

Online-survey of keepers of rare animals or plants about their activities and attitudes in Germany

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Summary

In Germany the problem of loss of diversity is barely apparent in daily life due to a broad range of products with similar ingredients or products imported from all over the world. Consequently the topic engenders neither broad attention nor engagement. Furthermore there is no overview of existing private activities in this area. The goal of the study is to for the first time characterise persons who are engaged in On Farm Management in Germany. An online survey was carried out with the help of the appropriate associations targeted to these special interest groups. Detailed information on the attitudes and form of involvement could be gained. Very different species and varieties or races are kept. Unexpectedly this is not a field predominantly led by farmers because 70 % of the participants do not own a farm but are still involved in On Farm Management. Only a scant half of those surveyed consider their own abilities as adequate for conservation. Support is desired both in terms of maintenance activities and in marketing questions. The results offer a starting point to show where individuals contributing to the maintenance of rare plants or animals can be supported.

JEL: H 44, Q 13, Q 57

Keywords: agrobiodiversity, conservation, genetic resources, on farm management, online survey

Zusammenfassung

Online-Befragung von Personen in Deutschland, die seltene Nutztiere oder Nutzpflanzen erhalten, zu ihren Aktivitäten und Einstellungen

Die Gefährdung der genetischen Ressourcen in Deutschland ist im Alltag kaum offensichtlich, da eine fast unbegrenzt scheinende Vielfalt an Produkten das Lebensmittelangebot prägt. Diese Produkte basieren jedoch häufig auf nur wenigen pflanzlichen oder tierischen Inhaltsstoffen oder werden aus der ganzen Welt importiert. Damit im Einklang steht, dass der Aspekt landwirtschaftliche Vielfalt in der Öffentlichkeit weder auf großes Interesse noch Engagement trifft. Zudem besteht kein Überblick über Aktivitäten und Initiativen in diesem Bereich. Ziel der Studie 'Online-Befragung von ErhalterInnen seltener Nutztiere oder Nutzpflanzen zu Ihren Aktivitäten und Einstellungen' ist es, erstmalig für Deutschland bzw. den deutschsprachigen Raum diesen Personenkreis zu charakterisieren. Dazu wurde eine Online-Befragung durchgeführt, die sich mit Hilfe von einschlägig bekannten Organisationen gezielt an interessierte Personen richtete. Es konnten detaillierte Erkenntnisse über Einstellungen und Ausgestaltung des Engagements gewonnen werden sowie über Art und Umfang der unmittelbaren Erhaltung seltener Nutzpflanzen bzw. Nutztiere: Es werden verschiedenste Arten und Rassen bzw. Sorten erhalten. Vermarktungsaspekte sind wichtig und 'Erhalten durch Essen' wird einhellig befürwortet. Nur knapp die Hälfte der Befragten schätzt die eigenen Fähigkeiten als ausreichend ein. Unterstützung wird sowohl in Erhaltungsaktivitäten als auch in Vermarktungsfragen gewünscht. Die Ergebnisse bieten Ansatzpunkte, wie der Personenkreis in seinem Bemühen, einen Beitrag zur Erhaltung seltener Nutzpflanzen oder Nutztiere zu leisten, unterstützt werden kann.

Schlüsselworte: Agro-Biodiversität, biologische Vielfalt, Erhaltung, genetische Ressourcen, On Farm Management, Online-Befragung

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Introduction

The introduction of scientific breeding methods in agricultural practice starts in the 19th Century in Germany, first in plant production and later on in animal husbandry (BDP 1987; Barth et al., 2004). The successful distribution of these new highly productive varieties and races led to a speedy drop in the traditional varieties or landraces used until then. Now, and for decades, agricultural practice concentrates on a few species and uses mainly modern commercial seeds and breeds. While agricultural production becomes less and less diverse, one can find an enormous range of food products in the supermarkets. But this diversity is fuelled to a large degree by imports from all over the world and additionally by the processing of a few agricultural raw materials into as many different products as possible. Thus, in sum, it is a deceptive diversity because the problem of loss of diversity is barely apparent in daily life in industrialised countries like Germany and doesn't affect producers or consumers directly, as it does perhaps in subsistence agriculture. As a result the topic engenders no direct pressure and, consequently, neither broad attention nor engagement (see also L. MAGGIONI, E. LIPMAN, 2009, PP. 8). Furthermore, in a study prepared on behalf of the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) on communication strategies for agricultural biodiversity, the difficulties tied to this topic were presented in detail. "Massive problems do not only occur in the semantic comprehension of the meaning of the term, but rather also in relation to the perception and acceptance as a socially relevant topic, as a national and supra-national problem, affecting not only policy and agricultural economics, but also private consumption." (Kleinhüchelkotten et al., 2006, P. 68).

Against this background the question is: how to fulfil the obligations laid down in the Convention on Biological Diversity (CBD) and successive international and national regulations in Germany (BfN 2009, SCBD 2009).

The collection of samples in so-called gene banks is an inexpensive strategy (WBGU, 2000, P. 944) implemented both in Germany and internationally. But this form of conservation can only be realized to a certain extent in the realm of animals. Also the protected samples are decoupled from evolutionary processes (Ibisch et al., 1996, P. 188; WBGU, 2000, P. 92). It is further argued that a collection of samples is only a partial solution to the problem of a loss of diversity, since it is neither possible nor desirable to conserve total biological diversity *ex situ* (Hammer, Gladis, 1996). Moreover gene banks cannot solve the problem of a loss of agricultural diversity on farms or the diversity of food, and the related cultural diversity (Mooney, 1983). Here it is necessary to maintain and to plant and breed a huge variety of cultivated plants and animals for every-

day life (WBGU, 2000, P. 94). As a first step one can see the "On Farm Management" (OFM) of genetic resources (Hammer, 1999, P. 39). With this method, the genetic material is constantly exposed to current environmental conditions and breeding. In addition, OFM links agricultural and socio-cultural aspects since both local knowledge about cultivated plants or animals and all possible forms of use are obtained (see, i.e., Virchow, 1999, 38 f.). An important component of OFM is, besides the immediate maintenance of rare plants and animals, their use in crops and husbandry. In agriculture and horticulture, "use" means production for consumption. Thus, maintenance or even extension of the used agricultural plants and animals on a species- or race- or variety-level has an effect on the consumer because he is confronted with the theme agro-diversity and biodiversity in daily life. In summary, the re-introduction of rare cultivated plants and animals for use and marketing can be seen as a form of conservation in Germany and in industrialised countries in general.

How can this be placed on a solid base? Is it enough, for example, to rely on voluntary activity in the hope that a constantly adequate number of persons will be active in the area? Is it at all possible that OFM be carried out on a voluntary basis in all cases? Particularly the keeping of large animals (cattle, horses, pigs) is tied to considerable financial and time inputs. Specifically in these cases, but also as a basic question, a search for stable and above all sustainable conservation strategies is needed (DGfZ, 2003; Efken, 2005; Feldmann, 2002).

In Germany, no even near-to satisfactory overview is available of existing private activities to conserve genetic resources on farm (who maintains what, how many and how). Until now knowledge was limited to case studies (Becker et al., 2003) and publicly perceived activities as well as the few publicly known actors, companies and organizations. This stands in contrast to the higher information level with regard to the activities in public agencies such as the Gatersleben Gene Bank, the Julius Kühn Institute (German Federal Research Institute for Cultivated Plants) (JKI) and botanical gardens. Information can be found, for example, in the BIG, XGRDEU, ZEFOD databases [www.genres.de/genres_eng/index.htm].

On the political level it has been recognized that activity to maintain diversity must be strengthened (BMELV, 2007). How, however, can support be provided when only inadequate knowledge exists about the people currently involved in this field. Ultimately, due to inadequate information, the basis for descriptions and analysis of this group of persons is missing. Deficits, barriers, strengths and weaknesses, as well as strategies, can first be discussed when the level and form of conservation work becomes clear. This gap shall be closed with the help of a survey based on a questionnaire including information on both direct

conservation activities and information on motivation, obstacles, chances and opinions.

The survey was conceived as an online survey. With an online survey only minimal costs occur. A disadvantage of this method is that it excludes all those with no access to Internet, particularly older persons (AGOF, 2008). The questionnaire was made available via newsletters of various organisations engaged in the conservation of genetic resources to approximately 4000 households from the beginning of May to the end of August 2007. In this time, 1261 persons clicked on the questionnaire, 500 filled it out completely, and a total of 485 questionnaires flowed into the analysis.

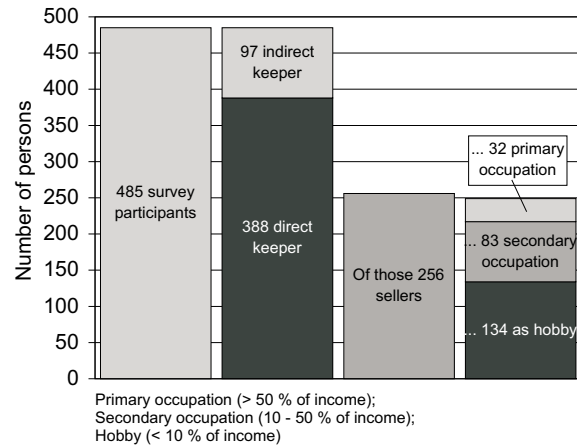
Demographic classification of the survey participants

About 60 percent of the participants were men, and accordingly 40 % women. The age of participants in the survey ranged between 10 and 80 years.. The age group between 30 and 60 years of age can be seen as the majority, set by 80 % of the participants. Here, one can not speak neither of an 'youth movement' nor of an aging group of participants. With regard to the educational situation, the profile of survey participants confirms the findings mentioned in other studies that a large affinity to the field of biological diversity exists in population groups with a higher educational level. The occupational situation of participants was also questioned in relation to its proximity to agriculture. In this survey, 60 % of the participants had a tie to agriculture, either because they own a full or part time farm or exercise a profession related to agriculture. Nonetheless, 70 % of the participants do not own a farm, but are still involved in the maintenance of rare animals or plants. Apparently this is not a field predominantly led by farmers. This is of high importance since agricultural support schemes (national as well as EU) are almost entirely related to farmers and thus a majority of actors in this field are excluded from existing public support possibilities.

Conservation activities and marketing

In the following, the concrete conservation of rare plants and animals is described in detail. Apparently the survey particularly addresses active animal and plant keepers, since 80 % of the participants actively keep rare plants or animals. Half of the participants are organized in supra regional associations or initiatives. In any case, 123 persons, or 23 % of the participants, are not linked to a club or initiative. Participants are very active in conservational activities since they invest more than 10 hours per week, meaning one quarter of the standard work week. Of the 388 persons who actively keep cultivated plants or animals, 256 persons market the products from their activi-

ties with plants, animals or products (Figure 1). For 54 % of the marketers this activity is a hobby, 33 % attain a significant part of their income from the activities, and for 13 % it is the main source of income.



Source: Efken (2010)

Figure 1: Percentage of marketers and significance of marketing

The most important sales route is marketing via farm stores or similar outlets. Cooperation with trade partners and other marketing forms play a less important role. But the sellers, for whom this is more than a hobby, sell much more frequently to gastronomy, retailers and wholesalers. Only a scant 15 % of those who marketed their wares had no interest in increasing their marketing. Mostly limited resources (time, capital, equipment, land) were cited as obstacles to expansion. Legal obstacles were also of importance, as were a lack of co-workers. In contrast, inadequate demand was seldom a problem, but rather fluctuation in demand. This is in line with information with several representatives of relevant organisations and an important, albeit rough, indication about the market potential of 'diversity products'.

Conservation of rare plants and farm animals

90 % of the people who took part in the survey are animal keepers or plant cultivators and 80 % of the participants actively keep rare plants or animals. Of the latter, 42 % keep both animals and plants and 23 % cultivate only plants and 35 % keep only animals. In sum, the data show that survey participants who maintain rare plants and/or farm animals like to have diversity 'on farm' because most of them keep different species and often of plants as well as animals. As Table 1 shows, OFM nevertheless plays a really marginal role compared to the general agriculture in Germany.

Table 1:
Scale of OFM of the participants of the survey

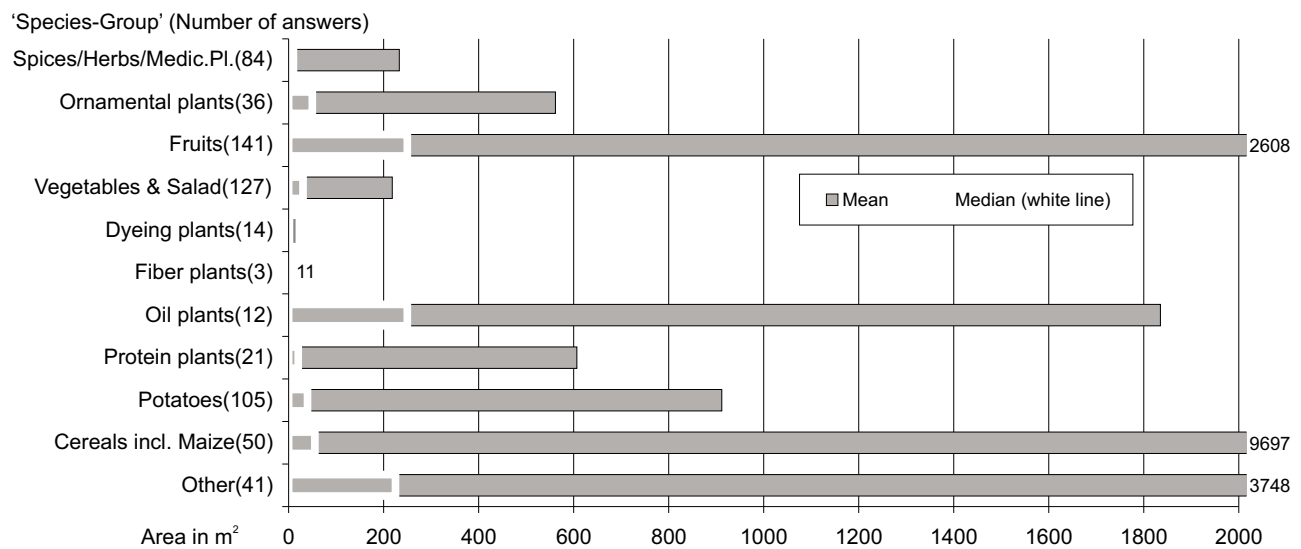
Species	Keepers	Head	Species	Keepers	m ²
Dogs	71	148	Fiber plants	3	15
Turkeys	25	158	Dyeing plants	14	142
Colonies of bees	20	183	Protein plants	21	1 2139
Horses	65	264	Ornamental plants	36	1 9093
Ducks	46	402	Spices/Herbs/Medic.Pl.	84	1 9561
Geese	51	456	Oil plants	12	2 2020
Goats	64	868	Vegetables & Salad	127	2 7741
Rabbits	72	1 062	Potatoes	105	9 5704
Pigs	66	1 128	Fruits	141	33 6454
Cattle	54	1 543	Cereals incl. Maize	50	46 5433
Chicken	141	3 189	Other	41	6 7475
Sheep	141	6 950			
Other	73	140			
Sum	252	16 491	Sum	294	106 5777

Source: Efken (2010)

252 persons (52 %) grow rare cultivated plants. The emphasis is, on the one hand, on typical garden plants which only use a minimal amount of land, and the other on arable cultures. The selection possibility "Other, namely ____" was chosen 40 times. Particularly fodder plants, wild vegetables, wild fruit and wild herbs as well as individual special plants were mentioned. It is conspicuous that in regard to the average land area used, a small group of persons uses a relatively large amount of land, so that the mean is very strongly above the median (see Figure 2). In the median, half of the participants use less land and

half of the participants more land. More or less all species and varieties show this skewed distribution.

Vegetables, herbs, decorative plants and fruits are often combined. This ultimately reflects the common practice of horticulture, at least in the case of private gardens. Reasons for this are crop rotation restrictions and the various seeding and harvest time points for the cultures as well as the relative simplicity of the cropping for various cultivated plants. In conservation many different varieties of one species are planted: there is no concentration of one variety, rather the contrary holds true, on average mostly 5 to 35



Source: Efken (2010)

Figure 2:
Average and median land area used to plant rare cultivated plants

varieties are used. Just as with the average amount of land area used, the number of varieties kept per individual can vary greatly, sometimes causing misleading distribution figures.

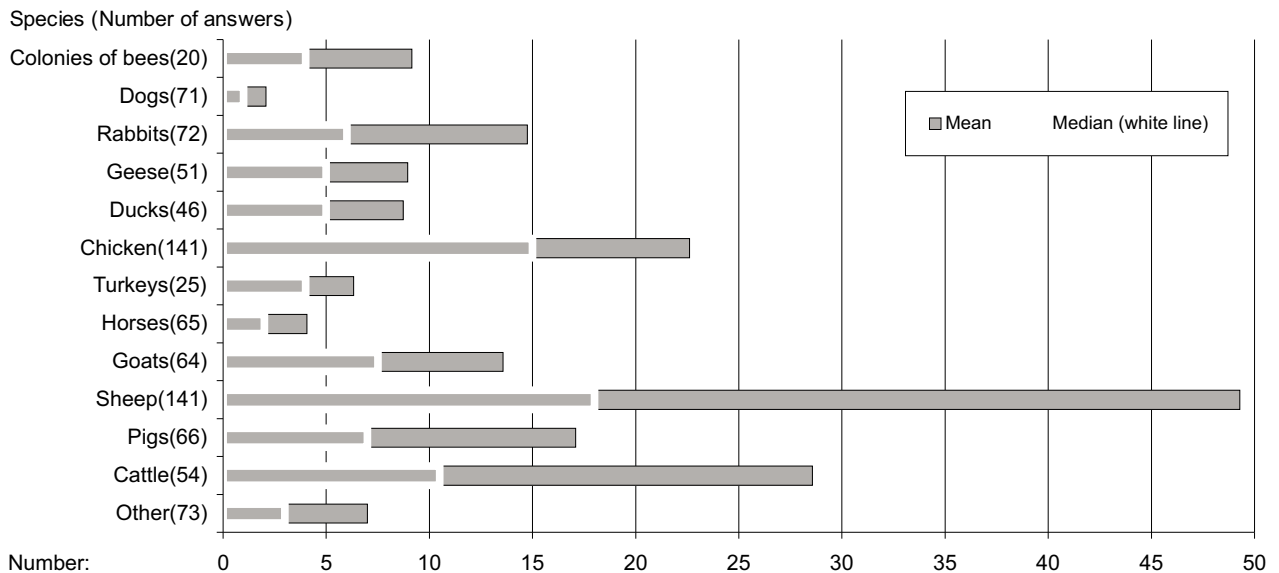
294 participants keep rare breeds. Sheep, cattle, poultry, goats and pigs are most frequently kept (Figure 3). Surprisingly many more keepers were likely to hold larger animals. This fact becomes clear when considering that participants with farms keep larger numbers of large animals. In comparison to the analysis of cropping of rare plants, it is evident that the difference between the average and median are not that great. In other words, individuals keeping animals tend to keep similar numbers of each species. Under the rubric "Other, namely..." 72 participants gave additional information. A total of 31 cats, 19 mules, and 13 different decorative birds as well as exotic species were mentioned. This information highlights in an impres-

The median is "one" throughout, meaning that always at least half of the keepers keep just one rare breed of one species. This result is clearly different from that for rare plants. Apparently the keeping of animals is linked to so much more work than the plants, that people keeping a multiplicity of rare breeds tend to be overwhelmed.

Both the information on rare plants, as well as on rare animals, indicate that the majority of the direct conservers do this on a really small scale while few persons maintain a wide range of species, varieties and races respectively.

Opinions of the participants

Besides information about the practical conservation activities, it is important to know why persons are engaged and what their opinions are. The results presented in Table 2 show a relatively clear pattern of perspectives



Source: Efken (2010)

Figure 3: Average and median numbers of rare animals kept

sive way the need for coordinated action and strategies to clarify what makes sense for conservation and what is no more than a personal hobby without an impact on agro biodiversity/biodiversity.

In addition to the number of rare animals kept, the number of species and races held in each case is also of interest. Half of those keeping rare animals do this with one or two species. Anyhow, almost half of the conservers keep between three and ten species. In husbandry the races level reflects the diversity or rather here the extent of the conservation activity within one species. Frequently more than one race is kept. In particular in cattle, sheep and chickens, an average of more than two races are kept.

on the part of the participants. Over 90 % of those surveyed prefer organically directed agriculture and support stronger state support for organic farming. Unanimous support was voiced that the government should do more for the conservation of biological diversity. At first glance this will probably not surprise anyone. Under the rightful assumption that the circle of participants is comprised primarily of experts, the current government activities in this field however were judged poorly. The statement on the high level of state control on seeds and varieties and the explicitly provocative statement on the public support of established breeding, in particular through the use of provocative words "large breeders" and above all "big busi-

Table 2:
Evaluation of agriculture and the protection of genetic resources of the survey participants

Question	n	Ans.	μ	σ	Not at all true		Completely true		Don't know
					1	1.5	2	2.5	
1) Organic farming is clearly preferable to conventional agriculture	485	475	3.6	0.7				●	11
2) Government should support organic farming more strongly than conventional agriculture	485	473	3.5	0.8				●	11
3) The government should do more to maintain biological diversity	485	474	3.8	0.5				●	2
4) The state controls far too much in the area of seed and varieties	485	471	3.3	0.8				●	111
5) With the seed/varieties laws, the state protects above all large-scale breeders and concerns	485	473	3.7	0.7				●	80

Source: Efken (2010)

nesses" should filter out to what extent the participants see themselves as an opposition movement and in how far institutional framework conditions are perceived as the cause of poorly developed situations. Both statements tended to be completely accepted by the participants.

In how far marketing activities can be seen as an unavoidable problem or as a natural part of the conservation of rare plants and animals should be clarified with another block of statements (Table 3). The sale of products from conservational activities is very strongly supported, there is no resentment against a commercialization of the conservational activity. The assessment of the economic sustainability of direct conservational work is rather modest. On average, participants assess the economic perspectives in the conservation of rare plants or animals favourable to only a limited extent. However, the participants appear to be convinced of the attractiveness of the products to be won from rare plants and animals.

At the end of the questionnaire, participants had the chance to express their reasons for conserving rare plants or animals into their own words. A total of 380 persons, or 80 % of the participants took advantage of this opportunity. Statements similar in content were summarized (Figure 4). The frequency of the responses gives no exact

information on the number of participants since in the answers often multiple topics were addressed, thus partial answers are considered in two or three topic areas.

Besides the dominant topic 'conservation of diversity,' conservation of cultural diversity as well as diversity of treatment were frequently mentioned reasons. Participants also see their activities as a contribution to conservation of cultural aspects. One reason stated relatively often for the conservational activities was that in contrast to modern bred varieties and species, healthier and more robust plants and animals were dealt with here. It is worthwhile to point out that the topic "self realization" was also a significant topic. It was mentioned directly or expressed in the form of "pleasure in the activity" or "personal meaning." These aspects should be considered not only in public support to expand engagement for genetic resources but also concerning promotion strategies towards consumers and consumption. In other words: Diversity of agricultural genetic resources and of food are more than an obligation of society and every individual, diversity is a way to improve public and even personal welfare.

Table 3:
Attitudes towards the sale of products from conservation activities of the survey participants

Question	n	Ans.	μ	σ	Not at all true		Completely true		Don't know
					1	1.5	2	2.5	
1) Whoever can earn money with rare cultivated plants and animals should certainly do it	485	476	3.6	0.7				●	19
2) Rare cultivated plant crops are not economically viable	485	475	2.4	0.8				●	92
3) Keeping rare animal breeds is not economically viable	485	471	2.3	0.9				●	65
4) Products derived from rare plants or animals are not attractive for today's consumers	485	478	1.8	0.8			●		15

Source: Efken (2010)

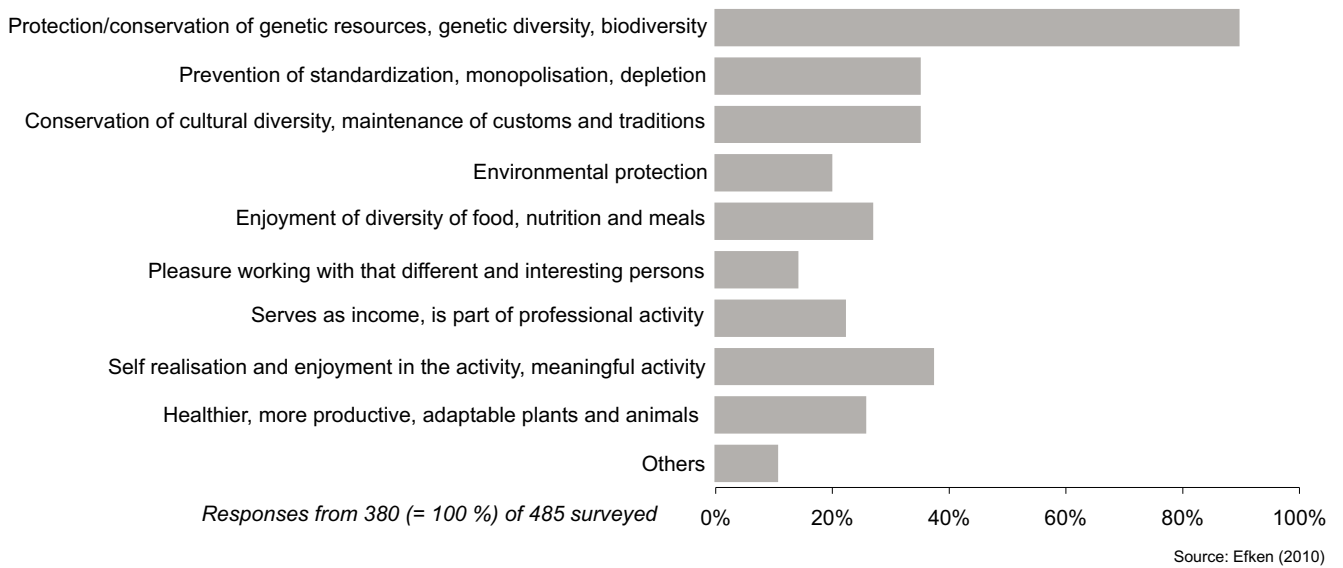


Figure 4: Frequency of mentions of a topic in the answering of a question „I am involved with the conservation of rare plants or animals because“

Competencies and deficits in the conservational activities

Also asked were the areas in which the survey participants possess adequate abilities or in which they desire support (Figure 5). Adequate abilities existed, as expected, above all in the direct conservational activities breeding, husbandry and growing of rare animals. In contrast, the results for rare cultivated plants were surprising: only ¼ of the active conservers had adequate competence in the breeding conservation of rare plants according to their

own information. Here a significant deficit became apparent, since this ability is the core of the OFM. Particularly conspicuous is also the overall low level of available competencies, which only exceeded the 50 % level in a few cases. Interesting are especially the relatively low quotas of available competencies in the areas important for the sale of products (sales, marketing, production of products and making connections). Accordingly participants chiefly voiced interest in topics related to marketing. Additional support is also desired in the field of financing and procuring public support.

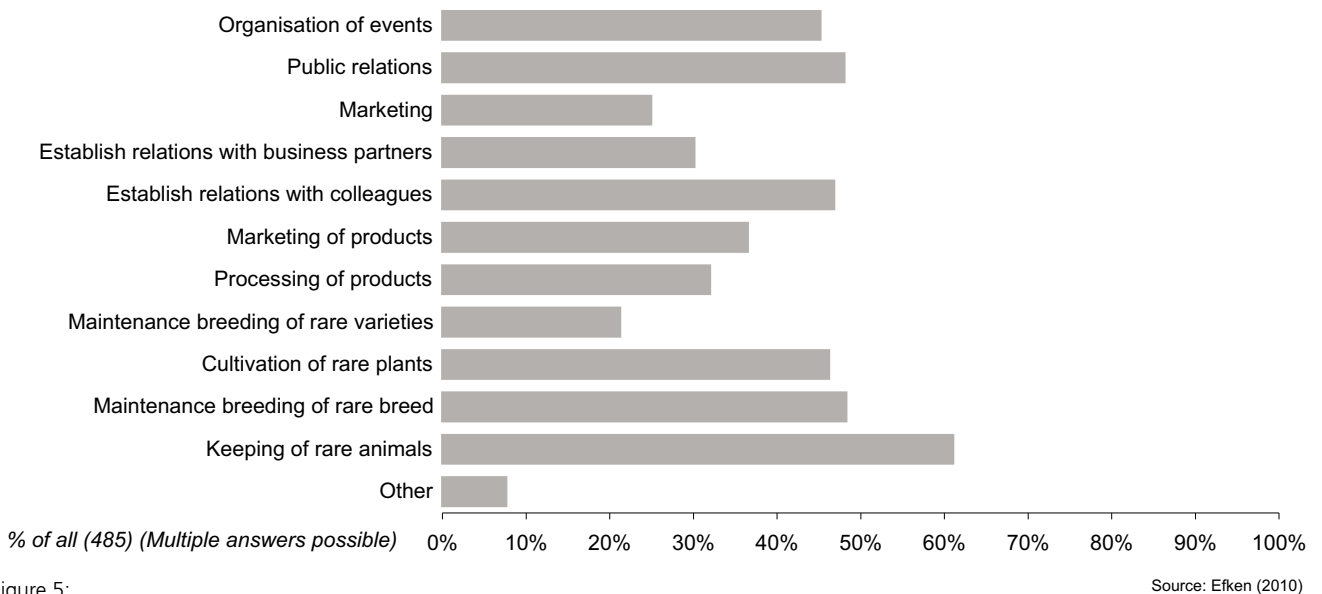


Figure 5: Areas in which adequate competencies are available

Concluding remarks

Agricultural practice in Germany has concentrated for decades on only a few species and modern commercial seeds and breeds. But consumers perceive no obvious lack of diversity, because a broad range of processed products are available from the same raw materials. Against this background it can be observed that only a small group within society is engaged in maintaining agro biodiversity and OFM. No overview existed until now about OFM in Germany and the extent of the conservation activities conducted as well as the motivation. Without this information public support and promotion strategies could hardly be established in a targeted and target group oriented manner. An online survey obtained detailed information in this area.

The main age group engaged in conservation of genetic resources is between 30 and 60 years of age. They have an above average educational level. Important to note that 70 % of those surveyed do not own a farm. Accordingly OFM is a small scale activity, often carried out in private gardens and households. This should have consequences for support strategies because farmer-oriented agricultural policies obviously do not meet the target group.

Direct maintenance is characterised through diversity: many species plus different varieties and races are maintained. Nevertheless it is quite unclear whether all these activities serve to protect genetic resources or are no more than a personal interest in some special plants or animals without an impact on protection of agro biodiversity. Strategies also need to give an answer in this direction. This gains importance since many feel they lack adequate ability concerning maintenance breeding (especially with plants). Here support is strongly needed.

With regard to the opinions, persons involved showed a significant preference for organic farming and a critical opinion of conventional plant breeding, seed law and plant variety law. They interpret themselves as alternative concerning sustainable agriculture. There is a lack of support for the conservation of genetic resources according to the opinion of those surveyed. However, on the other hand, the organisational structure in this area in Germany is only poorly evolved so that lobbying activities are still underdeveloped.

The option of use, consumption or marketing for conservation was judged strongly positive. Less positively rated was the actual economic potential of products from the maintenance activities. Accordingly, a lack of abilities, primarily in the relevant marketing areas, is seen. Until now policies in this area are neither market oriented nor consumer oriented. Since the consumer and market developments are primarily responsible for the decline of agro biodiversity – at least in countries like Germany – there is a

need to react on this level too. There is a need for support and the implementation of strategies concerning marketing activities in order to connect agro biodiversity with the general public via markets and consumption.

An interesting result of the study is that people engaged in protecting genetic resources highlight clearly, that they find pleasure in their activities and the consumption of the products they obtain. The protection of genetic resources and agro biodiversity was hardly perceived as a burden or hardship. Thus a stronger accentuation of the positive effects of agro biodiversity on personal well being besides the frequently mentioned effects on the environment and general public should be part of strategies.

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