
IMAGE

Innovative Management of Animal Genetic Resources

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Abstract: The concepts of stakeholder, technological innovation and acceptance are analysed in the frame of gene banking strategies. The approaches of IMAGE were the Dialogue Forum, the participation to targeted workshops and the ethical survey (see D9.3). The conclusions showed that a tailored approach is likely to be more successful than a general one, by presenting technological innovations in the frame of the value system of each category of stakeholders. Furthermore, emergency situations lead to enhance acceptance of complex biotechnologies for farm animals.

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PU Public (must be available on the website)
PP Restricted to other programme participants (including the Commission Services)
RE Restricted to a group specified by the consortium (including the Commission Services) (precise to whom it should be addressed within IMAGE consortium)
CO Confidential, only for members of the consortium (including the Commission Services)

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Executive Summary

Background	Gene banking requires specific and complex technologies. IMAGE is developing new technologies which are aimed at improving the efficiency of animal gene banks. They may require biotechnologies or invasive procedures which could be difficult to accept by stakeholders. Our aim could be missed if these technologies were rejected by potential users of gene banks, or by the general public. Therefore, understanding the drivers for acceptance of technological innovations is important for the success of IMAGE.
Objectives	The objective of Task 1.2 was to provide a sociological analysis of the innovation challenges for animal genetic resources, taking advantage of the Dialogue Forum (Task 1.1), and realising additional interviews and surveys on innovation and ethical issues.
Methods	The first step was to precisely explain our concept of stakeholders, then to analyse technological innovations developed for gene banking according to TRL and to species, and finally to define the meaning of acceptance. Then, actions undertaken by IMAGE were: the Dialogue Forum, the ethical survey, a set of focused interviews aimed at understanding the perception of gene banking strategies by stakeholders in charge of on-farm (in situ) conservation programme.
Results & implications	<p>We first observed that innovative challenges for animal genetic resources (AnGR) management do not constitute “issues” that circulate out of the social worlds of animal production and conservation. Hence, there is no(t yet) a “general public” around these innovations. Stakeholders were organized in 4 categories: enabling stakeholders, functional stakeholders, diffused stakeholders, and normative stakeholders. Then, we showed that a given technology may be more less mature and costly according to species. We identified three conditions that innovations have to meet in the field of AnGR management: be technically practicable, be economically affordable and be ethically tolerable.</p> <p>Implications: innovations for gene banks should be presented in the frame of concrete actions matching the interest of each type of stakeholder (farmers, NGOs, breeding companies, researchers); they should be described with a non-specialist language in order to facilitate appropriation by policy makers and farmers or their representatives. Interestingly, situations of emergency were found to change the position of some stakeholders and to increase acceptance of complex technologies on a case by case approach.</p>

1. Definition of relevant public and stakeholders

The purpose of this part is to explain which stakeholders we consider, and why. There are many different ways of identifying key stakeholders or publics. These different ways rely on the way in which these terms are used. The terms stakeholder and public are often used interchangeably, but they should not be. We differentiated the terms “stakeholder” and “public” as follows.

First, our definition of “**public**” rely on John Dewey’s writings that define a public as a grouping of actors who are affected by actions, events, decisions, innovations... but who are not directly involved or concerned by them : “*The public consists of all those who are affected by the indirect consequences of transactions [...]*” (Dewey, 1954, 15-16). The public may then be understood as an effect of particular political processes of issue formation that became a “public problem”. Dewey’s definition of a public is thus situational: “no issue, no public” (Marres, 2005). Built upon this situational definition of a public, James E. Grunig distinguishes “nonpublics” (who have no problem), “latent publics” (who have a problem), “aware publics” (who recognize that they have a problem), and “active publics” (who do something about their problem) (Grunig, 1983).

Focusing on improved acceptance of technological innovation by the “general public”, we first looked at whether, in fact, a “general public” existed around these technological innovations. We realized that innovative challenges for animal genetic resources management are, in general, little known and little discussed apart from the narrow circles of specialists, directly involved in animal genetic resources conservation. Therefore, unlike what happens for GMO corn or animal welfare for instance, innovative challenges for animal genetic resources management do not constitute “issues” that circulate out of the social worlds of animal production and conservation. Hence, there is no(t yet) “general public” around these innovations. We then focus the survey on stakeholders.

According to R. Edward Freeman, a stakeholder is “any group or individual who can affect or is affected by the achievement of the organization’s objectives” (Freeman, 1984 : 46). Following the Grunig’s organizational linkage model (Grunig & Hunt, 1984) we distinguished four groups of stakeholders: enabling stakeholders, functional stakeholders, diffused stakeholders, and normative stakeholders (see box 1).

According to this typology, we chose to consider several stakeholders directly affected by AnGRs’ technological innovations, as users, producers, managers, regulators, etc. of animal genetic resources and related innovation (see figure 1).

Box 1– The four types of stakeholders from the Grunig’s Organizational Linkage Model (Source: Rawlins, 2006 :)

- **Enabling stakeholders** have some control and authority over the organization, such as stockholders, board of directors, elected officials, governmental legislators and regulators, and so on. These stakeholders provide an organization with resources and necessary levels of autonomy to operate. When enabling relationships falter, the resources can be withdrawn and the autonomy of the organization limited, restricted, or regulated.
- **Functional stakeholders** are essential to the operations of the organization and are divided between input—providing labor and resources to create products or services (such as employees and suppliers)—and output—receiving the products or services (such as consumers and retailers).
- **Normative stakeholders** are associations or groups with which the organization has a common interest. These stakeholders share similar values, goals, or problems and often include competitors that belong to industrial or professional associations.
- **Diffused stakeholders** are the most difficult to identify because they include publics who have infrequent interaction with the organization, and become involved based on the actions of the organization. These are the publics that often arise in times of a crisis; linkages include the media, the community, activists, and other special interest groups.

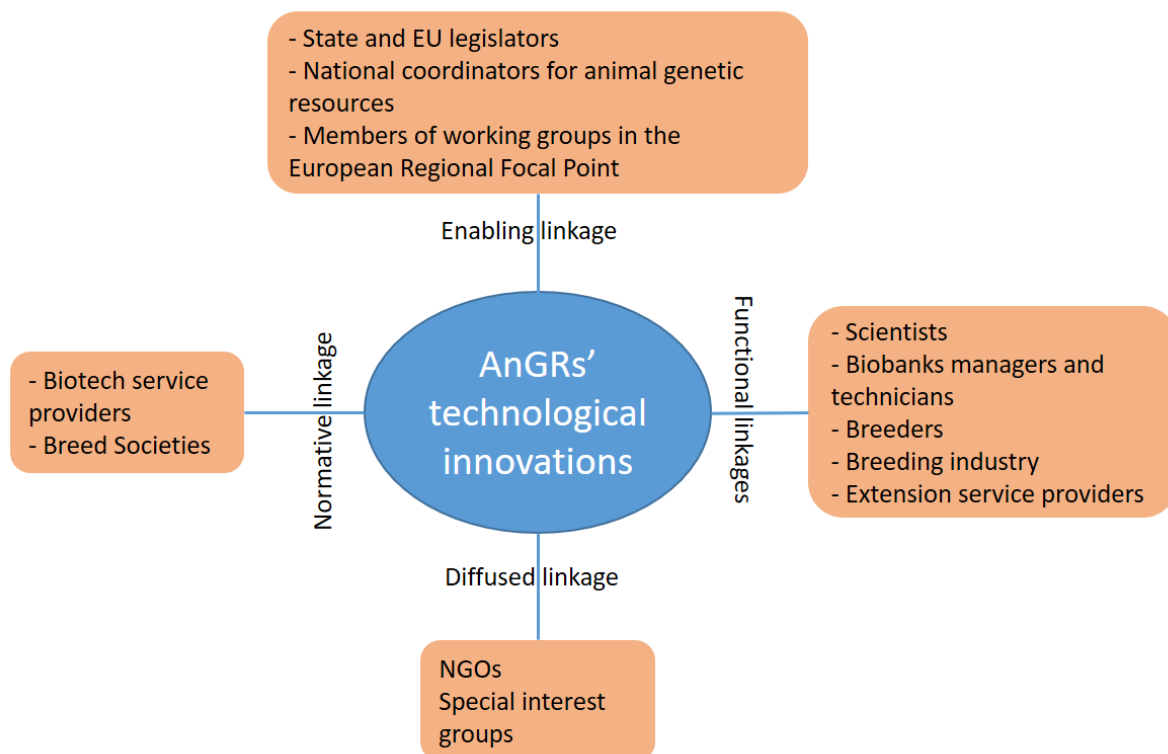


Figure 1 – Linkage model (modified from Grunig and Hunt, 1984).

2. Technological innovations to be considered

IMAGE involves two main types of technologies: genomics and reproductive biotechnologies. Genomics involve SNP genotyping and whole genome sequencing; these technologies are commonly used in animal breeding programs and are not specifically developed for animal gene banks. So we did not consider them for the study of social acceptance.

Methods and techniques of reproductive biotechnologies, which are used for cryoconservation, have varying maturity level and cost according to species. They are the target of this deliverable.

In theory, a technical innovation is a technique which has found a market, it is mature 'in the operational environment' with a high TRL (TRL=>7). For reproductive biotechnologies, new methods are 'inventions' which are first validated in the lab, but do not easily reach the market, because of organisational difficulties and associated costs in terms of human resources and logistics. For example, gonad transfer is currently not allowed by public policies for farm animals in Europe, because its usefulness has not been demonstrated. For technologies developed within IMAGE, such as gonad transfer or avian primordial germ cells, we need to gather justifications of their usefulness (what problem will be solved) and their feasibility, considering animal welfare. Indeed, the level of invasiveness also varies according to species and can be a motivation for rejection.

Furthermore, techniques which are used routinely have little additional costs for biobanking. For non-routine techniques, however additional costs take place either at the time of sampling and/or at the time of use, which may be limiting their use.

Techniques of low maturity are generally used only experimentally and are not known by the general public. It is thus almost impossible to get the opinion of the general public on a newly developed technique unless the collection of opinion is organised at an event where the technique is explained. On-line description is generally difficult to understand for non-specialists.

The maturity of techniques used for the cryopreservation of germplasm can be rated according to the TRL scale, below, and is listed in table 1, according to species.

TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 7 – system prototype demonstration in operational environment

TRL 8 – system complete and qualified

TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Table 1 : Maturity level of reproductive biotechnologies according to livestock species

technology	cattle	sheep	goat	pig	horse	rabbit	chicken
Frozen semen	TRL9	TRL8	TRL9	TRL8	TRL9	TRL4	TRL5
Frozen embryo	TRL9	TRL8	TRL8	TRL5	TRL6	TRL8	none
Gonad transfer	Not used	Not used	Not used	Not used	Not used	TRL3	TRL4
Stem cells preservation with germinal potential	Not used	Not used	Not used	Not used	Not used	TRL3	TRL3
Somatic cells preservation & cloning	TRL9	TRL4	TRL3	TRL3	TRL9	TRL2	TRL2

3. Acceptance

Also referred to as a social license to operate, in comparison with the legal license to operate that focuses on government permissions (Raufflet et al., 2012 ; Thomson et Boutilier, 2011), acceptance generally refers to the perception of local stakeholders that a project, technology, or any kind of innovation is socially acceptable or legitimate. The notion of acceptance is vague, open to various interpretations. This part aims to propose a definition and an analysis grid that departs from a linear and diffusionist conception of innovation and takes seriously some of the multiple dimensions (social, technical, moral, etc.) of the concept.

Literature on innovation studies provides different analytical frameworks and technological acceptance models (Terrade et al. 2009). These models are characterized by a deterministic standpoint: the practices related to social acceptance appear to seek to accelerate the ways and rates of appropriation of the technology, as illustrated in the Everett M. Rogers' general linear model of diffusion of innovation (Rogers, 1971). Technological acceptance models, based on a linear approach of innovation, seem to seek to increase the influence of innovators within social networks described as systems of influence (Katz, Lazarsfeld & Roper, 1955;

Merton, 1949). This linear model of innovation has been criticized for a long time (Kline, 1985; Godin, 2006). As demonstrated by recent authors, innovation should not be analyzed as a sequential and linear process from invention to diffusion; it rather should be analyzed as an interactionist and iterative process (Akrich, Callon, & Latour, 2002). This implies two important points for the acceptance analysis.

First, following Barbier and Nadaï (2015), we distinguished between the "issue" and the "problem" of acceptance: *"The former refers to a condition that is inherent to the assemblage of any socio-technical device [...], the latter points at a specific configuration in which the issue takes on a public dimension and a public mode of regulation."* Stakeholders concerned by the issue and the problem of acceptance are not always the same. Stakeholders involved in the issue of acceptance are often involved in the problem of acceptance, but the opposite is not true. This refers to two traditions in the management literature (Raufflet et al., 2012): acceptance as an immediate result of the efforts of innovators (and/or the company), for example in Corporate Social Responsibility activities, acceptance as a social contract that binds innovators (and/or the company) to its stakeholders.

Second, we adopted a perspective that accounts for the many differences between law, science, politics, economic, and other domains of acceptance. Therefore, "social" acceptance corresponds to only one of the many possible dimensions of the way in which stakeholders perceive, evaluate and judge the acceptability of an innovation. Among these multiple dimensions, we identified three conditions that animal genetic resources management innovation have to meet:

- The technological innovation has to be **technically practicable**, and in accordance with concrete activities of the (future) users.
- The technological innovation has to be **economically affordable**
- The technological innovation has to be **ethically tolerable**; for instance, this condition has a lot to do with the invasiveness degree of the technology

All these dimensions vary considerably from a species to another.

4. Actions of IMAGE

4.1 Dialogue forums

Approach

WP1 is addressing the needs for communication and knowledge exchange between all stakeholders regarding the management of Animal Genetic Resources.

IMAGE stakeholder involvement shall give a direct feedback from different stakeholders, from the beginning of the project. In a first phase, stakeholders have been identified as Breeders from the commercial sector and NGOs representing the conservation breeder scene as well

as the animal genetic resources scientific sector and the governmental sector. This stakeholder involvement should benefit the collaboration of the in-situ and the ex-situ sector. The IMAGE Dialogue Forums (wp1 task 1.1) were set up as a series of annual discussion events in association with the ERFP (European Regional Focal Point for Animal Genetic Resources) annual meeting and the EAAP (European Federation of Animal Science) annual conference. These events should encourage the participants to make a view beyond the own horizon. A broad range of stakeholders were invited: commercial (EFFAB, European Forum of Farm Animal Breeders) and small breeders (NGOs), science, policy makers and practitioners in the field of conservation of animal genetic resources. The stakeholders have got the chance for intervention and discussion, the placement of wishes, concerns and expectations. Additionally they have got a better understanding of the European Gene Banks and their possibilities and limits. Around 150 stakeholders were identified and invited. Of these, 26 were NGO's working on the conservation of rare breeds, 45 commercial breeders and 51 FAO National coordinators for Animal Genetic Resources, IMAGE Consortium Partners and scientists. Because of the very technical nature of the issues which deal with aspects before the actual production chain, a broader public and consumer organisations like Slow Food were not invited.

The topics of the Dialogue Forums were discussed in advance with the IMAGE consortium at the annual meetings and agreed on important approaches and questions within the project.

General outcome of the Dialogue Forums

A large range of stakeholders have been invited to participate in the Dialogue Forums. The participation of science and authorities was relatively high due to the fact that the Forums took place between two important European scientific events. The interest of the commercial sector was low although special presentations took place at events of the commercial sector (EFFAB workshops). This low interest may be due to the fact that many companies run their own storage of material and do not feel concerned by issues about local breeds. Furthermore, the presentation which was done at the EFFAB meeting in May 2019 took place next to several presentations about gene editing for genetic improvement which was rather disconnected from the gene banking objectives.

The participation of NGOs to Dialogue forums also was low even though they have got special conditions like the reimbursement of travel costs. To make the meeting more attractive in Zagreb, Croatia, 2018, a whole-day-event with a field trip was offered. But this also did not attract more stakeholders from any side, all the more that the ERFP was not organized in the same city as the EAAP conference (held in Dubrovnik). This decreased the visibility of the Dialogue Forum for participants to EAAP. The reason for holding ERFP in Zagreb instead of Dubrovnik was the lower cost in Zagreb.

In order to make widely known the topics and discussions in the dialogue forums, in particular among the conservation NGOs, SAVE Foundation gave oral reports at its annual meeting during the whole project. This annual meeting gathers the 22 NGO partner organizations of SAVE which come from 15 European countries. Also, the questionnaire on ethical issues was

discussed in an oral session at the SAVE meeting in 2018 and the preliminary results were presented in 2019. Furthermore, from every Dialogue Forum a report was published in the SAVE eNews. This quarterly electronic newsletter is produced in English and in German and reaches an audience of more than 3300 subscribers throughout Europe and from very different professions and interests like breeders, general in agricultural diversity interested people, journalists etc. Besides other relevant messages of the project also, the Dialogue Forums were published on the SAVE Facebook account which has around 500 followers.

Through these measures, the stakeholders became more informed about gene bank issues and the interest increased as it could be seen at different meetings and conversations. At the last SAVE meeting, which was held just after the 4. Dialogue Forum, the SAVE partners asked for short and understandable information sheets for download on the SAVE website especially for the topics “Sanitary Rules” and “ABS”. Together with the relevant IMAGE partners SAVE will prepare such summary papers by the end of November 2019.

During the meetings and discussions it became clear, that the work and problems of gene banks for animal genetic resources is very technical and therefore not very attractive for the in-situ conservation scene which consists of a lot of individuals with a non-commercial view on breeding. An ongoing process and ongoing information is needed to foster the attention to animal genetic resources and gene banks. This is important to spread information to a broader public about the benefit of gene banks for conservation and breeding. People on the street need short and clear information and do not like difficult technical explanations. Therefore the understanding of stakeholders is important to transport the message “gene banks are an indispensable part of conservation and breeding” and “the rules for gene bank conservation are useful and obeyed”. The decision to invite stakeholders who already know about conservation and breeding proved to be correct: **There are a lot of technical and legal questions one has to deal with for a better understanding of the subject. This cannot be acquired in one meeting and needs repeated discussions.**

A comparison with the plant sector may be difficult, because the material and possibilities for use are very different. The heated debates in the 1990s showed that a lack of information focuses the view of the public sometimes in a not valuable direction. Gene banks are seen closely connected to gene technologies like genetic engineering. An objective communication is necessary to really exchange information. This runs in a far better way, when first those people are involved in the discussion, which have any knowledge about animal breeding and conservation. Otherwise the debate would run into an emotional and fundamentalistic way which does neither help for a better understanding nor inform the public. **This was the most important reason not to spread the survey on ethical issues as broad as possible, but to have first a presentation about the issue and then let the stakeholders fill in the survey.**

The content of the IMAGE project as a whole, and especially the content of the Dialog Forums, will continue to occupy the SAVE community in the future as it is a hot topic within the conservation scene. Therefore, the discussion on topics such as exchange and testing of

material, economic aspects of the transfer of material, sanitary regulations and ABS within the SAVE community will be continued. Through these discussions between the European NGOs, the topics are discussed with the individual breeders and keepers, who in turn have a closer contact with their interested clients. This way of communicating the conservation work itself and the collaboration with the gene banks seems to be a promising way to disseminate information and to largely prevent negative emotions.

Detailed outcomes of the successive dialogue forums are presented in annex 1.

4.2 Ethical survey

The ethical survey was launched in 2018 and is reported in details in D9.3. It was distributed to the participants at various meetings and events concerning cryobanks and breed conservations and 159 answers were collected. The survey included a section on **Innovations in bio banking and trades off**, with the following questions:

- 1 Do you support further research on semen properties and improvement of semen freezing procedure to ensure higher efficiency of Artificial Insemination in conservation and in breeding programmes?

☐ No ☐ Yes ☐ Do not know

☐ No ☐ Yes ☐ Do not know

- 2 Would you support using cloning methods to increase the number of animals of rare breed

☐ No ☐ Yes ☐ Do not know

- 3 Would you agree to sacrifice a few females of a rare rabbit breed in order to obtain sufficient number of embryos for biobank collection to ensure that this rare breed diversity is captured for future needs of livestock production?

☐ No ☐ Yes ☐ Do not know

- 4 Would you agree to sacrifice a number of one day old female chicks to sample gonad for further grafting in order to store female reproductive cells of a rare poultry breed in a biobank and ensure that this rare breed diversity is captured for future needs?

☐ No ☐ Yes ☐ Do not know

5a If the only option to collect biological material of rare breeds is collecting tissue samples (e.g. skin from the ear while tagging) would you accept using this method knowing cloning methods have to be performed to recreate individuals from such biological material?

☐ No ☐ Yes ☐ Do not know

5b If the only option to collect biological material of rare breeds is collecting tissue samples (e.g. skin from the ear while tagging) would you accept using this method knowing reprogramming methods using transgenic materials have to be performed to recreate individuals from such biological material?

☐ No ☐ Yes ☐ Do not know

The majority of the respondents supported the use of these techniques, except for cloning in question 2 where the answers were distributed as follows : 43% against, 38% for, 19% do not know, out of 155 answers. This negative opinion about cloning might be related to the fact that increasing the number of animals in a local breed is generally viewed as keeping larger flocks or supporting more farmers with a more diversified set of animals, rather than increasing the number of identical animals which is the outcome of cloning. For all the other questions, the relative majority was in favor of the 'yes'. Question 5 was also mentioning cloning and answers were distributed as follows : 26% against, 55% for, 19% do not know, out of 151 answers, which is quite different from answers to Question 2.

Thus, it is interesting to see here that **'if no other option exists'** then cloning could be accepted. In other words, it seems that **emergency situations or extreme cases can justify the use of biotechnologies and lead to an increased acceptance of technological innovations**. It is important to note that the level of support varied according to the respondents' profile. Particularly, it was higher for students and scientists, and for people involved in the aquaculture industry, and lower for NGOs. The same scheme was observed for ethical issues, namely the use of slaughter of animals (rabbits or chicks) for sample cryobanking.

4.3 How in situ programme managers perceive ex situ conservation

A qualitative survey using long semi-structured interviews was conducted to analyze the practices and strategies of **in situ conservation stakeholders** and **their perception of ex situ conservation methods** and technologies. This survey has been conducted among 27 in situ conservation stakeholders, distributed in the areas of Normandy, Brittany, Pays de la Loire, Île-de-France and Occitanie (France).

At the end of this survey, we find that, apart from some of the breed society leaders, the set of technics, practices and devices of *ex situ* conservation are largely unknown and foreign to the practices and the speeches of the breeders and the farmers. We conclude that they are not constitutive of their identity. This is why these actors generally prefer the *in situ* conservation and are not easily attracted by Forums about gene banks.

In addition, breeders cannot fully grasp the importance of conservation as perceived by scientists and the public administration. While for the latter, it would represent long-term insurance, for the breeders it is directly related to their daily activities. It is also often linked to a traditional farming system, used by peasant families since before the creation of the *ex situ* technique, and where conservation practices involve the establishment of social links to exchange or purchase animals. The *in situ* technique would, therefore, be the most appropriate because it constitutes these links.

Another important point is the long duration of conservation: as in a “game”, the actors take advantage of the whole course, its successive challenges and the surprise of the unknown result that the reproduction can generate. Cryobanks and biological resource centers are deemed not to offer this experience to the farmers who consider not being completely part of the game anymore when *ex situ* conservation infrastructures are involved. Moreover, even though the role of breeders remains fundamental for initial sampling and for end-using of the stored material in *ex-situ* conservation, cryobanks and biological resource centers give the impression of shortening and reducing the importance of the work of the breeders. Indeed, they often emphasize the value of their participation and the *in situ* technique seems to be a valuable tool to keep them at the center of conservation.

In their speeches, some breeders are clearly opposed to the public administration and the dominant livestock model, which is responsible for the disappearance of various ancient breeds and the economic, social and political marginalization of small farmers. This more productive model is directly linked to bodies such as the Ministry of Agriculture, responsible for breed selection, or the Chambers of Agriculture, which, according to some of them, do not really seem to support small breed conservation.

5. Conclusions

A main driver to improve acceptance would be to present the role of gene banks in the frame of concrete actions matching the interest of each type of stakeholder:

- preservation of diversity for NGOs motivated by local breeds,
- support to selection for breeding companies,
- resource for research on genetic diversity,
- challenge for reproductive physiology.

A second driver would be to describe with a non-specialist language what are the technical difficulties encountered for some species and what are the solutions under study, in order to facilitate appropriation by policy makers and by the general public of new and complex technologies.

Finally, it appears that situations of emergency are able to inverse the position of some stakeholders and to increase acceptance of complex technologies on a case by case approach.

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7. Annex

Annex 1: Outcomes of the successive Dialogue Forums

1st Dialogue Forum Belfast, Ireland, 28. August 2016:

„Knowledge and Understanding of Gene Banks”

This event was an introduction into the “Role of Gene banks for the conservation and management of animal genetic resources”.

To be able to prepare themselves the participants – especially the NGOs working in the conservation of animal genetic resources together with the invitation a short survey with the following questions was sent:

1. How is your professional activity connected to gene banks in Europe?
2. How do you assess the current situation of collaboration between your institution and gene banks?
3. Which changes do you propose in the current management of farm animal genetic resources in Europe for greater benefit in your work?

The evaluation showed that, especially in the in situ / on-farm conservation scene, there is little contact with the national gene banks. There are several reasons for this:

In contrast to the plant conservation sector, there are (still) many restrictions for a partnership exchange between in situ animal genetic resources conservation and gene banks.

In the plant scene, the material from the gene bank can be used in most cases without any problems or special equipment. Animal genetic material needs to be prepared before use, regardless of whether it is fresh (AI Centre) or frozen. Cell cultures, etc., can hardly be used in life preservation, but serve to date exclusively scientific purposes.

Plant conservation gene banks deliver small amounts of material for free. Material from AI centres must be paid for and the situation may depend on countries for access to animal conservation gene banks.

The most frequently mentioned needs for better collaboration with gene banks:

- international common access to genetic resources and data specific conservation action
- standardisation
- transboundary breeds
- specific regulations

These outcomes influenced other work packages of the project e.g. WP 2 “Enhancing gene bank functioning to improve quality and access transparency”.

2nd Dialogue Forum Tallinn, Estonia, 27. August 2017:

„ Sanitary regulations - Possibilities and hindrances for the exchange of gene bank material for breeding and science”

Besides an introduction about the current legal frame of the international and national sanitary regulations for the exchange of material, the needs and challenges for the collection, storage and dissemination of material was emphasised. The answers of the preparatory survey sent with the invitation showed that “sanitary regulations” was a burning issue for all stakeholder groups. Especially the need for a better use of old material which no more complies with modern sanitary requirements was a point of discussion. At this event the participants were divided in the different groups “Science”, “NGOs”, “Authorities”. Questions to be discussed were: What are the opportunities, challenges and obstacles for the exchange of gene bank material and which suggestions and demands can be made?

Intense discussions in groups were followed by a plenum discussion to find a consensus on how to work with the sanitary regulations and the exchange of gene bank material.

- Actions to be taken by the IMAGE project but also by the participants were identified: IMAGE shall push a **direct discussion with the European Commission** on sanitary rules and exceptions from the current regulations in context with the exchange of genetic material especially for science, conservation and management of Animal Genetic Resources. At that moment gene banks were not mentioned at all in the new Animal Health Law (Reg. 2016/429).
- Participants shall push the respective persons responsible in their own countries to **push national derogations** from particularly challenging sanitary regulations for gene banks.
- IMAGE (WP1 Task 1.4) should ask at the commission for an **EU implementation act** specifically considering the needs of gene banks
- Participants shall **identify and list exceptions** for which national derogations from EU Animal Health Law would be beneficial for gene bank management.
- Participants shall **push the use PCR test** to guarantee safety (freedom of zoonosis) within single countries.
- IMAGE should promote the European gene bank network (**EUGENA**) as a speaker towards the EU authorities.
- Participants should collect and publish **success stories** (like in countries with national derogations).
- For transboundary exchanges, IMAGE should promote Bi- or multilateral rules

In the meantime contacts to authorities responsible for the EU implementation act on sanitary regulations could help to include gene banks in the sanitary regulations. Also cross-border agreements for the exchange of material shall be made possible in the nearer future.

3rd Dialogue Forum Zagreb, Croatia, 24. August 2018:

Economics of Conservation: Economic trade-offs between gene bank and in-situ conservation?

Introductory presentations on the economics on conservation contrasted the view of the efficiency of ex-situ conservation and the value of in-situ conservation. This time the group formation for discussion was created by random principle. Questions asked were:

1. Do public preferences and trends play a role in what we should be spending on ex situ conservation?
2. Does the livestock conservation / commercial breeding currently benefiting from the genetic variability that is stored in the gene banks? How to optimise the benefit?
3. What policy incentives should be in place to promote (on farm and in gene banks) conservation effort? Are there incentives more of a hindrance?
4. In Europe there are about 25 gene banks (run by a host institution authorized and/or recognized by a national authority), the costs of which are covered by the respective state. Would one consolidated Pan EU resource bank be better than several – why?/why not

Outcomes

All groups agreed that conservation is a long term issue. Therefore the public should not control the goals, but public preferences need to be taken into account. What to be collected is a scientific issue.

The re-establishment of breeds and support of the breeding can take place through gene banks. This is not very exploited by the commercial sector. The ratio of entry to exit is unbalanced at the moment (many more entries). Therefore, the utilization of the material should be more emphasized.

The target of public incentives should be better analysed. There are very large subsidies in the commercial sector, but less in the conservation sector; a better and more precise targeting is necessary in the conservation sector according to real costs and declared needs.

Because of sanitary and trade rules as well as zootechnical logistic limits it seems to be unlikely to have one central gene bank within Europe.

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Access and Benefit Sharing (ABS) Rules: What does ABS mean for conservation research and use of Animal Genetic Resources (AnGR)?

The challenges arising from access and benefit sharing for exchange of genetic material are subject of WP1 Task 1.4 (Implementation of access and benefit sharing regulation). After an introduction to Access and Benefit sharing in animal breeding, conservation and research, a

Policy Officer of the European Commission and EU ABS National Focal Point explained obligations and rules within the EU, and for the exchange with other countries, like the key provisions of the EU ABS regulation, user obligations like Due Diligence obligations, declarations, and the tools to use on internet.

It became clear that the ABS rules do not play a role in most of the cases of the exchange of material for breeding. On the other hand, science is heavily affected by the ABS rules. The provider countries may draw up their own regulations. Therefore, it seems sometimes to be impossible to get material for scientific issues. In general, ABS in animal breeding is less relevant than in other sectors due to sanitary measures in the EU, the limited import of animal material to the EU and the rare occurrence of specific legislation on ABS for animal breeding in the Member States. Yet, attention should be paid to the fact that new products are in the scope of the EU regulation.

Among the conservation NGOs it is known that there is an ABS regulation and that they should check whether the countries signed the Nagoya Protocol. Yet, the National competent authority is hardly known among NGOs. In the recognition of best practice examples, the national or regional acting conservation NGOs are mostly not involved.