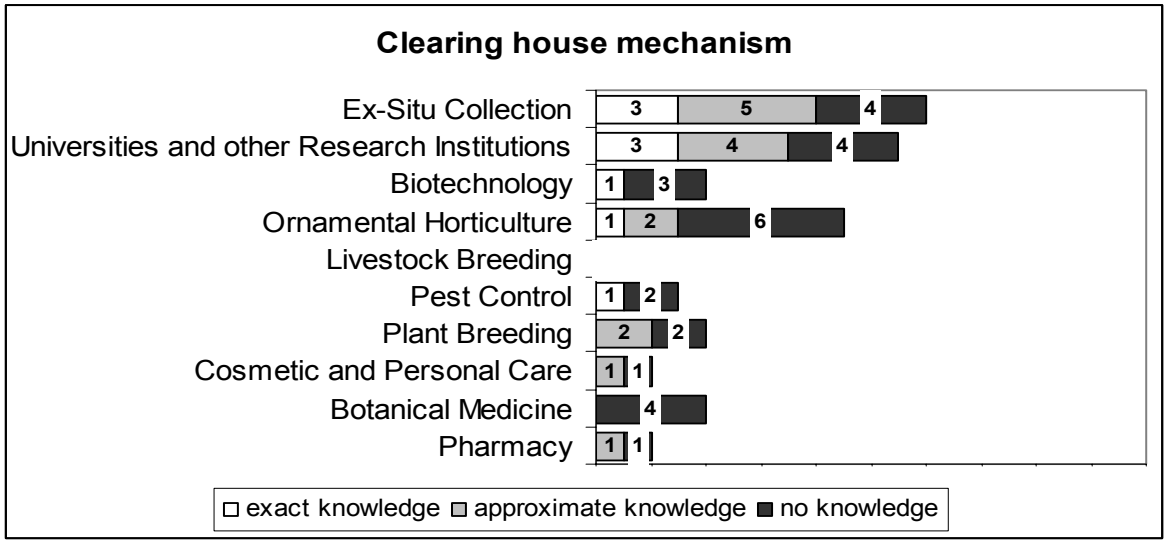
Figures A. 8.1 to 8.5: User level of information in the context of the CBD on sector level




Bonn Guidelines
Ex-Situ Collection
Universities and other Research Institutions
Biotechnology
Ornamental Horticulture
Livestock Breeding
Pest Control
Plant Breeding
Cosmetic and Personal Care
Botanical Medicine
Pharmacy
9 2 3
6 2 3
1 2 1
1 3 5
1 2
3 2
2
1 1 2
1 1
exact knowledge
approximate knowledge
no knowledge


National Focal Point / National Competent Authority
Ex-Situ Collection
Universities and other Research Institutions
Biotechnology
Ornamental Horticulture
Livestock Breeding
Pest Control
Plant Breeding
Cosmetic and Personal Care
Botanical Medicine
Pharmacy
6 7 1
3 6 2
1 2 1
1 5 3
1
1 2
2 2
1 1
2 2
1 1
exact knowledge
approximate knowledge
no knowledge


Access and benefit-sharing
Ex-Situ Collection
Universities and other Research Institutions
Biotechnology
Ornamental Horticulture
Livestock Breeding
Pest Control
Plant Breeding
Cosmetic and Personal Care
Botanical Medicine
Pharmacy
6 7 1
3 6 2
1 1 2
1 4 4
1 2
1 2 1
1 1
2 2
1 1
exact knowledge
approximate knowledge
no knowledge



Source: Own survey.

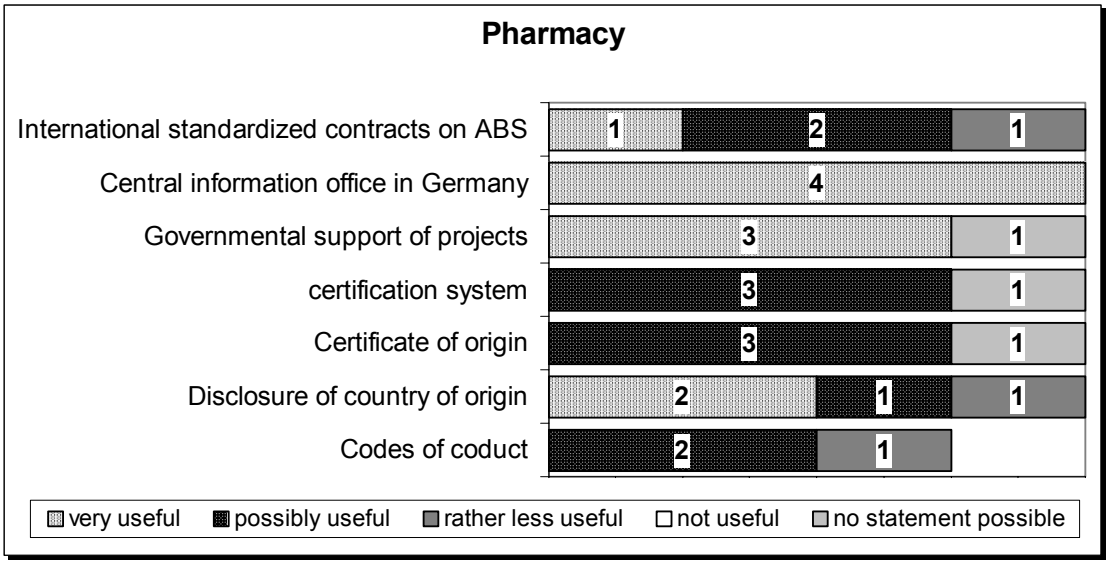
Table A. 3: Users` channels of information in the context of the CBD and the use of genetic resources on Sector level (only users who know the CBD, multiple entries possible)

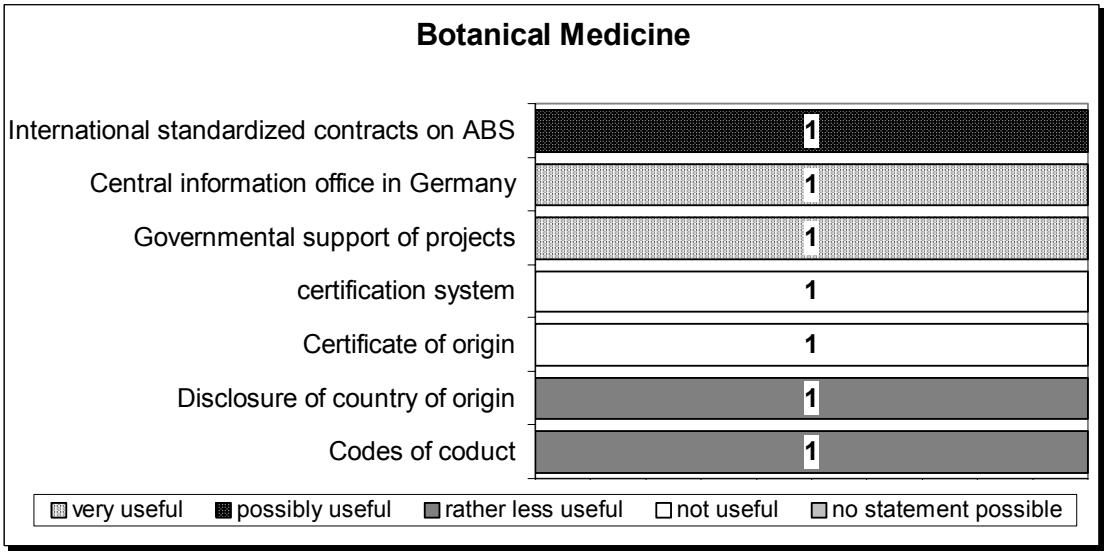
	BMU/BfN		Federations		Internet	
Sector	entries	% of users	entries	% of users	entries	% of users
Pharmacy			1	100%	1	100%
Botanical Medicine	1	33%	1	33%	2	67%
Plant Breeding			3	100%	1	33%
Pest Control	1	50%			2	100%
Livestock Breeding					1	100%
Ornamental Horticulture	2	25%	2	25%	3	38%
Biotechnology	1	33%			2	67%
Cosmetics & Personal Care			1	50%	2	100%
Universities & other Research Institutions	4	36%	6	55%	9	82%
Ex-situ collections	6	43%	8	57%	10	71%

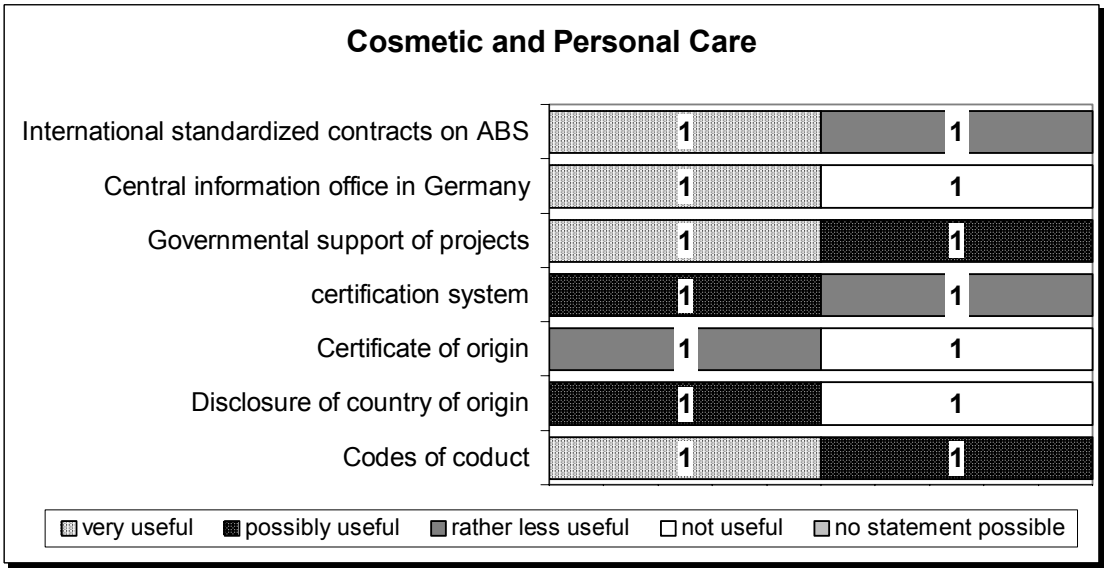
	Scientific journals		Providers from country of origin	
Sector	entries	% of users	entries	% of users
Pharmacy	1	100%		
Botanical Medicine	1	33%	1	33%
Plant Breeding	1	33%		
Pest Control	1	50%		
Livestock Breeding	1	100%		
Ornamental Horticulture	4	50%	2	25%
Biotechnology	2	67%	1	33%
Cosmetics & Personal Care	2	100%		
Universities & other Research Institutions	6	55%		
Ex-situ collections	8	57%	2	14%

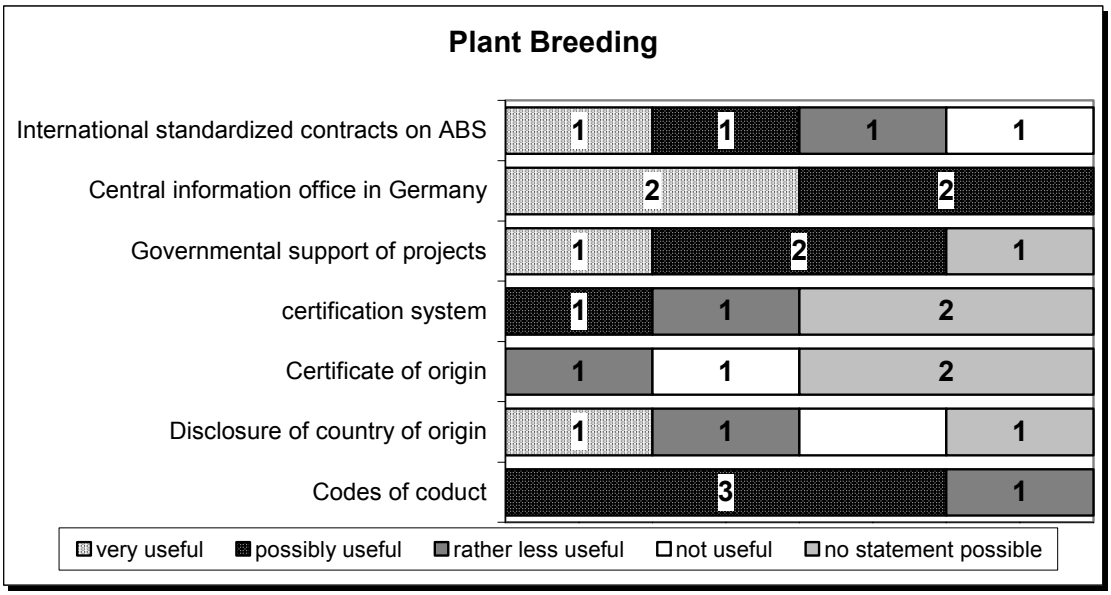
Source: Own survey.

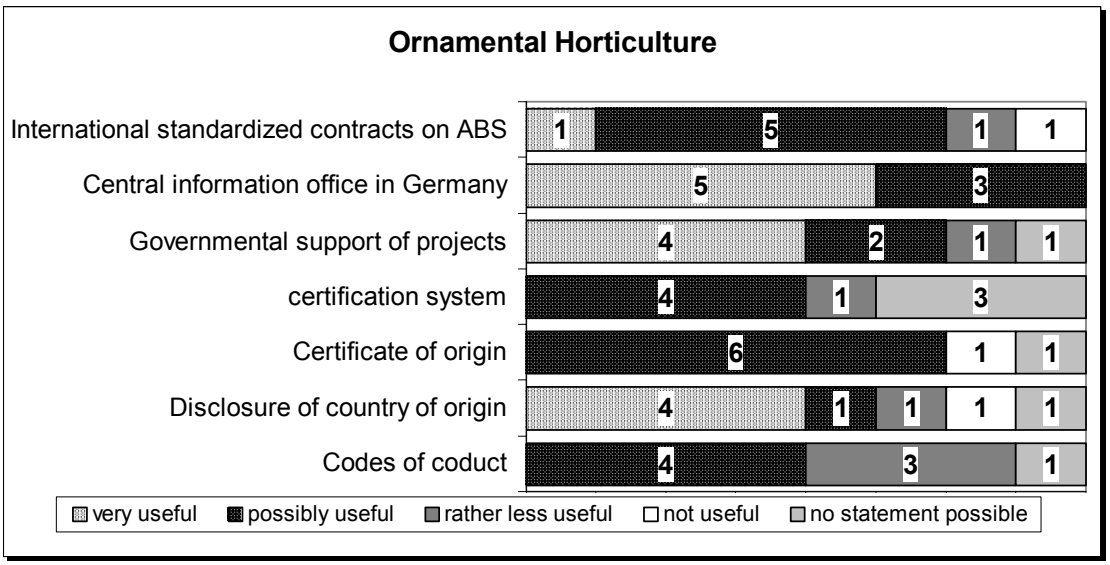
Figures A. 9.1 to 9.10: Acceptance of different user measures on sector level

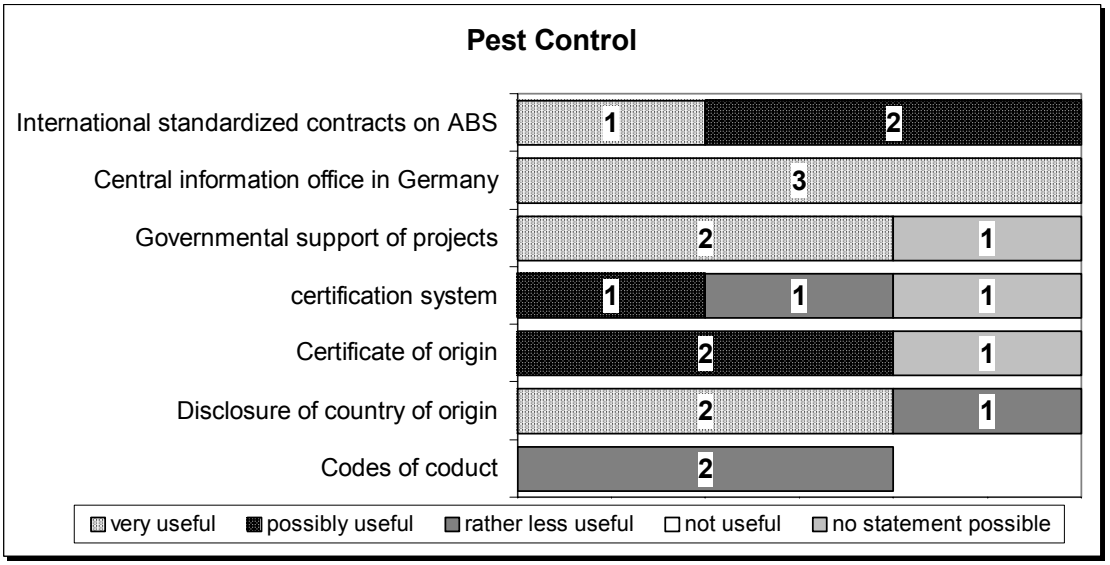


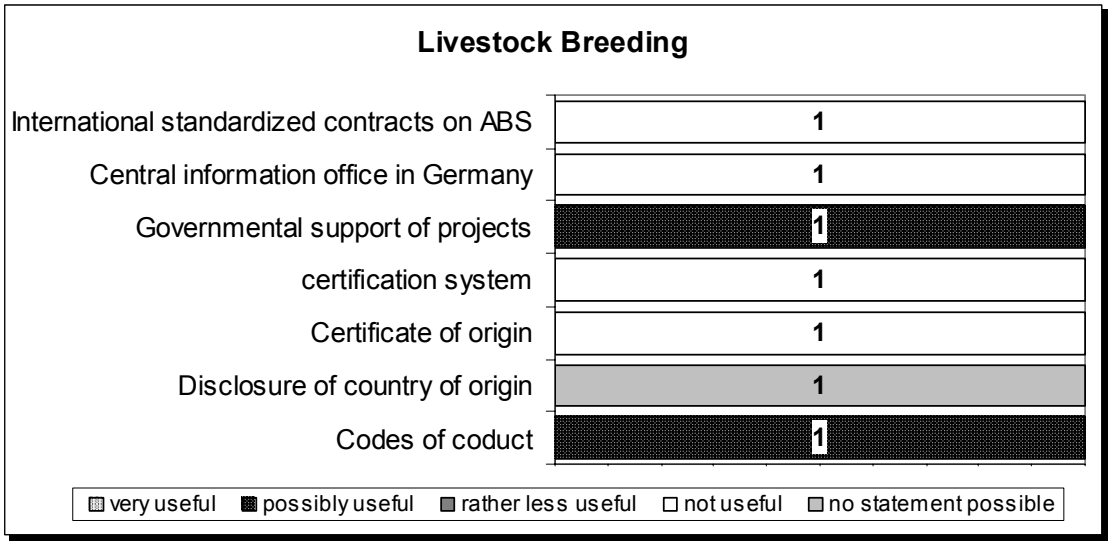





Plant Breeding
International standardized contracts on ABS
Central information office in Germany
Governmental support of projects
certification system
Certificate of origin
Disclosure of country of origin
Codes of coduct
very useful
possibly useful
rather less useful
not useful
no statement possible


Ornamental Horticulture
International standardized contracts on ABS
Central information office in Germany
Governmental support of projects
certification system
Certificate of origin
Disclosure of country of origin
Codes of coduct
very useful
possibly useful
rather less useful
not useful
no statement possible


Pest Control
International standardized contracts on ABS
Central information office in Germany
Governmental support of projects
certification system
Certificate of origin
Disclosure of country of origin
Codes of coduct
very useful
possibly useful
rather less useful
not useful
no statement possible


Livestock Breeding
International standardized contracts on ABS
Central information office in Germany
Governmental support of projects
certification system
Certificate of origin
Disclosure of country of origin
Codes of coduct
1
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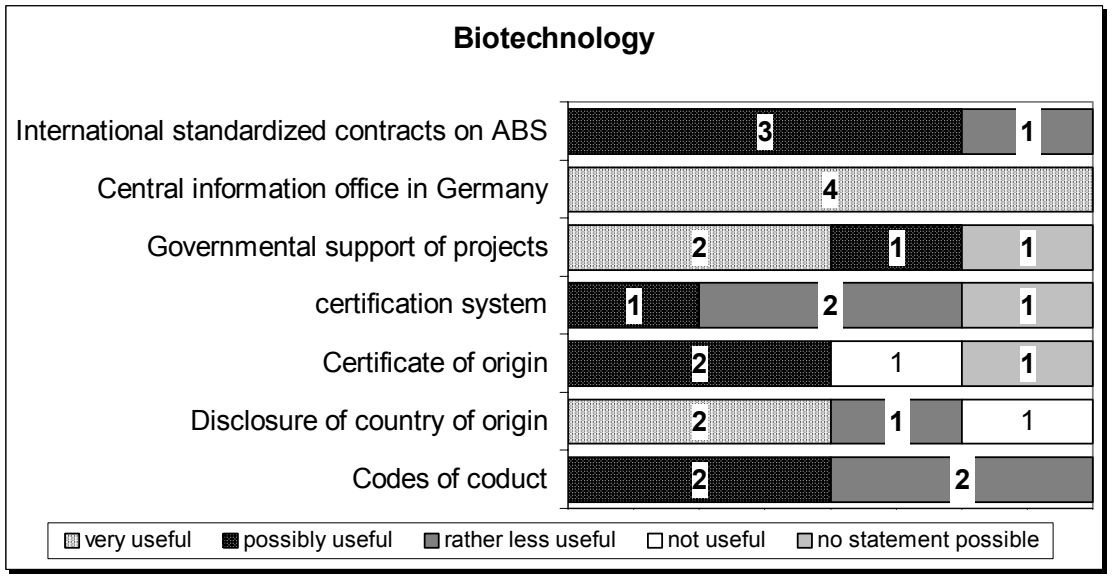
rather less useful
not useful
no statement possible


Biotechnology
International standardized contracts on ABS
Central information office in Germany
Governmental support of projects
certification system
Certificate of origin
Disclosure of country of origin
Codes of coduct
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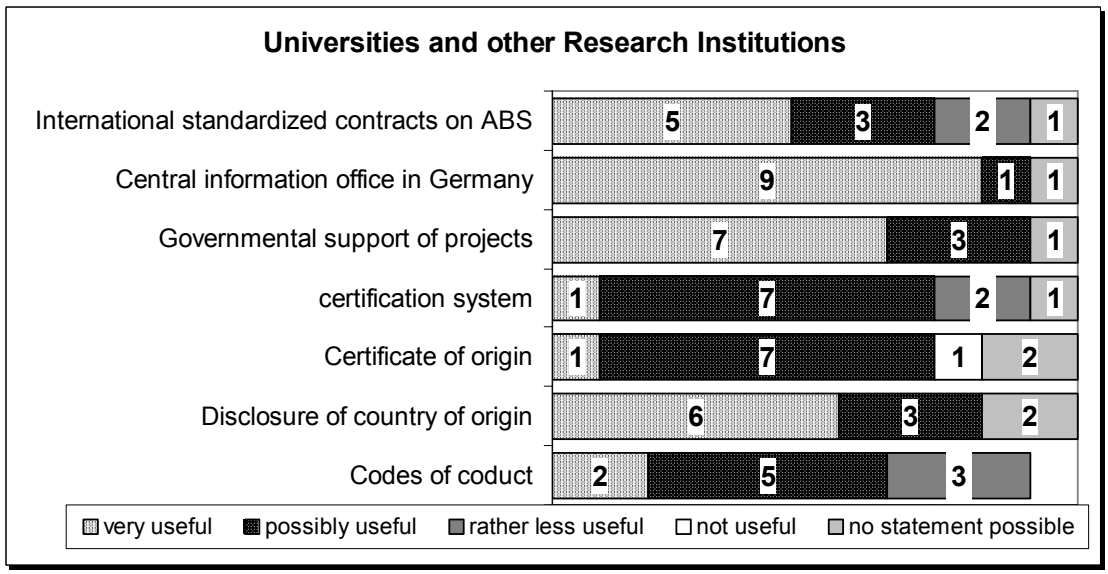
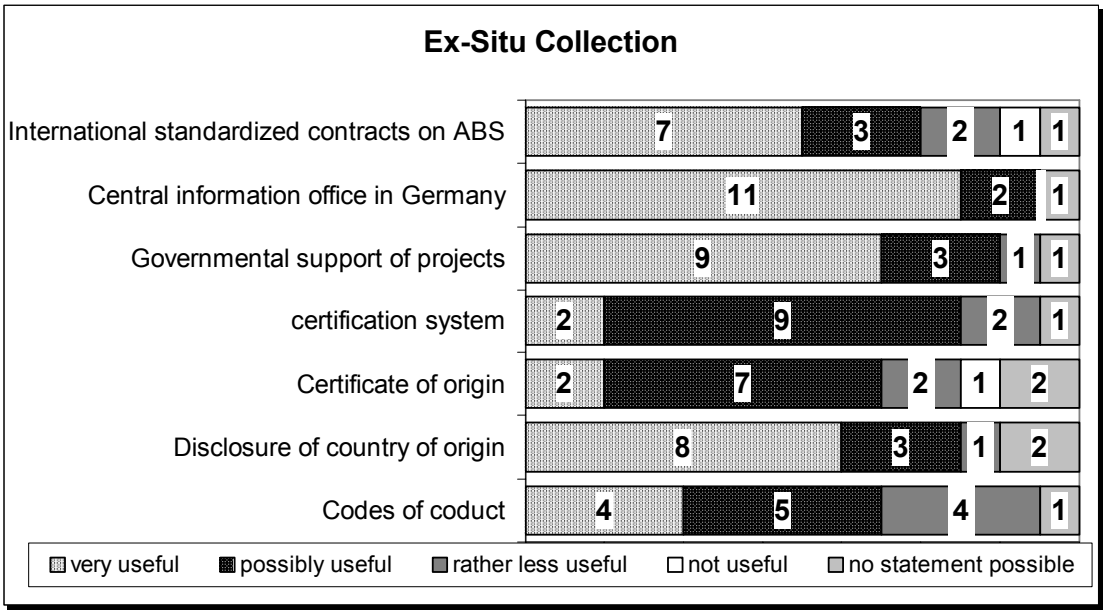
4
2 1 1
1 2 1
2 1 1
2 1 1
2 2
very useful
possibly useful
rather less useful
not useful
no statement possible


Universities and other Research Institutions
International standardized contracts on ABS
Central information office in Germany
Governmental support of projects
certification system
Certificate of origin
Disclosure of country of origin
Codes of coduct
5 3 2 1
9 1 1
7 3 1
1 7 2 1
1 7 1 2
6 3 2
2 5 3
very useful
possibly useful
rather less useful
not useful
no statement possible



Source: Own survey.

Appendix III:

IPEN Code of Conduct
for botanic gardens[1] governing the acquisition, maintenance and supply of living plant material[2]

The conservation of the Earth's biological diversity is the responsibility of all humankind. Throughout their history, botanic gardens have made an essential and indispensable contribution to preserving the diversity of plant life. The *Convention on Biological Diversity* (CBD, Rio de Janeiro, 1992) respects the sovereignty of individual countries over their own biological resources as elements of biological diversity.

In compliance with this Code of Conduct, botanic gardens and their employees contribute to implementing the goals of the Convention on Biological Diversity.

Under this Code of Conduct, the garden commits itself with regard to acquiring, maintaining, and transferring living plant material to act within the framework of the CBD and the Convention on International Trade in Endangered Species (CITES). In addition, the garden will endeavour to act in compliance with further national and international laws.

Member gardens of the International Plant Exchange Network will act under the following Code:

1. Acquisition: How plant material enters the International Plant Exchange Network

a. To the best of its knowledge, the garden shall only accept plant material (including material derived from in-situ and ex-situ conditions) which has been acquired in accordance with the provisions of the CBD and further national and international laws related to the protection and sustainable use of biological diversity, access to genetic resources, associated knowledge, and benefit sharing, as far as can be ascertained.

b. When acquiring plant material from in situ conditions, the garden shall obtain information on the country of origin's access laws and the procedures for obtaining Prior Informed Consent and relevant permits. One source of this information is from the national focal point of the CBD (or the national focal point for ABS, if one exists).

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[1] ‚Botanic gardens are institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education' (Wyse Jackson, BGCI 1999)

[2] According to the CBD "genetic resources" means genetic material of actual or potential value. This definition covers both living and non living material. The Code of Conduct and the IPEN covers only the exchange of living plant material (living plants or parts of plants, diaspores) thus falling in the definition of genetic resources.

c. When acquiring plant material from ex situ conditions the PIC will be obtained according to national law from the institution that holds the collection[3].

1.1 Procedure of material entering the IPEN

Not all the plant material of a botanic garden that is IPEN member garden is automatically to be distributed within IPEN. Material entering the IPEN means material that is supplied by one IPEN member to another. The terms and conditions under which the plant material was acquired have to be kept. That means only plant material that was acquired without restrictions in respect of its use or its supply to third parties may enter the International Plant Exchange Network and be exchanged within it (see also "1.2 Material unsuitable for the International Plant Exchange Network").

In case of being the first garden supplying a specific plant sample (accession) within IPEN this garden has to provide the material with an IPEN-number consisting of an acronym of the country of origin, a note about the existence of any restrictions, the acronym of the first supplying garden and a identification number (# 7). Furthermore, the material that shall be supplied as well as the terms under which it was introduced have to be documented by the supplying IPEN garden (e.g. with the "documentation sheet for plant material entering the International Plant Exchange Network ", # 8).

In case of receiving material from another member of the IPEN it is sufficient to document the information listed in the "Minimum set of data to be documented in any case of transfer of plant material" (#9).

1.2 Material unsuitable for the IPEN

If the terms and conditions under which the material was acquired do not allow the transfer to third parties, this material cannot enter the IPEN.

Even in the case that the transfer to third parties is allowed but other restrictions are given the material may be unsuitable for the network. Examples for imaginable restrictions:

- the country of origin wants to be informed about any plant transfer in advance
- the use for public display is not allowed
- annual reports on the use of plant material are requested by the country of origin
- etc.

Theoretically it would be possible to exchange such material within the IPEN because

[3] When requesting plant material for non-commercial purposes, the request will automatically be considered as a request for the PIC. A positive response, i.e. the supply of the requested material, will be considered as granting the PIC.

the IPEN-number includes a code for the restrictions (see identification number (# 7)), so the recipient garden may get the information on the specific restrictions. But, in practice it would be very difficult to honour the restrictions in such a dispersed network. Therefore such material is unsuitable for the network and should not be circulated within it.

1.3 Pre and post CBD material

Botanic gardens are strongly advised to treat all plant material 'as if' acquired after the CBD came into effect and therefore subject to the CBD. By doing so, it should be clear however that no responsibility is accepted for retroactive benefit-sharing claims regarding commercial use of plants acquired before the CBD came into effect.

2. Maintenance: What happens with the material within the IPEN member gardens?

2.1 Curation/Documentation

For the purposes of conserving biological diversity, supporting scientific study, education and benefit-sharing, the garden will make best efforts to ensure the care and cultivation of the plants entrusted to it and to keep the relevant information, especially the terms under which the plant material was acquired.

That means they need to use a database or record system that tracks all relevant data as plant material comes in and out of the garden. International standards on data exchange and taxonomic databases (e.g. by the Taxonomic Databases Working Group, http://www.bgbm.org/ TDWG/) should be considered. The database must easily distinguish between material that is suitable for the IPEN and the unsuitable material.

2.2 Use

Any use of the plant material is restricted to the terms under which it has been acquired. For uses not covered by these terms, the garden commits itself to obtain a new Prior Informed Consent of the country of origin.

Commercial use of the plant material is not covered by the IPEN. In case of intended commercial use and other uses not covered by these terms and conditions, the participating garden commits itself to obtain a new Prior Informed Consent of the country of origin.

2.3 Benefit Sharing

In the spirit of implementing the objectives of the CBD, the garden shall endeavour to share benefits resulting from the use of plant material with the country of origin. Since

the garden‘s use of the material covered by this exchange network is non-commercial, such benefit sharing will be non-monetary.

The following list includes examples of non-monetary benefit sharing which are already in practice among botanic gardens and are based on co-operation with partner institutions:

- joint expeditions and projects with a partner institution in the country of origin
- knowledge and know-how transfer
- technical support
- exchange of gardeners and other staff
- reintroduction of threatened plant species
- joint publications with scientists and institutions from the country of origin or
- publication of research results in the country of origin or at least providing access to the research results in the country of origin

Supply

3.1 Supply of plant material within the International Plant Exchange Network

1. Plant material will be supplied under the same terms under which it was acquired.
2. The supply of plant material includes the transfer of information connected to the material especially data relevant for benefit sharing with the country of origin (see “Minimum set of data to be documented in any case of transfer of plant material” (#9).

3.2 Supply of plant material outside the International Plant Exchange Network

1. Plant material will be supplied under the same terms under which it was acquired.
2. The supply of plant material includes the transfer of information connected to the material, especially data relevant for benefit sharing with the country of origin (see “Minimum set of data to be documented in any case of transfer of plant material” (#9).
3. The garden supplies plant material for non commercial uses by using the „Agreement on the supply of plant material for non-commercial purposes leaving the International Plant Exchange Network“ (# 10). By signing this Agreement the recipients commit themselves to act in compliance with the CBD and its agreed provisions on Access and Benefit-Sharing. This includes a new Prior Informed Consent (PIC) of the country of origin for any uses not covered by terms under

which it has been acquired (such as commercialisation).

4. The garden supplies plant material for commercial uses only if adequate evidence is provided that the country of origin‘s Prior Informed Consent has been granted. In this case, too, it is the recipient‘s responsibility to ensure an adequate and equitable sharing of benefits with the country of origin. The supply of material for commercial purposes requires a bilateral agreement. (see Practical models and examples/Commercialisation).