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The Access and Benefit-Sharing Agreement on Teff Genetic Resources

Facts and Lessons

Regine Andersen and Tone Winge

FRIDTJOF NANSENS INSTITUTT
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Access and Benefit Sharing
ABS Capacity Development Initiative for Africa

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Regine Andersen and Tone Winge

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Abstract

This report tells the story of an agreement on access to teff genetic resources in Ethiopia, and the fair and equitable sharing of benefits derived from their use, that was hailed as one of the most advanced of its time. This agreement between the Ethiopian Institute of Biodiversity Conservation and the Dutch company Health and Performance Food International was entered into in 2005. It was seen as a pilot case of the implementation the Convention on Biological Diversity in terms of access and benefit sharing, and expectations were high. And yet, implementation of the agreement failed. The Dutch company was declared bankrupt in 2009. And, as a result of several circumstances, Ethiopia was left with fewer possibilities for generating and sharing the benefits from the use of teff genetic resources than ever before. How was this possible? Exactly what happened, and what can we learn? How can we ensure that future access and benefit-sharing agreements will have better prospects of success? These are the central questions of this report, which provides an in-depth analysis of the course of events with regard to the agreement as well as a related patent on the processing of teff, and concludes by deriving recommendations concerning future access and benefit-sharing agreements as well as for the implementation of the Convention on Biological Diversity.

Key Words

bioprospecting, access, benefit sharing, genetic resources, teff, Convention on Biological Diversity, Nagoya Protocol, patent, intellectual property rights

Orders to:

Fridtjof Nansen Institute
Postboks 326
N-1326 Lysaker, Norway.

Tel: (47) 6711 1900
Fax: (47) 6711 1910
Email: post@fni.no
Internet: www.fni.no

Contents

Executive Summary

This report tells the story of an agreement on access to teff genetic resources in Ethiopia and the fair and equitable sharing of benefits derived from their use, originally hailed as one of the most advanced of its time. The agreement was seen as a pilot case for the implementation of the Convention on Biological Diversity in terms of access and benefit sharing (ABS), and expectations were high. And yet, implementation of the agreement failed. As a result of various circumstances, Ethiopia was left with fewer possibilities to generate and share benefits from the use of teff genetic resources than ever before. How was this possible? Exactly what happened? What can we learn? How can we ensure that future ABS agreements will have better prospects of succeeding? These are the central questions of this report, which provides an in-depth analysis of the course of events with regard to the agreement as well as a related patent on the processing of teff, and draws lessons for future ABS agreements as well as for the implementation of the Convention on Biological Diversity.

Since the adoption of the Convention on Biological Diversity (CBD) in 1992 and its entry into force in 1993, various attempts have been made to establish agreements between providers and recipients of genetic resources on access to such resources and the fair and equitable sharing of the benefits arising from their use. Nevertheless, few success stories can be noted so far. That makes it important to analyse experiences to date, in order to draw lessons for future access and benefit-sharing (ABS) agreements. Such lessons will also be useful for the implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, which was adopted in 2010 and will enter into force 90 days after the 50th country has ratified it.

With this case study, we focus on the Agreement on Access to, and Benefit Sharing from, Teff Genetic Resources (the Teff Agreement), negotiated in March 2004, finalized in December 2004 and signed in April 2005. The parties to this agreement were the Ethiopian Institute of Biodiversity Conservation (IBC), together with what was then the Ethiopian Agricultural Research Organization (EARO), and the Dutch company Health and Performance Food International (HPFI).

The agreement provided HPFI with access to specified teff varieties and with the right to use these varieties to produce a wide range of specified food and beverage products not traditional in Ethiopia. In return, the company was to share monetary and non-monetary benefits with Ethiopia – including shares of the royalties, licence fees and profits as well as research cooperation and the sharing of research results. In addition, the agreement stipulated that HPFI should recognize Ethiopia as the origin of teff genetic resources; further, it prohibited the access to traditional Ethiopian knowledge or to claiming rights over such knowledge, or making commercial profits from its use. Teff products were considered to have considerable marketing potential in Europe and the USA, because teff is gluten-free and high in nutritional value. Thus, there were great expectations as to the benefits that Ethiopia could obtain from the agreement.

However, these expectations failed to materialize. When the company was declared bankrupt in August 2009, the sole benefits to have reached Ethiopia were a payment of only EUR 4000 and a small research project that was discontinued early on. The HPFI claims to have shared benefits with Ethiopian farmers directly instead of through the IBC, under the framework of a development co-operation project supported by the German Federal Ministry for Economic Cooperation and Development (BMZ), through the organization Sequa. However, the present report documents serious irregularities with regard to that project, and questions what benefits actually reached Ethiopia.

In the years prior to the bankruptcy, the HPFI directors had transferred values to new companies. These companies continued to produce and sell teff flour and teff products, expanding their activities to other countries and continents as well. Since it was the now-bankrupt HPFI that had been the party to the agreement, these other firms, even though operating under the same directors and partly the same owners, continued to sell teff flour and teff products without being bound by the obligations of HPFI towards Ethiopia.

To understand how the Teff Agreement came about, it is also important to be aware of a Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products that had been signed on 26 March 2003. The Parties to this MoU were EARO, Larenstein Transfer and Soil and Crop Improvements (S&C), which was a precursor to HPFI. Based on this MoU, 1440 kg teff seeds were sent from Ethiopia to the Netherlands for research and development purposes: 120 kg each of 12 specified teff varieties.

The company (S&C) then filed a patent application on the processing of teff flour and related products in the Netherlands as early as in July 2003; this application was later filed under the European Patent Office (EPO) in July 2004 (by HPFI). The teff patent was granted by EPO in 2007. It covers teff grain (no mention of specific varieties) with certain falling number values at the time of grinding (which, according to the patent, make the flour suitable for baking), to be achieved by storing the teff grain for some months for after-ripening – in fact, a procedure common in Ethiopia. The patent also covers the milling of flour from these grains to a fine powder; the dough or batter resulting from mixing this flour with liquid; as well as a range of non-traditional products from such a dough or batter, including bread, pancakes, shortcakes, cookies and cakes of various kinds. The company felt that such a broad patent was required to secure its investments in teff and thus also the prospects of benefit sharing with Ethiopia. However, this report documents that the novelty and inventive steps of the claims covered by the teff patent are both highly questionable.

In practice, the teff patent excludes all other parties, including Ethiopia itself, from utilizing teff for most forms of relevant production and marketing in the countries where the patent is granted. The patent was also filed in the USA and Japan. Ethiopia was becoming sidelined. The country found itself squeezed out of position to utilize its own teff genetic resources – for example, through collaboration with other foreign

companies – in the European countries in question and wherever else the teff patent might be granted, while also losing all prospects of sharing the benefits from the use of these genetic resources. After the HPFI bankruptcy, there was no longer any legal counterpart to the Teff Agreement.

Explaining the failure

An important factor in explaining the failure of the Teff Agreement was the fact that the Dutch company had originally overestimated the market potential for teff and was overly optimistic about potential profits. These miscalculations, combined with the company's lack of knowledge and experience on the subject of ABS, resulted in benefit-sharing provisions which the company later found itself largely unable to fulfil.

Communication problems were a further important factor. These problems started when the Ethiopian Institute of Biodiversity Conservation (IBC) asked for the up-front payment provided for in the Teff Agreement, which they did not receive. They continued when IBC requested annual reports from HPFI, according to the agreement, which were not provided – except for one annual report, in Dutch. When it became clear to the IBC in 2007 that HPFI did not intend to comply with its obligations under the Teff Agreement, the situation worsened significantly. The communication difficulties between the IBC and the HPFI can be linked to internal problems within the HPFI. Several shareholders left the company due to internal communication problems – moreover, the HPFI had originally been established because of disagreements among shareholders in the original company, S&C.

A central factor is the HPFI commitment to the Teff Agreement. According to its director, much of this commitment had dwindled already by 2006. He cites communication problems, and in particular the fact that IBC demanded up-front payment from the Dutch company in a situation where no benefits had yet been generated. This was indeed a difficult situation, as the agreement provided that a fixed minimum amount was to be transferred to IBC in advance, with no reference to the prospects of benefit generation. The company had miscalculated the prospects for benefits and thus found it difficult to comply with this provision in the agreement. Nevertheless, the IBC in Ethiopia had reason to expect that payments would be forthcoming according to the Teff Agreement. When the HPFI realized that the company was in no position to implement the provision on up-front payment, it could have done more to create better mutual understanding of the situation. Instead, the company appeared to be irritated at the demands from Ethiopia.

Coordination problems on the Ethiopian side were a complicating factor. When the Dutch company (then S&C) first contacted Debre Zeit Agricultural Research Centre, the Ethiopian Agricultural Research Organization (EARO) was brought in. A Memorandum of Understanding was negotiated by EARO, without involving the IBC, which was the authority that had been authorized to provide access to genetic resources. This can be explained because the IBC was at that time a subordinate body to EARO, and EARO might have deemed it unnecessary to ask a subordinate institution for permission to provide access to teff genetic resources.

There was also very limited flow of information at this juncture. Nevertheless, the IBC was brought in for the Teff Agreement, and from this point onwards most of the relevant institutions were consulted.

HPFI argued that the export ban on teff constituted a substantial barrier to implementation of the Teff Agreement: the company wanted to export teff for further processing in the Netherlands. Since the export ban was introduced only in 2006, it can be assumed that the HPFI had not foreseen that exporting teff from Ethiopia would prove problematic when negotiating the Teff Agreement. Nevertheless, it can also be argued that the export ban was used partly as an excuse, and was not a central factor explaining the failure of implementation. This is because HPFI did not accept the offer from Ethiopia to produce ***and*** process teff in Ethiopia for export, and because the HPFI had already identified communication problems as a major problem in the collaboration.

A further explanatory factor has to do with professionalism. In light of the miscalculations and communication problems, several stakeholders have argued that HPFI and S&C did simply not appear to be professional companies. Also the continuous internal conflicts, first in S&C and then in HPFI, indicate a lack of professionalism.

The fact that the teff patent and the Teff Agreement were not interlinked may have contributed to the negative effects of the patent as regards Ethiopia. The teff patent was meant to secure the production chain of teff and thus enable benefit sharing under the Teff Agreement. This was the argument from the side of HPFI, and it was accepted by the Ethiopian negotiators. However, the patent application had already been filed by then. The Ethiopian counterparts had not been involved in the patent application process, and the topic was not covered in the MoU. The Ethiopians found themselves confronted with a *fait accompli*, as the patent application had already been filed when they negotiated the Teff Agreement.

With hindsight we can see that although benefit sharing was used as an argument for getting the Ethiopian side to accept the teff patent, in the end it resulted in a monopoly that made it impossible for Ethiopia to enter into ABS agreements on teff with other companies in countries where the patent is valid, even after termination of the Teff Agreement. An important lesson here is to beware of benefit sharing being used as an argument for filing patent applications, unless the legal security for the expected benefit-sharing arrangements is fully safeguarded.

The Teff Agreement did not prohibit the patenting of methods for processing teff flour, but it prohibited the patenting of teff genetic resources. This was problematic. Probably the negotiators of the Teff Agreement, unaware of the details of the patent claims, felt that the formulation on this in the agreement would be sufficient to keep teff genetic resources in the public domain. However, the teff patent shows that this formulation on its own was easy to circumvent, as the patent in practice covers all ripe grain, all genetic resources of teff – in addition to relevant products. Here we see the importance of ensuring that the intention of keeping genetic material in the public domain cannot be circumvented by formulations which in practice make the genetic resources in question patentable.

The teff patent claims can hardly be said to contain any new or inventive step, as required for patenting. Therefore it is difficult to understand on what grounds the patent could be granted. We must ask whether EPO as it functions today is up to the task of properly handling patent applications of this kind, often referred to as bio-patents.

Whether the teff patent violated the Teff Agreement is an open question. In particular, there might be reason to claim that the patent violates Article 4.5 of the Teff Agreement, according to which the company is not permitted to access the traditional knowledge of Ethiopian communities on the conservation, cultivation and use of teff: the company is not to claim any rights over, or make commercial benefit out of, such traditional knowledge without explicit written agreement from the provider. In particular this applies to the after-ripening of teff in order to make it suited to baking – which the patent application claims is not practised in Ethiopia. As shown in the report, that is not the case, so it can rightly be argued that the patent description is wrong on this issue. Whereas this could provide a basis for challenging the patent, the Teff Agreement as such is not relevant for the legality of the patent: it is relevant only in terms of determining the extent to which the company has violated the Teff Agreement.

This report documents grave irregularities surrounding the public private partnership project on teff production initiated by the Dutch company. This project was initiated and presented as an alternative approach to benefit sharing in Ethiopia. Whereas the HPFI/S&C director claims that the project made good progress, this report shows that most goals were not achieved, and it documents severe irregularities. We must conclude that the project cannot be seen as a benefit-sharing measure under the Teff Agreement, and that any benefits to the Ethiopian side were minimal.

Unsuccessful mediation efforts cannot explain why implementation failed in the first place, but they are important in explaining the difficulties later faced by the Ethiopian side in seeking to get the Dutch counterpart to comply with their joint agreement. Several efforts were made at getting mediation started, but without success. In particular, the IBC tried to involve the Embassy of the Netherlands.

Whether the Netherlands had any obligations with regard to the Teff Agreement is a much-discussed topic among the involved stakeholders in Ethiopia, and many think that there was an obligation in this regard. However, the Netherlands had no contractual obligation under the agreement to take action. The ambassador had signed the Teff Agreement as a witness, but was not a party to the agreement: the Teff Agreement was an agreement between the Ethiopian state and a Dutch company. Nevertheless, the Embassy of the Netherlands did interact with the IBC, in providing information and through some meetings. Also, the Focal Point for ABS in the Netherlands has proven quite active in sharing information with the IBC, especially on developments in the bankruptcy case.

This in turn leads to another important factor, the absence of user-country measures. The burden of seeking to ensure that the Dutch company complied with its obligations under the Teff Agreement rested completely with the IBC, on behalf of Ethiopia. However, neither the IBC nor the Ethiopian Consulate in the Netherlands had the capacity or financial resources to follow up on this towards HPFI in the Netherlands. Language was a central barrier, as well as understanding the legal system. Hiring legal expertise is costly; moreover, Ethiopia had already suffered substantial losses connected with the agreement, and the prospects for getting these losses covered were low. A financially poor developing country has few prospects of achieving justice, as long as there are no support measures from the side of the user countries. In such a case, an ABS agreement must rest entirely on the mutual trust between the parties.

In any case, the question of mutual trust is central to ABS agreements. Despite all possible measures to force a recipient of genetic resources to comply with an ABS agreement, such measures cannot truly replace this essential factor. Mutual trust is built on mutual respect and good faith. According to most stakeholders in Ethiopia, that is what it all boils down to in the end. As they see it, only when true mutual trust is in place can a truly collaborative ABS project be realized. One important challenge is therefore to identify the factors that are decisive for mutual trust in ABS relations.

Based on these conclusions, the report offers some recommendations for Ethiopia, the Netherlands and for the implementation of the CBD.

Recommendations in brief

Ethiopia has already derived lessons from the negotiation and implementation of the Teff Agreement, as reflected in its legislation on bioprospecting. Furthermore, the report provides recommendations to Ethiopia (and other provider countries) as to:

- how the country can improve its coordination and information flow concerning bioprospecting and ABS issues
- how to assess the professionalism of bioprospecting actors before entering into future ABS agreements
- the importance of establishing the language and venues of meetings for ABS agreements explicitly in any future ABS agreement texts
- how to include provisions in any future ABS agreement texts on how to deal with affiliated companies of the signatories to the agreement
- how to safeguard against the misappropriation of genetic resources through patents
- how to ensure more effective provisions in ABS agreements on the protection of traditional knowledge
- how to ensure efficient mediation at a sufficiently early stage.

In the context of the actual situation after the bankruptcy of HPFI and the termination of the Teff Agreement, the report offers recommendations as to:

- how IBC may follow up the Ethiopian claims with regard to the HPFI bankruptcy case in the Netherlands
- how EIAR may challenge the teff patent in selected European countries
- how Ethiopia may consider an alternative path for ABS related to teff genetic resources if the above efforts do not succeed – relating to the International Treaty on Plant Genetic Resources for Food and Agriculture.

The relevant authorities in the Netherlands have no contractual obligation to undertake any activities with regard to the bankruptcy case. The Focal Point for ABS in the Netherlands ensures information flow to Ethiopia. The Embassy of the Netherlands in Ethiopia maintains contact with IBC. Thus we ask: could the Netherlands do more? We offer recommendations as to how the Netherlands may facilitate access to financial and technical support for a project to follow-up the Ethiopian claims in the Netherlands.

We also provide some recommendations concerning further implementation of the CBD and the Nagoya Protocol:

- The Parties to the CBD may consider strengthening the Clearing House Mechanism by introducing a separate entity in charge of assisting provider countries by providing information on bioprospecting applicants in order for provider countries to assess the applicant's professionalism and whether there is sufficient basis for establishing trust.
- The Parties to the CBD may consider establishing an ombudsman facility to assist and support provider countries in cases of alleged violations against ABS agreements. As an alternative option to the ombudsman facility, the Parties to the CBD may consider establishing a Third Party Beneficiary, inspired by the model of the Third Party Beneficiary under Multilateral System on ABS under the International Treaty on Plant Genetic Resources for Food and Agriculture.
- Focal points on ABS in user countries could be vested with the responsibility for providing access to the legal system in their countries for provider countries.
- The Parties to the CBD may consider organizing national workshops on ABS in user countries for companies working with genetic resources and bioprospecting, to inform about aspects important for successful ABS arrangements.

Acronyms and Abbreviations

ABS	access and benefit sharing
BMZ	German Federal Ministry for Economic Cooperation and Development
CBD	Convention on Biological Diversity
COP	Conference of the Parties
CPVO	Community Plant Variety Office
EARO	Ethiopian Agricultural Research Organization
EIAR	Ethiopian Institute of Agricultural Research
EIPO	Ethiopian Intellectual Property Office
EOSA	Ethio-Organic Seed Action (Ethiopia)
EPA	Environmental Protection Authority (Ethiopia)
EPO	European Patent Office
FAO	Food and Agriculture Organization of the United Nations
FCE	Facilitator for Change, Ethiopia
FiRST	Financial Resource Support for Teff (also referred to as FIRST)
FLET	Foundation Larenstein Ethiopia Teff
FMO	farmers' marketing organizations
FNI	Fridtjof Nansen Institute, Norway
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (formerly GTZ)
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (now GIZ)
HPFI	Health and Performance Food International
IBC	Institute of Biodiversity Conservation (Ethiopia)
ICCO	Interchurch Organization for Development Cooperation, the Netherlands
IPR	intellectual property rights
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture

LAFCU	Lume-Adama Farmers' Cooperative Union
LH	Landwirtschaftskammer Hannover (Germany)
LN	Landwirtschaftskammer Niedersachsen (Germany)
MFA	Ministry of Foreign Affairs, Ethiopia
MLS	Multilateral System of Access and Benefit Sharing under the ITPGRFA
MoU	Memorandum of Understanding
NSIA	National Seed Industry Agency, Ethiopia
PCT	Patent Cooperation Treaty
PGRC/E	Plant Genetic Resources Centre/Ethiopia (1976-1998)
PPP	public private partnership
S&C	Soil & Crop Improvement
SCEAR	S&C and EARO foundation (Netherlands)
UPOV	International Union for the Protection of New Varieties of Plants
WIPO	World Intellectual Property Organization

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The authors wish to convey warm thanks to Dr Gemedo Dalle Tussie, Director General of the Institute of Biodiversity Conservation (IBC), for generous support to this study by providing us with available documents, sharing his knowledge and reflections about the access and benefit-sharing (ABS) agreement on teff (the Teff Agreement), and arranging interviews. Without his support, an in-depth study of this kind would not have been possible. We would also like to thank Mr Abiyot Berhanu, Head of the Information and Documentation Service, and Mr Kebu Balemie, Researcher of the Biodiversity Conservation and Sustainable Use Directorate, IBC, for all their help in providing documents, as well as for travelling with us to the Debre Zeit Agricultural Research Centre and sharing their insights and reflections about the Teff Agreement.

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The authors would also like to thank the 90 participants at the two-day seminar on the Teff Agreement and ABS issues organized by the IBC in Adama, Ethiopia, 16–17 March 2012. Among those attending were 50 members of the Ethiopian Parliament, including the Chairman of the Standing Committee on Agriculture, H.E. Ato Mohammed Abdosh, members of the Standing Committee on Agriculture, the Legal Standing Committee and the Standing Committee on Budget and Finance. There were also 40 invited guests from government institutions, NGOs, media outlets in Ethiopia, as well as two representatives from the Dutch Embassy in Ethiopia. The seminar provided a unique opportunity to present and discuss preliminary results of the case study and tailor the report to answer remaining questions. The questions, comments and input from the participants have been invaluable for the finalization of this report.

We would also like to thank the Norwegian Ministry of Foreign Affairs and Norad, the Norwegian Agency for Development Cooperation, for funding this study as part of their support to the ABS Capacity Development Initiative for Africa, hosted by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), in the form of earmarked funds for the Access and Benefit Sharing Research Project of the Fridtjof Nansen Institute (FNI). This constellation makes possible independent research from the FNI in support of the ABS Capacity Development Initiative for Africa as well as for the development and implementation of ABS in general.

The topic of this study proved far more complex and demanding than initially foreseen. Thus additional funding was required from own sources of the FNI. The authors would like to thank the FNI for this support.

Finally, we would like to thank the Development Fund, Norway, for support that enabled Dr Andersen to travel to Ethiopia to present and discuss preliminary findings at the above-mentioned seminar in Adama. This provided an invaluable contribution to the report as well as to the discussion of experiences with the Teff Agreement and ABS issues in Ethiopia.

We extend warm thanks to all contributors! However, final responsibility for this report, including any shortcomings, remains with the authors.

Lysaker, Norway, October 2012

Regine Andersen[1] and Tone Winge[2]

[1] Senior Research Fellow (Dr polit) and Project Director, Fridtjof Nansen Institute (Regine.Andersen@fni.no)
[2] Research Fellow, Fridtjof Nansen Institute (tow@fni.no)

1 Introduction

Since the adoption of the Convention on Biological Diversity (CBD) in 1992 and its entry into force in 1993, various attempts have been made to establish agreements between providers and recipients of genetic resources on access to such resources and the fair and equitable sharing of the benefits arising from their use. Nevertheless, few success stories can be noted so far. That makes it important to analyse the experiences to date, in order to draw lessons for future access and benefit-sharing (ABS) agreements. Such lessons will also be useful for the implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, which was adopted in 2010 and will enter into force 90 days after the 50th country has ratified it.

Several studies have analysed experiences with ABS agreements to date; a compilation of relevant literature can be found at the project website of the ABS research project of the Fridtjof Nansen Institute (FNI).[3] These studies provide valuable insights into factors important to the outcomes of these agreements. Nevertheless, much still remains to be done to uncover the details of these experiences and to examine them within an analytical framework that can help us identify likely factors for success with ABS agreements. The case studies from the ABS project of the FNI aim at contributing towards this end.

The Agreement on Access to, and Benefit Sharing from, Teff Genetic Resources (henceforth: the Teff Agreement) was already known to the ABS team of the FNI when the authors of this report went to Ethiopia for another purpose: to conduct the 2010 Global Consultations on Farmers' Rights in cooperation with the Institute of Biodiversity Conservation (IBC), Ethiopia.[4] At this point we asked Dr Kassahun Embaye, then Director of the IBC, and Dr Gemedo Dalle Tussie, then Director of ABS at the IBC, whether an in-depth study of the Teff Agreement could be of interest from an Ethiopian point of view. As one of the objectives of the ABS project at the FNI has been to support developing countries, and particularly African countries, in their efforts to implement ABS, Ethiopia's views regarding the usefulness of such a study were very important. The Ethiopian response was positive, and the IBC deemed it particularly useful that such a study could be conducted by an independent outside institution. In turn, the IBC promised to provide all support required, in terms of documentation, arranging appointments and practicalities, as well as a major seminar for presentation of the report in Ethiopia (see 1.5), always stressing that the authors should feel free to write a fully independent report. This provided an optimal basis for the present report.

[3] A collection of FNI publications and other publications can be found at: www.fni.no/ABS/publications.html

[4] See the Farmers' Rights website for further information about the consultations: www.farmersrights.org/about/fr_in_itpgrfa_8.html

The research team has consisted of two members of the ABS project of the FNI, with formal backgrounds in the disciplines of political science[5] and development studies,[6] backed up by support from a legal scholar.[7]

1.1 The topic of this report

With this case study, we focus on an ABS agreement that received considerable attention when it was signed, and that gave rise to great expectations for its potential to spearhead how future ABS agreements could be. The Teff Agreement was negotiated in March 2004, finalized in December 2004 and signed in April 2005. The parties to this agreement were the Ethiopian Institute of Biodiversity Conservation (IBC), the Ethiopian Agricultural Research Organization (EARO)[8] and the Dutch company Health and Performance Food International (HPFI).

The agreement provided HPFI with access to specified teff varieties and with the right to use these varieties to produce a wide range of specified food and beverage products not traditional in Ethiopia. In return, the company was to share monetary and non-monetary benefits with Ethiopia, including shares of the royalties, licence fees and profits as well as research cooperation and the sharing of research results. In addition, the agreement stipulated that HPFI should recognize Ethiopia as the origin of teff genetic resources; further, it prohibited the access to traditional Ethiopian knowledge or to claim rights over such knowledge, or making commercial profits from its use. Teff products were considered to have considerable marketing potential in Europe and the USA, because teff is gluten-free and is high in nutritional value. Thus, there were great expectations as to the benefits that Ethiopia could obtain from the agreement.

However, these expectations failed to materialize. When the company was declared bankrupt in August 2009, only 4000 Euro and a small, early interrupted research project were the benefits that reached Ethiopia. In the years prior to the bankruptcy, its directors had established other companies and transferred values to these companies, which continued to produce and sell teff flour and teff products, and to expand their activities to other countries and continents. Since it was the now-bankrupt HPFI that had been the party to the agreement, these other firms, even though operating under the same directors and partly the same owners, could continue selling teff flour and teff products with no obligations towards Ethiopia.

To understand this story, it is also important to be aware, that a Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products had been signed on 26 March 2003. The Parties to this MoU were EARO, Larenstein Transfer (a fully-owned subsidiary of Larenstein University) and Soil and Crop Improve-

[5] Dr Regine Andersen, senior research fellow and project leader
[6] Ms Tone Winge, research fellow
[7] Prof. Ole Kristian Fauchald, research professor, FNI (legal questions concerning central documents)
[8] EARO is now called the Ethiopian Institute of Agricultural Research (EIAR).

ments (S&C), which was a precursor to HPFI. Based on the MoU, 1440 kg teff seeds were sent from Ethiopia to the Netherlands for research and development purposed: 120 kg each of 12 specified teff varieties.

Following from this development, the company filed a patent application on the processing of teff flour and related products in the Netherlands as early as in July 2003; this application was later filed under the European Patent Office (EPO) in July 2004. The teff patent was granted by EPO[9] in 2007. It covers teff grain (without any mention of specific varieties) with certain falling number values at the time of grinding (which, according to the patent, make the flour suitable for baking), to be achieved by storing the teff grain for some months for after-ripening, as is in fact common in Ethiopia; the patent also covers the milling of flour from these grains to a fine powder; the dough or batter resulting from mixing this flour with liquid; as well as a range of non-traditional products from such a dough or batter, including bread, pancakes, shortcakes, cookies and cakes of various kinds. The company argued that such a broad patent was required to secure the investments in teff and thus also the prospects of benefit sharing with Ethiopia.

In practice, the teff patent excludes all others, including Ethiopia itself, from utilizing teff for most forms of relevant production and marketing in the countries where it is granted. The owners also filed this patent in the USA and Japan. A development had started whereby Ethiopia was becoming sidelined. The country found itself squeezed out of position to utilize its own teff genetic resources – for example, through cooperation with other foreign companies – in Europe and wherever else the teff patent might be granted, while at the same time losing all prospects of sharing the benefits from the use of these genetic resources. After the HPFI bankruptcy, there was no longer any legal counterpart to the Teff Agreement, and few prospects that other companies would seek to develop such resources under an ABS agreement with Ethiopia as long as teff grain, flour, dough and non-traditional products remained covered by such a far-reaching patent in central countries.

How was this possible? What actually happened? How to explain the failure of the Teff Agreement? What prospects are there for justice after this failure? What lessons can be drawn in terms of potential success factors for similar agreements in the future? Since the Teff Agreement had been hailed by CBD enthusiasts as one of the most advanced and promising of its time, there is a need to look into these questions in depth.

1.2 Some words on intentions

The experiences with the Teff Agreement have caused disappointment and anger in Ethiopia, as well as heated discussions about reasons for the failure, and a search for scapegoats. What this report shows is that all parties on the Ethiopian side did what they considered best for their

[9] The European Patent Office (EPO) is the executive arm of the European Patent Organization, which currently has 38 members (see www.epo.org/about-us/organisation/member-states.html).

country in the context of the time. There is no specific person or institution in Ethiopia to blame for the failure. We feel that the efforts of the ABS pioneers of those days should be appreciated and recognized as well-meant, and that further lessons should be drawn from what we, with hindsight, can now point out as the critical factors behind the events.

1.3 State of research and objectives

Several reports and articles shed light on the experiences with the Teff Agreement (Dalle 2010; Gebreselassie 2009; Wynberg 2008; Demissew 2008; McGown 2006). Wynberg (2008) concludes that the parties came together with the best intentions, but that failure to engage the right players and implement the correct rules delayed the process. She highlights the conclusion drawn by legal advisor Mesfin Bayou, who was central in drafting the agreement, that negotiating and administrative skills together with the availability of required information are factors crucial to the success of such an agreement (Bayou 2005). This view is supported by Gebreselassie (2009), who has also offered insights into some of the details of the agreement and its aftermath, like the plant variety protection of three teff varieties in Europe. Dalle (2010) provides further details of the story and discusses the outcome of the agreement. Important shortcomings, in his view, were limited capacity and lack of effective enforcement and follow-up mechanisms. He concludes that there is a great need to coordinate efforts to ensure Ethiopia's right to benefit from its genetic resources.

These contributions provide important information and background for the present report. However, the case is a highly complex one. After examining the material, we found that several questions remained and that further data collection would be required. In this report, we have sought to bridge the gaps by reviewing the available material published to date, analysing central documents from the entire period, and interviewing key actors.

The objective of this study is therefore to provide an in-depth analysis of the Teff Agreement and to draw lessons of relevance for Ethiopia as well as other provider countries wishing to enter into ABS agreements in the future. On this basis, we will also offer some recommendations to the Conference of the Parties (COP) of the CBD for the implementation of the Nagoya Protocol.

1.4 Analytical framework

The analytical framework for this report is based on political science and informed by legal analysis. The point of departure is regime analysis – the study of how international regimes are shaped internationally and implemented at the national level (see e.g. Underdal and Young, eds, 2004; and Andersen 2008).

An analytical framework for the ABS case studies of the ABS research project at the FNI is presented in Rosendal (2010), and provides a further point of departure. However, the present study differs in scope from the country case studies that have been the focus of other cases studied by the ABS research project at FNI, since we take one ABS agreement as the point of departure.

After a background chapter on teff, its history and distribution, our point of departure for the analysis will be the institutional and legal context of the Teff Agreement. We will outline the international legal context as well as relevant legal frameworks in Ethiopia and the Netherlands. On this basis we will start to tell the story of the Teff Agreement from the very beginning and until it's signing, and analyse our findings with a view to lessons for future ABS arrangements. We will then introduce the parallel story of the teff patent, starting with the patent application and an analysis of the patent claims. On that background we will proceed to the story and analysis of the implementation of the Teff Agreement. Here we will also analyse a public-private partnership on teff cultivation in Ethiopia that was claimed by the Dutch counterpart to be a benefit sharing arrangement. We then turn to the bankruptcy, its history and implications, before investigating the teff patent in further depth, including its implications for the Teff Agreement and for Ethiopia after the termination of the Teff Agreement due to the bankruptcy of the Dutch counterpart. Finally we will draw lessons from this case study, including also lessons drawn by the stakeholders. This will be summarized in overall conclusions and recommendations for the involved countries as well as for the further implementation of the Convention on Biological Diversity, including the Nagoya Protocol.

1.5 Data collection

This study is based mainly on document analysis and interviews. In addition, it draws on the insights from previous studies on the Teff Agreement.

The IBC and Debre Zeit Agricultural Research Centre have generously provided copies of agreements, letters, printouts of e-mail communications as well as other documents related to the early history, negotiation and implementation of the Teff Agreement, as well as its aftermath (see Annex 1). In addition, documents on the relevant legal framework have been consulted. From the Netherlands, former HPFI Director, Mr Hans Turkensteen, has been an important informant. He shared his recollections in a telephone interview and forwarded documents via e-mail. Also former HPFI employees have contributed extensively with their information. In addition, a comprehensive literature and media survey was conducted, covering *inter alia* interviews, articles and promotion material from HPFI and other relevant companies established by the same owners. We have also received information from the Public Receiver of the bankruptcy case, the ABS focal point, and the Dutch Embassy in Ethiopia.

In addition, we conducted a document search that yielded information on the context, for example as to companies involved in teff production and marketing in various countries. Landwirtschaftskammer Niedersachsen, a German institution that has challenged the EPO patent on the processing of teff flour, provided information on their opposition case.

Key negotiators, participants and observers in the process related to the Teff Agreement in Ethiopia, in the Netherlands and in Germany, have shared their knowledge and reflections regarding the developments and outcome of the agreement. Their information has proven invaluable for this study (see Annex 2 for details of interviewees).

The documents at hand and the information gathered through interviews and e-mail communication have provided the research team with unique insights into the early history of the Teff Agreement, its implementation and termination, as well as the bankruptcy, the teff patent and the first attempt to challenge it, and further prospects in this context.

A preliminary version of this report was presented and discussed at a seminar organized by the IBC on the implementation of the Teff Agreement in Adama, Ethiopia, 16–17 March 2012. The seminar had 90 participants, with 50 members of the Ethiopian Parliament, including the Chairman of the Standing Committee on Agriculture. Members of the Standing Committee on Agriculture, the Legal Standing Committee and the Standing Committee on Budget and Finance also attended. The remaining 40 participants were invited guests from government institutions, NGOs and media outlets in Ethiopia, as well as representatives from the Dutch Embassy. The seminar provided a unique opportunity to discuss the results of our investigations into the Teff Agreement, and tailor the report in light of questions and points brought up there.

2 Background: About teff

2.1 Teff: The 'super-grain'

Teff is an annual grass whose plants range from 30 to 120 cm in height. The grains of teff come in many different colours: in general, the darker the grain, the richer the flavour. Teff grows well under difficult conditions poorly suited for cultivating other cereals, and will produce grain even in a bad season. This predictability, with stable yields under varying conditions, makes it invaluable to poor farmers, and a much-appreciated cereal in areas with changeable conditions, as pointed out by the US-based Board on Science and Technology for International Development of the US National Research Council (BOSTID 1996).

Teff is used mainly in making the Ethiopian staple *injera*, which is a spongy, flat and slightly sour bread eaten as an accompaniment to spicy stews. It also has other uses in Ethiopia – in gruel, cakes, other types of bread and homemade beverages. Additionally, as teff has become popular outside Ethiopia it has also been used to make non-traditional products (BOSTID 1996).

The nutritional value of teff is often referred to as being similar to that of wheat (Spaenij-Dekking et al. 2005), but teff is actually more nutritious, as the seeds are so small (between 1 and1.5 mm long) that they contain a greater proportion of bran and germ. In addition, precisely because the seeds are so small, teff flour is usually whole-grain (BOSTID 1996).

Teff is also quite high in energy, and has an average fat content of about 2.6%. Protein content also tends to be just as high as, or higher than, that of other cereals, ranging from 8% to 15% (with an average of 11%). While the vitamin content is about average compared to other cereals, the fermentation process of making *injera* generates additional vitamins, further enhancing the value of the grain. In addition, the mineral content shows especially good values for iron and calcium. The iron content seems to play a particularly important role in Ethiopia, as absence of anaemia has been found to correlate with areas of teff consumption (BOSTID 1996).

According to Spaenij-Dekking et al. (2005), teff does not contain gluten and is therefore a promising alternative for those suffering from coeliac disease or other forms of low gluten tolerance. In the 14 teff varieties tested by the researchers, 'no gluten or gluten homologues could be detected' (Spaenij-Dekking et al. 2005: 1749).[10] The lack of gluten in teff, at least gluten of the same type found in wheat, was also noted by American experts in 1996, who mentioned that people with wheat allergies bought teff for that reason (BOSTID, 1996). Thus, it would seem that in the mid-1990s this feature was already well known in some circles.

[10] As it happens, these were, according to the authors, 'provided by Soil and Crop, Assen, the Netherlands' (Spaenij-Dekking et al. 2005: 1748).

It is particularly the absence of gluten and its nutritional value that have made teff increasingly well-known and attractive in the United States, Europe and other regions and countries outside Ethiopia. Among the expanding segments of health-conscious consumers, teff is marketed by various sellers as a unique and healthy alternative to more common staples like wheat. HPFI championed teff, promoting it as a grain for athletes, people with coeliac disease or gluten intolerance, and the health-conscious in general. Its directors have continued to market it as a healthy choice, now under the brand name 'Ecosem'.[11]

Apart from the features that make it a nutritious cereal well-suited for human consumption, teff also contains features that make it useful for fodder. As a fodder plant, teff is quite quick and cheap to produce, and has a high leaf-to-stem ratio, in addition to its soft and fast-drying straw (BOSTID 1996).

However, teff also comes with some serious drawbacks – not least the tiny seeds, which make it difficult to handle (BOSTID 1996).

2.2 History and distribution of teff

After an expedition to Abyssinia, Egypt and Somalia in 1927, the famous Russian botanist, agronomist, plant geneticist and plant breeder Nikolai Ivanovich Vavilov concluded that Ethiopia was the centre of origin of teff (Vavilov 1992: 313). This was later confirmed by the likewise renowned US plant geneticist Jack Harlan (Harlan 1992: 71), who called teff 'the noble cereal of Ethiopia' (ibid: 187). He added that teff is a semi-endemic crop, i.e. a crop that originated in a definable centre and with limited dispersal. Harlan noted that teff has had some dispersal to other countries, such as India, but that it 'is not an important crop elsewhere than in Ethiopia' (1992: 137), which then included Eritrea. Whereas teff is typically grown in the Ethiopian highlands and has its centre of diversity there, it is also grown in Eritrea, according to both experts (Vavilov 1997: 109; Harlan 1992: 185).[12]

According to the BOSTID (1996) teff has been grown in Ethiopia since before recorded times. Little is therefore known about its domestication and early use. However, from morphological, biochemical and bio-systematics data and DNA sequencing, the most likely direct wild progenitor is believed to be *Eragrostis pilosa*, a weedy species that can be found in temperate and tropical regions throughout the world and which is very common in Ethiopia (Ingram and Doyle 2003).

In the tombs of Egyptian pharaohs, samples have been found that are thought to be teff (BOSTID 1996). This would indicate that teff was used, perhaps also cultivated, outside of Ethiopia many millennia ago, in the early history of the crop.

[11] See Ecosem website: www.teff-grain.com/

[12] During the expeditions and research of Prof. Vavilov and Prof. Harlan, Eritrea was a region of Ethiopia. It became an independent state in 1993.

As part of the exchange of crops during recent colonial times, the Royal Botanic Gardens at Kew, England, obtained teff seed from Abyssinia in 1886 and distributed it to various botanic gardens and other institutions (BOSTID 1996). Kew's own *Bulletin of Miscellaneous Information* presented teff as a crop that could be introduced to hill stations in India and other higher areas in the British Empire (BOSTID 1996).

In Yemen, Kenya, Malawi and India, teff has long been used for food production. In South Africa and Australia it has to some extent been used as forage for grazing animals (BOSTID 1996).

In the 1990s, Ethiopian restaurants were becoming popular in North America and Europe. Teff has been produced and sold in the United States at least since 1984, when Wayne Carlson from Idaho founded 'The Teff Company'.[13] This company currently sells teff flour and grain under the brand 'Maskal teff',[14] but it also promotes teff as fodder for horses and cattle, has developed two varieties for this purpose and sells seed from these varieties to American farmers.[15] Wayne Carlson, a biologist who learned about teff when he was living and worked in Ethiopia and among Ethiopian farmers in the 1970s, wanted to bring this promising crop to North America, and started selling teff to Ethiopian and Eritrean restaurants and immigrants in the United States.[16] Each year a portion of the grain Carlson bred was given to Ethiopia for trials and to farmers, according to one source (BOSTID 1996).

Teff is also cultivated in Kansas, where it was first introduced by Edgar Hicks, an official at the Nebraska State Grange who works with minority farmers (Canon 2009). Nicodemus, Kansas, is a town established by freed slaves in the mid-1800s, and its black farmers feel a cultural connection to teff. Funded by a grant from the US Department of Agriculture and in collaboration with researchers from Kansas State University, the Kansas Black Farmers' Association has been exploring the potential of teff in western Kansas (Haag 2009). According to Edgar Hicks, 'raising teff is about more than selling a commodity; it goes beyond agriculture to a whole different level': he feels that teff 'represents the Ethiopian people and their culture' and that 'Ethiopians want to share everything they have just as they share their *injera*, and that is the spirit embodied by teff' (Haag 2009: 4). Hicks hopes that teff will eventually benefit Kansas both economically and psychologically.

Prograin International/Ecosem, the new company established by the HPFI directors, is also trying to establish itself on the US market. As will be shown in Chapter 6, this company grows and markets teff in various countries. Furthermore, a new company, Millets Place bv,[17] has been

[13] See 'history' section on the company websites: www.theteffcompany.com/history-of-teff and www.teffco.com/teffco_history.html
[14] See the company's website for Maskal tef: www.teffco.com/products.html
[15] See the company's website for the sales of seed: www.theteffcompany.com/
[16] See the history section on one of the company's websites: www.teffco.com/teffco_history.html
[17] See the company website for more information: www.milletsplace.com/

established by former HPFI shareholders and employees in the Netherlands in 2010.

2.3 Teff in Ethiopia

Ethiopia is commonly regarded as the only country in the world where teff is a significant crop. In Ethiopia it is particularly popular in the western provinces (BOSTID 1996).

Teff is a resilient crop, and in areas where it can be cultivated most farmers grow it as a security crop. During the Mengistu rule, from 1974 to 1991, the cultivation of teff was discouraged, as it was considered to be of little value in terms of nutrition. Wheat, sorghum and maize were promoted as alternatives. However, this policy did not put an end to teff cultivation in Ethiopia.[18] Whereas in 1960, approximately 40% of the country's total area used for cereal cultivation was devoted to teff, by 1980 this figure had grown to 50% (BOSTID 1996). And despite various policy challenges, teff has remained important for most Ethiopians: it is often the only crop that survives and bears grain during difficult periods.[19]

According to Ketema (1997) the Ethiopian germplasm collection held 3892 teff accessions in 1995. He also refers to the existence of 2255 pureline accessions. The IBC genebank holds 4540 teff accessions, although some of these may be copies of the same accession.[20] Since 1970, 32 varieties of teff have been released in Ethiopia. Eighteen of these have been released by Debre Zeit Agricultural Research Centre, with the rest coming from other federal research centres (two from Holetta Agricultural Research Centre and one from Melkassa Agricultural Research Centre) and regional research institutes.[21]

According to Dr Kebebew Assefa of Debre Zeit Agricultural Research Centre, some of the released varieties may not have been cultivated by farmers at all,[22] but this is uncertain and the reasons are unclear. If this is so, it would it would limit the accessibility of those varieties for foreign companies to the breeders.

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[18] Interview with Mr Regassa Feyissa, Addis Ababa, 24 October 2011

[19] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011

[20] According to the Ethiopian National Information Sharing Mechansim of Plant Genetic Resources for Food and Agriculture, available through www.pgrfa.org/gpa/eth/advanced search.jspx. As for the accessions of Eragrostis tef, this database was last updated in 2007. In an interview with the authors on 24 October 2011, Dr Kebebew Assefa of the Debre Zeit Agricultural Research Centre highlighted that the Ethiopian collections of teff accessions are not exhaustive when it comes to the representation of different regions and agro-ecologies.

[21] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011, who referred to the *Crop Variety Registry* of the Ethiopian Ministry of Agriculture (Issue No. 13, June 2010, Addis Ababa)

[22] Ibid.

Teff landraces are disappearing quickly. Part of the explanation is that some of the released varieties have acted to displace the older landraces.[23] If teff genetic diversity is to be saved, immediate action is necessary – for example, by organizing collection expeditions. As such action is costly this is important information in a benefit sharing perspective.

The grain of teff is very easy to store. In Ethiopia, teff is commonly stored for many months (Sertse 2008), and it can survive for years in traditional storehouses without being destroyed by insects (BOSTID 1996).

2.4 Summing up central information about teff

In this chapter, we have seen that teff is quite high in energy. Whereas the vitamin content is about average compared to other cereals, the fermentation process of making *injera* generates additional vitamins, further enhancing the value of the grain. In addition, the mineral content shows especially good values for iron and calcium. Importantly, teff does not contain gluten and is therefore a promising alternative for those suffering from coeliac disease or other forms of low gluten tolerance, as we have seen. Not only does the unique properties of teff make this grain an invaluable source of healthy nutrition for Ethiopians: the combination of high mineral contents without gluten makes teff particularly attractive for markets in Europe and North America. This is an important background of the Teff Agreement.

We have also seen in this chapter, that teff is a semi-endemic crop, i.e. a crop that originated in a definable centre and with limited dispersal, and that its centre of origin is Ethiopia. Teff has been grown in Ethiopia for at least 2000 years, and has dispersed to neighbouring countries, in particular Eritrea. Meanwhile it is also grown in Yemen, Kenya, Malawi and India, as well as South Africa and Australia – in addition to some places in the USA and Europe in the later years.

In Ethiopia, teff is a resilient crop, grown in the highlands, and close to 4,000 accessions have been conserved *ex situ*. Teff landraces are disappearing quickly, partly because released varieties have acted to displace the older landraces. If teff genetic diversity is to be saved, financial support is required, and benefit sharing is thus particularly important in this context.

[23] Ibid.

3 Institutional and legal frameworks

This chapter presents the most relevant institutional and legal frameworks in Ethiopia and the Netherlands, as well as the international agreements that are pertinent in this context.

3.1 Relevant international agreements

When the Teff Agreement was signed in 2005, it was hailed as one of the most advanced and promising ABS agreements to be negotiated in connection with the CBD. Some remarks on the main objectives and the relevant articles of the CBD are therefore in place here. And since the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) contains provisions on ABS, that treaty, and its relevance for the case of teff, will be presented as well. Ethiopia and the Netherlands are parties to both these international agreements.

3.1.1 The Convention on Biological Diversity

The CBD was adopted in 1992, signed at the United Nations Conference on Environment and Development in Rio de Janeiro the same year, and entered into force in 1993. It was the first legally binding international treaty to address the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits derived from such utilization. The CBD covers all biological diversity and genetic resources except for human genetic resources.

The objectives of the CBD are closely interrelated. Conservation and sustainable use of biological diversity and its components are decisive for the continued existence of this diversity, much of which is threatened by massive and rapid erosion – particularly in developing countries. To enable them to conserve and sustainably use biological diversity and its components, it has been a vital concern under the CBD to establish principles and systems for fair and equitable sharing of the benefits derived from the use of genetic resources, in combination with other forms of international cooperation.

Article 15 of the CBD recognizes that the authority to determine access to genetic resources rests with the national governments and is subject to national legislation. This provision is based on the principle of national sovereignty over resources within national jurisdiction, which is well established in international law. In order for countries to exercise this authority, they will need to establish legislation towards this end.

Article 15 further stipulates that the contracting parties shall facilitate access to genetic resources in line with the provisions of the CBD. Parties that are countries of origin of specific genetic resources (or have acquired them in accordance with the CBD) have the authority to provide access to these genetic resources, which is to be granted on mutually agreed terms between the provider and the recipient, and subject to prior informed consent. The Teff Agreement represents an effort to implement these principles.

Article 8j, though formulated in less mandatory language, states that the contracting parties are to respect the traditional knowledge of indigenous and local communities, and promote its wider application with the approval and involvement of the holders of such knowledge, all the while encouraging the fair and equitable sharing of benefits arising from its use. Thus, whereas Article 15 concerns benefit sharing with provider countries, Article 8j provides for internal distribution of shared benefits in the provider countries, although this is not mandatory.[24] As shown in sections 3.2.4 and 9.2 of this report, Ethiopian legislation contains provisions on the rights of communities with regard to traditional knowledge.

Finally, Article 15 sets out that each contracting party shall take measures aimed at ensuring that the results of research and development and the benefits arising from the commercial and other utilization of genetic resources are fairly and equitably shared with the countries that provide such resources. This latter provision is addressed particularly towards user countries, and notes that such measures may be legislative, administrative or policy measures, as appropriate.

After the entry into force of the CBD, many developing countries adopted legislation on the bio-prospecting of genetic resources, to ensure that access to such resources would be granted on mutually agreed terms and subject to prior informed consent, often also involving indigenous and local communities. However, the user countries of genetic resources failed to enact and implement compatible legislation, so important measures to ensure benefit sharing once the genetic resources had left the providing countries, were missing. As a result, bioprospecting has been met with wide mistrust, and in many countries achieving access to genetic resources has proven difficult, involving lengthy and complicated processes. There have been few examples of actual benefit sharing.

To seek a solution to this imbalance and critical challenge to the implementation of the CBD, the Conference of the Parties (COP) in 2002 (during COP6) adopted the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits arising out of their Utilization (Decision VI/24). These were voluntary guidelines intended to assist in domestic efforts to establish policies and legislation on access and benefit sharing. They included a specification of roles, functions and tasks, as well as a list of monetary and non-monetary benefits.[25] As we will see, the drafters of the Teff Agreement used the Bonn Guidelines as an important source of ideas.

3.1.2 The Nagoya Protocol on ABS to the CBD

At the next COP in 2004, the process of spelling out in further detail how a system for access and benefit sharing should be implemented was started. This process was concluded in 2010 with the adoption of the

[24] Article 8 provides for measures that each party shall take, 'as far as possible and appropriate', whereas Article 15 is formulated with a mandatory language stating what the Parties 'shall' do, without modifications.
[25] For more information on the CBD, see www.cbd.int

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD, which established more detailed provisions towards this end. The Nagoya Protocol is currently in the process of being signed, and will enter into force 90 days after ratification by the 50th country.

The Nagoya Protocol aims at creating greater legal certainty and transparency for providers and users of genetic resources once it enters into force and is implemented at the national and international level.[26] It provides for the establishment of more predictable conditions for access to genetic resources as well as ensuring benefit-sharing when genetic resources leave the provider country. Thereby it aims at creating incentives to the conservation and sustainable use of genetic resources. The Protocol specifies operational measures for providing access along these lines, and the types of benefits that are eligible for sharing.

Moreover, according to the Protocol, each party shall establish information check-points and issue internationally recognized certificates of compliance with laws and regulations in the provider country in the form of access permits (Article 17). In case of alleged violations of domestic ABS legislation, the countries involved are to work together and take measures to grant access to justice and mutual recognition and enforcement of foreign judgments and arbitral awards (Articles 15, 16 and 18). The Protocol is based on a contractual mechanism for realizing ABS, as it prescribes a system for giving access based on agreements and a system for enforcing those contracts in user countries. The Protocol further specifies that the parties are to consider the needs and modalities for a multilateral benefit-sharing mechanism for resources and knowledge that occur in transboundary situations, or for which it is not possible to obtain prior informed consent (Article 10).

The Nagoya Protocol marks a substantial step forward in the international regulation of ABS to genetic resources. Ultimately, however, the success of the Protocol will depend on its implementation at the national level and the further international operationalization of provisions that could not be concluded in Nagoya. For the analysis in this study, the Nagoya Protocol is not directly relevant, since it did not exist in the period under scrutiny. However, it is relevant for the discussions presented later in this report, where we seek to draw lessons for future ABS agreements. In this context, the experience from the case of Ethiopian teff will be highly relevant to the further development and implementation of the provisions under the Nagoya Protocol.[27] Except for that we will relate our analysis of this case study to the CBD, in particular Article 15, as the international legal framework.

[26] For more information on the Nagoya Protocol, see www.cbd.int/abs/about
[27] For more information on the Nagoya Protocol, see www.cbd.int/abs

3.1.3 The International Treaty on Plant Genetic Resources for Food and Agriculture

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was adopted in 2001 and entered into force in 2004. It is the first legally binding international agreement devoted exclusively to the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits derived from their use (Article 1). The ITPGRFA covers all plant genetic resources for food and agriculture,[28] although its provisions on ABS are limited to specified crops and forage plants (see 3.1.4). The general sections of the ITPGRFA provide for concrete measures to ensure the conservation of these resources, *in situ* on-farm as well as *ex situ*, their sustainable use, and for the realization of Farmers' Rights in this regard (Articles 5, 6 and 9).[29] There are provisions on international cooperation and technical assistance for the implementation of the Treaty at the national level (Articles 7 and 8), as well as various supporting components and institutional provisions (Articles 14–17).[30]

3.1.4 The Multilateral System of Access and Benefit Sharing under the ITPGRFA

The ITPGRFA was developed in harmony with the CBD, but with a different approach to ABS (Articles 10–13). This is because it is almost impossible to determine the countries of origin for most crop genetic resources, and because all countries are net recipients of such resources: therefore all countries are interdependent in this regard, as users and providers (Palacios, 1998). Whereas the ITPGRFA as such covers all plant genetic resources for food and agriculture, including teff, the Multilateral System of Access and Benefit Sharing under the ITPGRFA (MLS) covers 35 food crops and 29 forage plants that are in the public domain and under the management and control of the parties.[31] As these are listed in Annex 1 to the Treaty, they are often referred to as the 'Annex 1 crops'. They include major staple crops as well as a range of other plants widely used for food and agriculture. The negotiation of ITPGRFA followed the consensus principle: for Annex 1 this meant that if even one country wished to exclude a crop species or genus from the list, then it was excluded. Countries that considered themselves the country of origin of certain plants made use of this opportunity, and so *inter alia* soybeans, tomatoes, oil palm, cotton, sugarcane, cocoa and many vegetables were excluded from the list. Ethiopia decided to exclude teff from the list, since it was considered to have originated in Ethiopia. Thus, when it comes to regulating ABS to teff genetic resources, the CBD applies as the international legal framework.

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[28] Defined as any genetic material of plant origin of actual or potential value for food and agriculture (Art. 2)

[29] For more information on Farmers' Rights, see www.farmersrights.org

[30] For more information, see www.planttreaty.org

[31] In practice, this means seed samples and propagating material found in national and international gene banks and depositories.

This has implications for the benefit sharing that takes place under the Multilateral System. The basic principles of the MLS are that the parties (countries) include all their genetic material of the Annex 1 crops that are in the public domain and under their control in the MLS, and that this material becomes freely accessible upon the signing of an internationally negotiated Standard Material Transfer Agreement. In order for this material to remain in the public domain, recipients are not allowed to seek any intellectual property rights (IPR) over it in the form in which it was received. If the recipient develops it further and patents it, then a mandatory fixed payment is to be paid to the Benefit-sharing Fund under the MLS. If the developed material is commercialized but without patenting, then such payment is voluntary. Other voluntary contributions may also be paid to the MLS fund – in fact, most of the funds received so far belong to this latter category. Between 2009 and 2011, more than USD 10 million was disbursed to projects, mostly in developing countries, directly or indirectly supporting farmers in their work of conserving and sustainably using crop genetic resources. The Parties to the ITPGRFA are currently discussing how to strengthen the benefit-sharing mechanism.

As for distribution of the funds, there are important differences between the MLS and the CBD. Whereas the CBD is based on a bilateral approach between recipients and providers of genetic resources, the MLS is aimed at distributing its funds directly and indirectly to farmers in developing countries and countries with economies in transition who conserve and sustainably use crop genetic resources. For such distribution to take place, it is not important whether they were providers of resources that were commercialized: the main point is that they contribute to maintaining and further enhancing the global genetic pool. However, the crops eligible for support from the benefit- sharing fund must be Annex 1 crops. Thus, projects related to non-Annex 1 crops will not be eligible for benefit sharing under the MLS, as they are not part of the MLS. Support from the Global Crop Diversity Trust,[32] which has managed to generate substantial funding for *ex situ* conservation, is also basically tied to priority crops, i.e. Annex 1 crops and crops listed in Article 15 of the ITPGRFA. That means that Ethiopia has no direct access to benefit sharing for the conservation and sustainable use of teff genetic resources through the mechanisms under the ITPGRFA. All benefit sharing related to teff genetic resources must take place on a bilateral basis, whereby Ethiopia negotiates with the applicant/user, on the basis of the principles of the CBD and, since 2010, of its Nagoya Protocol.

3.2 Institutional and legal framework in Ethiopia

Ethiopia has been an important actor in the international negotiations leading to the CBD and the ITPGRFA. Through outstanding negotiators like Dr Melaku Worede and Dr Tewolde Berhan Gebre Egziabher, the country has advocated in these international forums for the fair and equitable sharing of the benefits arising from the use of genetic resources and for farmers' rights. Ethiopia has also significantly contributed to the

[32] For more information, see www.croptrust.org

development of the *African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources* (often referred to as the African Model Law).[33] Also in Ethiopia itself, there have been many developments in connection with implementing the international norms and principles in national law. However, much of this happened after the Teff Agreement was signed. In this sub-chapter, we present the relevant legislation and institutional framework, summarizing at the end how this relates to our case study.

3.2.1 Ethiopian ratification of international agreements

The CBD was ratified by Ethiopia in 1994 through Proclamation No. 98/1994 of 31 May 1994, titled 'Proclamation to ratify the Biodiversity Convention'. The ITPGRFA was ratified through Proclamation No. 330/2003 of 29 April 2003, titled 'Proclamation to provide for the ratification of the International Treaty on Plant Genetic Resources for Food and Agriculture'. In that connection, the Institute of Biodiversity Conservation (see below) was mandated to 'undertake all acts necessary for the implementation of the treaty' (Proclamation No. 330/2003: Art. 3).

According to IBC, Ethiopia ratified the Nagoya Protocol on 28 June 2012.[34] This had as of writing (August 2012), however not yet been registered by the CBD Secretariat.[35]

3.2.2 Institute of Biodiversity Conservation

The IBC is a government institution whose objective is to ensure the appropriate conservation and utilization of Ethiopia's biodiversity.[36] In terms of organization it is divided into two directorates: the Biodiversity Conservation and Sustainable Use Directorate, and the Genetic Resources Transfer and Regulation Directorate. The former is engaged in work on animal, crop, forest and microbial genetic resources and maintains a gene bank and laboratories, while the latter is responsible for issuing export and import permits for genetic resources, regulating the transfer of genetic resources, capacity building with regard to ABS, preparing manuals and guidelines on ABS, promoting high-value genetic resources for benefit sharing, and advising the government on ABS.[37]

The history of the IBC goes back to 1976, when the Plant Genetic Resources Centre/Ethiopia (PGRC/E) was established through a bilateral technical cooperation agreement between the governments of Ethiopia and the Federal Republic of Germany. The main objective was to

[33] Adopted by the Organization of African Unity (OAU) in Algeria, 2000.
[34] See IBC press release 'Ethiopia Ratifies Nagoya Protocol on Genetic Resources' on the IBC website: www.ibc.gov.et/2349
[35] See the list 'Status of Signatures, or Ratification, Acceptance, Approval or Accession' of the Nagoya Protocal at the CBD website: www.cbd.int/abs/nagoya-protocol/signatories/
[36] See section on 'Vision and Mission' on the IBC website: www.ibc.gov.et/
[37] See the 'about us' section on the IBC website: www.ibc.gov.et/about-us/departments

safeguard Ethiopia's plant genetic resources.[38] The centre was later re-established as the Institute of Biodiversity Conservation and Research in June 1998 by Proclamation No. 120/1998 of 25 June 1998, titled 'Proclamation to provide for the establishment of the Institute of Biodiversity Conservation and Research'. In 2004, this proclamation was amended by Proclamation No. 381/2004 of 13 January 2004, titled 'Proclamation to amend the Institute of Biodiversity Conservation and Research Establishment Proclamation'. As the IBC has been so central to the Teff Agreement, its development is central to the story and will be presented in further detail.

With regard to the establishment of the institute, Proclamation No. 120/1998 states: 'it has become necessary to establish an institute which is responsible for undertaking, directing and coordinating biodiversity conservation, research and proper utilization endeavours at national level' (Preamble). Article 3 of the proclamation establishes the institute as 'an autonomous body of the Federal Government' which is to be 'accountable to the Ethiopian Agricultural Research Organization' (however, this was amended in January 2004). The objective of the institute is established in Article 5 as being to 'cause and ensure the appropriate conservation, research, development and sustainable utilization of the country's biodiversity' and it is in Article 6 provided with a range of powers and duties, including to 'give permits to those who need to collect, dispatch, import or export any biological specimen/sample'. Article 12 specifies that 'any person that needs to collect, dispatch, import or export any biological specimen/sample shall secure permission from the Institute' and Article 13 establishes that 'any person who collects, dispatches, exports or imports any biological specimen/sample without permit from the Institute shall be punished with five to ten years of imprisonment and from fifteen to twenty thousand birr fine.'

When Proclamation No. 120/1998 was amended by Proclamation No. 381/2004, both the placement of the IBC in the government structure and its name underwent a change. According to the new proclamation, the institute was now to be known as the 'Institute of Biodiversity Conservation' (Article 1), accountable to the Ministry of Agriculture and Rural Development (Article 4). Previously, it had been accountable to EARO, as stipulated in Article 3 (Paragraph 2) of Proclamation No. 120/1998. This means that from June 1998, when this first proclamation was enacted and until January 2004, the IBC was accountable to EARO. This is important for the understanding of the history of the Teff Agreement, and in particular with regard to its predecessor, the Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products (see sub-chapter 4.1), signed in 2003.

In addition, the objective of the institute is now 'to ensure the appropriate conservation and utilization of the country's biodiversity' (Proclamation No. 381/2004: Art. 2.5), which is a simplification of the previous objective, 'to cause and ensure the appropriate conservation, research, development and sustainable utilization of the country's biodiversity' (Proclama-

[38] See IBC website: www.ibc.gov.et/

tion 120/1998, Art. 5). In this context, we may also note that, since 2004, the IBC is required to submit separate reports on the implementation of the CBD to the Ethiopian Environmental Protection Authority (EPA), in addition to its annual reports to the Ministry of Agriculture and Rural Development (Article 9 of Proclamation No. 381/2004). Previously, all reporting had been to EARO (Article 9, paragraph 3.f of Proclamation No. 120/1998).

Article 6 on the powers and duties of the institute is also amended. With regard to the IBC's responsibility when it comes to access permits, sub-article 2.6 has been re-formulated to state: 'issue directives on the collection, dispatch, import and export of any biological specimen/sample and give permit to collect, dispatch, import and export same'(Proclamation No. 381/2004: Art. 2.6) – the main change here being the issuing of directives. The new proclamation also introduces a definition of 'biological specimen/sample' which reads: 'the specimen/sample of plant, animal or micro-organisms genes or species and does not include agricultural inputs'[39] (Proclamation No. 381/2004: Art. 2.3).

In December 2005 the Director of the IBC, at that time Dr Girma Balcha, was officially appointed as the Ethiopian focal point with regard to the CBD. Up until then Dr Tewolde Berhan Gebre Egziabher had held that function, due to his central role in the CBD negotiations.

After the Proclamation No. 482/2006 titled 'access to genetic resources and community knowledge, and community rights proclamation' (see section 3.2.4) had been adopted, it became necessary to restructure the IBC to enable implementation. The institute was therefore organized into the two directorates previously mentioned: a directorate for transfers and regulations that handles ABS, and a directorate for conservation and use. Previously, the institute had been organized into nine departments (crop, forest, forage, medicinal, ethno-biology, microbiology, animal, biosafety and biotechnology). The reorganization took place in 2009.

3.2.3 Other relevant Ethiopian institutions

In addition to the IBC, a handful of other institutions in Ethiopia are also involved in the maintenance of biological diversity or with issues relevant to this maintenance, and have played a role during one or more stages of the process with regard to the Teff Agreement. These are the Environmental Protection Authority (EPA), the Ethiopian Institute of Agricultural Research (EIAR) and the Ethiopian Intellectual Property Office (EIPO).

[39] With regard to 'agricultural inputs', the proclamation refers to the definition provided in Article 8 (3) (a) of the Reorganization of the Executive Organs of the Federal Democratic Republic of Ethiopia Proclamation No. 256/2001, as amended by Proclamation No. 380/2004. It reads: '"agricultural input" means plant seed, fertilizer, pesticide, improved small agricultural implements, modern bee hives, improved variety of livestock breeds, livestock feed and small scale irrigation and water harvesting materials available for market to improve production and productivity of the agricultural sector and include other inputs designated as such by the Ministry. This definition may introduce a difficult distinction between seed in terms of agricultural input (not included in the definition) and specimen/sample of plants (included in the definition).

EPA was originally set up under the Ministry of Natural Resources, Development and Environmental Protection in May 1994, but it was later established as an independent institution by Proclamation No. 295/2002 and is now accountable to the Office of the Prime Minister. EPA is responsible for preparing the State of Environment Report, developing environmental strategic plans, formulating environmental laws and standards, providing support for environmental regulatory bodies, and implementing, monitoring and evaluating the effectiveness of the system.[40]

Since the signing of the Teff Agreement, EARO has undergone a name change and is now called the Ethiopian Institute of Agricultural Research (EIAR). This institution can trace its roots back to the Institute of Agricultural Research, the first nationally coordinated agricultural research institution in Ethiopia when it was established in 1966. EIAR is responsible for the running of the federal agricultural research centres, while the Regional Agricultural Research Institutes are administered by the regional authorities. In addition to conducting research at its federal centres, the EIAR is responsible for the overall coordination of agricultural research in Ethiopia, and advises the government on agricultural research policy.[41] It is organized under the Ministry of Agriculture and is directly accountable to the Minister of Agriculture. Debre Zeit Agricultural Research Centre was established in 1953;[42] it is organized under and accountable to the EIAR. The EIAR and the IBC are accountable to different ministers within the same ministry.[43]

The Ethiopian Intellectual Property Office (EIPO) was established in 2003. It is organized under the Ministry of Science and Technology and is accountable to the Minister of Science and Technology. EIPO sees its role as to support the government's efforts to use intellectual property as an effective policy tool for promoting social and economic development.[44] It is particularly relevant in our context because of the Teff Patent.

3.2.4 Proclamation on access to genetic resources and community knowledge

Proclamation No. 482/2006 of 27 February 2006 bears the title ‘access to genetic resources and community knowledge, and community rights proclamation’. Its objective is to ‘ensure that the country and its communities obtain fair and equitable share from the benefits arising out of the use of genetic resources so as to promote the conservation and sustainable utilization of the country’s biodiversity resources’ (Art. 3). As this law was passed almost one year after the Teff Agreement was signed,

[40] For more information about EPA, see the EPA website: www.epa.gov.et/default.aspx

[41] For further information about EIAR, see the EIAR website: www.eiar.gov.et/

[42] For more information about the centre, see www.eiar.gov.et/research-centers/3-federal-research-centers/29-debrezeit-agricultural-research-center-

[43] Interview with Dr Gemedo Dalle, Mr Kebu Balemie and Abiyot Berhanu, 25 October 2011.

[44] See EIPO website: www.eipo.gov.et/index.php?option=com_content&view=category&layout=blog&id=14&Itemid=21&lang=en

it might well reflect lessons learned through the negotiations of that agreement.

The scope of the proclamation is specified as covering 'access to genetic resources found in *in situ* or *ex situ* conditions and community knowledge' (Art. 4), with the exception of customary use and exchange and the 'sale of produce of biological resources for direct consumption' (ibid.). 'Access' is defined as 'the collection, acquisition, transfer or use of genetic resources and/or community knowledge' (Art. 2), whereas 'genetic resource' is defined as 'any genetic material of biological resource containing genetic information having actual or potential value for humanity and it including derivatives' (ibid.). Article 2 also provides definitions of 'biological resource' and 'derivative': it is specified that biological resource 'includes genetic resources, organisms or parts thereof, populations or any other biotic component of ecosystem with actual or potential value for humanity' and that derivative 'means product extracted or developed from biological resource this may include products such as plant varieties, oils, resins, gums, chemicals and proteins'. As underlined by Munyi, Rukundo and Haas (2012) these definitions provide the proclamation with a fairly wide scope, as both 'derivative' and 'biological resource' are defined in a broad sense. However, this is somewhat modified by the exceptions mentioned above, for customary use and exchange and sale of produce for direct consumption. And while ownership of genetic resources is specified as belonging with the state and the people, ownership of community knowledge is placed with the local communities in question (Proclamation No. 482/2006: Art. 5).

Local communities are given the rights to regulate access to community knowledge (including by granting prior informed consent), to use their genetic resources and community knowledge and to share in the benefits arising from the utilization of these genetic resources and community knowledge (including a right to 50% of the monetary benefits received by the state, to be used for the common advantage of the communities in question).

Further, according to Proclamation 482/2006, an access permit granted by the IBC based on prior informed consent is necessary to access genetic resources or community knowledge. For access to genetic resources, prior informed consent is to be given by the IBC, whereas for access to community knowledge this is the prerogative of the concerned local community. In both cases such consent is a precondition for access. A further precondition for access worth noting is the requirement that 'an access applicant who is a foreigner shall present a letter from the competent authority of his national state or that of his domicile assuring that it shall uphold and enforce the access obligations (of) the applicant' (Art. 12). According to Munyi, Rukundo and Haas (2012), this provision is unique because it represents an effort to transfer, at least in part, responsibility for enforcing ABS agreements made with foreign nationals to the competent authorities in the applicants' own countries.

As will be explained in Chapter 4, the Ethiopian negotiators wanted to include similar guarantees in the Teff Agreement, so Article 12 in

Proclamation No. 482/2006 might be a result of lessons learned on the Ethiopian side from the negotiation process.

After prior informed consent has been given, a genetic resources access agreement is to be negotiated. Where community knowledge is involved, the IBC shall take the prior informed consent of the relevant community as the point of departure. The Proclamation lists issues that the access agreement must specify and the obligations placed on the holder of an access permit. The latter include the obligations to inform the IBC in writing of all findings, not to transfer the accessed genetic resources or community knowledge to third parties, to negotiate a new agreement with the IBC if the permit-holder wants to apply for IPR over the accessed genetic resource 'or part thereof' (Proclamation No. 482/2006: Art. 17), and to seek the explicit written consent of the IBC if the permit-holder wants to apply for a patent or other IPR over accessed community knowledge.

The type and amount of benefit-sharing, as well as the sharing of non-monetary benefits between the state and local communities, shall be decided in each of the access agreements concluded with the IBC. However, Article 19 lists various types of benefit sharing that might be included in such agreements. The share of monetary benefits from access to genetic resources not going to the local communities is to be used for the conservation of biological diversity and promotion of community knowledge.

Further, the holders of access permits must submit periodical reports to the IBC on the progress of their work and any findings. The IBC is given the right to suspend or terminate access agreements if permit holders 'have violated or failed to comply with the provisions of this Proclamation or the terms and conditions of the access agreement' (Proclamation No. 482/2006: Art. 21) or if there is a risk that the access will damage the genetic resource, the environment or the public interest.

Exploration for genetic resources without an exploration permit from the IBC is prohibited (Art. 22). The only exceptions relate to customary use and exchange, sales of biological resources for direct consumption and state institutions in charge of conservation.

In Part Six of the Proclamation, on the administration of access, the responsibilities of local communities, regional bodies and customs offices are specified. Local communities and regional bodies are to ensure that nobody from outside the communities in question accesses genetic resources without a proper access permit. Similarly with the responsibilities of the customs offices: they must ensure that all genetic resources to be taken out of the country are accompanied by an export permit issued by the IBC.

Here we should note that when the powers and duties of the IBC are outlined in this part, no distinction is made between powers and duties. As a result, it is unclear what the institute *may* do and what it *must* do.

In connection with the Teff Agreement, we may note Article 33 of the Proclamation, which states: 'access agreements made prior to the coming

into force of this Proclamation shall be revised and harmonized with the provisions of this Proclamation', and that access to genetic resources under such agreements 'shall be suspended' until the agreements are 'revised and harmonized with the provisions of this Proclamation'. These provisions apply to the Teff Agreement, as this was signed before Proclamation No. 482/2006 entered into force. However, the Teff Agreement was considered to be in harmony with Proclamation No. 482/2006, so it was not suspended or revised.

Proclamation No. 482/2006 also contains provisions on penalties. These seem quite strict, as the general rule regarding punishment for accessing genetic resources or community knowledge and exploring genetic resources without a permit from the IBC is 'rigorous imprisonment of not less than three years' (Art. 35) in addition to a fine. If the genetic resource in question is endemic to Ethiopia, the minimum term of imprisonment is five years and the maximum twelve. However, it is also specified that if the offences in question are 'committed in negligence', the penalty shall be a fine or 'simple imprisonment of not less than three months' (ibid.). This means that, for example, a foreign scientist who is unaware of the ABS legislation in Ethiopia and who explores or accesses genetic resources without the necessary permit might be punished with only a fine of minimum five thousand birr; provided he or she is willing and able to pay the fine, such a person will then not face imprisonment.

Article 37 gives the Council of Ministers the power to 'issue regulations necessary for the proper implementation' of the Proclamation. This is what was done with the issuing of Council of Ministers Regulation No. 169/2009.

Proclamation No. 482/2006 on access to genetic resources and community knowledge was a huge step for Ethiopia in its efforts to implement the CBD in terms of ABS, and is inspired by the African Model Law as well as the Bonn Guidelines. It was also informed by the experiences with the negotiation of the Teff Agreement in 2004, which showed what kinds of questions might arise in practice when negotiating ABS agreements. As such it was not part of the legislative framework for the adoption of the Teff Agreement, but is important as a first attempt to implement lessons learned from this agreement.

3.2.5 Regulation on access to genetic resources and community knowledge

In 2009, Ethiopia introduced a new regulation on access to genetic resources and community knowledge. This regulation, Council of Ministers Regulation No. 169/2009 of 9 November 2009, is titled 'Council of Ministers Regulation to Provide for Access to Genetic Resources and Community Knowledge, and Community Rights' and was developed partly on the basis of lessons drawn as a result of the Teff Agreement. The regulation specifies the procedures to be followed concerning access to and benefit sharing from Ethiopian genetic resources. It operates with two types of access procedures: one for commercial access, and one for non-commercial access. Annex 1 and 2, respectively, set out the specific requirements as to what such applications must contain.

The requirements for commercial access applications are somewhat stricter and more complicated. Such applications must be submitted in accordance with the specifications of Annex 1. If any information is missing from an application, the IBC, as the institute responsible for the entire access proceedings, must return it to the applicant to be completed. If an application contains all the required information, it is admitted and registered. The IBC must then examine the application. 'If it ascertains that there is sufficient ground to deny the proposed access', access is denied; however, if it ascertains that there is no ground sufficient to deny the intended access, the IBC must give public notice of the access application in question(Art. 5). Clearly, the point of departure is whether the application can be denied.

If the application is not denied at this point, public notice at the expense of the access applicant is to be given in a national newspaper, as well as in 'the local newspaper of the locality where the access is intended to take place' (Art. 6), if appropriate. A public notice must include a 'description of the proposed genetic resource and/or the community knowledge' and 'the proposed use of the genetic resource and/or the community knowledge' (ibid.).

Any person may then, within 30 days from the date of publication, 'lodge objection to' or 'give comment on' (Art. 6) the access application in question. The IBC can also request relevant institutions to provide their opinion. Any information communicated to the IBC during this time or 'in the course of monitoring access' (Art. 7) is public. However, 'upon acceptable justification', confidentiality may be granted by the IBC for a period of up to 10 years – but not regarding information 'on the identification of the applicant, the genetic resource to be accessed, the locality where the genetic resource is found, the supplier of the genetic resource or the relevant institution accompanying and monitoring the access' (Art. 8).

Also with the next step in the process, the point of departure is whether there exist sufficient grounds to deny access. When 30 days have passed since publication of the access application, and the IBC has examined any public objections and opinions submitted, the institute must either deny the proposed access, 'if it ascertains that there exists a sufficient ground' (Art. 10) to do so; or, 'if it ascertains that there exists no ground sufficient to deny access', it must 'determine that the access may be granted and call upon the access applicant to negotiate an access and benefit agreement' (Art. 10). As the access only *may* be granted and negotiations are to be initiated, this presumably means that access will be denied if the negotiations are not successful. If access to community knowledge is included in the access application, the IBC is responsible for securing community consent.

The section of the regulation on non-commercial access procedures, section two, stipulates that 'upon receipt of access application by national higher learning or research institution or an inter-governmental institution based in Ethiopia' presented in accordance with Annex 2 of the regulation, the IBC 'shall, having determined the obligation the applicant shall have while having access and upon signing of access agreement to this

effect, grant access to the applicant' (Art. 12). This indicates that the only entities encompassed by the rules for non-commercial access are Ethiopian institutions or institutions based in Ethiopia; further, that an Ethiopian entity that cannot be classified as a 'higher learning or research institution' and institutions based in Ethiopia that are not 'inter-governmental' cannot access genetic resources and community knowledge as non-commercial entities. Examples of institutions that would presumably fall outside the scope of section two include national and international non-governmental organizations, as well as other non-commercial foreign entities. Moreover, the phrasing of Article 12 makes the granting of access to the applicants covered by it automatic, in the sense that the IBC 'shall' grant access as long as the application is in accordance with Annex 2 and the IBC has determined the obligations of the applicant.

The institutions granted access under Article 12 cannot take the genetic resources in question out of Ethiopia unless given explicit permission to do so. If the IBC has established that it is not possible to undertake the research in Ethiopia, it may state this in the access permit and grant permission to move the resources out of the country.

Regulation No. 169/2009 also specifies the procedures to be followed for access under the Multilateral System of the Plant Treaty (MLS). Access in accordance with the MLS can be granted if 'the type of the genetic resource requested is listed' in Annex 1 of the Plant Treaty and 'the intended use of the genetic resource is solely for the purpose of utilization and conservation for research, breeding and training for food and agriculture, provided that such use does not include chemical, pharmaceutical and/or other non-food or feed industrial uses', and provided the applicant is a citizen of a member country to the Plant Treaty (Art. 14). The IBC is the entity to grant the applicant access if the conditions in Article 14 are met, and is charged with following up and monitoring whether the utilization of the resource provided in this way is in compliance with the Standard Material Transfer Agreement.

As mentioned, the IBC is responsible for securing community consent. Article 21 of the Regulation refers to 'the survey it has undertaken on the distribution of genetic resources and/or community knowledge'; on the basis of this survey and in consultation with the relevant regional bodies, it shall identify 'the community which is the custodian of the community knowledge', as it is this community which 'shall give consent to the access application'. If the community resides in only one Woreda,[45] the Woreda Council will be the body granting community consent; if it resides in different Woredas in the same region, a committee under the Regional Council, consisting of representatives from the Woredas in question, will grant the consent. Finally, if the community lives in an area that falls under different regions, a committee under the House of Peoples' Representatives will be the body to grant consent. According to Article 14, these bodies 'shall give community consent in accordance with the procedure of their respected councils'. A copy of the consent

[45] Woredas are composed of a number of wards, or neighbourhood associations, which are the smallest units of local government in Ethiopia.

shall be sent to the IBC and filed. All costs associated with obtaining community consent are to be covered by the applicant.

The Regulation does not mention under what circumstances communities may or may not give their consent, but in Proclamation No. 482/2006 it is specified that, with regard to access to community knowledge and prior informed consent, local communities have the right to 'refuse consent when they believe that the intended access will be detrimental to the integrity of their cultural or natural heritages' (Proclamation No. 482/2006: Art. 7). In addition, they are given the right to withdraw or place restrictions on consent already given to access community knowledge if they find out that the consent is 'likely to be detrimental to their socio-economic life or their natural or cultural heritages' (ibid.) and the right to demand that the prior informed consent given by the IBC to access their genetic resources is restricted or withdrawn if they discover that this access is likely to be detrimental in the same way.

The monetary resources resulting from access permits 'shall be deposited in a special fund called 'access fund' (Regulation No. 169/2009: Art. 26) and the money from each agreement 'shall be deposited in a separate account in the access fund' (Art. 26). The money in these accounts is to be used either to 'finance projects designed for the conservation and promote the sustainable utilization of the biodiversity resources and the associated community knowledge' (Art. 27) or to 'finance development projects designed to benefit the community which is the custodian of the genetic resources and/or the community knowledge accessed' (Art. 28). The development projects can therefore be seen as a direct form of benefit-sharing, whereas the biodiversity project represents more of an indirect form of benefit-sharing. With biodiversity projects, the IBC shall invite relevant regional and federal bodies to submit project proposals, whereas for development projects the IBC shall identify the community to benefit, on the basis of the previously mentioned survey and in consultation with relevant regional bodies.

With regard to the development projects, it is also specified that when the identified community 'resides in an area which lies in different Woredas, Zones or Regions, the relative share of the communities residing in such Woredas, Zones or Regions from the access money shall be determined based on their relative contribution to the conservation of the genetic resources and/or the community knowledge' (Art. 29) in question. In practice, however, it is very likely to prove difficult to determine the extent to which the various communities have contributed to conservation of the relevant resources and/or knowledge.

According to Regulation No. 169/2009, the IBC shall maintain an access register that is open to the public. Further powers and responsibilities of the institute include issuing the directives necessary for implementation of the Regulation, coordinating the relevant institutions and encouraging residents in possession of genetic resources covered by the MLS to include them in the MLS.

Annex 1, which specifies what commercial access applications must contain, requires that when the access applicant is a foreigner, this applicant

must 'confirm that he can present' a letter from the competent authority in his country 'assuring that it shall uphold and enforce the access obligations if the applicant is granted access' (Annex 1: Art. 2.2). The inclusion of this provision can be seen as one of the results of experience with the Teff Agreement: many of the stakeholders interviewed in Ethiopia said that the importance of such guarantees and the need to involve government institutions in the user-country were among the main lessons learned from this agreement.[46]

3.2.6 Relevance for the Teff Agreement in sum

As we have seen above, the IBC has had responsibility for issuing access permits for the bioprospecting of genetic resources since 1998. This means that the IBC was in charge of issuing such permits under the entire period in question with regard to the story of the Teff Agreement, including its predecessor, the Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products. However, until 2004, the IBC was accountable to EARO, and then became accountable to the Ministry of Agriculture and Rural Development. This is important for understanding the course of developments (see sub-chapter 4.1).

We have also seen that the IBC reports to EPA in terms of CBD implementation in general. Such reporting does not, however, seem to include the implementation of the Teff Agreement. Nevertheless, EPA has been involved at different stages of the history of the Teff Agreement, and in particular in its negotiation, as we will see below.

It is also important to note that when the Teff Agreement was being negotiated there was no explicit legislation or regulation on how to ensure ABS in Ethiopia except for the Articles 12 and 13 of Proclamation No 120/1998 providing that IBC was (and still is) in charge of providing access to genetic resources in the country. Further, the proclamation establishing the IBC did not provide any details as to how access permits were to be issued, or upon what conditions. On the other hand, as a party to the CBD, Ethiopia had the Bonn Guidelines, and also the African Model Law, to which it had significantly contributed. In the absence of national regulations, these documents were important for the negotiations of the Teff Agreement. They were also central for the development of the proclamation and the regulation on access to genetic resources and community rights, which are relevant to the Teff Agreement in terms of incorporating lessons learned from its negotiation.

Finally, we have seen that EIPO is a relevant institution with regard to the Teff patent, even though its possibilities for action towards patent offices in other countries are limited.

[46] This issue was mentioned by Dr Kebebew Assefa (interview at Debre Zeit, 24 October 2011), Mr Regassa Feyissa (interview in Addis Ababa, 24 October 2011), Dr Tewolde Berhan Gebre Egziabher (interview in Addis Ababa, 26 October 2011) and Mr Mesfin Bayou (interview in Addis Ababa, 26 October 2011).

3.3 Legislation in the Netherlands

The Netherlands has been a party to the CBD since 12 July 1994. It signed the Nagoya Protocol 23 June 2011, but has not yet ratified it. Whereas the Netherlands applies a policy of free access to its genetic resources, no further national measures for implementing ABS have as yet been introduced; among other things, this means that there are also no user-country measures in place.[47]

The Netherlands has introduced legislation on the conservation of genetic resources *in situ*.[48] There is also legislation on intellectual property rights and biotechnology. However, as the Netherlands is the country of origin of only a few species, the Dutch government has not deemed it necessary to introduce legislation that secures national sovereignty regarding access to and use of such resources. The development of common legislation and regulations within the European Union is, according to the Dutch government, being considered.[49]

3.4 Summing up institutional and legal frameworks

When the Teff Agreement was signed in 2005, it was hailed as one of the most advanced and promising ABS agreements to be negotiated in connection with the Convention on Biological Diversity (CBD). In this chapter we have seen how the CBD is relevant, in that it provides the international framework for the conservation and sustainable use of biological diversity, a well as of the fair and equitable sharing of the benefits from the use of these resources. We have also presented the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (NP) to the CBD, which was adopted in 2010 and is relevant for this study in terms of the lessons that can be derived for its future implementation. Finally, we have presented the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) with its Multilateral System of Access and Benefit Sharing (MLS) which is not directly relevant because teff is not comprised by the MLS, but which is interesting in terms of lessons for the future.

Furthermore we have seen what a central role Ethiopia has had internationally in the negotiations on ABS under the CBD and Farmers' Rights under the ITPRGRA, and in developing model legislation for Africa in this context. We have also seen that Ethiopia has ratified the CBD, signed the Nagoya Protocol, and ratified the ITPGRFA. The Institute of Biodiversity Conservation (IBC) was established in 1998, but its

[47] Interview with Dr Bert Visser, Addis Ababa, 27 October 2011.
[48] See Dutch policy document 'Sources of Existence: Conservation and the sustainable use of genetic diversity', available at: http://documents.plant.wur.nl/cgn/pgr/ABSFocalPoint/documents/note_on_biodiversity_Complete.pdf and its summary: http://documents.plant.wur.nl/cgn/pgr/ABSFocalPoint/documents/note_on_biodiversity_Summary.htm
[49] Ibid.

history goes back to 1976. The IBC has had responsibility for issuing access permits for the bioprospecting of genetic resources since 1998. This means that the IBC was in charge of issuing such permits under the entire period in question with regard to the story of the Teff Agreement, including its predecessor, the Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products. However, until 2004, the IBC was accountable to the Ethiopian Agricultural Research Organisation (EARO, now Ethiopian Institute of Agricultural Research, EIAR), and then became accountable to the Ministry of Agriculture and Rural Development only after that. This is important for understanding the course of developments with regard to the MoU and the Teff Agreement. Also the Environmental Protection Authority (EPA) has a role in this context, both in facilitating the negotiations for the Teff Agreement, as we will come back to, but also since IBC reports to EPA in terms of ABS issues. We have seen that EIPO is a relevant institution with regard to the Teff patent, even though its possibilities for action towards patent offices in other countries are limited. It is furthermore important to note that when the Teff Agreement was being negotiated, there was no explicit legislation or regulation on how to ensure ABS in Ethiopia except for the Articles 12 and 13 of Proclamation No 120/1998 providing that IBC was in charge of providing access to genetic resources in the country. Instead, the Bonn Guidelines, and the African Model Law provided important guidance for the negotiations of the Teff Agreement. The later proclamation (2006) and the regulation (2009) on access to genetic resources and community rights incorporated lessons learned from the negotiations of the teff agreement, but came too late to help out during the negotiations.

Finally, we have seen that the Netherlands has ratified the CBD, signed the Nagoya Protocol, and that it has ratified the ITPGRFA. Whereas the Netherlands applies a policy of free access to its genetic resources, no further national measures for implementing ABS have as yet been introduced; among other things, this means that there are also no user-country measures in place. The development of common legislation and regulations within the European Union is being considered.

4 The story of the Teff Agreement: early history, negotiations and adoption

4.1 The short story: A timeline (I)

1994: 31 May – Ethiopia ratifies the CBD through Proclamation No. 98/1994

1997: Larenstein University of the Netherlands (later Van Hall Larenstein University) starts collaboration with Mekelle University and Alemaya University of Ethiopia on two teff projects

1998: 25 June – the IBC established by Proclamation No. 120/1998, mandated, *inter alia*, to grant access permits and issue regulations specifying access criteria (this Proclamation was later amended by Proclamation No. 381/2004 of 13 January 2004)

2000: Two Dutch inventors from the company Awenyddion, Dr A.L. Buwalda and Dr A.J.O. van Velden, learn about teff from staff at Larenstein University who have been involved in collaboration projects with Ethiopia and have carried out small experiments on teff at Larenstein University. The two inventors embrace the idea of growing teff in the Netherlands and run a first field experiment that is not very successful in terms of yield.

2001: The two inventors seek support for the introduction of teff to the Dutch market, but without success. They approach the Hilbrands Laboratory for Soil-borne Diseases (HLB) at Wijster. The Deputy Director, Jans Roosjen, shows interest, but the Director does not. Two retired employees and shareholders of the company, who still do some work there, are involved in the discussions: Dr Arnold Mulder and Dr Lodewijk Turkensteen.

2002**:** A conflict over teff at HLB results in Jans Roosjen being fired from the company on 25 February 2002. In response to this, also Dr Arnold Mulder and Dr Lodewijk Turkensteen leave the company. They decide to start a new company, and invite Jans Roosjen to join them; he in turn invites Hans Turkensteen. Soil and Crop Improvement (S&C) is established on 21 October 2002 with Jans Roosjen as General Director and Hans Turkensteen as Financial Director. Jans Roosjen and Hans Turkensteen also involve the two inventors in S&C and invite them to become shareholders. In practice Hans Turkensteen leads the company.

2002: Teff is sown experimentally for research purposes on around 17 hectares in the Netherlands.

2002: Hans Turkensteen contacts Debre Zeit Agricultural Research Centre about access to teff varieties on behalf of S&C.

2003**:** March – H. Turkensteen visits Idaho, to find farmers interested in growing teff there; he informs the newspaper *Idaho Statesman*

(13 March) that the S&C company is aiming for 300 acres of teff in Idaho in 2003.

2003: 26 March – a Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products between the Ethiopian Agricultural Research Organization (EARO), Larenstein Transfer (a fully-owned subsidiary of Larenstein University) and S&C is finalized and thereafter signed.

2003: 29 April – Ethiopia ratifies the Plant Treaty through Proclamation No. 330/2003.

2003: 22 July – S&C files a patent application in the Netherlands on the processing of teff flour.

2003: By August, a partnership of 91 agrarian entrepreneurs has been set up for teff production and experimentation in the Netherlands; 620 hectares of teff are harvested.

2003: 21 August – the manager of Debre Zeit Agricultural Research Centre sends a letter 'To whom it may concern', informing about the sale of 1,440 kg teff seeds to Larenstein University for research and development purposes: 120 kg each of 12 specified teff varieties.

2003: September – Dutch television documentary on teff is aired.

2003: 19 September – the Ethiopian Ministry of Foreign Affairs (MFA) sends a letter to the IBC requesting follow up and necessary action regarding teff production in the Netherlands and the patent application on teff.

2003: 7 October – the IBC sends a letter to the Ethiopian Consulate in The Hague requesting information about the S&C patent application.

2003: 6 November – a meeting is held at the Ethiopian Ministry of Rural Development on the 'research and development of teff in the Netherlands' and how to follow up the MoU.

2003: 3 December – a letter on the teff issue is sent from the Consulate General of Ethiopia in The Hague to the IBC.

2004: 13 January – Proclamation No. 381/2004 amends the proclamation that established the IBC; the institute is no longer accountable to the EARO but to the Ministry of Agriculture and Rural Development, established on that same day by merging the Ministries of Agriculture and of Rural Development (Proclamation No 300/2004).

2004: 13 February – the international Coalition Against Biopiracy awards S&C the Captain Hook Award in the category 'Most

Outrageous' for 'seeking to negotiate joint ownership of Ethiopian teff varieties with the Ethiopian government, and for falsely claiming that Soil & Crop has acquired intellectual property for growing the teff crop as well as for the production of all products containing teff or teff-flour'.

2004: 23–28 March – negotiations take place between the IBC, EARO and S&C regarding access to and benefit sharing from teff genetic resources.

2004: A new company is established,[50] Health and Performance Food International BV (HPFI), aimed at introducing teff to Europe, North America, Australia/Oceania and the Far East. All shareholders from S&C, except for the two inventors, are invited as shareholders of the new company, in addition to several new shareholders. H. Turkensteen and J. Roosjen become co-directors. S&C continues to exist, but is now treated as a subordinate part of HPFI.

2004: 22 July – HPFI files a patent application on processing of teff flour with EPO.

2004: December – the text of Teff Agreement between Ethiopian and Dutch counterparts is finalized.

2005: 24 March – the patent application on the processing of teff flour is published internationally by the World Intellectual Property Office (WIPO), under the Patent Cooperation Treaty (PCT).

2005**:** 5 April –the Teff Agreement is signed by representatives of the IBC and HPFI, witnessed by representatives of the Dutch and Ethiopian authorities, and including EARO as a party.

4.2 How it all began

In order to understand the Teff Agreement and its development, it is important to know about the events that preceded it. This sub-chapter focuses on the origin of Dutch–Ethiopian collaboration on teff, on the establishment of the institutions that entered into the Teff Agreement in 2005 and how the Teff Agreement was initiated and negotiated. The story is quite complicated, particularly the developments regarding the Dutch companies.

4.2.1 The beginnings: Research cooperation

The story of the cooperation between Ethiopia and the Netherlands on teff genetic resources started in 1997, three years after Ethiopia had

[50] According to Dr Arnold Mulder and Dr Lodewijk Turkensteen, this company was offically established on 28 July 2005, but 'set up' in 2004 and initiated already in 2003. As can be seen from the timeline, the patent application to EPO was filed under the name HPFI in July 2004 and the ABS agreement on teff was finalized in December 2004 and signed in March 2005 with HPFI as the user.

ratified the CBD through Proclamation No. 98/1994. Larenstein University of the Netherlands,[51] which had by then been involved in tropical agriculture for almost one hundred years, started collaboration with Mekelle University and Alemaya University of Ethiopia on two teff projects.[52] These projects were warmly welcomed from the Ethiopian side, since teff had received scant attention in Ethiopian research and development due to other priorities, but had remained a major staple crop of significant importance for nutrition in the country. It was hoped that joint research could help to boost the development of teff production for the benefit of Ethiopia.[53]

At that time, EARO (later EIAR) was officially in charge of international agricultural research collaboration. However, one year later, on 25 June 1998, the IBC was established through Proclamation No. 120/1998, to promote and ensure the appropriate conservation, research, development and sustainable utilization of the country's biodiversity. The IBC was, as mentioned in 3.2.2, mandated, *inter alia*, to 'give permits to those who need to collect, dispatch, import or export any biological specimen/ sample' (Art. 6, para. 20). In institutional terms, the IBC was placed under the EARO Board and was thus accountable to EARO. This was not changed until January 2004, when the IBC became directly accountable to the Ministry of Agriculture and Rural Development (see 3.2.2). Prior to then, the division of labour between the two might have been unclear, as it was perhaps not self-evident to EARO that it would have to apply to a subordinate body for permission regarding access to genetic resources.

4.2.2 Dutch companies established to produce and sell teff

In 2000, the two Dutch inventors Mr A.L. Buwalda and Dr A.J.O. van Velden, who had a small company called Awenyddion, learned about teff from Mr Meinders of Larenstein University.[54] Mr Meinders was involved in collaborative teff projects with institutions in Ethiopia,[55] and Larenstein University ran small experiments with teff in the Netherlands with the involvement of students. The two inventors embraced the idea of growing teff in the Netherlands and ran a small field experiment. However, this first trial was not very successful as far as yield was concerned.[56]

According to Dr Arnold Mulder and Dr Lodewijk Turkensteen, the two inventors visited several institutions, including banks and government institutions, to bring the possibilities of growing teff to their attention and

[51] Larenstein University merged with several other universities in 2003 into Van Hall Larenstein University, which shortly afterwards became a part of Wageningen UR.

[52] Information from Memorandum of Understanding on Research and Development of International Markets for Tef-based Products, between EARO, Larenstein Transfer and S&C, 26 March 2003.

[53] Based on various interviews with stakeholders in Ethiopia, October 2011.

[54] According to Dr Arnold Mulder and Dr Lodewijk Turkensteen (e-mail communication with Dr Regine Andersen, 6 March 2012).

[55] Probably Mekelle University and Alemaya University, see 4.2.1.

[56] According to Dr Arnold Mulder and Dr Lodewijk Turkensteen (e-mail communication with Dr Regine Andersen, 6 March 2012).

to try to obtain funding, but with no success.[57] Towards the end of 2001 they visited Hilbrands Laboratory for Soil-borne Diseases (HLB) at Wijster. Dr Arnold Mulder, then retired Director of HLB, was still doing some work there; and Dr Lodewijk Turkensteen, also retired, was supporting the scientific staff of HLB. Both were HLB shareholders. Jans Roosjen, who was the deputy director at that time, became interested in teff, but his director Mrs Janny Peltjes did not see much potential in the crop.[58] The disagreement escalated and, as a consequence, Jans Roosjen was fired on 25 February 2002.

Dr Arnold Mulder and Dr Lodewijk Turkensteen explain that they were unhappy that Jans Roosjen had lost his position, and decided to leave HLB themselves.[59] Subsequently, they decided to set up a research company to combine scientific and applied research. Teff was chosen as one of the main topics of research. As he was unemployed, Jans Roosjen was invited to join them. Preparations started under the leadership of Dr Arnold Mulder, and on 21 October 2002 the company was officially established as Soil and Crop Improvement BV (S&C). While they were preparing to establish the company, Jans Roosjen introduced Johannes (Hans) Turkensteen[60] to the group in March 2002. He was invited to join the company because of his commercial and financial experience. When the company was established, Jans Roosjen was given the position of General Director, while Hans Turkensteen was appointed Financial Director. However, according to Dr Mulder and Dr Turkensteen, Hans Turkensteen in practice led the company from the moment he joined it. In 2002, teff was sown experimentally for research purposes on approximately 17 hectares in the Netherlands.

S&C provided the basis for the establishment of three further companies: Soil & Crop Research and Breeding, Soil & Crop Production Europe B.V. and Soil & Crop Milling and Sales B.V.[61] The sole shareholder of these three companies was S&C. Later, Hans Turkensteen and Jans Roosjen founded other companies: these developments are presented in Chapter 6. S&C and Health & Performance Food International B.V. (HPFI), the latter established in 2004 (see 4.2.9), were the ones that entered into collaboration with Ethiopia.

Where did the teff material initially used by S&C come from? Hans Turkensteen has maintained that the breeding material used by S&C at that time had been obtained from gene banks around the world (Wynberg, 2008: 64). However, he has also referred to research results from S&C

[57] The information in this paragraph is based on e-mail communication between Dr Arnold Mulder with Dr Lodewijk Turkensteen and Dr Regine Andersen, 6 March 2012. The two think that most likely the suggestion was turned down because the two inventors did not know much about farming and had stated that three crops of teff a year could be grown without fertilization.

[58] According to A. Mulder and L.J. Turkensteen, she did not believe in the stories of the two inventors. Source: E-mail communication, ibid.

[59] The information in this paragraph is based on e-mail communication, ibid.

[60] Who, it turns out, is Dr Turkensteen's younger brother.

[61] According to the Bankruptcy Report of the Public Receiver R.A.A. Geene, August 2009.

that showed that the best baking results were achieved by using a mix of Ethiopian/American and European teff grain.[62] As Ethiopian teff had by then reached the Netherlands through the Larenstein collaboration, and the Larenstein connection was among the building blocks of S&C, it seems likely that Ethiopian material was used by S&C from the beginning, possibly together with material from other sources.

In 2002, Hans Turkensteen contacted Debre Zeit Agricultural Research Centre, located southeast of Addis Ababa, concerning access to teff varieties that could perform well in cold climates. According to Jans Roosjen, the harvest of teff in the Netherlands was about 1000 kg per hectare in 2002.[63] It was important to improve the yield, and access to suitable Ethiopian varieties was seen as the key.

4.2.3 Memorandum of Understanding

The request from Hans Turkensteen served as the point of departure for negotiations that led to the Memorandum of Understanding (MoU) on Research and Development of International Markets for Teff-based Products between EARO, Larenstein Transfer (a fully-owned subsidiary of Larenstein University) and S&C. The MoU was finalized on 26 March 2003. It was signed by Hans Turkensteen (as Director of S&C) on the same day, by Dr Demel Teketay (Director General of EARO) on 12 April, and by Henk Dijk (Director of Larenstein Transfer) on 1 June that year.[64]

The MoU covered the registration of Ethiopian and S&C cultivars outside Ethiopia; the right of S&C to use Ethiopian released varieties worldwide upon the payment of royalties; co-ownership of new varieties developed by S&C; research by S&C on baking quality, product development, adaptation to different climate zones and breeding; and research in Ethiopia in collaboration with Larenstein University on production for export, mechanization of teff production and processing. It also covered funding from S&C of activities in Ethiopia and scholarships for Ethiopian students from Larenstein University. Last, but not least, it involved the transfer of genetic material from EARO to S&C, as detailed below.

The preamble of the MoU stated that developing other products than *injera* from teff is an important part of the Ethiopian government's investments in market-based agricultural research. Cooperation with foreign stakeholders was seen as an important tool for the purpose of commercialization, investments and export of teff and teff products. S&C, for its part, sought to initiate research for the benefit of Dutch farmers looking for alternative crops. As the MoU noted: 'S&C found

[62] Hans Turkensteen (2008): Introduction to HPFI bv (Eragrain: 2008), p. 2
[63] *Leeuwarden Courant*, 18 July 2003
[64] Here we may note that Ethiopia ratified the ITPGRFA on 29 April 2003, through Proclamation No. 330/2003 (see sub-chapter 3.2.1). This took place while the MoU was in the process of being signed. Teff was, however, not included in the MLS under the ITPGRFA, so there was no immediate connection between the two processes.

production promising and is targeting interesting niche markets.' The potential market for teff products was believed to be especially strong among athletes, in the organic and health food sector and among people intolerant of or allergic to gluten. Research conducted by S&C and partners had also showed that the baking qualities of teff were promising, and S&C aimed to introduce 'bread, cake, cookies, beer, binding agents, and different types of premixed flour', again according to the MoU.

Also emphasized in the MoU were the cooperation between S&C and Van Hall Larenstein, as well as the university's good relations with Ethiopia: 'in order to secure the required scientific support for its ambitious plans and to benefit from the long lasting relationship that Larenstein University has with Ethiopia, S&C has proposed to Larenstein University to enter into a formal relationship, which Larenstein is willing to accept.' The preamble also mentioned a 'teff fund', to be established in accordance with the MoU, and it was noted that 'the people behind S&C sincerely believe that Ethiopia should benefit from the international developments of this indigenous cereal'.

The objectives of the MoU were listed as being to 'strengthen the position of Ethiopia as a leading teff producer in commercializing the international market for teff-based gluten-free products, encompassing a wide variety of products suitable for consumers with and without intolerance to gluten', 'support Ethiopia to further develop local and international markets for teff-based products' and 'assist and strengthen teff research and production in relation to the project in Ethiopia'.

With regard to the registration of varieties, it was deemed important that Ethiopian teff varieties outside Ethiopia be registered in the name of EARO, to ensure that Ethiopia would benefit from the intellectual property rights of these varieties. S&C was given the responsibility for such registration. However, the phrasing ('S&C will take action to register Ethiopian cultivars outside Ethiopia as far as possible concerning the regulations of UPOV and comparable administration authorities [for example in the USA]') leaves some doubt as to whether the parties were sufficiently informed about plant breeders' rights in general and UPOV (the International Union for the Protection of New Varieties of Plants) in particular, as the text gives the impression that UPOV is a body that grants such rights.

It is also worth noting that Article 4.1 specifically stated that this registration will not take place until 'a renegotiated settlement is reached between S&C, EARO and other relevant institutions in Ethiopia, and possibly, in the Netherlands'. This indicates that the MoU was always seen by the parties as a first step, and that a further 'settlement' was envisioned from the beginning. It could also be argued that the reference to 'other relevant institutions in Ethiopia' meant that the parties signing the MoU were aware of the need to involve other institutions in Ethiopia, like the IBC.

According to Article 4.3, S&C 'has the right to use Ethiopian released varieties worldwide under the conditions of payment of property rights to EARO'; and that S&C may not distribute the seeds of these varieties to

third parties 'without the knowledge of EARO'. Here it is logical to assume that the 'payment of property rights' referred to the royalties S&C were to pay to EARO: according to Article 6.2 this was to amount to EUR 10 per hectare. However, the inclusion of 'up to the decision of EARO' preceding this part of the article makes this particular commitment somewhat unclear.

With regard to new teff varieties developed by S&C, the MoU stipulated that these shall be 'co-owned by EARO and S&C', and that both parties can use these varieties 'for their own purposes under the condition that one party should not damage the interest of the other party while doing so'.

The MoU also stated that the information S&C gathered from its research on the baking qualities of Ethiopian teff varieties cultivated in Ethiopia and the Netherlands 'will be shared and can be used for mutual interest' (Art. 5). This presumably meant that the knowledge resulting from this research could be used in projects of benefit to both parties – but not by EARO in projects that would not benefit S&C. Also according to Article 5, the information resulting from research on product development based on grain produced in Ethiopia 'about what variety delivers which results will be shared with Ethiopian counterparts'.

As to the question of production of teff in Ethiopia for export, Article 5.2.1 stated that 'the feasibility to grow teff in Ethiopia and deliver it according to the norms and standards of the gluten free market demands' should be investigated, and that this should encompass the distribution, storing, preparation and packaging of teff, in addition to production.

Article 5 further specified that the knowledge accumulated outside Ethiopia regarding the mechanization of teff production was to be shared with EARO, and that a later agreement on research and development would be reached between Larenstein University and EARO.

According to the MoU, S&C 'is funded through private capital of shareholders, bank loans based on farmers' participation with land to cover risk and limited support by the local government'.

The MoU also introduced a fund, the objective of which was to contribute to the 'improvement of Ethiopian agricultural infrastructure', with the main focus on 'strengthening teff research in Ethiopia for further improvements of the teff-production in Ethiopia' – an idea later included in the Teff Agreement as well. The MoU specified that contributions to this fund, the Foundation Larenstein Ethiopia Teff (FLET), would come from S&C, with Larenstein Transfer responsible for its management. In addition to the above-mentioned royalty payments from the use of Ethiopian teff varieties, funding was stipulated to come from royalty payments from the S&C (also 'up to the decision of EARO') of EUR 5 per hectare from the use of 'new varieties co-owned by EARO and S&C', as well as yearly donations from S&C representing 5% of their net profits – or a minimum of EUR 20,000.

As part of the MoU, S&C was also permitted to purchase between 60 and 150 kg of each of the released Ethiopian teff varieties, to enable them to sow Ethiopian teff in the Netherlands in 2003 (before May 2003) for research and multiplication of seed intended for use in production in 2004. The related activities were dealt with under Article 4.1 on 'Registration of Ethiopian and S&C cultivars' and Article 5.1 on 'Research by and through S&C (outside Ethiopia)'. Article 7 explicitly stated that the S&C was not allowed to 'pass the seeds of these varieties to a third party for research purposes without a written consent of EARO'. In contrast to the similar limitation in Article 4.2 on the distribution of seeds of Ethiopian varieties to third parties, written consent and not just 'the knowledge of EARO' is required under Article 7. However, the specification 'for research purposes' could indicate that S&C was given the freedom to distribute the seed to third parties for other purposes.

4.2.4 Assessment of the Memorandum of Understanding

As we have seen, the initiative that led to the MoU came from S&C, based on their needs for genetic material of teff. The IBC was the actual body in charge of providing access to genetic resources in Ethiopia. However, it was a subordinate body to EARO at that time (see 3.2.2). This might explain why EARO took the responsibility for negotiating the MoU with S&C and Larenstein University, after S&C had approached Debre Zeit Agricultural Research Centre (another sub-ordinate of EARO) for access to genetic resources, even though that was not formally correct. The MoU refers to the necessity of negotiating a new agreement, possibly with the involvement of other institutions in Ethiopia. This indicates that EARO might have been aware of the role of the IBC in such matters, thus preparing the ground for their possible later involvement.[65]

Whereas the objectives of the MoU were rather one-sided, focusing on strengthening Ethiopia in terms of teff production and commercialization, the agreement itself was designed to strengthen all three parties. It is somewhat strange that this is not reflected in the objectives.

Provisions on the registration of Ethiopian varieties outside Ethiopia and the payment of royalties to Ethiopia by S&C appear generous at first glance. However, the provisions were made conditional upon a decision by EARO. They would enter into force only if EARO made the relevant decisions – which was difficult, since plant breeders' rights had become a controversial political issue in Ethiopia. As far as we know, no such decisions were made. Nevertheless, the provision shows the serious intention of S&C to involve Ethiopia in the sharing of royalties under the MoU. When this did not happen, it was due to Ethiopian hesitation. No varieties were registered with Ethiopian ownership and no royalties were paid to Ethiopia based on the MoU.

[65] This assumption was confirmed by Dr. Getachew Belay, who was involved in the process at the time. He said that the provision on re-negotiation was included in the MoU purposely, because they knew that IBC would take over at some point. E-mail communication with Dr Regine Andersen, 4 july 2012.

The provisions on research outside Ethiopia involve some general statements on information sharing with Ethiopia. As no details are provided in this regard, it was probably left to S&C and Larenstein University to decide what information to share.

The provisions on research in Ethiopia define broad research topics but no division of labour or details about how the collaboration was to be organized. Funding was to be facilitated through the Foundation Larenstein Ethiopia (FLET), which was to be composed of funds from S&C, as explained above, and perhaps by additional financial support from other sources. It has not been possible for the authors of this report to find out whether FLET was in fact established, whether it received any funds from S&C and whether any transactions were made to Ethiopia to support research and development on teff cultivation and production. We have been unable to trace any indications that this happened; in view of later developments as regards S&C, we assume that FLET never materialized. What we know, however, is that teff material was transferred to S&C, on the basis of the MoU.

4.2.5 Transfer of teff to the Netherlands under the MoU

In 2003, Debre Zeit Agricultural Research Centre sold 1,440 kg of teff seeds to Larenstein University for research and development purposes: 120 kg each of 12 specified teff varieties. The sale was made known in a letter 'to whom it may concern' from the manager of Debre Zeit Agricultural Research Centre, Dr Solomon Assefa, on 21 August 2003, and in which reference was made to the MoU.

Since the letter is addressed simply to 'to whom it may concern', it is somewhat unclear who the actual recipients were. As the authors of this report received a copy of the letter from the IBC Archives, we may assume that the IBC was among the recipients. It can also be noted that although it is S&C and its need for seed from Ethiopian teff varieties that is referred to in Article 7 of the MoU, this letter shows that the seed was in fact sold to another party to the MoU: Larenstein University. We assume that it was shared with S&C, since they had requested it in the first place.

In Ethiopia, there has been discussion as to whether this transaction was legitimate. A strong argument for the legitimacy of the transfer is that it took place after a comprehensive process between the parties that resulted in a MoU covering specified benefits for Ethiopia. Another argument is that the Dutch parties had opted for the quite time-consuming legal path to access, instead of simply purchasing seed from the market in Ethiopia. However, it has also been discussed whether all varieties were available on the market. Against the legitimacy of the transaction, it can be argued that it was the IBC that was in charge of providing access to genetic resources – and that, since they were not involved in the process, EARO was not entitled to enter into the MoU with Dutch counterparts, and Debre Zeit Agricultural Research Centre was not entitled to provide access to these genetic resources. On the other hand, at this point the IBC was still formally subordinate to EARO, as stipulated in Article 3 of Proclamation No.120/1998 (see 3.2.2), and this constellation might have caused confusion as to where the power to make decisions rested. In this

context, it has also been noted that permission to purchase the seed was given by the National Seed Industry Agency (NSIA), which serves as a focal point for policy and regulatory functions of the seed sector, and that there was disagreement as to whether IBC or NSIA was in charge of providing access to these varieties.[66]

It has also been remarked in Ethiopia[67] that the amount of seed was large, indeed too large to justify the claim that it was to be used for research purposes. However, the MoU explicitly states that S&C is permitted to purchase between 60 and 150 kg of each of the released Ethiopian teff varieties, to enable them to sow Ethiopian teff in the Netherlands in 2003 for research and multiplication of seed intended for use in production in 2004. In other words, all parties were aware of the fact that these seeds should not only be used for research but also for multiplication, intended for production of teff in the Netherlands. The reason why this has come up as an argument in Ethiopia is probably that the specific contents of the MoU were not known, and that it was assumed that it dealt solely with research purposes.

The weak point of this part of the agreement is the provision that these seeds should not be passed on to third parties for research purposes, a formulation that may allow the transfer of the seed to third parties for other purposes, for example multiplication and production.

4.2.6 S&C teff production, and patent rumours

Still in March 2003, Hans Turkensteen visited Idaho in the northwestern USA, to find farmers interested in growing teff there. In an interview with the newspaper *Idaho Statesman* (13 March), he stated that the company was aiming for 300 acres of teff to be grown in Idaho in 2003.

On 22 July 2003, S&C filed a patent on the processing of teff flour in the Netherlands. In autumn 2003, S&C-produced teff flour was introduced to the market in the Netherlands for the first time. The grain was milled by the company Koopmans Meel, which used a special mill for the purpose. According to Marten Jongsma, Accounts Manager at Koopmans Meel BV, the cost of teff flour was initially several times higher than that of wheat flour,[68] although it might be possible to reduce this difference if teff were to be produced on a larger scale. According to the Director of Koopmans Meel BV, Daan Koopmans, teff was warmly received, however.[69] S&C together with Koopmans Meel BV were engaged in a partnership with 91 farmers who had sowed a total of 620 hectares with teff in 2003.[70]

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[66] Information provided by Dr Getachew Belay in an e-mail to Dr Regine Andersen, 4 July 2012

[67] For example at the seminar on the implementation of the tef agreement in Adama, Ethiopia, 16–17 March 2012 (see 1.5).

[68] According to an article by Loentien Braakman in the Dutch magazine *Vakblad* from August 2003.

[69] *Leeuwarden Courant*, 18 July 2003.

[70] *Leeuwarden Courant*, 18 July 2003, and the Dutch magazine *Vakblad*, August 2003.

In July and August 2003, two different Dutch magazines announced that S&C had patented the production and processing of teff in the European Union.[71] At that time this was in fact not true – but what is important for our story is that it indicates that rumours regarding the patent application were already circulating.

At this point the information about a patent application on teff had spread to Ethiopia as well. A letter from the Ethiopian MFA to the IBC from 19 September 2003 shows that the ministry had been informed by the Ethiopian Consulate in The Hague about a documentary on teff and teff production in the Netherlands recently aired on Dutch television, and that a patent application had been filed on teff by S&C and Koopmans Meel BV. The letter stated that the Ethiopian government was very disappointed about this development and instructed the IBC to follow up. The two Dutch magazine articles mentioned above were attached to this letter. However, the ministry seemed aware that no teff patent had been granted yet. Copies of this letter were also sent to the EPA, the Ministry of Trade and Industry, the Ministry of Agriculture, the Ethiopian Science and Technology Commission and the Ethiopian Embassy in Addis, which illustrates the importance that the MFA accorded to this matter.

4.2.7 Second thoughts in Ethiopia, and discussions on how to proceed

Seeking further details about the patent application on teff that had been filed by S&C,[72] the IBC sent a letter to the Ethiopian Consulate in The Hague 7 October 2003, requesting information. In response to this the Consulate General of Ethiopia in The Hague sent a letter to the IBC on 3 December 2003 (a copy was also sent to the MFA) informing the IBC about the response the Consulate received from the Dutch Patent Office regarding the patent: that it had not yet been granted. According to this letter, the Ethiopian Consulate in The Hague and the Ethiopian Embassy in Brussels had discussed the question of patents on teff and had come to the conclusion that, as Ethiopia had been promoting the view that patents in general should be granted only on processes and procedures and not on end products, this principle should form the basis of teff negotiations as well. The Consulate and the Embassy had also discussed the implications of anticipated policy changes with regard to agricultural subsidies in the EU. Here the letter recommended that negotiations on teff be undertaken with a view to not damaging trade relations between the EU and Ethiopia, and to ensuring that teff export from Ethiopia to the EU could be encouraged in the future. In this context, the Consulate and the Embassy believed that it would be central to emphasize the suitable agro-ecological conditions and cheap costs with regard to teff production in Ethiopia, in order to attract companies.

[71] Ibid.

[72] The patent application is referred to as having been filed by both S&C and Koopmans Meel, but as the authors of this report have not seen this patent application (it was presumably this application that was later withdrawn), no conclusions can be drawn on this point.

Thus we see that, after the MoU was signed in the first half of 2003, the Ethiopian MFA entered into the process. The ministry also corresponded with the Dutch Embassy in Ethiopia, the background being the need for Ethiopian institutions to gain confidence in the good intentions of the Dutch counterparts to the MoU.

In a letter to the Ethiopian MFA from the Embassy of the Netherlands in Ethiopia after the MoU in 2003,[73] the Embassy responded to the questions, presumably communicated in an earlier letter,[74] of the Director General Europe and America (presumably at the ministry) regarding the cultivation and processing of teff by S&C. The letter briefly explained the history of S&C, referred to the MoU and its main contents, including the benefits for Ethiopia, and S&C's responsibility for registering teff outside Ethiopia in the name of the Ethiopian government. It further stated that the MoU concerned research programmes in the Netherlands by S&C and in Ethiopia by EARO and Larenstein University. In reference to the FLET fund mentioned in the MoU, the letter explained that a fund had been created to finance research in Ethiopia; it mentioned the S&C commitment to contribute 5% of its profits to this fund and that the minimum contribution per year was set to EUR 20,000. In conclusion, the Embassy noted that it believed that the activities of S&C were not in violation of international laws and plant breeders' rights, and that the MoU did take the interests of Ethiopia into account.

However, as a meeting was later held where these issues were discussed by the Ethiopian side, it would appear that this letter from the Dutch Embassy had not completely assuaged the fears of the Ethiopian government. This meeting was held on 6 November 2003 at the Ministry of Rural Development,[75] and the topic was 'research and development of teff in the Netherlands'. According to the tentative agenda, the meeting was to discuss the following: global trends in teff culture (including worldwide distribution of teff, teff germplasm worldwide, teff production outside Ethiopia, food and sources of teff in the USA and teff export from Ethiopia); the EARO–Larenstein University–S&C contact (including background, the MoU and activities); teff research and development in the Netherlands, the visit report and 'what is expected of the group' (discussion and decisions regarding the upcoming visit of the Dutch partners); whether the MoU should be accepted/rejected/modified; plans for the meeting (variety registration, management of the teff fund, research cooperation and other negotiable points); and the assigning of responsibilities.

The inclusion of a 'visit report' on the agenda indicates that someone must have travelled to the Netherlands to look into teff activities there. The agenda item 'upcoming visit of Dutch partners' and associated

[73] This letter is not otherwise dated.

[74] The authors of the present report did not receive any specific information about communication preceding this letter between sender and recipient, but assume that the MFA had contacted the Embassy with questions.

[75] On 13 January 2004, the two Ethiopian ministries of agriculture and of rural development were merged into the Ministry of Agriculture and Rural Development, through Proclamation No. 300/2004.

agenda items indicate that such a visit from the Netherlands was expected soon and that certain issues were to be discussed, in particular the registration of varieties, the fund, and research collaboration. This tentative agenda suggests that these three elements were seen as central by the Ethiopian stakeholders. This document also indicates that at this point no conclusion had yet been reached as to the follow-up of the MoU, and discussions were still underway as to what the best approach would be.

Then the Office of the Prime Minister in Addis Ababa expressed some concern regarding the situation, and the IBC made it clear that it should take over the case, as the institute was in charge of permits on access to genetic resources.[76] In this connection, two meetings were held at the Office of the Prime Minister, where it was made clear that EARO did not have the formal authority to enter into agreements on access to genetic resources on behalf of Ethiopia, and that the IBC should be in charge of further negotiations. In response, EARO said that it had been under the impression that it (EARO) did have the power to handle such issues, but consented to a re-negotiation of the MoU.[77] At the second of these two meetings, the points to be addressed in the new negotiations were identified, and a working paper for the negotiations was developed and sent to S&C.[78]

There were some differences of opinion during these internal discussions in Ethiopia, among other things regarding which institutions should be involved in the new negotiations with S&C and who should sign the agreement. EARO argued that, since the genetic material in question was research material and most of it was registered in their name, they should sign the agreement. This opinion was met with the argument that the material was national and that the national entity with responsibility for such issues was now the IBC.[79]

According to the summary of the pre-negotiation work on the Ethiopian side given in the minutes from the negotiations with S&C, a committee was established by the Ministry of Agriculture and Rural Development, on instruction from the Ministry of Foreign Affairs, to investigate the teff case. The Ministry of Agriculture and Rural development headed this committee, while the IBC, EPA, EARO and the Ethiopian Science and Technology Commission were represented. This committee concluded that the MoU was not sufficiently clear regarding some issues, that it did not protect Ethiopia's interests sufficiently and that it had not been signed by the appropriate institution, i.e. the IBC.

As a result of these discussions, the Ethiopian government requested EARO (now EIAR) to bring S&C into negotiations with the IBC, in order to enter into a formal agreement with the IBC on behalf of Ethiopia.[80] When S&C were informed that they would have to negotiate a new

[76] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[77] Ibid.
[78] Ibid.
[79] Ibid.
[80] This information was provided by several interviewees in Addis Ababa, October 2011.

agreement with the IBC, they were somewhat unwilling at first, and responded that they already had an agreement with EARO. However, when they realized that the relevant Ethiopian legislation was clear on this point, they agreed to proceed accordingly.[81]

The reorganization of the relevant authorities in Ethiopia may have influenced this process. When the two Ethiopian ministries responsible for agririculture and for rural development were merged on 13 January 2004 through Proclamation No. 300/2004, the status of the IBC was also strengthened, through Proclamation No. 381/2004. As mentioned in 3.2.2, the IBC had been institutionally placed under the EARO Board since its inception in 1998 but was now made directly accountable to the new Ministry of Agriculture and Rural Development. This is important background information, because it shows how the division of labour between EARO and the IBC changed during this central period in Ethiopian–Dutch teff collaboration. Originally, EARO was in charge of any permits relating to agricultural research; then the IBC became responsible for permits related to access to genetic resources, while still being institutionally subordinate to EARO; finally, the IBC became independent from EARO in January 2004, which made the division of labour and powers between the two more clear-cut.

4.2.8 The Captain Hook Award for Biopiracy

The importance of further negotiations with S&C became evident when stakeholders in Ethiopia found out that S&C had claimed to have a patent on teff. The Director of Ethiopian Ethio-Organic Seed Action (EOSA), Mr Regassa Feyissa, was informed about these claims at an early stage, and in turn told the ETC Group,[82] which then undertook further research into the claims. On this basis the ETC Group suggested that S&C be awarded the Captain Hook Award for Biopiracy.[83]

Discussing the MoU with the ETC group,[84] S&C mentioned that the Ethiopian government was interested in re-negotiating the MoU.[85] When asked how the fund mentioned in the MoU might be used, Hans Turkensteen 'indicated that the fund might be used to help Ethiopians register their own varieties' (quoted in Captain Hook Awards 2004: 1). He also told the ETC Group that he was frustrated by 'the slow process of negotiations with the Ethiopian government' and 'indicated that S&C plans to seek intellectual property 'with or without them'.[86]

[81] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[82] The ETC Group is an international NGO with headquarters in Canada; among other issues, it works on biodiversity and genetic resources.
[83] According to Regassa Feyissa, interview in Addis Ababa, 24 October 2011.
[84] The ETC group is one of the organizations behind the Coalition Against Biopiracy.
[85] As the company was awarded the Captain Hook Award on 13 February 2004, this means that the company had been told this by the Ethiopian authorities before that date.
[86] See www.captainhookawards.org/winners/2004_pirates

On 13 February 2004, the international Coalition Against Biopiracy awarded S&C the Captain Hook Award for Biopiracy in the category 'Most Outrageous', for 'seeking to negotiate joint ownership of Ethiopian teff varieties with the Ethiopian government, and for falsely claiming that Soil & Crop has acquired intellectual property for growing the teff crop as well as for the production of all products containing teff or teff-flour'.[87] The award was formally announced at a ceremony organized by the Coalition, at the Seventh Conference of the Parties to the CBD in Kuala Lumpur, Malaysia.

In explaining their reasons for giving the award to S&C, the Coalition Against Biopiracy[88] underlined that 'like the other Captain Hook Award winners, S&C had done nothing illegal' and that 'many would say that the company is well-intentioned, and has negotiated a generous benefit-sharing agreement with the Ethiopian government'. However, for the Coalition Against Biopiracy the most important thing was that the company was 'seeking to monopolize teff varieties that were developed over millennia by Ethiopian farmers and community plant breeders'. The Coalition's rationale was that 'ignorance of diversity is no excuse for monopoly'; they opined that 'offering joint ownership of Ethiopian teff to the Ethiopian government is like asking Ethiopia to betray its farmers and become 'equal partners' in a shameful and offensive act of biopiracy' (all quotes in this paragraph from Captain Hook Award 2004: 1).

According to many of the Ethiopian stakeholders, S&C was under pressure and facing bad publicity after the signing of the MoU, and that was part of their reason for entering into new negotiations and signing the Teff Agreement.[89]

On 16 February 2004, the Consulate General of the Federal Democratic Republic of Ethiopia in The Hague wrote an official letter[90] to notify of the activities being undertaken by the S&C in the Netherlands (Dalle 2010: 26–27). In the letter, the General Consulate reminded the concerned Ethiopian authorities to pay due attention to the activities that had been started, as well as those planned by the S&C. It was indicated that all concerned Ethiopian government organizations should take urgent and appropriate timely action.

A news report by Joris Tielens in the Wageningen University student newspaper *Wispr* (18 March 2004) titled 'Wageningen involved in conflict over teff. The charge is biopiracy: is the claim nonsense or justi-

[87] Website of the Coalition Against Biopiracy (2004): Captain Hook Awards 2004. See: www.captainhookawards.org/winners/2004_pirates

[88] The Coalition Against Biopiracy consists of civil society and peoples' organizations that came together at the 1995 Conference of the Parties to the CBD in Jakarta. It includes the ETC Group (Action Group on Erosion, Technology and Concentration, based in Canada), SEARICE (South-East Asia Regional Initiatives for Community Empowerment, based in the Philippines) and IPBN (Indigenous Peoples Biodiversity Network, based in Peru).

[89] Interviews with various stakeholders in Addis Ababa, October 2011

[90] Ref. No INV/v2/137/04.

fied?'[91] discusses the claims from the Coalition Against Biopiracy that S&C had engaged in 'biopiracy'. The article notes that negotiations between the S&C and the Ethiopian government on how to share the profits from the company's teff activities had been progressing slowly, but that the company was 'proceeding with its patent applications'. Further, according to this article, Hans Turkensteen, financial director of S&C, had explained that the company had to apply for intellectual property protection of their products in order to ensure sufficient returns on its research investments in the improvement and commercial uses of teff.

The article notes that Applied Plant Research ('PPO') of Wageningen UR had been involved in research on how to cultivate teff in the Dutch climate, and the Van Hall Institute had given advice regarding the use of teff in gluten-free products. In addition, 'Larenstein higher agricultural education college had advised the company in its contact with the Ethiopian authorities.' The article also mentions the negotiations between Ethiopia and the company regarding a new agreement, and refers to Hans Turkensteen having said that because the negotiations with the Ethiopian authorities took so long the S&C had proceeded with its patent applications.

Furthermore, the article mentions Pat Mooney, director of the ETC Group, who stated that the company was attempting to patent varieties of the crop itself. This indication that the company had filed two patents was strengthened by statements made by Turkensteen, who said that he did not wish to specify the exact nature of S&C's two patent applications that he claimed had been submitted in 2003. However, here we may note that if a patent application on teff varieties had been filed in addition to the one on the processing of teff flour, it had probably been rejected, as patenting of plant varieties is prohibited in the EU.

Due to these developments, relations between the university and the company went sour. The article refers to a telephone conversation with Hans Turkensteen, quoting him as having said that 'the university has to stop this bullshit' and that 'I think the position the university has taken in supporting us is good, but I can't appreciate that it is apparently ashamed of us and doesn't want to be associated with us'. This may explain why Wageningen University was not a party to the Teff Agreement when it was finally reached in late 2004.

The article by Joris Tielens is an important source from this period, as central stakeholders were interviewed. The head of Global Cooperation and the International Affairs Directorate of the Dutch Ministry of Agriculture, Marcel Vernooij, is also quoted as having stated that 'the ETC award is based on an initially too-broad text on patents that appeared on the company's website.' At his request, Dr Bert Visser in his capacity as National Focal Point approached the company, after which the website was amended. Then Marcel Vernooij spoke with the

[91] Available at: http://resource.wur.nl/en/wetenschap/detail/wageningen-researchers-involved-in-international-conflict-over-teff/

Ethiopian government, which declared itself pleased with the changes to the website and said it was looking forward to strengthening its cooperation with the Netherlands and with the company, according to Mr Vernooij. In Kuala Lumpur, Mr Vernooij approached the ETC Group and informed them of this. But that did not lead them to change their minds about the Captain Hook Award.

4.2.9 Health and Performance Food International BV is established

Already in 2003, severe disagreement related to the involvement in teff arose between the two inventors Dr Buwalda and Dr Velden on the one side and the other shareholders of S&C on the other.[92] As a consequence, the two inventors were fired from the company. Subsequently, they tried to take the case to the court, where it ended undecided. From that time on, the two inventors were seen as a risk to the further development of S&C. This was a central reason for the establishment of a new company.[93] As we will see, this way of sorting out problems by establishing new companies has been chosen also at later crossroads.

Hans Turkensteen suggested establishing a new company to all shareholders of S&C except for the two inventors, Drs Buwalda and Velden.[94] He saw a great commercial potential in teff, and wanted the new company to be more commercially oriented and aimed at introducing teff to Europe, North America, Australia/Oceania and the Far East. He wished to organize a business chain involved in teff production, processing and sale.[95] The new company was named Health and Performance Food International BV (HPFI), and a foundation of HPFI shareholders was set up.[96] The directors of HPFI itself were Hans Turkensteen and Jans Roosjen, participating in the company through their private companies Tucko Beheer BV and Roosjen BV respectively.[97] All shareholders participated through their private companies, most of which were formed in the course of 2004, before signing up for the new company, Health and Performance Food International (HPFI). This was to safeguard them-

[92] According to Dr Lodewijk Turkensteen and Dr Arnold Mulder (telephone interview with Dr Regine Andersen, 1 March 2012).
[93] According to Dr Lodewijk Turkensteen and Dr Arnold Mulder (telephone interview with Dr Regine Andersen, 1 March 2012).
[94] According to Dr Lodewijk Turkensteen (telephone interview with Dr Regine Andersen, 1 March 2012).
[95] See 'Introduction to HPFI bv', brochure by Hans Turkensteen from March 2008: www.ecnc.org/file_handler/documents/original/view/198/turkensteen--introduction-to-health--performance-food-international-bvpdf.pdf?PHPSESSID=ba2441d02e93085dcee2718c1e9bc784
[96] According to Dr Arnold Mulder and Dr Lodewijk Turkensteen (personal communication with Dr Regine Andersen 6 March 2012), five new shareholders were invited to participate in the company: Bakker, Bottemanne, Hulst, van Klaveren and NV Teff (a farmers' cooperative).
[97] According to Dr. Arnold Mulder and Dr Lodewijk Turkensteen (personal communication with Dr Regine Andersen 6 March 2012).

selves against claims. S&C continued to exist, but now treated as a subordinate part of HPFI.[98]

4.2.10Analysis: Were there any warning signals?

An important question in connection with analysing the beginnings of this story is whether it is possible, with hindsight, to identify already at this early stage any signs that things could go wrong.

This story starts with collaboration between universities in Ethiopia and the Netherlands concerning the development of teff production in Ethiopia. Through this collaboration, samples of teff came to the Netherlands and stimulated the idea of developing teff for a European market. Based on overly optimistic beliefs in the market prospects for teff, a company was founded. Since collaboration with Ethiopia had already been established through the Larenstein University, trust building between the parties was probably not difficult. All parties shared the enthusiasm about the promising properties of teff and its market potentials outside Ethiopia. The prospects that Ethiopia could benefit from these developments added to the enthusiasm. The involved negotiators and observers from this time report that the atmosphere was good and that they believed that all parties were in good faith. Until this point there were no signs of anything going wrong.

The outcome of this process was the Memorandum of Understanding. This was a document of varying quality, as several provisions were made conditional on further decisions, whereas other provisions were unclear in terms of obligations. Nevertheless, a foundation was to be established to fund research and development activities in Ethiopia and breeding material would be sent from Ethiopia to the Netherlands. Whereas the latter took place, the foundation never seems to have materialized. This can probably in part be explained by developments that took place soon after the MoU had been signed and the material had been transferred.

EARO had to make certain decisions to effectuate central provisions of the MoU. However, uncertainty arose as to the legal status of the MoU in Ethiopia. The MoU was not a legally binding agreement, and it had not been entered into with the government authority formally in charge of entering into such agreements in Ethiopia. The reason for that was probably a combination of two factors. First, S&C was not aware of the division of labour in Ethiopia in this regard, and instead took a direct approach to the institution that had the desired teff material. Debre Zeit Agricultural Research Centre informed its parent institution, EARO, about the request, which was obviously the correct thing to do. However, instead of forwarding the question to the IBC, which would have been formally correct, EARO then negotiated the MoU on its own. One reason for this may be that the IBC was at that time still a subordinate body to EARO, and that EARO thus felt that it could take the responsibility for

[98] According to Dr Arnold Mulder and Dr Lodewijk Turkensteen (personal communication, ibid.), even though HPFI was set up in 2004, the company was not officially founded until 28 July 2005.

the negotiations, perhaps in particular when it referred to further negotiations to be carried out with relevant Ethiopian institutions, probably the IBC. Despite these understandable reasons, EARO was in fact not authorized to negotiate such an agreement on behalf of Ethiopia, and this led to great uncertainty with regard to the legal basis of the MoU and EARO's mandate to follow it up. Thus, the provisions of the MoU needing a decision from EARO could not be implemented, which meant that co-ownership of teff varieties and thus the sharing of benefits from royalties became impossible. All the same, however, that should not have stopped the implementation of the provisions on the FLET fund.

The legal uncertainty in Ethiopia turned into anxiety among Ethiopian stakeholders when the patent rumours spread and S&C was awarded the Captain Hook Award for biopiracy in 2004. Could the company be trusted? Genetic material had already left Ethiopia – so how could Ethiopian interests be secured? The matter was brought to the Office of the Prime Minister, and it was clear that the IBC would have to be involved. Whereas the atmosphere had been friendly and trustful, there was now suspicion. It was necessary for Ethiopia to bring the company back to the negotiation table and to arrange for a binding agreement that could secure Ethiopian interests. On the part of S&C, negotiations were necessary to improve its bad reputation after the Captain Hook Award, as well as for it to have further access to Ethiopian teff material. The company also felt that it was necessary because they understood that they had negotiated the MoU with an authority without the mandate to do so.

Thus, the second round of negotiations would not take place in such an amicable atmosphere as the first round. The new round was born out of necessity on both sides and great pressure on the side of the Ethiopian negotiators to secure Ethiopian interests. The mutual trust of the first round had been replaced with suspicion. New actors entered the scene: the IBC as the entity mandated to provide access to genetic resources in Ethiopia, and HPFI, which was led by the same directors as S&C, but composed of partly different shareholders.

So, can we find any signs that things could go wrong in this first phase of the process?

- At that time there was within EARO inadequate understanding of how a request for access to genetic resources should be handled, including the procedures for informing all relevant Ethiopian stakeholders. However, this was later sorted out, and should thus not indicate that anything would go wrong later on.
- That the FLET fund never became operational is perhaps more worrying, as it could indicate that the Dutch counterparts were not in a position to keep their promises. However, it could be explained by the developments highlighted above.
- The patent rumours were definitely a warning sign. There was no mention of a patent in the MoU and, as far as we have understood, the Ethiopian negotiators of the MoU had not been informed about this intention on the part of S&C. Thus, the Ethiopians had reason to become suspicious.

- Because important genetic teff material had already been sent from Ethiopia to the Netherlands, and because S&C had already applied for a patent, the company was in a relatively stronger bargaining position than the Ethiopians prior to the second round of negotiations. These unequal power constellations may also be seen as a warning signal.
- And finally, we note that S&C did not appear as a very professional company: it involved a small group of teff enthusiasts who were unable to identify the entity entitled to negotiate an access agreement on the Ethiopian side and who did not comply with their obligations with regard to the FLET fund. S&C was also ridden by internal conflicts that were intended to be resolved by establishing a new company. This too could be seen as a warning signal.

4.3 A parallel story: patent application on processing teff flour

On 22 July 2003, S&C filed a patent application in the Netherlands for the processing of teff flour.[99] The international filing date and the date of filing under EPO is given as 22 July 2004,[100] and the teff patent was granted by EPO on 10 January 2007.[101] The proprietor of the teff patent is stated as HPFI B.V. in the European Patent Specification published by EPO, whereas in the International Application published under the PCT by the WIPO the equivalent applicant (for all countries except the USA) is given as S&C B.V.[102] All three publication papers list the inventor as being Jans Roosjen from Hooghalen in the Netherlands.[103]

4.3.1 Patent claims

According to the publication papers, the invention in question covers 29 specific claims, including a combination of product and process claims. First of all, it covers a flour of a grain belonging to the genus *Eragrostis*, preferably *Erarostis tef*, with what it calls a particularly high falling number (at the moment of milling at least 250, preferably at least 380). This high falling number should be achieved, according to the claims, through after-ripening of the grain for at least 4 weeks or preferably at least 8 weeks after harvesting. A further patent claim is that the grain is

[99] European Patent Specification EP 1 646 287 B1, United States Patent Application Publication US 2006/0286240 A1 and International Application published under the Patent Cooperation Treaty WO 2005/025319 A1

[100] Ibid.

[101] European Patent Specification EP 1 646 287 B1.

[102] In the European Patent Specification published by the European Patent Office the proprietor is listed as Health & Performance Food International B.V., but in the International Application published under the Patent Cooperation Treaty by WIPO the applicant (for all designed countries except the USA) is listed as Soil & Crop Cruise Control B.V. (in the USA the applicant is the same as the inventor, here listed as Jans Roosjen).

[103] European Patent Specification EP 1 646 287 B1, United States Patent Application Publication US 2006/0286240 A1 and International Application published under the Patent Cooperation Treaty WO 2005/025319 A1.

milled into flour after this after-ripening period, thereby achieving a higher falling number than at harvesting. Furthermore, the flour is ground to a powder so fine that it can pass through a sieve with maximum pore size of 150 microns. The flour to be covered by the teff patent is gluten-free and is described as containing minimum values of iron, calcium and mineral-binding substance. The patent claim also defines the composition of carbohydrates in the flour.

Furthermore, the patent claims cover a dough or batter made from this flour, as well as a food product with such flour. Also according to the patent claims, the teff patent covers a method for baking a product, involving three steps: a) preparing a dough or batter by mixing flour with a liquid and, optionally, a leavening agent; b) kneading this dough into the desired shape; and c) heating the dough for some time. Baked products prepared according this method are also covered by the patent, as well as a food product or luxury food product prepared from unground teff grain with a falling number of at least 250. Finally, the patent claims cover methods for binding a composition, preferably a pharmaceutical or cosmetic composition, of at least two components, involving mixing components with starch from a flour produced according to the claims of the patent.

4.3.2 Assessing the novelty of teff patent claims: use of falling numbers

For a patent to be granted, the applicants must prove that a new and inventive step is involved. As claimed by its applicants, the novelty of the teff patent rested, *inter alia*, in the use of falling numbers. The mention of 'falling number' in the teff patent refers to the international standard of sprout measurement with the full name 'Hagberg Falling Number', which is used to determine wheat quality (Sorenson 2006). This method was developed by Hagberg and Perten in the 1960s 'to determine the alpha amylase activity of wheat flour' (Best and Muller 1991: 273), but is now widely used by the baking industry to indicate flour quality (Best and Muller 1991). In this context the term 'falling number' refers to 'the amount of time it takes for the Hagberg steel ball in this sprout analysis tool to fall through a flour/water slurry that has been heated to release the starch from water' (Sorenson 2006: 1). As sprouted grain produces enzymes that break down starch, the ball will fall more quickly if the starch content is low, and this results in a lower falling number (Sorenson 2006).

According to Sorenson (2006) a falling number value of 350 seconds or longer is an indication of good-quality wheat. Grain buyers have been known to bypass wheat if the falling number values are below 300 seconds. These values are also mentioned by Sologuk and Sorenson (2005), who explain that falling number values of 350 seconds or longer mean that the wheat flour has low enzyme activity and is therefore of sound quality, because sprout damage can affect mixing strength, loaf volume, shelf-life and dough quality. According to Sologuk and Sorenson, many wheat buyers have actually specified minimum tolerances of 300 to 350 seconds in their purchase contracts. Best and Muller write that 'very low levels of alpha amylase are required' (1991: 273) for baking wheat flour, and that a sample of good quality will typically have a falling number of 400 or more.

Documents where the minimum value used is mentioned as lower can also be found, for example in a 2001 article from the 'Farm Direct' website in the UK, where the common commercial minimum for bread-making is mentioned as being 250.[104] However, as shown by the examples above, it has long been known that wheat used for baking should display high falling numbers, and this knowledge has also been put to use by the industry in the form of minimum values. Thus, the falling number values of at least 250 (ideally higher and 'preferably at least 380')[105] presented as ideal for baking flour from teff in the teff patent should not really be novel or surprising. However, that is exactly how these numbers are presented. In addition, it is also stated in the teff patent that this is unexpected because 'for baking bread of wheat flour, the optimal falling number for wheat is between 200 and 250'.[106] Further: 'wheat flour with a falling number lower than 120 or higher than 300 is not suitable for processing into (yeast-leavened) a baked product'.[107] However, as the publications cited here show, these figures are simply not correct.

It is difficult to say just why such statements should have been included in the patent application. Perhaps it was merely the result of lack of knowledge – but the knowledge presented in this regard cannot be termed 'new'.

In this connection, it is also worth noting that an analysis of 22 Ethiopian teff varieties the IBC had conducted showed that the falling-number values for flour made from these varieties ranged between 273 and 400+.[108] If these values are representative of teff varieties in general, that means that the teff patent in practice would cover the processing of *all* teff flour. These results also contrast with the patent description, where it is stated that traditional teff flour has 'a too low or a too high falling number to be processed into a good baking product',[109] as it can be assumed that the term 'traditional teff flour' is meant to describe the teff flour used in Ethiopia, as opposed to the teff flour produced by the company.

4.3.3 Assessing the novelty of teff patent claims: storing of teff grain

Central to the 'invention' on which the teff patent is based is the requirement of storing teff grain for a certain period before milling, so the resulting flour will have the desirable falling numbers and be well-suited for baking. In the patent description, it is stated that the grain should be ground 'at least 4, preferably at least 5, and more preferably at least 8 weeks after harvesting',[110] as by that time the grain will have after-ripened sufficiently to produce flour with the required falling numbers.

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[104] Farm Direct: www.farm-direct.co.uk/farming/stockcrop/wheat/wheatcurr.html
[105] European Patent Specification EP 1 646 287 B1: 2.
[106] European Patent Specification EP 1 646 287 B1: 3.
[107] Ibid.
[108] This analysis was conducted in May/June 2008 by Kaliti Food Share Company, and the report was sent to the IBC on 23 June 2008.
[109] European Patent Specification EP 1 646 287 B1: 3
[110] Ibid.

However, it is difficult to see how this can be claimed to be a novel or inventive step, as grain has traditionally been stored for some time before grinding in Ethiopia, precisely in order to achieve the best baking quality.[111] Despite this, it is claimed in the patent description that traditional teff flour 'is obtained by grinding the grain directly after the harvest'.[112] This is far from correct, and stands as a further instance where the patent description simply does not fit known facts.

4.3.4 Assessing the novelty of teff patent claims: the grinding of flour

Furthermore, the applicants claim that teff flour is usually not ground fine enough, and that their procedure for grinding flour to a fine powder represents a new and inventive step.[113] This can be done according to conventional procedures for the preparation of flour, they describe, but a pin-mill with integrated cooling is preferable. Again, it is difficult to see the novelty of this step, as the procedures for making flour were already well known.

4.3.5 Concluding the assessment of novelty

As shown above, these patent claims can hardly be said to contain any 'new' or 'inventive' step. Therefore it is difficult to understand on what grounds a patent could be granted. As this nevertheless happened, the question becomes, why did the EPO grant this patent? According to Minkmar (2011) part of the explanation is that the patent examiners at the EPO are pressed for time and mostly assess the patent applications by purely technical criteria. As she sees it, any thorough examination of such patent claims is as a result moved to any opposition procedures that might take place. Regardless of the explanation, the granting of such patents makes it clear that the EPO as it functions today is not up to the task of properly handling patent applications of this kind (often referred to as bio-patents).

The patent claim is also very broad in scope. In practice it covers all ripe grain of teff, since all such grain falls within the described range of falling numbers, regardless of varieties. The patent claim also applies to all teff flour of baking quality, and all dough made from such flour, including the resultant products. Thus, even if the patent claim does not specifically deal with the genetic resources of teff or particular teff varieties, in practice it covers the use of all genetic resources of teff. This means that the granted patent would ensure full control of teff production for the patent holders in all the countries covered.

[111] During a trip to Ethiopia in October 2011, the authors asked many of the interviewees about common practices and knowledge with regard to teff. All of them explained that the necessity of storing teff before grinding is traditional knowledge in Ethiopia.
[112] European Patent Specification EP 1 646 287 B1: 3.
[113] European Patent Specification EP 1 646 287 B1: 3–4

4.3.6 Ethical aspects

Was it unethical to apply for this patent in the context of the Teff Agreement? Views differ on this point.[114] From the point of view of S&C, the patent was an absolutely necessary precondition for the investments made in the production chain of teff. Also it was necessary, to ensure that Ethiopia would have its share of the benefits as agreed through the MoU and the later Teff Agreement, it was claimed. This stand has support from others as well. Dr Ir Jan Vos, experienced teff researcher from Wageningen University, has said that he can understand the arguments for the patent when it was filed.[115] The company organized the teff production chain in the Netherlands and sincerely wished to share the benefits with all partners in the chain (growers, collectors, cleaners, millers, etc.) and their Ethiopian counterparts, he recalls. In order to be able to do so, it was necessary to ensure that the company would have complete control over the production chain. Therefore there were good reasons to file the patent, he explained.

If all parties did in fact intend to share the benefits of the introduction of teff on the international market, this is a strong argument. The problem here is that the Ethiopian counterparts were not involved in the patent application process, and that the topic was not covered in the MoU. Instead the Ethiopians found themselves confronted with a *fait accompli* when the patent was filed, which put them in a weaker bargaining position. This said, Ethiopian negotiators of the Teff Agreement found the patent acceptable, because it was said to only be a process patent, and perceived as a necessity to secure the benefits to be shared. Moreover, as to the ethical aspects, we should recall that the genetic resources in question originated in Ethiopia. A further aspect is that genetic resources from Ethiopia important for developing teff for the European market had been obtained through a MoU to which the Dutch counterpart and patent applicant failed to fulfil their parts of the obligations.

As we will see in the following chapters, the ethical aspects of the teff patent became particularly serious when the Dutch counterpart failed to fulfil its obligations also under the new Teff Agreement. The company finally went bankrupt, and the patent was sold for a relatively small amount to another company – one owned by the same directors, but without any obligations towards Ethiopia. Had the MoU and the later Teff Agreement contained sufficient provisions regarding a teff patent, this situation could perhaps have been avoided. That would have made it necessary for S&C to take the initiative to inform openly about its intentions during the MoU negotiations and for the negotiators of the MoU to integrate into provisions in this text that linked its provisions on benefit sharing with the patent in formulations acceptable to all parties. How much legal security such provisions would have established for Ethiopia remains an open question, to which we return in Chapter 7.

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[114] A further discussion is the 'patent on life' debate. It is far beyond the framework of this report to take up that discussion here, so we focus on the issue-specific questions here.

[115] In a telephone interview with Dr Regine Andersen, 27 June 2012.

Instead, the Dutch company acquired the sole monopoly over the use of teff in all the countries where the patent was in force, thereby effectively discouraging any other initiative to utilize teff in these countries, for instance by seeking to enter into an ABS agreement with Ethiopia. So in a benefit-sharing perspective, Ethiopia was the losing part in a double sense: it lost the prospects of benefits from the teff patent, and it lost the prospects of benefits from potential new ABS agreements on teff with other partners in the countries where the teff patent applies.[116] This must be borne in mind in an overall assessment of the ethical aspects of the patent.

Here we leave this parallel story for now, and move back in history to the chronology of the Teff Agreement, where we left it above – after 'the beginnings'. We will return to the parallel story on the teff patent in Chapter 7.

4.4 Negotiating the Teff Agreement

In previous chapters we have seen how the stage was set for negotiating the Teff Agreement, and how important this was for the context of the negotiations. We now turn to the details of the negotiation process and the resulting agreement.

4.4.1 The parties to the negotiations and the negotiators

When the Teff Agreement was negotiated, the IBC represented the Ethiopian government. According to the minutes from the negotiations of 23–28 March 2004, the following persons took part in these negotiations: Dr Tewolde Berhan Gebre Egziabher (Director General, EPA), Mr Fikre Markos (Ministry of Agriculture and Rural Development), Dr Tsedeke Abate (Director General, EARO), Dr Girma Balcha (Director, IBC), Dr Solomon Assefa (Director, EARO- Debre Zeit), Dr Kassahun Embaye (Deputy Director, IBC), Dr Hailu Tefera (Researcher, EARO-Debre Zeit), Dr Getachew Belay (Researcher, EARO-Debre Zeit), Mr Tesema Tanto (Head Dept. of Crop Genetic Resources Dept., IBC), Mr Mesfin Bayou (Lawyer, IBC), Mr Hans Turkensteen (Director, S&C) and Dr Ir Lodewijk Turkensteen (Board Member, S&C). On the final day of negotiations Mr Eshetayehu Tefera, another IBC employee, was also present.[117]

Dr Tewolde Berhan Gebre Egziabher, Director General of EPA, was brought into the negotiations to function as a mediator, to 'smooth the

[116] This situation also gives rise to the question of whether such broad patents are instrumental in stimulating innovations, as is a declared purpose of the patent system. In this case, the broad patent on teff serves to *hinder* other actors in making innovations in the development of teff products, while the patent holder can barely utilize the full scope of the patent. This need not mean that the patent applicant is to blame. As long as the patent system allows such broad patents, patent applicants will seek to make their patent claims cover innovations as broadly as possible, to secure their investments and profit potentials.

[117] Interview with Mr Eshetayehu Tefera, Ethiopia, 24 October 2011.

process' and to chair the meetings.[118] This was decided at the beginning of the negotiation process by the IBC and the Ministry of Agriculture and Rural Development.[119] Dr Tewolde Berhan Gebre Egziabher had considerable experience from international negotiations, and had been central in the CBD negotiations.

It was at this point also decided that Mr Mesfin Bayou and Mr Tesema Tanto from the IBC and Dr Hailu Tefera and Dr Getachew Belay from EARO would be responsible for negotiating the agenda items with the company representatives. The agreement was drafted by Mr Mesfin Bayou,[120] who took part in the negotiation process as legal consultant for the IBC.

4.4.2 Objectives and expectations of the parties

According to Mr Hans Turkensteen, the main objective of HPFI in negotiating an ABS agreement was to ensure that local Ethiopian farmers would benefit from the new future of teff.[121]

According to the IBC, the main Ethiopian objective was to benefit from the utilization of teff genetic resources, among other things in the form of employment opportunities, value added related to teff products in Ethiopia, technology transfer, research cooperation and monetary benefits. The products were expected to do well in Europe, so that there would be benefits to share.[122] One of the benefits Debre Zeit Agricultural Research Centre was interested in receiving in connection with the collaboration with the Dutch company and the university was the generation of basic scientific information on teff.[123] It was also expected that this agreement would lead to other ABS agreements.[124]

The Ethiopian negotiators also wanted security. They felt that the involvement of the Dutch state would contribute towards this, which was why they wanted the Dutch ambassador to Ethiopia to sign the agreement as a witness. According to Dr Tewolde Berhan Gebre Egziabher, this was one of the few issues of substance that he himself contributed to the negotiations. In his view, this would function as a sort of guarantee, putting pressure on the Dutch counterparts to honour their commitments.[125]

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[118] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.
[119] According to the minutes of the meetings.
[120] Interview with Dr Girma Balcha, Addis Ababa, 21 October 2011.
[121] Interview with Mr Hans Turkensteen, telephone conversation with Dr Regine Andersen, 16 May 2012, and e-mail from him, 23 June 2012.
[122] Interview at the IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu), Addis Ababa, 20 October 2011.
[123] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011.
[124] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011.
[125] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.

4.4.3 The negotiation process and the signing of the agreement

After it had been agreed that negotiations should take place between the IBC and S&C, the actual negotiations started 23 March 2004. The minutes from these meetings show that the negotiation process was divided into three parts. As mentioned above, two representatives from the IBC and two representatives from EARO were given responsibility for going through the negotiation agenda prepared by the Ethiopian negotiation committee with the company representatives. This took place between 23 and 26 March 2004. The results of these negotiations were then presented to the directors of the IBC, EPA and EARO, and re-negotiation was initiated with regard to those agenda items where agreement had not been reached. Agreement was then reached with regard to most items. Finalization of the few most-contentious items was postponed; another meeting was held on 28 March, where these were addressed. Agreement was then finally reached, and the resulting document was sent to the government of Ethiopia and the S&C board for approval. It had been decided that the agreement would be signed when both these instances had given their approval. Here we may note that although it is HPFI that is party to the signed Teff Agreement, the minutes of the negotiations refer to S&C. This was because the company that was to be known as HPFI had at this stage not yet been founded.

Mr Turkensteen remembers the negotiations of the Teff Agreement as being difficult.[126] The Ethiopian counterparts were scientists (genetic resources experts) and not businessmen, from a state that had been close to the former Soviet Union; thus, he has explained, they had no experience with negotiations with Western companies. For example, he said that they wished to negotiate with a state entity rather than a company, because they were not accustomed to making contracts with private companies. Also, he felt that they expected to reach agreements on several provisions that did not belong under such a contract. For example, they suggested a fine of EUR 25,000 for delayed payments, according to Mr Turkensteen. Much effort was required to get such elements out of the contract. He also recalled that there was much confusion about contract versions, and at one point as many as eight versions of the contract on the negotiation table at the same time. Furthermore, Mr Hans Turkensteen felt that the Ethiopian counterparts were afraid of doing things wrong, as this could cause punishment in the form of e.g. degradation. All of this made the negotiation situation difficult, he later explained.

According to Dr Tewolde Berhan Gebre Egziabher, the reason that he himself was brought in as mediator was that the parties were not communicating well, and because certain personal animosities among key individuals were interfering with the substance of the negotiations.[127] He was therefore asked to attend the meetings as a mediator to facilitate communication between the parties. When he joined the negotiations the

[126] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012.
[127] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.

atmosphere was very tense and heated.[128] Dr Tewolde Berhan Gebre Egziabher was deeply respected by all parties for his role during the negotiations.[129]

Mr Mesfin Bayou also mentioned that the atmosphere could be very tense during the negotiations and that there were some quarrels. He added that both he himself and Mr Turkensteen would sometimes get angry and have to be calmed down by the others. However, he underlined that the atmosphere could also be very friendly at times. As he saw it, both sides had good intentions and had come to the negotiation table in good faith, but various issues caused friction. According to Mr Mesfin Bayou, relations with the Dutch Embassy in Ethiopia were also very good.[130]

Also Mr Eshetayehu Tefera described the atmosphere during the negotiations as being very good. He recalled that it was believed that there was a great market potential for teff in Europe and that the Ethiopian negotiators were happy and hopeful about the agreement.[131]

One of the issues discussed during the negotiations was teff production in Ethiopia. S&C did not think that they would be able to produce enough teff in Europe, and the possibility of producing teff in Ethiopia for export together with Ethiopian investors was therefore brought up. However, as Dr Tewolde Berhan Gebre Egziabher underlined, export of teff was not, and could not be, part of the agreement: this was an ABS agreement, whereas export is a purely commercial activity.[132]

According to Mr Mesfin Bayou, the most contentious issues during the negotiations were whether the company should have the right to transfer teff genetic material to third parties; the amount of monetary benefits to be shared; the obligations of the company; and whether the IBC should be able to grant other users access to teff.[133] The IBC did not want to grant the company the right to transfer teff genetic material to third parties without consent; moreover, S&C wanted exclusive access rights, but the Ethiopian side was willing to accept exclusive rights with regard to specific products only. As Mr Mesfin Bayou sees it, that issue was perhaps the most difficult of all during the negotiations: the company felt that if Ethiopia could grant other companies access to teff that would represent a threat to their commercial interests.

Mr Mesfin Bayou found Mr Hans Turkensteen to be a person with good intentions who was very excited about the quality and commercial potential of teff and expected the company to achieve great commercial success. However, he also found it difficult to accept the demands of Ethiopia regarding benefits and restrictions. According to Mr Mesfin

[128] Ibid.
[129] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012, confirmed by the other participants in the negotiations interviewed for this report.
[130] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[131] Interview with Mr Eshetayehu Tefera, Ethiopia, 24 October 2011.
[132] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.
[133] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.

Bayou and Dr Visser, Mr Turkensteen seemed to have limited experience when it came to negotiations and international cooperation, and appeared poorly informed about the CBD provisions on ABS.[134]

Not all of the representatives from the Ethiopian side had considerable international negotiation experience either.[135] Dr Kassahun Embaye underlined that although the staff at the IBC tried to support the negotiators as best they could, their capacity to provide relevant advice was limited because this was the first time they were involved in such a process.[136]

As mentioned in 4.2.6 and 4.2.7, the Ethiopian government and the IBC were aware of the patent application before the negotiations between the IBC and S&C were initiated. It had been discussed that their position should adhere to Ethiopia's official position regarding patents: that patents should be granted only on processes and procedures, not on the end products. Dr Tewolde Berhan Gebre Egziabher indicated that Ethiopian participants in the negotiations had known about the patent application when the agreement was negotiated, but that they had felt that European patents were not their affair, as they would not affect Ethiopia. During the negotiations the Ethiopian side was very conscious about deliberately excluding intellectual property rights to teff genetic material and this is reflected in the final agreement, but it was felt that European patents on processing were not relevant for Ethiopia.[137] This point was also repeated by Mr Mesfin Bayou, who said that S&C representatives were told that they could not take out patents on teff genetic material, but that for other types of patents, as on products and processes, the agreement left the door open.[138] In this connection, Dr Tewolde Berhan Gebre Egziabher also noted that it should be possible to circumvent such patents, as they must be difficult to enforce in practice.[139] During the negotiations the Ethiopian members were optimistic about the potentials of the agreement.

Despite the difficulties, including what Mr Mesfin Bayou called 'several collapses'[140] of the talks, the parties were able to agree on a final draft of the Teff Agreement after about a week of negotiations. Based on the consensus reached in March 2004, the agreement was then finalized in December 2004, but as Dr Girma Balcha wanted the green light from the Prime Minister's Office, it was not signed until April 2005. In addition, Dr Tewolde Berhan Gebre Egziabher insisted that someone from the Dutch government ought to sign the agreement. After some communica-

[134] Interviews with Mr Mesfin Bayou, Addis Ababa, 26 October 2011, and with Dr Bert Visser, Addis Ababa, 27 October 2011.
[135] Interview with Mr Eshetayehu Tefera, Ethiopia, 24 October 2011.
[136] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011.
[137] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.
[138] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[139] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.
[140] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.

tion with the Dutch Embassy in Ethiopia, it was decided that the Ambassador would sign as a witness.[141]

4.4.4 Contents of the agreement

The Teff Agreement between the IBC and EARO and HPFI, or the 'Agreement on access to, and benefit sharing from, teff genetic resources', was signed on 5 April 2005.[142] It was signed by Dr Girma Balcha on behalf of the IBC and Mr Hans Turkensteen on behalf of HPFI, which at that time had more or less taken over from S&C, whereas EARO was listed as a third party without signatory. The Ambassador of the Kingdom of the Netherlands to Ethiopia, Mr Rob Vermaas[143] and Dr Tewolde Berhan Gebre Egziabher signed as witnesses.

The main parties to this agreement were the IBC as the agreement's designated 'provider' and HPFI, in the agreement referred to mainly as 'the company'. According to Article 10, the agreement 'shall remain in force for a period of 10 years', after which time the parties may renegotiate it. As it was signed in 2005 this means that the agreement was intended to remain in force until 2015.

According to this agreement the company was permitted to access and use 'the genetic resources of teff specified in Annex 1' (Art. 4.1) for the purpose of 'developing non-traditional teff based food and beverage products that are listed in Annex 3' (Art. 4.2), but 'explicit written consent' (Art. 4.3) would be required from the IBC in order to use teff for other purposes; further, the company was not allowed 'to access the traditional knowledge of Ethiopian communities on the conservation, cultivation and use of teff' (Art. 4.5). With regard to traditional knowledge it is also specified that the company cannot 'claim rights over, nor make commercial benefit out of, such traditional knowledge unless explicit written agreement is given to it by the provider'. In addition, Article 4.6 states that 'to avoid possible confusion between the traditional knowledge of Ethiopian local communities and inventions made by the company, the provider shall, upon submission by the company of its research proposals, inform the company of the existing traditional knowledge of relevance to the research areas proposed by the company'.

Annex 1 lists 12 teff varieties released by and registered by EARO and 8 varieties developed by S&C, to be registered as co-owned by EARO and HPFI, all of which the company could use to make food and beverage products. Annex 3 lists the various types of products based on gluten-free flour and beverages the company can make based on these varieties. The flour is divided into '100% teff', 'premix' and 'breadmix with teff', again divided into white and brown. The beverages that can be made are pilsner

[141] Ibid.
[142] One of the witnesses, Dr Tewolde Berhan Gebre Egziabher, signed later, on 5 May 2005.
[143] The signature of the Ambassador is not legible in the agreement, but according to his Linkedin-profil (see: http://nl.linkedin.com/pub/rob-vermaas/1b/733/456) Mr Rob Vermaas served as the Ambassador of the Kingdom of the Netherlands to Ethiopia and Djibouti and Permanent Representative to the African Union from September 2001 to July 2005.

beer, liquors and genever. Thus, the 'specifications' regarding product types provided in Annex 3 are rather general and wide.

In addition to giving the company the right to access and use the listed varieties for the above-mentioned products, the Teff Agreement also specifies that the IBC may not grant other parties access to teff genetic resources 'for the purpose of producing the products listed in Annex 3 of this agreement unless it secures the consent of the Company'.

The rights and obligations of the parties are also dealt with in Article 7 on 'effects of the agreement'. Here it is stated that the IBC retains the right to grant access to teff genetic resources to other parties; that the agreement does not affect traditional products made from teff but affects only the non-traditional products listed in Annex 3; and that Ethiopia is free to export teff to other parties as long as the buyers do not use the teff to make the products listed in Annex 3. Here we should note that the mention of teff export in this article, and the exception agreed to by Ethiopia with regard to buyers engaging in production similar to that of HPFI, mean that the scope of the agreement is in fact not strictly limited to teff as a genetic resource. Mention is also made of export of teff.

Intellectual property rights are addressed in Article 5: 'the company shall neither claim nor obtain intellectual property rights over the genetic resources of teff or over any component of the genetic resources' (Art. 5.1). This sentence presumably refers to patents, as it is specified that plant variety protection 'may be obtained over teff varieties' (Art. 5.1). However, the agreement does not rule out patents on processes or the products related to teff – only the genetic resources themselves and their components.

Concerning plant breeders' rights, for new teff varieties developed by the company such rights are to be 'co-owned by the company and EARO' (Art. 5.2). In this connection, it is also specified that such varieties cannot be used in a way that damages the business interests of the company with regard to the products listed in Annex 3.

Article 6 on transfer to third parties establishes that the company cannot transfer teff seed or 'any component of the genetic resources of teff' to third parties without the explicit written consent of the IBC.

The benefit-sharing aspects are dealt with in Article 8. With respect to monetary benefit-sharing, the agreement specifies four ways in which the company should share monetary benefits: in the form of a one-time payment to the IBC to be made in 2010 based on the company's net income in 2007, 2008 and 2009; in the form of annual royalty payments to the IBC from the sales of basic and certified seed from the teff varieties listed in 'column 3 of annex 1' representing 30% of the net profits resulting from such sales; in the form of annual license fees to the IBC based on the number of hectares of teff grown by the company and 'by anybody supplied seed by the company'[144] in Europe and North

[144] Introductory text to Annex 2 of the Teff Agreement.

America (EUR 10/ USD 10 for every hectare grown in Europe/North America of the 12 varieties released by EARO, and EUR 5/USD 5 for every hectare grown in Europe/North America of the of the co-owned varieties); and fourthly, in the form of annual contributions to a fund, the Financial Resource Support for Teff fund (FiRST), to amount to 5% of the company's net profit but never less than EUR 20,000.

Further, the FiRST fund 'shall be used for improving the living conditions of local farming communities and for developing teff business in Ethiopia' (Art. 8.4) and 'be administered jointly by the provider and the company' (Art. 8.5). Larenstein University is also given a role in this context, as Article 8.5 specifies that the university 'will participate in the administration of the FiRST' in order to 'ensure that Dutch scientific knowledge and experience with product innovation are transferred into Ethiopia in the process of using the FiRST'; further details regarding the administration of this fund 'shall be specified by another agreement of the parties'.

As to payments, the company is to pay a 'sufficient sum of money in advance from which the requests by the provider for payment will be subtracted' each year. Interesting here is the reference made to 'requests by the provider', as that indicates that it is up to the IBC to send a request every year for the benefits to be shared. If correct, this must be seen in connection with the provisions on monitoring. Article 16 states that the company must submit annual research and financial reports to the IBC and that the IBC has the right to review the 'bookkeeping as well as the relevant administrative details of the items covered by this agreement'. It is also stipulated that meetings will be held for the purpose of information exchange between the parties.

Also non-monetary benefit-sharing is dealt with in the Teff Agreement. Five different ways in which such benefit-sharing is to take place are outlined: the company will share its results from teff research with the IBC and EARO; it will involve Ethiopian scientists in its research; EARO should be the preferred institution for teff breeding; the company will establish teff businesses in Ethiopia together with Ethiopian counterparts; and it will acknowledge in its publications and applications that Ethiopia is the country of origin of teff. The company also commits itself to finding additional funding for the FiRST fund 'using the opportunity created by the joint ventures'.

Further, the results of any joint research on teff 'shall be owned by both parties and shall be released upon written consent of both parties' (Art. 9.1), and information identified as confidential by either of the parties 'shall be kept as such by both parties' (Art. 9.2).

With regard to penalties, the agreement states that 'a party that breaches the terms of this agreement shall pay to the aggrieved party a penalty of 50,000 Euro if asked to do so by the aggrieved party' (Art. 11.1). Further, 'if the company fails to fulfil its financial obligations' with respect to benefit-sharing, 'the provider may add a penalty of 5% of the due payment for any delay of between 90 and 180 days, and 25% thereafter' (Art. 11.4). As the agreement does not specify here precisely how to

determine that a breach has actually occurred and that a penalty is therefore due, it can be assumed that this must be seen in connection with Article 13 on dispute settlements. According to Article 13.1, 'if any dispute arises in connection with the interpretation of application of this agreement, both parties shall seek solution by negotiation'; and if the dispute cannot be settled in this way 'it shall be submitted to an arbitration body in accordance with the procedure laid down in part I of Annex II of the Convention on Biological Diversity'. Article 13.3 specifies that the decision made by this body 'shall be final and binding on the parties without appeal'.

However, although negotiation is mentioned as the procedure to be used first if a dispute arises, the agreement does not contain any further information about such negotiations – how they should be initiated, where and how they should take place, or if mediators should be involved.

Termination of the agreement is dealt with in Article 12. Here it is stated that 'if the company is in the process of bankruptcy, the provider can immediately terminate the agreement'; that if one of the parties repeatedly violates or fails to fulfil its obligations, 'the aggrieved party may terminate the agreement upon 30 days' notice given in writing to the other party' and that termination 'will be done through mutual agreement by both parties' except with regard to bankruptcy. It is also specified that termination of the agreement does not 'affect the rights and obligations that were due to accrue to either party prior to the effective date of termination', and that the company cannot continue to use the genetic resources of teff after the agreement has been terminated. An exception to this last rule is made for the case of co-owned teff varieties: these may be used if mutually agreed royalties are paid.

4.4.5 Assessing the agreement in light of the negotiation history

As noted, the Teff Agreement was celebrated as one of the most advanced and promising of its time. With hindsight, we can identify strengths as well as weaknesses – and this is important, in order to draw lessons for future ABS agreements. To understand what the negotiators achieved, we must take the negotiation context into consideration, as elaborated above. We have seen that the negotiations were sometimes tense and difficult and that several issues caused deep controversies. The negotiations proved difficult not least due to the prehistory described in this report, which resulted in unequal power constellations with pressure to reach an agreement.

4.4.5.1 Scope of access

The scope of access is limited to the use of the listed material for non-traditional and defined purposes and does not allow the company to make use of traditional knowledge in this regard. Also the company through this agreement acknowledges that teff, irrespective of source, originated in Ethiopia and belongs to Ethiopia. Through its signature the company agreed to respect this fact. These formulations should be seen as a victory for Ethiopia in terms of the clear definition and limitation of the scope of access as well as in terms of recognition of Ethiopia as the country of origin of teff resources.

4.4.5.2 Intellectual property rights

Provisions regarding intellectual property rights are easy to circumvent. As mentioned in 4.4.4, the Teff Agreement prohibits intellectual property rights on genetic resources of teff, but does no mention patenting of products and processes related to teff. During the negotiations this process patents were even accepted. What the negotiators probably did not realize was that such patents might affect the use of the genetic resources in question. A reason why they agreed to such a patent was that they accepted the argument that the company needed to control the production chain in order to generate benefits to be shared. With hindsight we recognize that it would have been better to include in the agreement provisions regarding all sorts of relevant patents, to seek to ensure, in legal terms, the sharing of benefits resulting from such patents.

However, the parties did provide for the sharing of benefits from teff varieties protected with plant breeders' rights. These varieties were to be co-owned. The issue of plant breeders' rights was therefore solved more optimally than the patent issue.

4.4.5.3 Transfer to third parties

Also the provision on the company's transfer to third parties is clear, and in light of the difficult negotiations on this point, must be seen as a victory for the Ethiopian negotiators. In return, Ethiopia agreed not to export teff for the making of the products covered by the Teff Agreement. Whereby several provisions ensure Ethiopia's sovereign rights over teff, including the export of teff, this provision is actually quite broad. It covers most relevant non-traditional products, and is not limited in geographical terms. Thus, Ethiopia would not be allowed to export teff to any country in the world for purposes covered in the agreement – a point probably overseen by the Ethiopian negotiators.

4.4.5.4 Benefit-sharing arrangements

As for the benefit sharing arrangements, they seem generous at first sight. The one-time payment that was to have been made to the IBC in 2010 was made dependent on how the company accounted for its expenses. Also the provision on the sharing of net profits from the sale of seeds depends on how profits are calculated. The licence fees are more predictable, as they are given in EUR per hectare. The provision that the company is to contribute 5% of its net profit to the FiRST fund depends again on the calculations, but here there is an additional provision that this amount is not to be less than EUR 20,000 per year. In terms of monetary benefit sharing, this would mean that Ethiopia would earn at least EUR 20,000 per year plus annual payments per hectares of teff cultivation in Europe and North America. The rest of the monetary benefit sharing would depend on the company's calculations. As this is not further elaborated in the agreement, it represents a weakness, and much would depend on the good will of HPFI.

However, a guarantee is provided, in that the company is to pay the previously mentioned 'sufficient sum of money' in advance from which the requests by the IBC for payment will be subtracted (Paragraph 14). Whereas such a guarantee should provide some security, the term 'suffi-

cient sum of money' is not particularly precise. However, it could be interpreted to cover at least the minimum sum of benefits to be shared with Ethiopia under the agreement: i.e. EUR 20,000 per year.

The obligations of the parties with regard to the FiRST fund are not very clearly defined, except that the fund is to be administered jointly by HPFI and the IBC; the van Hall-Larenstein University will participate in the administration to ensure the transfer of scientific knowledge, and HPFI will contribute at least EUR 20,000 per year. Further details are left for specification by another agreement to be negotiated by the parties – this is a clear weakness of the Teff Agreement. It should also be noted that van Hall-Larenstein University was not a party to the Teff Agreement and was not represented during the negotiations.

The non-monetary benefit sharing provisions are partly subject to further agreements, but they provide clear intentions of the company to provide information and invite research collaboration.

4.4.5.5 Reporting procedures, termination of the agreement and penalties

The reporting requirements are quite strict. What was not mentioned in this regard was the language. As it later turned out, the company was not willing to provide annual reports in English. We now see that the reporting language could have been explicitly stated. It was taken for granted among Ethiopian negotiators that the language of the reports would be English, since the agreement was formulated in English, and the annual reports would have no value for the recipients if they were available only in Dutch.

Here we should also note that the agreement foresees that the IBC can immediately terminate the agreement if the company is in the process of bankruptcy. This, of course, presupposes that HPFI keeps the IBC informed about such developments. Another formulation regarding termination is that the HPFI in such a situation is to stop using the genetic resources of teff. However, the company is entitled to use co-owned teff varieties, upon payment of royalties to be mutually agreed by both parties. As the HPFI was not allowed to provide teff genetic resources to third parties, this provision is quite strong. In case of bankruptcy, no other company would be allowed to continue using the teff genetic resources covered by the agreement unless this had been previously agreed by the IBC.

The penalty provisions are substantial and apply in case of defined breaches of the agreement, if the aggrieved party so requests.

4.4.5.6 Dispute settlement mechanisms

In light of the later history, the dispute settlement procedures are indeed of interest. If a dispute cannot be resolved by negotiation, the dispute settlement mechanism of the CBD, Annex II, Part 1 is to apply. The Secretariat of the CBD is to be notified by the claimant party in case of a dispute. In disputes between two parties, an arbitral tribunal shall be

established consisting of three members. Each of the parties to the dispute is to appoint an arbitrator, and the two arbitrators so appointed shall designate by common agreement the third arbitrator, who shall serve as President of the tribunal. Certain provisions apply in case one of the parties fails to appoint an arbitrator within a given time. The tribunal is to render its decisions in accordance with the provisions of the CBD, any protocols concerned, and international law. The text of Part 1 provides details of the modes of work for the tribunal. The final award of the tribunal shall be binding on the parties to the dispute. It shall be without appeal, unless the parties to the dispute have agreed in advance on an appellate procedure.

In case either of the parties fails to comply with the award of the arbitral tribunal, reference is made to the Bonn Guidelines (Decision VI/24 of the CBD), Paragraph 16 (d) (iv), which states that 'Contracting Parties with users of genetic resources under their jurisdiction should take appropriate legal, administrative, or policy measures, as appropriate, to support compliance with prior informed consent of the Contracting Party providing such resources and mutually agreed terms on which access was granted. These countries could consider, *inter alia*, the following measures: (…) (iv) Cooperation between Contracting Parties to address alleged infringements of access and benefit-sharing agreements'. In accordance with this paragraph, the aggrieved party may ask the government of Ethiopia or the government of the Netherlands to enforce the award given by the arbitral tribunal. This is a strong formulation in light of the signatories to the Teff Agreement, not least since the ambassador of The Netherlands to Ethiopia signed the agreement as a witness.

4.4.5.7 The Teff Agreement in sum

Given the context at the time, the Teff Agreement was an advanced text in terms of ABS. The scope of access was precisely defined. Intellectual property rights were addressed perhaps to the extent possible, given the situation at hand: i.e. that a patent had already been filed by the company, and that the parties believed that benefit sharing connected with the patent was ensured through other provisions of the agreement. Also, the Ethiopian parties to the negotiations had not yet seen the patent claims, and believed that it was a process patent: they were not aware of its wide scope. In terms of plant variety protection, co-ownership of teff varieties and the sharing of royalties were secured. Benefit sharing seemed generous, but was based mainly on profits to be calculated by the company. Nevertheless, minimum amounts of benefits to be shared were defined, and up-front payments provided for. Reporting procedures seemed well organized, and there were termination provisions intended to ensure that the genetic resources in question were then no longer used, except for in cases subject to mutual agreement. Also the penalty arrangements and the dispute settlement procedures seemed solid.

As such, the Teff Agreement could rightly be celebrated as one of the most advanced and promising ABS agreements of its time, and it could have provided a good point of departure for success. When success failed to materialize, this was not because of the agreement as such, but due to other developments – as we will see.

5 Implementation of the Teff Agreement

The implementation story of the Teff Agreement can be divided into two phases. In the first phase there were attempts at implementation, but also communication problems. In the second phase, starting in April 2007, there were no further attempts at implementation, and the communication problems were severe. This phase ends with repeated attempts from the Ethiopian side at reconciliation, and finally in bankruptcy for the HPFI. This chapter relates the story of these developments, and summarizes the achievements in terms of the implementation of the Teff Agreement. Finally, we seek to explain what went wrong.

5.1 The short story: A timeline (II)

2005: 28 June – the Foundation SCEAR is established by HPFI to manage and register new teff varieties[145]

2005: HPFI directors in contact with Sequa[146] regarding collaboration on teff project in Ethiopia[147]

2006: 27 January – HPFI sends three letters to the IBC, requesting further germplasm and that three new lines of teff be included in Annex 2 of the Teff Agreement; also informing about progress with regard to research cooperation with Debre Zeit Agricultural Research Centre

2006: late January 2006 – Ethiopia bans export of teff and other key cereals, to curb soaring prices in the country[148]

2006: 27 February – Ethiopia passes Proclamation No. 482/2006 on 'access to genetic resources and community knowledge and community rights'

2006: 19 April – patent application on the processing of teff flour published by EPO

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[145]According to Dr Arnold Mulder and Dr Lodewijk Turkensteen (e-mail communication in May 2012)

[146] Sequa is a development organization based in Germany but operating worldwide. It is a non-profit company whose shareholders are Germany's top business membership organizations (DIHK, ZDH, BDA, BDI) and Deutsche Gesellschaft für Internationale Zusammenarbeit (giz) GmbH. Sequa promotes the development of the private sector; its business membership includes organizations as well as qualification of skilled employees and managers. Its programmes and projects are both publicly and privately funded and are oriented towards the principles of a social market economy. Source: www.sequa.de/index.php?option=com_content&view=article&id=216&Itemid=100&lang=en

[147] According to Dr Arnold Mulder and Dr Lodewijk Turkensteen(e-mail communication in May 2012)

[148]http://nazret.com/blog/index.php/2006/01/30/ethiopia_bans_grain_exports_as_domestic

2006: 25 April – research agreement on 'Collaborative Teff Breeding Project' signed by EIAR and HPFI

2006: June – meeting held in Assen between Sequa and HPFI regarding the planning of a project to support teff production in Ethiopia[149]

2006: 22 September – the teff research project at Debre Zeit sends a letter to the Director of Debre Zeit Agricultural Research Centre, requesting that an account be opened that shows that an amount equivalent to EUR 4,070 has been transferred from the company to a government account to cover the costs of research collaboration, as per the research agreement between EIAR and HPFI.

2006: 21 December – patent application on the processing of teff flour published in the USA

2007: 15 January – a public–private partnership project is launched by HPFI, another Dutch company and the German development organization Sequa. It is funded by the German Federal Ministry for Economic Cooperation and Development. In the media it is announced as a benefit-sharing project, and is to involve the S&C fund. However, central information provided to Sequa about the project has proven incorrect, and it is now uncertain to what extent, if at all the project has been carried out.

2007: 10 January – EPO publishes the granting of the patent on processing of teff flour (EP 1 646 287 B1)

2007: 13 March – HPFI transfers EUR 4,000 to the IBC, but without indicating what part of the Teff Agreement this payment concerns

2007: 28 March – letter from Debre Zeit Agricultural Research Centre to the IBC informing them about the research agreement with HPFI and requesting permission to send experimental teff seeds to the Netherlands. A handwritten note from the Director General of the IBC from 2 April states that the request should be checked against the agreement and granted as soon as possible.

2007: Sometime in April – Mr Hans Turkensteen terminates the 'Collaborative Teff Breeding Project' per telephone to Dr Getachew Belay.

2007: 5 April – two Dutch breeders, Dr Arnold Mulder and Dr Lodewijk Turkensteen, are fired from HPFI after protests against the termination of the 'Collaborative Teff Breeding Project'. Termination of their contracts is made effective from 31 December 2006.

[149] According to Dr Arnol Mulder and Dr Lodewijk Turkensteen (e-mail communication in May 2012)

2007: May – in response to a letter of 8 May 2007, the IBC[150] sends a letter to the Ministry of Agriculture and Rural Development commenting on HPFI's application to cultivate teff in Ethiopia

2007: 16 August – letter from the IBC to the company, expressing concern over implementation of the Teff Agreement, particularly as regards the FiRST fund, variety registration and reporting

2007: 17 August – Hans Turkensteen of HPFI responds to these concerns in an e-mail, stressing that the IBC must send a representative to the Netherlands to sign registration documents for the SCEAR Foundation, and mentioning his planned trip to Ethiopia in October/November

2007: 24 August – an IBC employee sends an e-mail to HPFI, expressing appreciation that the company recognizes the need to meet

2007: 25 August – HPFI replies to the e-mail, asking for a response to their request that someone from the IBC be sent to the Netherlands

2007: 29 August – Dr Abera Deresa, State Minister at the Ethiopian Ministry of Agriculture and Rural Development, sends a letter to the company explaining the ban on teff export and encouraging investment in teff cleaning and processing in Ethiopia for export purposes

2007: 3 December – Hans Turkensteen of HPFI sends an e-mail to the IBC, apologizing for not coming to Ethiopia as planned; he announces his intention to come in February 2008 and promises to send the HPFI annual report shortly

2007: 5 December – the IBC replies to the e-mail, recognizing the need to meet; the company then sends the annual report for 2006, but the IBC respond that they have received the Dutch version and would like one in English; the company replies that it is published in Dutch only, and asks how they might help

2007: Annual turnover for the HPFI reaches EUR 828,460.[151]

2008: 2 April – Hans Turkensteen presents the case of HPFI at the 'Business and Biodiversity' conference in Bonn

2008: 16 May – the IBC requests Kaliti Food Share Company to conduct research on the falling number values of 22 teff samples

[150] It is not explicitly stated in the letter who the sender is, but the content indicates that it is the IBC.

[151] According to the bankruptcy report by R.A.A. Geene, public receiver of the HPFI and S&C bankruptcy case, from 27 August 2009.

2008: 23 June – Kaliti Food Share Company sends the IBC their report on the falling number values of the 22 teff samples, which shows values varying between 273 and 400

2008: 24 September – the IBC send a letter to the two witnesses to the Teff Agreement, requesting them to mediate for the purpose of improved implementation

2008: 27 December – HPFI sends an e-mail to Mr Eshetayehu Tefera, a former IBC employee, mentioning the need for the SCEAR registration documents to be signed and for a steering committee to be established; they further promise to send the annual report for 2007 in February 2009 and request to be sent an invoice for EUR 2,000

2008: 28 December – Mr Eshetayehu Tefera forwards the e-mail to the IBC and informs HPFI that they should now primarily contact Dr Girma Balcha and Dr Kassahun Embaye

2008: Annual turnover for HPFI is EUR 566,726[152]

2009: 20 February 2009 – Mr Eshetayehu Tefera re-forwards the two above e-mails to the IBC, this time to his successor, Ms Feaven Workeye

2009: 4 August – S&C/HPFI is declared bankrupt by the court of Assen in the Netherlands

2009: Annual turnover for HPFI at the time of the bankruptcy was EUR 32,371[153]

2009: 24 August – new letter from the IBC to the witnesses to the Teff Agreement, again asking them to mediate (IBC obviously not aware of the HPFI bankruptcy)

5.2 The first phase of implementation: Follow-up attempts

The first phase of the implementation of the Teff Agreement featured some important steps to get started, while at the same time central provisions of the agreement were neglected, such as guaranteed up-front payments and provisions relating to the FiRST fund. The period was beset with communication problems. The main achievement was the initiation of a collaborative research project on teff breeding – which was, however, terminated after less than a year, in April 2007.

5.2.1 A foundation is set up, and communication problems start

One of the first things that happened after the Teff Agreement had been signed was that HPFI established the Foundation (Stichting) SCEAR. This was officially founded on 28 June 2005; according to Dr Arnold

[152] Ibid.
[153] Ibid.

Mulder and Dr Lodewijk Turkensteen, the purpose was to register and manage new teff varieties that had been developed in cooperation with Ethiopian institutions and/or were partly based on Ethiopian genetic material. At the time it was not possible to register varieties with non-European involvement with CPVO, and HPFI therefore set up an independent organization for this purpose. As Dr Mulder and Dr Turkensteen recall, HPFI decided that the SCEAR board should consist of two Ethiopian members, two Dutch members and an independent chairman, who was to be Dutch. While the two Dutch members were appointed and a temporary chairman was nominated,[154] no Ethiopian members were nominated. According to Dr Mulder and Dr Turkensteen this was because Mr Hans Turkensteen failed to follow up on his promise to consult and reach agreement with the Ethiopian authorities on this issue.

Mr Turkensteen, on the other hand, recalls that things started to go wrong from the very beginning after the signing of the Teff Agreement.[155] The Ethiopian counterparts expected that benefit sharing meant that money was to be transferred, rather than to start setting up the organization (foundation) provided for in the Teff Agreement and identifying the projects with farmers to be financed from the funding of the foundation. Almost immediately it appeared that for the Ethiopians, the agreement was on transferring money, whereas for the company HPFI it was about organizing future benefit sharing to the farmers and making sure that those projects could be funded and managed, according to Mr Turkensteen.

These initial disagreements can probably be traced back to Article 14 of the Teff Agreement, which provides the guarantee that HPFI would annually pay a sufficient sum of money in advance from which the requests by the IBC for payment was to be subtracted. When this did not happen, the Ethiopians became worried.

5.2.2 More teff genetic material is needed in the Netherlands

Three letters from HPFI to Dr Girma Balcha of the IBC sent 27 January 2006 reveal some other early developments after the Teff Agreement had been signed in April 2005.

In the first letter, from Hans Turkensteen[156] (Financial Director, HPFI), Dr Arnold Mulder and Dr Lodewijk Turkensteen, the HPFI representatives write of the challenges involved in breeding and cultivating teff in the Netherlands. Their experience during the period 2002 to 2005 has shown them that only ‘a very limited proportion of the Ethiopian germplasm can perform reasonably well in the Netherlands, which most likely is associated with not being adapted to long day and low temperature

[154] Dr A.C. Hulst was appointed to serve as secretary and Dr A. Mulder as treasurer.
[155] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012.
[156] Hans Turkensteen sometimes signs ‘J. Turkensteen’, as ‘Hans’ is the short form of Johannes.

conditions'. The company has selected three lines for further breeding, and the authors of the letter suggest that Ethiopian landraces will probably offer the best candidates for further observation and screening during the long hours of daylight and cool growing conditions in the Netherlands. Referring to the Teff Agreement from 5 April 2005, they therefore 'kindly ask IBC to give us permission to procure seed samples of 300–400 g of 10–15 early maturing landraces of teff from their original growing locations'.

A handwritten note in the top left-hand corner of the copy of this letter filed by the IBC says 'new negotiation', perhaps indicating that the IBC did not regard this request to be covered by the Teff Agreement.

In the second letter to Dr Girma Balcha, which was signed by Hans Turkensteen, Dr Arnold Mulder and Dr Lodewijk Turkensteen, the company representatives write that they would like to use three lines they have selected as part of their work in the Netherlands on adaptation to conditions marked by cool temperatures and long hours of daylight in their joint breeding project with EIAR–Debre Zeit, and 'kindly request to include' these lines in Annex 2 of the Teff Agreement.

The third letter sent by the HPFI to Dr Girma Balcha of the IBC, also dated 27 January 2006, was signed by Dr Arnold Mulder and Dr Lodewijk Turkensteen. They write of their visit to the IBC on 6 December 2005 to meet with Dr Kassahun Embaye. At that meeting they discussed a 'mutual breeding project of HPFI–S&C Research and Breeding and Debre Zeit Agricultural Research Centre' with him; they mention that in a later phone conversation with him on 'Monday 12th' (presumably 12 January) they were told that they 'could go ahead with setting up the breeding programme, as it was completely in accordance with' the Teff Agreement from 5 April 2005.

The HPFI representatives go on to write that they would like to inform Dr Girma Balcha that they are 'in the process of composing a proposal for a mutual breeding programme in cooperation with Debre Zeit Agricultural Research Centre'. This probably refers to the research agreement signed in April 2006, described below.

As these three letters show, there was communication of a relatively amicable character between the IBC and the HPFI at this point, and at least one face-to-face meeting was held in 2006 between the two institutions. The references to Debre Zeit Agricultural Research Centre of EIAR and the research agreement about to be negotiated further indicate that the company had kept in touch with and was collaborating quite well with that centre.

The letters also reveal that the HPFI was experiencing some difficulties in the breeding of teff in the Netherlands, and for that reason needed access to more teff genetic material from Ethiopia.

Nevertheless, no progress was made in ensuring Ethiopian participation in the Foundation SCEAR or providing Ethiopia with the guaranteed up-front payment.

5.2.3 Research agreement between EIAR and S&C/HPFI

An agreement between EIAR, and S&C/HPFI on a 'Collaborative Teff Breeding Project' was signed on 25 April 2006. This research agreement was drafted jointly by teff breeders at Debre Zeit Agricultural Research Centre of EIAR and the HPFI and was signed by Hans Turkensteen (Managing Director, HPFI) and Dr Solomon Assefa (Deputy Director General for Research, EIAR). This research agreement mentions both S&C and the HPFI as the Dutch partners. It takes as its point of departure the Teff Agreement and refers to its provisions on research collaboration between the HPFI and EIAR (formerly EARO). The relevant points in the agreement are noted as being Article 8.7 and Article 8.8: the former is about the involvement of Ethiopian scientists in the company's research, whereas Article 8.8 specifies the HPFI's commitment to use EIAR for teff breeding. The research agreement can therefore be seen as part of an implementation process with regard to the Teff Agreement.

5.2.3.1 Objectives and tasks of the research agreement

The objectives of this research collaboration were to 'combine adaptation to long day growing conditions with earliness, raised productivity, and resistance to lodging' and to 'select for quality aspects like baking quality, taste, quality of starch, seed colour, seed size' (section c). The background for these objectives and the research collaboration itself is explained in the agreement as follows: only some of the Ethiopian germplasm used so far by the company has proven successful in the Netherlands, most likely because of the long hours of daylight and low temperatures in this part of Europe; further, more suitable genotypes can probably be found in Ethiopia. In this connection it is also stated that the best way forward would be to combine what has been observed so far as regards adaptation to cool and long days with the improved yielding capacity of teff varieties bred in Ethiopia. The agreement states that the crosses should be made in Ethiopia, as this is where the relevant knowledge and experience can be found. In addition, most of propagation should also be conducted there, as this would allow more propagation per season. Some selection cycles in the Netherlands should be included to ensure screening for the desired traits.

The research agreement specifies, *inter alia*, the parental material to be used and the crosses to be made, and provides a timetable for the first two years of the collaboration, 2006 and 2007. From what is written in the research agreement about planning, it appears that Dr Lodewijk Turkensteen and Dr Arnold Mulder from the HPFI were meant to go to Ethiopia in September 2006 and that Dr Hailu Tefera and Dr Getachew Belay were meant to travel to the Netherlands in July 2007. It is also suggested in the research agreement that with regard to communication, the norm should be 'at least one e-mail per month'.

5.2.3.2 Plant variety protection and financial compensation

Reference is made to the Teff Agreement also with respect to plant variety protection. Here it is stated that 'plant variety protection rights concerning teff varieties coming out of this breeding project are co-

owned by EIAR and the company and will be added to annex 2 of the agreement'. A budget is included in the research agreement, with the cost for each year to be paid to Debre Zeit Agricultural Research Centre following an invoice for the amount in question. For 2006, costs were estimated to be EUR 4,070, and this amount was to be paid 'shortly after this agreement becomes effective'. A bank receipt attached to a letter from the teff research project at Debre Zeit Agricultural Research Centre to the Director of the Centre, dated 22 September 2006, requesting the Centre to open an account for this purpose, shows that this amount was transferred to the Centre in September 2006. According to this letter, the HPFI had already deposited money in a government account; the teff research project therefore requested the finance office at the Centre to open an account that the project could use, and indicated the names of project members who should be authorized to withdraw money for the project.

5.2.3.3 Continuation of the research collaboration

The agreement also dealt with continuation of the research collaboration: 'the programme will be continued on a yearly base if mutually agreed upon'. However, one might argue that it was open to interpretation whether this referred to continuation beyond the first year or beyond 2008, although the latter was presumably meant. This is because the agreement was entered into on 25 April 2006, while the deadline for deciding on discontinuation of the agreement was before 1st April each year (see below), so 1st April 2007 would be before one year had passed. Also, the timetable for the project sets up detailed plans for 2006 and 2007. Further, according to the agreement, discontinuation could take place only on the condition of mutual agreement, in case of bankruptcy or the termination of the existence of one of the parties, or in case of failure to comply with the obligations of the collaboration. Further: 'each year the date for deciding about discontinuation of the programme will be before the first of April by means of a written notification.' Here it seems likely that this refers to any discontinuation of the collaboration before the planned three years had passed.

It is perhaps also worth noting that although the company signed the Teff Agreement with the name HPFI only, both S&C and HPFI are used in connection with this follow-up research agreement.

5.2.3.4 Notification of the IBC and shipment of teff genetic material to the Netherlands

The IBC was formally informed about the signing of the research agreement in a letter dated 28 March 2007 to Dr Girma Balcha (Director General, IBC) from Dr Kebebew Assefa (Centre Director, Debre Zeit Agricultural Research Centre), also sent to the Deputy Director General for Research at EIAR and the Coordinator of the National Teff Research Project.

In this letter, reference is made to the Teff Agreement between the IBC and the HPFI, specifically Article 8.7 and Article 8.8. The recipients are informed that, on the basis of this agreement, Debre Zeit Agricultural

Research Centre has entered into an agreement 'for a collaborative research project with HPFI'.

The exchange of experimental seeds is cited as an important component of this research agreement, and the sender therefore requests permission from the IBC for experimental teff-seeds to be sent to the Netherlands for testing and selection. The seeds in question are from 'F2 segregating populations from two crosses done at Debre Zeit'; from the research agreement, it can be seen that the two crosses in question were given priority 1 and 3.

A handwritten note dated 2 April 2007 in the bottom right-hand corner of this letter, presumably written by Dr Girma Balcha, gives the instruction to 'check against the agreement' and to 'permit them as soon as possible'. This indicates that the IBC did grant the required permission, and that the seeds in question were sent.

5.2.3.5 Preliminary achievements of the research project

According to the two Dutch participants in the project, Dr Arnold Mulder and Dr Lodewijk Turkensteen,[157] the teff breeding project was highly interesting and fruitful. A few day-length-independent mutants were discovered in the field in the Netherlands, which enabled adaptation to the long daylight conditions found in northern Europe, and crossings were made by the Ethiopian counterparts Dr Hailu Tefera and Dr Getachew Belay of EIAR. Two reports were produced.

5.2.3.6 Termination of the research agreement in April 2007

According to Dr Arnold Mulder and Dr Lodewijk Turkensteen, Mr Hans Turkensteen terminated the research agreement per telephone to Dr Getachew Belay sometime in April,[158] without consulting with the two Dutch breeders or the Ethiopian authorities involved in the Teff Agreement.[159] Again according to the two breeders, Mr Hans Turkensteen had told Dr Getachew Belay that the project was proving too expensive. The termination of the agreement came as a shock to all involved breeders, and was very frustrating, since they had then reached a stage they saw as a major breakthrough in the breeding work, the two breeders recall. In addition, they said, it was not true that the project was costly, since almost no costs had been covered. Except for the above-mentioned payment to Ethiopia, neither salaries/fees nor experimental costs had been paid to the Dutch breeders.

[157] In a telephone interview with Dr Regine Andersen, 1 March 2012.
[158] According to a letter to from Dr Arnold Mulder and Dr Lodewijk Turkensteen to Regine Andersen dated 24 February, 2012.
[159] The information in this paragraph is based on personal communication between Dr Arnold Mulder with Dr Lodewijk Turkensteen and Dr Regine Andersen, 6 March 2010.

According to Mr Turkensteen, the purpose of the research project was to find better varieties and find them rather quickly. [160] The project had been sub-divided in three phases, he said: phase 1 and year 1: find better varieties; phase 2: develop and breed with those varieties; phase 3: make these varieties usable in common agricultural practices. After phase 1 it appeared that no appealing varieties had been found, according to Mr Turkensteen. The scientists wanted to proceed to phase 2, but due to lack of financial resources and low result expectations, the Board of Directors of the HPFI decided to postpone phase 2 to later years, he recalls. However, he did not think this should come as a shock, as the project continuation was to be reconsidered after the first year, he said. Not finding the results satisfactory, he decided to terminate the project.

Thereafter the Directors terminated the contracts of the two Dutch breeders Dr Arnold Mulder and Dr Lodewijk Turkensteen by e-mail on 5 April 2007 – with effect from 31 December 2006.

As this story indicates, the termination of the research agreement caused great frustrations among the participants involved. From the information provided by the two Dutch breeders, we can conclude that termination did not take place according to what had been specified in the contract. The first condition for non-continuation was mutual agreement. This was not fulfilled. The second condition for non-continuation did not apply, and the third condition was failure to comply with the obligations of the project. As we have seen, the Ethiopian counterpart did comply with its obligations, *inter alia* by providing for the shipment of seed samples to the Netherlands in early April. Therefore, none of the specified conditions for termination had been fulfilled. Furthermore, there is a question whether discontinuation was up for discussion at all in 2007. If so, the decision on non-continuation should have been taken before first April, and by written notification. The decision to terminate the research agreement and fire the two plant breeders seems to have marked the turning point in the implementation of the Teff Agreement. Let us now go back in history, to examine some other developments that also pointed to this turning point.

5.2.4 Communication problems and conflict in HPFI and with Ethiopia

According to Dr Mulder and Dr Turkensteen, the co-directors of HPFI stopped informing the shareholders of the company when the board was established in October 2005.[161] Communication came to a halt, they recall. They also report that the co-directors avoided any communication through official meetings and did not produce the required annual report to the shareholders. They also refused to participate in meetings called by

[160] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen 16 May 2012, and e-mail from him, 23 June 2012.

[161] The information in this section is based on personal communication with Dr Lodewijk Turkensteen and Dr Arnold Mulder (6 March with Dr Regine Andersen), and partly on the Bankruptcy Report produced by the Public Receiver of the S&C/HPFI bankruptcy case, R.A.A. Geene, August 2009.

the board. Finally a new board was set up, led by G. van der Schuur and P. Hoogschagen, who were new to the company and were invited to improve communication between shareholders and directors. However, this did not work out either, and the secrecy continued. For example, the sale of the teff patent from the HPFI took place without informing the shareholders, and a development cooperation project was initiated with German funding, based on information about the shareholders of which they were not aware, and which was not correct (see below).

Mr Hans Turkensteen recalls that communication problems with the Ethiopians were severe.[162] He felt that his Ethiopian counterparts were very suspicious about the motivations and actions of HPFI. On one occasion the Ethiopian news channel broadcast an item about various teff products, and the representative of the Genbank in Ethiopia accused HPFI of stealing intellectual property from Ethiopia and misusing the image of Ethiopian sportsman Bekele, he explains. To make sure that the agreement was better supported also on the political level Mr Turkensteen wished to discuss the problems at a higher level in Ethiopia, and approached several state ministers. However, he reported, there was little or no interest in any agricultural project on teff. In consequence he decided that it would be better to work with Ethiopian farmers directly, and not through government and scientific institutes. Mr Turkensteen reached this conclusion already in 2006, so ironically, again according to him, the suspicions of IBC Director General Dr Girma Balcha came true.

To our question of why Mr Hans Turkensteen did not terminate the agreement in 2006 when he saw that it could not be implemented the way it had been agreed upon, he answered that the alternative approach of working directly with farmers would be helpful for the international community and would help to make clear how benefit sharing could be done in a partnership with local farmers. In this way the agreement stayed alive, the objectives were met, he said. The foundation, as provided for in the agreement, and the need to establish a project plan, agreed upon by both parties, as foreseen in the agreement, were only tools, according to Mr Turkensteen, not the objective of the benefit-sharing contract. So by going to the farmers directly, the company HPFI was doing what it wanted to do: share benefits with farmers. The international society in favour of benefit-sharing agreements, including the Ethiopian counterpart, would still benefit from the fact that the agreement was in place and that benefit sharing was conducted actively.

Here Mr Turkensteen referred to a public private partnership project on teff cultivation that is presented in greater depth in sub-chapter 5.3. As we will see, there are serious reasons to doubt whether much benefits were shared this way. Also, since the Ethiopian counterparts of the teff agreement were not informed about the project, it does not provide sufficient justification for upholding an agreement that was in practice not working anymore. Nevertheless, the Teff Agreement remained in force, even though there were no more collaboration activities and communication activities between the parties had come almost to a halt.

[162] Telephone interview with Mr Hans Turkensteen, 16 May 2012, and e-mail from him, 23 June 2012.

5.2.5 The only indication of monetary benefit sharing

In an e-mail to Mr Hans Turkensteen from Ms Feaven Workeye of the IBC dated 30 April 2007, Ms Workeye asks him to send the IBC 'the official account data from your bank, specifying the amount and date of transfer', as 'the response from our bank is still negative'.

This e-mail indicates that there had already been some e-mail communication between the two and that a workshop had earlier been held in Ethiopia, attended by both of them. This e-mail does not specify when the workshop was organized, but it might have been in connection with the research agreement between the HPFI and Debre Zeit Agricultural Research Centre.

In his e-mail reply to Ms Feaven Workeye (with copy to Jans Roosjen) dated 30 April 2007, Hans Turkensteen sends bank information, such as date and payment number, regarding a payment of EUR 4,000. He also writes that she can contact their bank in Assen for further information, and provides the relevant contact information. He further writes that he is curious about what has gone wrong: according to his information 'your bank in Ethiopia received the above payment on March 13, 2007' and that 'I think the bank owes you and me an explanation'. He tells her to call him if she needs further information, and supplies a telephone number.

The EUR 4,000 in question refers to the only payment from the HPFI in relation to the Teff Agreement that was registered by the IBC. According to Dr Gemedo Dalle Tussie, the IBC received such a payment in March 2007, but without being able to match it to any of the agreed ways of monetary benefit-sharing specified in Article 8 of the agreement. Dr Gemedo Dalle Tussie made it clear that no other benefits had been shared with the IBC.[163]

5.2.6 How plant breeders' rights were dealt with

The European Community Plant Variety Office (CPVO) has issued three plant variety rights on teff to the foundation set up by the HPFI, Foundation SCEAR. The teff varieties in question are called Adina, Ayana and Tesfaya. Applications for plant variety protection on these varieties were filed on 17 December 2004, and plant variety protection rights were issued by CPVO in 2008 for all three varieties. The registered owner is Stichting SCEAR with Dr Arnold Mulder and Dr Lodewijk Turkensteen as the registered plant breeders. These plant breeders' rights are to be valid until 2033.[164]

[163] Interview with Dr Gemedo Dalle, Addis Ababa, 20 October 2011 (see also Dalle 2010)
[164] To be found through the CPVO website:
www.cpvo.europa.eu/main/en/home/databases/applications-and-titles-in-force

According to Mr Turkensteen, SCEAR was established to serve as the shared entity between the Ethiopians and HPFI.[165] But in practice it proved infeasible to get the Ethiopian counterparts officially recognized and established as co-founders and 50% responsible for the foundation. As a result, HPFI has never transferred any responsibility, project definitions or funds to this foundation, Mr Turkensteen recalls.

Today SCEAR is controlled by Dr Arnold Mulder and Dr Lodewijk Turkensteen, and through the foundation they control the plant breeders' rights to the three teff varieties. Dr Mulder and Dr Turkensteen are now involved in a new company selling teff; the previously mentioned Millets Place, that was established in 2010 (see 2.2). The teff varieties used by this company 'are officially protected by plant breeder's rights by Foudation Share MP and is exclusively licensed to Millets Place', according to their website.[166] Representatives of Millets Place have been in contact with IBC regarding the possibilities of an ABS Agreement. So far, such an agreement has not materialized.

5.3 A public–private partnership project on teff cultivation

After the initial communication problems with the Ethiopian counterparts, Mr Hans Turkensteen found collaboration with state entities challenging, and decided to work directly with Ethiopian farmers in terms of benefit sharing. For this purpose he initiated a public–private partnership (PPP) project on sustainable teff cultivation.[167] As we recall from Section 5.2.4 above, Mr Turkensteen saw that the Teff Agreement could not be implemented the way originally agreed, thus chose to work directly with farmers to show how benefit sharing could be done in a partnership with local farmers. This way, he explained, the agreement stayed alive, the objectives were met. The international society in favour of benefit sharing agreements, including the Ethiopian counterpart, would still benefit from the fact that the agreement was in place and benefit sharing was done actively, he said. Since Mr Turkensteen has claimed that this PPP project represented the benefit sharing that was carried out as an alternative approach to meeting the objectives of the agreement, this report assesses the project as well.

5.3.1 European partners, aims and funding

The partners of the PPP project on sustainable teff cultivation were Soil and Crop Improvement BV, the Dutch company Kremer Zaden[168] and the non-profit German development organization Sequa.[169]

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[165] Telephone interview with Mr Hans Turkensteen by Dr Regine Andersen, 16 May 2012, and e-mail from him, 23 June 2012.

[166] See 'What is MP-teff?' on Millets Place's company website: www.milletsplace.com/

[167] Interview with Mr Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012.

[168] Kremer Zaden is a company specialized in seed processing aimed at the food industry. See: www.kremerzaden.com . There is, however, no information about the project on their website.

[169] See www.sequa.de/index.php?lang=en

According to Sequa, the aim of the project was to promote a qualitative and quantitative augmentation of Ethiopian teff production by improving cultivation and the post-harvest conditioning techniques.[170] In Ethiopia they were, according to Sequa, to be assisted by the Sidama Coffee Union, which would train and consult local farmers and distributors in the development of functioning distribution channels. No organization with that name seems to exist in Ethiopia, but there is a Sidama Coffee Farmers Cooperative Union, and it can be assumed that this is the union in question.[171] As we will see below, that union never entered into the project.

The project was funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). In the press release, Sequa also announced that the project received scientific support from the University of Wageningen and the Institute of Agricultural Research (IAR). However, as we will see below, this was not the case. The project was to be carried out in the period 2007 to 2008, and was later extended by almost one more year, but was then terminated on 3 August 2009, due to the bankruptcy of S&C. Total expenditures for the project were budgeted to EUR 428,220, of which Sequa would cover EUR 200,000.[172]

5.3.2 Unwilling Ethiopian partners

As it turned out, the Sidama Coffee Farmers Cooperative Union did not find time to enter into a partnership with the HPFI.[173] According to Mr Turkensteen, this was because the union was facing serious financial problems because of a competing agreement with Starbucks; whereas, according to Sequa, it was because the union did not present itself as cooperative and goal-oriented.[174] We can conclude that Sidama Coffee Farmers Cooperative Union was unwilling to enter into the collaboration.

S&C also tried to enter into an agreement with EARO, under the Ministry of Agriculture. According to the final report from Mr Hans Turkensteen of 23 September 2009 to Sequa,[175] they had expected to receive a signed contract from EARO during their visit to Ethiopia in February 2008. On

[170] According to information on the Sequa website: www.sequa.de/index.php?option=com_content&view=article&id=589%3Anew-ppp-project-in-ethiopia&catid=45%3Apppen&Itemid=167&lang=de

[171] See http://sidacoop.com. There is, however, no mention of the project on the website.

[172] According to the final report written by Daniel Thomann, then Project Manager of the project 'Förderung des nachhaltigen Tef Anbaus in Äthiopien', project number 384-056, of Sequa GmbH, Partner of German Business. The final report is undated, written after finalization of the project on 3 August 2009. The information referred to is found on page 2.

[173] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012.

[174] According to the final report written by Daniel Thomann, see above, page 2.

[175] Final report from Mr Hans Turkensteen on the project 'Förderung des nachhaltigen Tef Anbaus in Äthiopien', 23 September 2009, titled *Anlage zom Weiterleitungsvertrag 384/056, A10. Abschlussbericht*. The quote was in English in the original text.

this basis they wished '*to discuss further research on breeding the right varieties for Ethiopian farmers*' with EARO. The final report continues (p. 4): '*Instead it proved that the institute [EARO, authors' addition] without signing any contract moved on in the breeding of new teff-varieties. Soil and Crop informed them that we still are waiting for their amended contract proposals and do need to work with a mutually signed contract. Given the fact that EARO expressed that they did not really believe in development of new varieties as well as the impact of amended production methods and technology S&C decided to stop working with EARO for the time being and concentrate on the contacts with farmers directly, without any influence of local and national authorities.*' In the final report from Sequa this is presented in a somewhat different wording. Here it says that EARO disregarded contractual agreements.[176] In any case, our documentation shows that EARO was not willing to enter into collaboration for the project.

Due *inter alia* to the lack of governmental support and because of the ban of teff export from Ethiopia, Kremer Zaden withdrew its participation in the project.[177] From now on S&C was the only Dutch company counterpart.

In the final report from Mr Turkensteen, he explains that S&C approached the Dutch Interchurch Organization for Development Cooperation (ICCO)[178] in order to find new partners in Ethiopia. According to the final reports from Mr Turkensteen and from Sequa (see above), the two partners that were finally selected were Adaa Lume Cooperative Union and Dawoo FMO Cluster.

The authors of this report have tried to identify these partners in order to get their perspectives on the project. We found no Adaa Lume Farmers' Cooperative Union under that name. In the final report from Mr Turkensteen (see above), a footnote provides a reference to the information presented on the Adaa Lume Farmers' Cooperative Union: Tesfaye Assefa, 2003. This report is available online,[179] but with no mention of Adaa Lume Farmers' Cooperative Union. However, we found a presentation of the Lume-Adama Farmers' Cooperative Union

[176] Final report written by Daniel Thomann, then project manager of the project 'Förderung des nachhaltigen Tef Anbaus in Äthiopien', project number 384-056, of Sequa GmbH, Partner of German Business. The final report is undated, written after the finalization of the project on 3 August 2009. The referenced sentence is written in German and reads: "Ebenso missachtete das Institute of Agricultural Research (heute EARO) vertragliche Absprachen und Vereinbarungen." (p. 2)

[177] Final report from Sequa, undated, page 6.

[178] See www.icco.nl/nl/

[179] Tesfaye Assefa (2003): Revitalizing Market-Oriented Agricultural Cooperatives in Ethiopia. A Case Study conducted In Cooperation with USAID's Cooperative Development Program, published byAgricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA). Available from: www.acdivocacoopex.org/acdivoca/CoopLib.nsf/All/78FF50CFC662C07985256DCC00681A0E?opendocument

(LAFCU) which corresponds with the information in the final report from Mr Turkensteen. We therefore assume that LAFCU is the farmers' union referred to. Unfortunately, LAFCU has not replied to our e-mails with questions regarding the project.

The Dawoo FMO cluster was, according to Mr Hans Turkensteen (from the final report, see above), established in 2007 as a result of a project conducted by the Facilitator for Change, Ethiopia (FCE), composed of eight farmer marketing organizations (FMOs). We contacted FCE to ask about their experiences with the project and received this answer:[180]

'It is correct that FCE, Facilitator for Change, has facilitated the establishment of FMO (Farmers Marketing Organizations) and their cluster in Dawo District. Teff is selected for value chain linkages based on subsector selection criteria in the project area. Currently, the FMOs of Dawo District including FMOs from three other districts have established unions of FMOs for input and output market to be competitive in the market. We would like to inform you that FCE and Dawo District FMOs have no information concerning collaboration with Mr Turkensteen, Teff Agreement and Sequa project.'

Also a teff working group was sought established, so as to bring together other donors and partners working on teff in Ethiopia in this group. However, this initiative had no effect, due to lack of demand/participation by the foreseen participants.[181]

5.3.3 Non-participation of Dutch and Ethiopian scientists

The authors of this report wished to find out who was involved in the project from the Dutch side, in addition to Mr Hans Turkensteen and Mr Jans Roosjen, the two co-directors of S&C. According to project documents the previous plant breeders of S&C, Dr Arnold Mulder and Dr Lodewijk Turkensteen, were to be involved as scientists, so we contacted them.

They forwarded a letter to us, which they had sent to Sequa in 2009.[182] Here Dr Arnold Mulder and Dr Lodewijk Turkensteen informed Sequa of what they believed to be various irregularities concerning the project. As S&C shareholders they had not been informed about the project when it was initiated, but had learned about it at a later stage. In particular, they had learned that the project had generated funds from BMZ via Sequa to cover the costs of their own salaries as full-time project employees from 2007 until 2008. However, as Dr Mulder and Dr Turkensteen had worked without pay since 2002[183] and had left the company in the beginning of 2007, they never received or had been informed about the mentioned

[180] Mr Misrak Aklilu, Programme Director for Agricultural Scale-up and Market Development, Addis Ababa, in an e-mail to Dr Regine Andersen, 25 June 2012.
[181] Final report from Sequa, see above, p. 2.
[182] Dated 30 November 2009, concerning 'Issue of Fraudulent Actions by S&C'.
[183] Hans Turkensteen had argued that there were not enough revenues to pay their salaries, and since they were retired they had an income.

payment. In addition, they claim in their letter that payments had also been included for several activities supposedly carried out by the two of them, but which they either had never been involved in or had conducted prior to and independently of the Sequa-financed project. Nor had they been informed about their supposed participation. A considerable sum – EUR 371,150 – had been included in the project budget to compensate for the work of these two scientists, who were then no longer working for the company.

In 2012, further explaining their recollections on the Sequa collaboration,[184] Dr Mulder and Dr L. Turkensteen specified that one of the claimed deliverables of the project, a handbook on modern teff cultivation, had actually been written by them, unrelated to the project, and then translated to English and Amharic without their involvement.

The authors of this report also wished to get in touch with the other Dutch scientists who were claimed to have been involved in the project. In the final report from Sequa (see above), Dr Ir Loes Terlouw is the only Dutch scientist mentioned except for the co-director of S&C Mr Jans Roosjen. In the final report from Mr Turkensteen (see above), Dr Terlouw is not mentioned, but Prof. Dr Jan Vos from Wageningen is. The latter was originally supposed to represent the link to Wageningen University that was announced when the project started. Both of them were given titles in the project documents which they do not possess or use (Prof/Dr). The authors of this report contacted both scientists.

In a recent telephone interview about the Sequa project, Dr Ir Jan Vos has stated: 'I have never ever had any contact with anyone asking me whether I wished to be involved in this project.'[185] He went on to explain that he had never seen any documents relating to the project. Later he was informed by others about the use of his name, and added that he was not very happy with the way S&C used his name in these project documents. He never gave his consent to doing so. Dr Vos had been told that his name had been associated with a German project, but was not aware of the role of Sequa, before the interview for the present report. Afterwards he googled 'Sequa project' and 'teff' and found a website on the internet, which to his astonishment states: 'The project gets scientific support from the University of Wageningen'.[186] That had never been discussed with him, and was not approved by him, he writes in a follow-up e-mail.[187]

This does not mean that Dr Vos was not in touch with S&C.[188] There had been collaboration relating to a research proposal to the Technology Foundation STW[189] in the Netherlands. According Dr Vos, a requirement for proposals in this case was that collaboration with relevant companies

[184] E-mail communication in May 2012.
[185] Interview of Dr Ir Jan Vos, by telephone with Dr Regine Andersen, 27 June 2012.
[186] www.sequa.de/index.php?option=com_content&view=article&id=589%3Anew-ppp-project-in-ethiopia&catid=45%3Apppen&Itemid=167&lang=en
[187] E-mail to Dr Regine Andersen, 27 June 2012.
[188] Telephone interview with Dr Regine Andersen, 27 June 2012.
[189] See www.stw.nl

would take place. The university gained the support of S&C, formally represented by Mr Hans Turkensteen, who signed on behalf of S&C, Dr Vos explains. The project was approved, and the collaboration started. The two plant breeders/agronomists of S&C, Dr Arnold Mulder and Dr Lodewijk Turkensteen, attended the meetings of the 'users committee' of the project. When the two were fired from the company, S&C was not excluded from the collaboration as a company; Mr Jans Roosjen was appointed as a new representative of S&C in the users committee, but never came to any of the meetings, Dr Vos recalls. Nevertheless, the research project continued, in collaboration with the two breeders; both remained members of the users committee. It was very successful, Dr Vos notes, highlighting the PhD thesis by Dr Sander H. van Delden (2011) 'On seed physiology, biomechanics and plant phenology in Eragrostis tef'.[190]

Ir Loes Terlouw worked for S&C when the company was exploring the possibilities of growing organic teff for export in Ethiopia, and was involved in these investigations.[191] She had her own private company (Terza BV), like the other S&C people, but was not a partner in S&C or HPFI. From 2004 to 2006 she did some work on a consultancy basis for S&C/HPFI, such as assisting in the breeding and research activities, giving advice on applying for breeder's rights, etc. This was not for the Sequa project, she emphasizes.

Ir Terlouw remembers having attended two meetings of relevance to the Sequa project. One she attended on 12 May 2006 together with Jans Roosjen and Peter Brul of Agro Eco (now a part of the Louis Bolk Institute) to discuss the possibilities of growing organic teff in Ethiopia. The second meeting was held on 28 June 2006 to discuss the Sequa project with Sequa representatives.[192] After that, a proposal for the project was made, she recalls. She agreed to be mentioned as a scientist involved in the project. What she did not know, she goes on to say, 'was that Hans[193] would write hours for me that I hadn't made for the project. Of course these hours were never paid to me.'[194] She continues: 'One of the things to do was the writing of a manual for teff production. However, this was already done by Lo and Nol[195] in the previous years. Jans and Hans suggested that I should write hours on the Sequa-project for the manual, which didn't appeal to me. At that time I had a job offer from a different company and left S&C. So, the only things I did were some preparatory work and one meeting. I might have seen the first draft of the project, but I spent less than a day on it in all. We had talked about the possibility of going to Ethiopia, but I never did', writes Ir Terlouw, who

[190] Available at: http://library.wur.nl/WebQuery/wda/lang/1964841
[191] E-mail from Ir Loes Terlouw to Dr Regine Andersen, 27 June 2012.
[192] According to the notes of Ir Loes Terlouw, other participants were Daniel Thomann and Frank Benderscheid from Sequa; Ferko Bodnár from Agro Eco, Jans Roosjen S&C and Patrick Kafka from Win-Win. Source: E-mail from Ir Loes Terlouw to Dr Regine Andersen, 27 June 2012.
[193] Hans Turkensteen is meant here.
[194] E-mail from Ir Loes Terlouw to Dr Regine Andersen, 27 June 2012.
[195] 'Lo' refers to Dr Lodewijk Turkensteen and 'Nol' to Dr Arnold Mulder.

is currently an independent consultant.[196] When we invited her to share her impressions on the Sequa project, she stated, 'I gather that there have been irregularities.'

As for her assignment with S&C, Ir Terlouw recalls that her invoices concerned a considerable amount of money. However, she states, 'I never have been paid (only some expenses), because there was not yet enough money coming from the starting business, according to Hans.[197] Later we learned that he gave himself a generous salary...'[198]

We then approached the Ethiopian scientist named in the final reports from Sequa and Mr Turkensteen, Dr Getachew Belay, to ask about his involvement in the project. He confirmed to have accompanied Mr Turkensteen and his colleague for a one day field visit to an NGO and farmers.[199] That was all of his involvement, which of course does not match the scientific role he was claimed to have had in the project documents.

Thus, none of the mentioned scientists were actually involved in the project, according to their own information, which has been provided independently from one another. This is a clear indication of serious irregularities in the project.

5.3.4 Funding arrangements and funds spent

According to Mr Turkensteen, the idea behind the project was that it should be funded by S&C and Sequa (on a 50%–50% basis) for the initial years, and that S&C would finance the continuation of the project.[200] Project support from Sequa was initially planned for two years, but was expanded due to the change of partners in Ethiopia.

Thus the funding started on 15 January 2007, and ended in August 2009 when both S&C and HPFI went bankrupt. As Mr Turkensteen explains the funding arrangement:[201] '*For any Euro which HPFI/S&C received from Sequa it had to spend at least two Euros. The project encompassed for 450,025 Euro expenditures, from which Sequa would finance 200,000 (46.7%). After the first two years, the idea was that HPFI/S&C would continue the project in other parts of Ethiopia. Actually that was done and also Prograin International bv did and still is working on such projects, silently and without any publications or exposure. (...) HPFI/S&C has spent 436,525.23 Euro from which 421,230.55 Euro was within the definition of the Sequa conditions against a participation of 190,000 Euro by Sequa.*'

[196] E-mail from Ir Loes Terlouw to Dr Regine Andersen, 27 June 2012.
[197] Hans Turkensteen is meant.
[198] E-mail from Ir Loes Terlouw to Dr Regine Andersen, 27 June 2012.
[199] E-mail from Dr Getachew Belay to Dr Regine Andersen, 4 July 2012.
[200] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012, and e-mail from him, 23 June 2012.
[201] In an e-mail to Regine Andersen, 24 June 2012.

According to the final report from Sequa (see above), these figures were different. Total project expenditures were, according to Sequa, EUR 400,588.08. The share of this amount that Sequa financed was EUR 178,021.34, which – still according to Sequa – amounted to 44.44% of the total costs.

5.3.5 The role of Sequa

As we have seen in this sub-chapter, the documentation presented above indicates grave irregularities in the project. The authors thus wished to find out if any evaluation or review had been carried out, and contacted Sequa. Programme Coordinator Mrs Susanne Sattlegger, who was not in charge of the project but answered on behalf of Mr Daniel Thomann (now Head of Division EU, formerly project manager of the project in question), was very helpful and provided further documentation.[202] She told us that individual projects usually have quite small budgets, with co-financing amounting to a maximum of EUR 190,000 per project; therefore there would be no systematic evaluations by the ministry. Instead a sample of projects would be examined by ministry experts, whereas all other projects were verified by regular reports and documentation submitted by the companies. In the case of S&C, Mr Thomann also visited Ethiopia and had a few discussions with the company. Also, German television (ZDF-3sat) had made two short documentaries on the project, she explained.

Mr Daniel Thomann was travelling during our exchange, but emailed from abroad that S&C had submitted the required reports and evidence that Sequa had requested and that we could be assured that Sequa – being officially mandated by the German government – had made every effort to clarify and document the situation and allegations.[203]

As the final report from Sequa states, the project objectives were largely achieved, and no irregularities were mentioned except for collaboration problems in Ethiopia.[204]

5.3.6 What goal achievements can be documented?

Having noted the conclusion by Sequa on goal achievements, the authors of this report looked into the documentation of the results, taking the final reports from Mr Turkensteen and from Sequa as points of departure.

The final report from Sequa states that new varieties have been tested and that they provided 25% higher yields than traditional varieties. There is no mention of the number or names of the varieties, or further reference to the tests. As the same information is provided in the final report from Mr Turkensteen, also without any documentation of these achievements within the project, it is difficult to validate this information. In any case, an important question is how this goal could have been achieved in light of the non-participation of the Dutch breeders mentioned above.

[202] In an e-mail to Regine Andersen, 9 March 2012.
[203] In an e-mail to Regine Andersen, 9 March 2012.
[204] Final report from Sequa, see above, p. 6.

An indication of goal achievement was that two European scientists were included in the project. According to the final report from Mr Turkensteen, the two were Prof Dr Jan Vos and Ing Jans Roosjen. According to final report from Sequa, they were Dr Loes Terlouw and Ing Jans Roosjen. As shown above, neither Dr Ir Jan Vos nor Ir Loes Terlouw were actually involved in implementation of the project (and they do not hold the titles indicated in the Sequa documents). Nevertheless, Sequa notes that the goal of the two involved European scientists was achieved.

According to both final reports, a handbook in modern teff cultivation was issued, available in Dutch and in English. However, as we have seen above, this handbook was not developed as part of the project, but was translated into English without the consent or knowledge of its authors.

According to both final reports, two scientific articles were to be published. Mr Hans Turkensteen reports in his final report that a TV documentary was produced by ZDF via 3SAT in September 2008. Sequa reports that a scientific article was published in *Berichten Buitenland Sectorspecial* in May 2007. The article is available online under the title 'Soil & Crop introduceert Ethiopisch oergraan Teff prima ingrediënt voor sporters en mensen met glutenallergie',[205] and was written by the journalist Jaap Holwerda. This is a journalistic presentation of barely three pages, with no references, and cannot be claimed to be a scientific article. Sequa also writes that a presentation with scientific results has been provided to Sequa. Thus the goal of two scientific articles had been achieved, Sequa concluded in its final report. In our view, this was not the case.

A report on the state of conventional technologies and their deficits was said to have been produced, and Sequa notes that it was presented to them. Also machinery for modern production technologies and training are said to have been leased. This proved difficult, according to the final report from Sequa. The level of education among farmers was too low, and the acceptance of new technologies inadequate in the target group. Training therefore had to be outsourced to external service providers. Nevertheless, Sequa notes that the goal of leasing machinery was achieved. Furthermore, at least 10 master farmers were to be trained. Sequa states that also this aim has been achieved, as they have signatures from 17 people who are listed as having been trained as master farmers.

We found that not much happened in Ethiopia the first year, because the envisaged partners not being willing to enter into collaboration. However, Mr Turkensteen claims that a line of organic teff production was set up in Alamata in the north of Ethiopia in 2007, together with Ethiopian farmers' associations.[206] The names of the associations are not mentioned,

[205] Jaap Holwerda (2007): 'Soil & Crop introduceert Ethiopisch oergraan Teff prima ingrediënt voor sporters en mensen met glutenallergie' in *Berichten Buitenland Sectorspecial*, No 5, May 2007, pp 25–27. Available at: www.rijksoverheid.nl/documenten-en-publicaties/brochures/2007/06/05/berichten-buitenland-sectorspecial-levensmiddeleningredienten-mei-2007-geillustreerde-versie.html

[206] Final report from Mr Hans Turkensteen, see above, p 3.

and the information is not documented. Activities in Alamata are not mentioned in the final report from Sequa.

When the two new partners had been identified (LAFCU and the Dawoo FMO cluster), Mr Turkensteen reports that a workshop was held for farmers of both partners in February 2008.[207] All in all 500 farmers were trained during the entire project period, according to Mr Turkensteen. However, participant lists documenting such participation include only 111 names, and there is a photo from a workshop in the final report from Sequa. We have also seen above that the Dawoo FMO cluster claims not to have been in touch with the project. The indictor for goal achievement was 400 farmers participating in workshops. Despite the lack of documentation of participation, this indicator was achieved, according to Sequa.[208]

Another goal was to conduct at least 24 one-day workshops. Sequa claims that at least 15 workshops were conducted, and that photos and participant lists have been provided for these. The goal was therefore partly achieved, according to Sequa.

According to Mr Turkensteen, it turned out that the two partners (LAFCU and the Dawoo FMO cluster) were not ready to enter into the project before the growing season in 2008. Therefore it was decided to start working with eight farmers in Sirba, close to Debre Zeit, to show how modern technology on eight trial plots would increase the harvest.[209] Here modern machinery was applied. The weed chemical Hussar was also introduced, provided by the Dutch company Horticoop, with good results in weed control, he explains.[210] Hand weeding would no longer be needed.

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[207] Final report from Mr Turkensteen, see above, pp 2–3.

[208] Final report from Sequa, see above, p. 4.

[209] Final report from Mr Hans Turkensteen, see above, p. 2.

[210] Hussar has been admitted to the market in Europe and has thus been tested according European protocols and using European norms. This means that it is considered having minimal risks when applied with the necessary precautions. However, it is worth noting that the chemical weeding control agent Hussar is classified as dangerous for human health and the environment, according to Bayer Crop Science, producer of Hussar. This warning applies if it not used with the necessary precautions. According to Bayer Crop Science, it is dangerous for humans if it enters the lungs, and it is toxic for water organisms (long-term effects). It is not readily biological degradable. Its use requires protective gear and boots for those handling it, and particular precaution measures if used close to water. It must not reach surface or ground water. If it burns, dangerous toxins will be released into the air, and gas masks must be used. Because it is inflammable, it is to be stored in a cool place and kept away from sun light. It must also not be stored close to food or fodder. Residues and cans are to be treated as dangerous waste. Here we must ask whether Ethiopian farmers were sufficiently informed about the dangers and the required precautions, whether this information will be accessible also if the technology spreads, and whether Ethiopian farmers are in a position, financially and logistically, to acquire the required protective gear and means. If not, Hussar may negatively affect Ethiopian teff farmers as well as the eco-system services of the environment for the local populations. This is not discussed in either of the two final reports. Source (in Danish): Bayer CropScience (2009): Sikkerhetsdatablad i henhold til Forordning (EF) nr. 1907/2006. HUSSAR OD 1/8. Udgave 1 / DK Revisionsdato:

Mr Turkensteen claims that there was an increase from 1600 kg to 2100 kg per hectare of teff.[211] The authors of this report are not aware of how this has been documented. The disadvantage would be that the costs of machinery and chemicals were high, Mr Turkensteen writes. The final report from Sequa notes that the new technologies will probably be applicable only for large-scale farmers, who may then achieve net incomes of between 150 and 450 USD per hectare per year; further, that in this segment the technologies might spread. This means that the technologies are unlikely to help in advancing teff cultivation among small-scale farmers in Ethiopia, even though the project is labelled as relevant for poverty alleviation.

Another goal was to ensure that at least 300 hectares of teff would be certified organic in Ethiopia. This goal was not achieved.

A further goal was that the Ministry of Agriculture and relevant development cooperation agencies would know and support the project. This was not achieved, as EARO was not willing to sign the contract. Study trips for Dutch and Ethiopian NGOs were organized, according to Sequa. An aim was to establish a teff working group consisting of involved organizations. This, however, did not work out.

A concept for using an S&C fund for the continuation of the project after Sequa ended its support was not developed, due to the bankruptcy of S&C. The fund in question was presumably the Foundation SCEAR,[212] which, according to Mr Turkensteen, had been empty all the time.[213] The foundation was also not under his control.[214]

Finally, at least three journalistic articles were to document the project in terms of public relations. This was partly achieved with the two ZDF films mentioned above.

5.3.7 Summing up in light of benefit sharing

According to Mr Hans Turkensteen, the project made good achievements, and helped to improve the yields of teff for farmers involved in the project.[215] He said that the local farmers proved how successful different methodologies to grow teff can be with very simple means, and commercial farmers copied the success by starting to use the same methodologies. The methods were disseminated this way, he has explained.

12.02.2009. Reference number: 102000011563. Available at: www.bayercropscience.dk/fileadmin/uploads/MSDS_Denmark/SDS_Hussar_OD_SAP_1.1_02.2009_01.pdf

[211] Final report from Mr Hans Turkensteen, see above, p. 2.

[212] This is the only foundation set up under S&C and HPFI, according to our knowledge.

[213] Explained in section 5.2.3.

[214] See section 5.2.3.

[215] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012, and e-mail from him, 23 June 2012.

Based on the assessment of the project achievements and its documentation above, however, we cannot see how it can be documented that the goals have largely been achieved, as stated by Sequa in its final report. It seems to us that the goals have largely *not* been achieved. The achievements that can be documented must have been very expensive, given the documented costs. Also there are serious questions related to the expenditure of EUR 450,025.- for the project in light of the irregularities presented above. Sequa was made aware of severe irregularities already in 2009,[216] but the authors of this report have not been informed by Sequa of any irregularities with regard to the project nor of claims to the public receiver of the bankruptcy case.

In a benefit-sharing perspective, it seems that the project was not wanted by the relevant government authorities, and that initial partners backed off. There is little evidence of reception among the second-generation partners as well: indeed, one of the two partners states that they have never heard about the project at all (the Dawoo FMO Cluster). One may ask why the funds that S&C claimed to have used for the project were not transferred directly to the IBC as part of the benefit-sharing arrangements under the Teff Agreement. Why were the IBC told that benefits had not yet been generated which could be shared, whereas S&C claims to have spent a considerable amount of money for the Sequa project? In light of the irregularities documented above, one may rightly ask who actually benefited from the Sequa project. Finally, it should be noted that the IBC was not formally informed of the project, which was intended as a contribution to the benefit sharing envisaged under the Teff Agreement, without being formally linked to the agreement.

5.4 The second phase: non-implementation and frustrations

Mr Eshetayehu Tefera, who worked at the IBC from 2002 to January 2007, initially felt that the company was serious about following up on their commitments.[217] However, apart from the three letters from the HPFI to the IBC dated 27 January 2006, the present research team has not been able to access any written communication between the parties before April 2007. When Mr Eshetayehu Tefera left the IBC in December 2006, Ms Feaven Workeye filled his position. A May 2007 letter to the Ministry of Agriculture and Rural Development from the IBC[218] refers to an earlier letter, dated 8 May 2007, from the Ministry requesting a comment on an application by 'the Dutch company', i.e. the HPFI, to cultivate teff in Ethiopia. In their letter, the IBC refer to the Teff Agreement and recommend that the government facilitate such cultivation and the necessary investments as long as the company agrees to process the teff into products for export in Ethiopia so that their activities will benefit the country's economy. This means that the HPFI had been in touch with

[216] Through a letter from Dr Arnold Mulder and Dr Lodewijk Turkensteen to Sequa, dated 30 November 2009, concerning 'Issue of Fraudulent Actions by S&C', sent to the authors of this report by the two plant breeders.
[217] Interview with Mr Eshetayehu Tefera, Ethiopia, 24 October 2011
[218] The content of the letter indicates that the IBC is the sender, although this is not specified.

the Ministry about this matter, most likely earlier the same year, and that the conditions for such production – that the processing must take place in Ethiopia – were probably made clear to them at this point.

5.4.1 Implementation concerns raised by the IBC

On 16 August 2007, Dr Girma Balcha sent a letter to Mr Hans Turkensteen concerning implementation of the agreement, outlining the concerns of the IBC. In this letter, Dr Girma Balcha refers to the signing of the Teff Agreement in April 2005, and states that since it has now entered its third year it is time to evaluate implementation progress so far and take measures to facilitate further implementation.

Further, he states that the establishment of the FiRST fund is among the serious concerns of the IBC. Referring to Article 8.4 of the agreement, according to which the HPFI is to contribute 5% of its annual profits to the fund (and not less than EUR 20,000 per year) and Article 8.5, which states that the details of administration of this fund shall be specified by a subsidiary agreement between the IBC and the HPFI, Dr Girma Balcha concludes that the fund should already contain at least EUR 40,000. However, to their knowledge, this is not the case, nor have the parties come together to work out the details of the fund's administration. He goes on to say that what worries the IBC the most is 'the decision you have taken unilaterally to establish FiRST in the Netherlands and enter into a project with German authorities using the fund from FiRST'. Dr Girma Balcha underlines that the IBC does not regard this as being in line with 'the spirit of article 8.5 of the agreement' and that it is not 'a constructive measure to our contractual relationship'. The IBC, he continues, is therefore of the opinion that there has been some misunderstanding between them and the HPFI regarding this fund.

The second main concern cited in the letter is the registration of varieties. The IBC fears that registering 'varieties in the name of FiRST is not in line with the very nature and purpose of FiRST'. The IBC is uncertain as to whether the company has developed new varieties that should be registered as co-owned, in line with Article 5.2 of the agreement.

Reporting is the last issue mentioned by Dr Girma Balcha in this context. He states that, even though according to Article 16 of the agreement the company is to send annual research and financial reports, the IBC has not 'received from you any formal comprehensive report in this regard, except the e-mail communications you made with Ms. Feaven in response to her queries'. As a result they feel that there is 'a considerable gap of information'.

Concluding, Dr Girma Balcha stresses the urgent need to 'clarify and rectify all the gaps created so far'. He invites Mr Turkensteen to come to Ethiopia to evaluate the progress of implementation and facilitate further progress.

5.4.2 HPFI responds to concerns

In an e-mail sent to Ms Feaven Workeye of the IBC on 17 August 2007,[219] with copy to Jans Roosjen,[220] Hans Turkensteen refers to the letter from the IBC, noting that he understands them as saying that they are unhappy about the follow-up of the agreement, that FiRST is a Dutch foundation and 'unhappy about the fact that the HPFI bv made a contract with German authorities to spend some 420,000 Euros (based upon an investment from S&C of 230,000 Euro's, including the first 40,000 Euro's) without first consulting you'.

This e-mail shows that Mr Turkensteen 'admits' that the HPFI has established the fund on its own and has made an agreement with German authorities. However, he does not specify exactly which German authorities are involved. In connection with his claim that his company has already donated an amount considerably larger than the EUR 40,000 they were obliged to according to the agreement, he does not specify where the other money for the foundation has come from. However, although the details are not explained in this e-mail it can be assumed that he is referring to the Sequa cooperation. In this context it should be mentioned that, according to Dr Mulder and Dr L. Turkensteen, Foundation SCEAR was not set up as a fund or meant to finance projects. And as Dr Mulder was the treasurer of Foundation SCEAR, any financial activities should have come to his attention. Dr Mulder and Dr L. Turkensteen also underline that Mr Hans Turkensteen and Mr Jans Roosjen have never been members of the board of SCEAR and have had no authority with respect to this foundation.[221]

Mr Turkensteen states in the e-mail from 17 August 2007 that also he is unhappy about the fact that they have not yet been able to sit down and 'start organizing the follow up of the agreement' and that 'as you know I have since 2004 several times asked for such a follow up'. He then adds, 'I have seen your invitation to come to Ethiopia and meet' but that he 'did not have time to respond due to holiday and other priorities' and that he appreciates the 'recent initiative in this matter very much'. This indicates that he had been invited to Ethiopia to discuss these matters prior to the invitation in the letter from Dr Girma Balcha from 16 August 2007.

Further, in Mr Turkensteen's opinion, the HPFI bv has done and is doing its utmost to follow up the agreement, but he writes that he understands the IBC complaint about financial information. However, he feels that this information is not especially relevant, as the HPFI is not yet profitable and 'the S&C invested far more in Ethiopia' than was agreed in the agreement. He agrees that the HPFI should have discussed the agreement

[219] This date is written by hand on the print-out of the e-mail, but is believed to be correct.
[220] Also with copy to Geert Westenbrink of the Royal Embassy of the Netherlands in Ethiopia.
[221] E-mail communication with Dr Arnold Mulder and Lodewijk Turkensteen in May 2012.

with the German authorities with the IBC first, but adds that he is sure that this agreement 'fulfils all rules as set by our agreement related to FIRST and its obligation to create a better future for Ethiopian farmers'. He also mentions that he is, 'as you know', very unhappy about 'the position of your government which blocks the possibilities for HPFI bv to export teff (…) even under the condition that HPFI bv will grow twice as much additional grain in Ethiopia' than what it will export, and that he sees this as a major infringement of the agreement.

Mr Turkensteen expresses his understanding for the IBC's concern regarding the 'validity of a Dutch foundation which is not yet for 50% in the hands of your institute', but that he expects that they have, based on the information he has given them, checked how they can participate in the foundation in accordance with Ethiopian law. In connection with this foundation, 'or SCEAR as we call it now', he also stresses that he feels it is impossible to register this foundation in Ethiopia because the country is not a member of UPOV. In his view, the co-owned varieties can be registered only in a country that has joined UPOV: moreover, he thinks that the foundation can be registered only in such a country as well.

According to Mr Turkensteen, the foundation has registered varieties in the EU, and adds that the IBC should be able to find them on the internet. He also writes that a South African organization has registered 'several varieties of teff under the UPOV legislation'.

He emphasizes that he feels the Ethiopian government does not want 'to help us move forward the Teff-Case', and that in his opinion the IBC should represent their interests and ensure that they are able to export teff from Ethiopia under certain conditions. He also indicates that he feels that this situation has put HPFI in a weaker position than their competitors, who have not entered into an agreement with Ethiopia, and that the Ethiopian government does not 'create conditions in line with the agreement under which HPFI bv can create profitable business from Teff in Ethiopia'.

As to the foundation, Mr Turkensteen explains that it is called SCEAR for S&C and EARO. Further, he writes in this email from 17 August 2007, it is necessary for a legal representative of the IBC to come to the Netherlands to sign documents to ensure that this foundation 'is registered in the official registers in the Netherlands as being 50% of Ethiopia'. He explains that his company can cover flight and hotel expenses in connection with such a trip, but that it is against company policy to pay daily allowances.

In this connection it is worth noting that according to Dr Mulder and Dr L. Turkensteen, who were both involved in SCEAR, the documents could easily have been signed in Ethiopia as well.[222]

Stating that the plan is to come to Ethiopia in October or November (2007), Turkensteen suggests that they schedule a meeting so that they

[222] According to e-mail communication with the present authors in May 2012.

can organize 'the follow up of the agreement in a proper and by both parties acceptable way'. He also wants the IBC to request the government to allow the HPFI to export teff, 'under restricted conditions', despite the export ban.

This letter illustrates the emphasis the HPFI placed on teff export from Ethiopia and their view that not allowing them to do this was contrary to the agreement. However, the Ethiopian side did not view this as part of the agreement, and felt that the company was using this as an excuse for not following up on their commitments.

5.4.3 Disagreement and lack of results

Ms Feaven Workeye responded to the e-mail from Mr Hans Turkensteen in an e-mail dated 24 August 2007. Here she underlines the IBC's appreciation of his recognition of the need for IBC and HPFI to sit down to discuss implementation of the agreement 'in a proper and mutually acceptable way', and asks him to send the schedule for his trip to Ethiopia.

In his response dated 25 August 2007, Hans Turkensteen writes that as soon as he knows the dates for the Ethiopia trip they can agree on a date for the meeting. In addition, he asks for her response to his request for someone from the IBC to come to the Netherlands for the signing of the foundation documents.

In a letter to Hans Turkensteen from Dr Abera Deresa (State Minister at the Ethiopian Ministry of Agriculture and Rural Development), with copy to Dr Girma Balcha of the IBC, dated 29 August 2007, Dr Abera Deresa responds to the HPFI's wish to invest in teff grain production and export. He explains that although the company's initiative is very much appreciated, the export of teff is 'for the time being prohibited and cannot be allowed until this restriction is officially removed'. However, he also explains that it is possible for the HPFI to invest in 'teff production, cleaning and processing into various industrial end products in Ethiopia in view of exporting the processed industrial products'. He adds that the government offers incentives like tax exemptions and low leases on land for such investments. This response was in line with the Ethiopian position regarding the need for processing of teff to take place in Ethiopia to support the Ethiopian economy.

An e-mail sent to Ms Feaven Workeye by Hans Turkensteen 3 December 2007, with copies to Dr Girma Balcha and Dr Kassahun Embaye, reveals that the above-mentioned trip to Ethiopia did not take place. Turkensteen apologizes for not coming to Ethiopia in October as promised, adding that this does not mean that they are not committed to discussing the implementation of the agreement – what happened was that they were very busy with restructuring their 'value chain and company in line with the growing demands on teff in the USA and Europe'. In this connection he again brings up the teff export ban, and mentions that one of the issues they need to resolve is teff production, as export from Ethiopia is not allowed.

He notes that he will be in Addis in February 2008 and that he hopes the IBC can find time to meet with them[223] then. He also writes that he will e-mail her the company's annual report from 2006 shortly and informs her that the project with the German government, 'directly related to S&C obligations to put at least $20,000 per year in a fund (Foundation SCEAR) is usefully underway'. He adds that they have spent 'some 158,000 euros until to-day on this project from which Euro 60,000 originates from the SCEAR fund'. Stating that they expect to start growing teff in 2008 and will plant about 200 hectares, he also claims that there were 'no activities in 2007'. The teff ban is brought up in this connection as well, a point which underscores the importance placed on this by the HPFI. Mr Turkensteen stresses that they would have liked to grow teff in Ethiopia instead.

In her e-mail reply dated 5 December 2007 Ms Feaven Workeye underlines the need for a meeting and states that they look forward to receiving the report. The same day Mr Turkensteen sends her an e-mail with the annual report for 2006 attached. Immediately after receiving this e-mail, Ms Feaven Workeye sends a reply to Mr Turkensteen, thanking him for sending the report, but asking for the English version as it is in Dutch. In a new e-mail to Ms Feaven Workeye, also on 5 December 2007, Turkensteen 'apologizes for the inconvenience' but explains they publish the annual report only in Dutch. He also asks how he might help her.

Although no written evidence was presented on this point, the general opinion among the Ethiopian stakeholders seems to be that, when they asked for the report to be sent to them in English, the HPFI responded that the Teff Agreement had not specified which language the reporting should be conducted in, and that it was up to Ethiopia to have it translated.[224] This communication might have taken place in later e-mails or by telephone. Such a response was surprising to the Ethiopians involved, as they felt it was obvious that all communication and reporting between the parties after the signing of the agreement would be in English, and not Dutch or Amharic.[225] According to Dr Girma Balcha it was problematic for the IBC to receive this report in Dutch, since even if they had managed to have it translated they would have had no way of knowing whether the translated version was correct.[226] Dr Kassahun Embaye underlined that this response led the Ethiopian side to believe that the HPFI was not committed to the agreement or serious about following up on their obligations.[227]

[223] Mr Turkensteen does not specify who, other than himself, he is referring to.
[224] Dr Girma Balcha (in an interview in Addis Ababa, 21 October 2011) and Dr Kassahun Embaye (in an interview in Addis Ababa, 20 October 2011) mentioned this. Dr Girma Balcha also confirmed that this report in Dutch was the only report the IBC received from HPFI.
[225] Dr Girma Balcha (in an interview in Addis Ababa, 21 October 2011) and Dr Kassahun Embaye (in an interview in Addis Ababa, 20 October 2011) mentioned this.
[226] Interview with Dr Girma Balcha, Addis Ababa, 21 October 2011.
[227] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011

Thus we see that this was another issue that contributed to distrust and dissatisfaction, this time felt mainly on the Ethiopian side. As for the funds that Hans Turkensteen claimed had been invested in the benefit-sharing fund (FiRST, later established as SCEAR), they never materialized in any projects in Ethiopia that the IBC or EIAR were informed about. Thus, it was difficult to believe that information received on this was true. This contributed to the distrust, further fuelled by the fact that the Ethiopian side had never been consulted about this new foundation structure.

5.4.4 IBC tries to initiate mediation

In a letter to the Dutch Ambassador to Ethiopia and Dr Tewolde Berhan Gebre Egziabher (with copies to Mr Hans Turkensteen and the Ethiopian Ministry of Agriculture and Rural Development) dated 24 September 2008, Dr Girma Balcha says he is writing to the two main recipients in their capacity as witnesses to the Teff Agreement, and that he is now asking them to mediate for the purpose of improved implementation.

The letter refers to verbal discussions and written communications by letter between the IBC and the HPFI. It goes on to state that 'these efforts have not improved the situation', which is why they have 'decided to go one step further and request your involvement in the matter'.

The main concerns of the IBC are listed: these relate to monetary benefit-sharing, the FiRST fund, reporting and intellectual property rights. With regard to benefit-sharing Dr Girma Balcha writes that the existing information gaps have not allowed the IBC to follow the progress of the company and that the only benefit-sharing of this type that has taken place so far is a payment of EUR 4,000 which they have been unable to 'correlate to any of the agreed financial benefits stated in article 8 of the agreement'. In addition, he claims that the institute has never received the advance annual payments specified in Article 14 of the agreement, from which requests are to be subtracted.

As to the FiRST fund, Dr Girma Balcha notes that the parties have not 'come together to discuss the details of establishment and administration of FiRST, and that the main concern of the IBC is 'the decision the company has taken unilaterally to establish FiRST in the Netherlands and enter into a project with some German authorities using the fund from FiRST'.

Further, he writes, the IBC has not received 'any formal comprehensive report' that fulfils the agreement's requirement regarding annual research and financial reports. The 'only formal report' they have received was a report in Dutch 'on the progress of year 2006'. Dr Girma Balcha also writes that when the IBC requested a translated copy, the response was that there was 'no agreement to give the reports in English'.

With regard to IPRs, the IBC Director General states that it is uncertain as to whether the company has developed new varieties that should be co-owned with EIAR; further, that they do not think registering varieties 'in the name of FiRST' is 'in accordance with the very nature and purpose of FiRST'.

A patent is also mentioned, presumably the teff patent. Dr Girma Balcha writes that as regards the possible use of Ethiopian traditional knowledge, the company should have submitted their research proposal to the IBC to ensure that the Teff Agreement was not breached, but that they have not received any such research proposal or been consulted in this matter.

In light of the listed concerns, Dr Girma Balcha therefore requests the mediation of the witnesses 'to facilitate the negotiation between the two parties in evaluating the progress of the implementation of the agreement so far'.

An e-mail sent on 27 December 2008 to Mr Eshetayehu Tefera by Mr Hans Turkensteen, with copy to Mr Jans Roosjen, illustrates the communication problems between the parties at that time – the recipient had left the IBC almost two years earlier, in January 2007.[228]

In this e-mail Mr Turkensteen updates Mr Eshetayehu Tefera on 'the progress made on teff in Europe and the obligations which HPFI bv will settle with you'. For 2008 and 2009 there will be no royalty payments as 'S&C Breeding and research organization did not make any profit'. However, it is not clear why he includes 2009 in this context, as the e-mail is from December 2008 – too early to conclude about the results from 2009. It is likely that this was a mistake on his part.

He goes on to write that the company did not harvest any teff in Europe in 2008, but that they expect to 'grow some 200 hectares of teff in 2009 which adds up to 2000 Euro'. With regard to 2009 he also states that 'in 2009 we are not yet in demand of any teff research by EARO', but that in 2010 they 'might pick up the program and develop new varieties of teff based upon the test we are performing during 2008 and 2009 in Europe and Africa'. This statement might refer to the research agreement between the HPFI and EARO from April 2006 and a possible continuation of this collaboration. As it is not specified where in Africa the testing takes place, it is possible that it is outside Ethiopia.

Mr Turkensteen also writes to Mr Eshetayehu Tefera that they 'again invite you' to co-sign papers regarding the foundation 'Stichting SCEAR' so that the Ethiopian government can formally become co-owners of the foundation and its registered varieties. He adds that the foundation has already 'registered three varieties of teff on behalf of the Ethiopian government and S&C, as agreed upon in the agreement of benefit sharing of genetic resources on teff'. This statement shows that he feels that using this foundation for the registration of varieties is in line with the agreement, even though the IBC in a previous letter had noted that they disagreed. Turkensteen also argues that the foundation 'is the logical legal carrier of any international rights based upon UPOV regulations as long as Ethiopia is not a member of UPOV'.

[228] According to Mr Eshetayehu Tefera (24 October 2011) he worked at the IBC from 2002 to January 2007, and when he left the institute Ms Feaven Workeye filled his position.

In this letter, Hans Turkensteen also writes that since 2007 S&C has been conducting activities that create 'income and jobs for Ethiopian farmer societies' to fulfil their obligations. He explains that in 2008 they changed their approach and 'decided directly to start working with farmers, without the bureaucratic involvement of local governments, farmer cooperations and international aid companies'; further, that since this change the project has been very successful, as 'farmers using S&C's methodologies for seeding and using improved chemicals for weed control of teff harvested some 25 to 30% more teff against reasonable cost'. As this statement illustrates, Hans Turkensteen appears to have felt a certain impatience with the institutions listed above and does not seem to believe in their usefulness when it comes to development projects. He further notes that the HPFI/S&C 'is spending some 240,000 Euro' on this project 'in line with the agreement on benefit sharing'. However, no indication is given of the location of these projects or precisely which companies were involved. There is merely a reference to a television programme where Hans Turkensteen spoke of the benefits his company was providing to Ethiopia.[229] Thus, so far no evidence had been brought forward that this benefit sharing had actually taken place.

In connection with urging the creation of a steering committee to enable them to 'mutually start steering the Ethiopian project program for farmers societies', Mr Turkensteen refers to having encouraged this in early 2007 and 'during several visits in Ethiopia'. This indicates that HPFI/S&C representatives may have visited Ethiopia more than once before December 2008 and that they may have been in touch with Ethiopian representatives on these occasions. However, as the e-mail mentions only an ambiguous 'you' it is uncertain whether the Dutchmen did meet with someone actually representing the IBC. If they met with other persons, their messages might not have been communicated to the IBC.[230]

Mr Turkensteen also states that he thinks he will be able to send the company's annual report for 2007 in February 2009, as this report 'is now in the authorization process with our shareholders'. However, according to the IBC, the only report they ever received was the one from 2006, written in Dutch.

Concluding the letter to Mr Eshetayehu Tefera, Mr Turkensteen asks to be sent an invoice for 'the mentioned' EUR 2,000. This request probably refers to the 200 hectares where he says the company expects to grow teff in 2009 in Europe, as the Teff Agreement states that HPFI will pay EUR 10 for each hectare on which the company grows teff in Europe.

A handwritten note dated 27 February 2009 has been added in the bottom left-hand corner of the print-out of this e-mail. It is addressed to 'Feaven' (presumably Ms Feaven Workeye) and asks her to please find out 'how Ato Eshetayehu Tefera has come to deal on teff project with this company'. This is probably in reference to the fact that when Mr Turkensteen

[229] See:
www.3sat.de/mediathek/frameless.php?url=/nano/bstuecke/89815/index.html
[230] Interviews with IBC employees in Addis Ababa, October 2011

sent this e-mail to Mr Eshetayehu Tefera, the latter was no longer working at the IBC. However, immediately on receiving this e-mail, he forwarded it to Dr Girma Balcha and Dr Kassahun Embaye, with copies to Turkensteen and Roosjen, letting them know that with respect to these issues all communications should be directed to Dr Girma Balcha and Dr Kassahun Embaye.

In this e-mail Mr Eshetayehu Tefera states that he is sending it to them urgently 'as it requires prompt action and reply'. He also includes his personal contact information in case they wish further information from him. In the same e-mail Mr Tefera also informs Mr Turkensteen that he should 'primarily contact this important issue to Dr Girma Balcha' and Dr Kassahun Embaye.

On 20 February 2009, Mr Eshetayehu Tefera also forwarded the e-mail communication from 27 and 28 December 2008 to Ms Feaven Workeye. In this e-mail, sent with a copy to Mr Mesfin Bayou, he writes that he hopes it has already reached her and that she has 'already kicked it', and refers to her 'additive assignment of ABS issue'.

Mediation efforts were taken up again in mid-2009, when Dr Girma Balcha sent a new letter to the Dutch Ambassador to Ethiopia and to Dr Tewolde Berhan Gebre Egziabher, with copies to the Ethiopian Ministry of Agriculture and Rural Development and the Ethiopian MFA. In this letter, dated 24 August 2009, the recipients are reminded of the letter from 24 September 2008 requesting them to mediate, in their capacity as witnesses to the Teff Agreement, between the parties to the agreement. Reference is also made to further communication reminding them to act, and stressing the need to act, since the matter is still not resolved. The recipients are then requested to state a time during the coming ten days when the issues in question can be discussed.

According to Dr Gemedo Dalle Tussie, Dr Tewolde Berhan Gebre Egziabher communicated that he was willing to take on the role of mediator. However, no actual mediation took place, as the IBC never received any response from the Dutch Embassy to the two letters.[231] By then, HPFI had been declared bankrupt.

5.4.5 Implementation of the Teff Agreement: the facts

As the above correspondence between the parties shows, there were highly differing views on what constituted implementation of the Teff Agreement. Also the information provided from the Dutch side was not always consistent. In this section, we will go through the operational parts of the Teff Agreement article by article, to provide a status as to implementation.

[231] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011

5.4.5.1 Article 4: Scope of access

As far as we know, HPFI has accessed the material specified in Annex 1 and additional material that was accessed through the above-mentioned research agreement with EIAR. Also as far as we know the company used the material according to the specifications in Annex 3. Ethiopia has not granted access to material covered by the agreement to other parties. So far the provisions have been followed.

As for the use of traditional knowledge, the teff patent covers knowledge about the storing of teff grain, which can be claimed to be traditional. The company has claimed patent rights over this knowledge, and has sought to make commercial benefit from it, without having obtained written agreement from the IBC. This may be considered a breach of the agreement.

The condition for the IBC to provide the company with information regarding traditional knowledge relevant to research was not applicable, so the IBC was not obliged to provide any such information.

In its product descriptions, the HPFI has mentioned Ethiopia as the country of origin of teff, and there have been no infringements by others to react to.

Thus, Article 4 has largely been complied with, except for the issue of traditional knowledge.

5.4.5.2 Article 5: Intellectual property ownership

HPFI has not claimed or obtained any patent over genetic resources of teff. The patent concerns the processing of teff flour, and covers all non-traditional use of ripe teff grain. However, in practice it affects the use of genetic resources of teff. Nevertheless, from a legal point of view, the company has complied with this provision.

Teff varieties have been protected with plant breeders' rights without co-ownership of Ethiopia. As Ethiopia could not be formally registered as co-owner of plant varieties to be registered at CVPO, HPFI sought to solve this by setting up Foundation SCEAR. However, this was done on a unilateral basis, not in mutual agreement with the IBC. Thus, the IBC refused to sign the papers. We may claim that the procedure chosen by the company represented a breach of the agreement.

5.4.5.3 Article 6: Transfer to third parties

The HPFI was not allowed to transfer tef seed samples to third parties. In this case all legal subjects except for HPFI can be held to be third parties, including other companies established by the directors of HPFI. As will be shown below, these directors established Prograin to continue its teff business, and continue using the material acquired through the Teff Agreement in this new company. This is a breach of the Teff Agreement.

An interesting question in this regard is how to consider the ownership structure for the three teff varieties that were protected with plant breeders' rights. The ownership to these varieties did not follow the directors of HPFI, but the plant breeders: the registered owner is Stichting SCEAR with Dr Arnold Mulder and Dr Lodewijk Turkensteen as the registered plant breeders (see 5.2.6). As Stichting SCEAR was never approved as part of the Teff Agreement, this ownership structure could possibly be seen as a breach of the contract in itself. The intention was, nevertheless, to solve problems with registering Ethiopian ownership to teff varieties at the CVPO through this foundation. Also, both breeders were working for HPFI at the time when the varieties were registered with CVPO. Thus, at that point in time, one could argue that the ownership structure was not a breach of Article 6. However, when the two plant breeders left the company in 2007, and the ownership to the varieties followed them, then this could possibly be seen as a breach of the agreement in terms of transferring material to a third party.[232] Probably none of the involved parties could foresee such an option when negotiating the agreement: that material could leave the company in this way, without being actively transferred.

5.4.5.4 Article 7: Effect of the agreement

Ethiopia has not exported teff covered by the agreement to any third parties, not least due to the export ban.

5.4.5.5 Article 8: Benefit sharing

A lump sum has never been paid. It should accrue in 2010, but by then HPFI was bankrupt. Annual royalties of certified seeds and annual licence fees have never been paid. The EUR 4,000 paid to the IBC in 2007, the only monetary benefit sharing that took place under the agreement, may have applied to one of these articles, but this was never clarified. The FiRST fund was never set up, and the minimum sum of EUR 20,000 was never paid. Thus the company did not comply with its obligations under the agreement in terms of benefit sharing. The claim that EUR 240,000 of the company's funds were spent on a project to benefit Ethiopian farmers is not relevant as part of the monetary benefit-sharing arrangements of the agreement, as the IBC was never informed about it and it was never agreed to by the IBC. Also, in light of the documentation above (see 5.3), it is questionable whether these funds were actually spent in Ethiopia.

As for non-monetary benefit sharing, the research project conducted from May 2006 until April 2007 was a good start, but it was terminated after less than one year. In this connection also relevant information was shared. After that there was no non-monetary benefit sharing. The company was to establish profitable teff businesses in Ethiopia, but there is no documentation that this has taken place.

[232] As explained elsewhere, the two breeders entered into contact with IBC after the bankruptcy of HPFI with a view to the prospects of establishing a new ABS agreement.

5.4.5.6 Article 11: Penalty

Since important provisions of the agreement were breached by HPFI, the provisions on penalties apply. However, this is conditioned on that the aggrieved Party, in this case the IBC, asks the company to do so. This did not happen before the bankruptcy. It is, however, part of the Ethiopian claims to the bankruptcy case (see 6.3.4).

5.4.5.7 Article 12: Termination

As the reporting requirements were not followed, the IBC was never in a position to find out about the bankruptcy process, and thus did not have the possibility to terminate the agreement during this process. Thus, the agreement was terminated officially only when Ethiopia sent its claims, through the IBC, to the public receiver of the bankruptcy case, on 15 November 2011 (see 6.3.4).

According to the agreement, HPFI should stop using the genetic resources of teff starting from the day of termination. As HPFI then no longer existed, this provision was complied with, strictly legally speaking. However, the new company (see below) continued using the material after the termination, and had obtained it without the written consent of the IBC. Thus the agreement was breached also here.

In this context, we may also note that the two plant breeders who left the company in 2007 and took the plant breeders' rights to the three plant varieties with them, established a new company together with former colleagues from HPFI in 2010, which focuses on teff, Millets Place (see 2.2 and 5.2.6). This means that is being used after the termination of the Teff Agreement, which has not been officially approved by the IBC. However, Millets Place has contacted IBC about this situation and there has been communication regarding the possibilities of an agreement between the two.[233]

5.4.5.8 Article 13: Dispute settlement

The IBC tried several times to initiate negotiations. The next step would have been to notify the Secretariat of the CBD and to start arbitration according to the procedures established under the CBD, Annex II, Part 1. However, as the IBC continued trying to get negotiations started, this step was not embarked on.

5.4.5.9 Article 14: Guarantee

The company never paid the guaranteed up-front payments from which the IBC was to subtract its requests.

[233] This has been confirmed by both parties in personal communication with Regine Andersen.

5.4.5.10 Article 16: Monitoring and follow-up

The company never sent annual research and financial reports, except for an annual report for 2006 in the Dutch language, which was of no use to the IBC. The IBC never made use of its possibility to review at any point, through an independent accountant, the book-keeping as well as relevant administrative details. Probably the IBC felt that this would be costly as compared to what could be expected to come out of such a review in terms of benefit-sharing payments. Meetings between the parties were rare.

5.4.5.11 Implementation of the Teff Agreement in sum

All in all, HPFI gained access to the material it required for the purposes it wished, without providing more than EUR 4,000 in terms of monetary benefit sharing. Non-monetary benefit sharing took place for about 11 months in the form of a promising research collaboration that was, however, terminated. The IBC kept to its obligations under the agreement, whereas HPFI breached central provisions. Implementation of the Teff Agreement must be described as a failure as seen from the Ethiopian side.

5.5 Implementation of the Teff Agreement seen from the provider side

One of the issues mentioned by the involved parties in Ethiopia in connection with implementation of the Teff Agreement was the export ban that was announced in late January 2006, and which lasted until 2010. HPFI emphasized this ban as an important reason for its difficulties in implementing the Teff Agreement. According to Dr Girma Balcha,[234] Mr Turkensteen 'took the agreement hostage' because of the export ban on teff and used the ban as an excuse for not fulfilling the company's obligations. Dr Girma Balcha explained that HPFI wanted to grow and buy teff in Ethiopia for export and that they had planned to do a second cleaning to make the teff suitable for the international market. However, because of the national food deficiency in Ethiopia the export of teff was banned[235] after a major debate in parliament. In Dr Girma Balcha's opinion, this ban made Mr Turkensteen less interested in sharing any benefits.[236] The IBC has also underlined that they think the export ban was used as an excuse for the lack of benefit sharing, and that they see lack of respect for the agreement on the part of S&C/HPFI as the main reason for the few benefits shared and for implementation difficulties in general.[237]

As mentioned in 4.4.3 above, S&C/HPFI were worried that they would not be able to produce enough teff in Europe and were therefore

[234] Interview in Addis Ababa, 21 October 2011.
[235] The ban on export of grain also encompassed maize, sorghum and wheat. The ban was passed January 2006 and lifted in July 2010.
[236] Interview in Addis Ababa, 21 October 2011.
[237] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011

interested in producing teff for export in Ethiopia together with Ethiopian investors. Although Dr Tewolde Berhan Gebre Egziabher was of the opinion that export was not at all part of the Teff Agreement, he added that if the company had signed this agreement under the impression that teff export would continue as needed, then he could understand that they would find it problematic when the export ban was passed.[238]

The Teff Agreement specifies that the IBC has the right to review the book-keeping of the company. However, as explained by Dr Girma Balcha, the IBC never made use of this right, as that would have been too expensive for them. Instead, they asked to be sent the company's annual reports. [239] Although there were no problems between the parties initially, the IBC started to wonder when they did not receive any reports.[240] According to the IBC, the only report they ever received from the company was the Dutch-language version of the annual report from 2006 (Dalle 2010).[241]

According to Mr Mesfin Bayou, Mr Turkensteen and Dr Girma Balcha did not communicate very well with each other.[242] Dr Gemedo Dalle Tussie specifically noted that Mr Eshetayehu Tefera and Ms Feaven Workeye were involved in the e-mail correspondence during their time at the IBC because, among other things, they were good at communicating diplomatically, and the directors of the IBC and HPFI had a hard time understanding each other.[243]

The 'breaking point' in the relationship between the two directors perhaps came when Dr Girma Balcha asked for a daily allowance of EUR 800 in connection with travelling to the Netherlands to sign the papers as requested by HPFI. This apparently upset Hans Turkensteen, who asked people who this man was who wanted that type of compensation for a meeting that he saw as advantageous for both parties. The two directors were not able to communicate properly with each other – and, as nobody mediated between them, this request blocked the communication.[244] As Turkensteen explained in the e-mail to Ms Feaven Workeye sent on 17 August 2007, the company was willing to cover flight and hotel expenses in connection with the trip, but it was against company policy to pay daily allowances.

According to IBC employees, Dr Girma Balcha became upset and angry when HPFI asked him to come to the Netherlands to sign the papers of a

[238] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011
[239] Interview in Addis Ababa, 21 October 2011.
[240] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[241] This information has been cross-checked: the authors of this report asked Mr Turkensteen if he could send the annual reports of the respective years in the English language. He responded by sending them in the Dutch language.
[242] Ibid.
[243] Mentioned by Dr Gemedo Dalle during interview, Addis Ababa, 26 October 2011.
[244] Mentioned by Dr Gemedo Dalle during interview, Addis Ababa, 26 October 2011.

foundation that was not in line with the Teff Agreement, and had not been set up in mutual agreement. He could not understand the need for him to go there – why could they not come to Ethiopia?[245] This can explain his decision to request a daily allowance, and clearly indicates that relations between the parties were deteriorating by that time.

Mr Mesfin Bayou has noted the lack of enforcement and monitoring of the Teff Agreement. In his view, this might have made it easier for S&C/HPFI to use traditional knowledge in their patent application without notifying the IBC and asking for permission.[246] However, as the application was filed before the agreement was signed, any use of traditional knowledge should have been disclosed already during the negotiations.

Further, according to Mr Mesfin Bayou, the IPR issue caused some friction in October 2005, when Mr Turkensteen was in Addis Ababa to hold a presentation at the Regional ABS Capacity-Building Workshop for Eastern and Southern Africa organized by the ABS Capacity Development Initiative (2–6 October), and proved unwilling to answer Mr Mesfin Bayou's questions about what type of IPR the company had filed. As Mr Mesfin Bayou saw it, confidentiality was not a valid reason for not sharing this information with him and the IBC, as they were obliged to respect the confidential nature of any information provided by the company. Looking back, Mr Mesfin Bayou speculated that this unwillingness on the part of the company to share information might have contributed the worsening of relations between Ethiopia and the company.[247]

In Mr Mesfin Bayou's opinion, part of the reason for lack of implementation of the agreement was that S&C/HPFI were proving less successful commercially than expected, and had encountered competition from other companies. He thinks Mr Turkensteen and the company had overly high expectations regarding the market potential for their products.[248]

Some of the Ethiopians interviewed felt, with hindsight, that S&C/HPFI entered into the negotiations because they had to, and with a hidden agenda.[249] They stressed that the bad publicity in connection with the Captain Hook Awards in 2004 had put the company under pressure, and speculated that perhaps the company did not in fact intend to adhere to the agreement.[250] The importance of good faith from both parties and mutual trust was also underlined, and it was felt that this was lacking on the part of HPFI.[251] According to the IBC, the company took advantage of

[245] Interview with Mr Abiyot Berhanu, Addis Ababa, 26 October 2011.
[246] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[247] Ibid.
[248] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[249] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011 and interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011.
[250] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011 .
[251] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011, interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011.

the good-will and trust of the Ethiopian negotiators, who were looking for a long-term relationship.[252]

As mentioned in 4.4.3 the atmosphere during the negotiations was at times quite amicable, and there was considerable optimism regarding the market potential for teff outside of Ethiopia. Finding it difficult to say exactly when the relationship changed, Mr Eshetayehu Tefera speculated that perhaps something had happened in the Netherlands.[253]

However, although the Ethiopians involved with the Teff Agreement were quite disappointed at the results of the Teff Agreement in general and the lack of benefit sharing in particular, positive consequences and results of the agreement have also been mentioned. According to the IBC, teff has been climbing up the national agenda as a result of the agreement, and there is now greater awareness regarding teff in particular and conservation of agricultural biodiversity in general. The process around the Teff Agreement has also been a learning process for the IBC and has helped them identify some gaps in their negotiating skills. Further, as the IBC sees it, the process has contributed to placing Ethiopia in the forefront with regard to ABS, as it now has ABS legislation.[254] Proclamation No. 482/2006 and Council of Ministers Regulation No. 169/2009 were also mentioned as results of the agreement.[255]

It is indeed possible that the negotiation of the Teff Agreement heightened the awareness of the need for national ABS legislation and that the proclamation was passed sooner than it would have been, had there been no agreement. However, when it comes to content, perhaps not enough time passed between the signing of the Teff Agreement and the drafting and passing of the proclamation for that to be affected by the difficulties associated with implementing the agreement. It seems more likely that this was a factor when the regulation was drafted.

In addition to these unexpected positive consequences, the agreement also had some unexpected negative consequences. According to Dr Kebebew Assefa, the Ethiopian authorities have now become less interested in entering into agreements as a result of their bad experiences. Debre Zeit Agricultural Research Centre is at the moment engaged in international collaboration with various institutions, but has been experiencing various difficulties with regard to the finalization of the research agreements. EIAR has said 'no', due to what they see as a lack of procedures for arbitration and dispute settlement. Through such collaborative ventures, the Centre gains access to important technical knowledge and resources. According to Dr Kebebew Assefa, the scientific partnerships the Debre Zeit Agricultural Research Centre has entered into with foreign

[252] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011.
[253] Interview with Mr Eshetayehu Tefera, Ethiopia, 24 October 2011.
[254] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011 and with Mr Abiyot Berhanu in Addis Ababa, 26 October 2001.
[255] Interview with Mr Abiyot Berhanu, Addis Ababa, 26 October 2001.

institutions have been valuable on the whole. EIAR's reluctance to accept new research agreements and their insistence on including procedures for dispute settlement might be a result of what they experienced with the MoU and the Teff Agreement; according to Dr Kebebew Assefa, EIAR is afraid of making any mis-steps, and rightly so.[256]

When interviewed, Dr Kebebew Assefa felt that the whole process had given Debre Zeit Agricultural Research Centre a poor reputation because of the attention to and the portrayal of the Centre's sale of seed to Larenstein University.[257] As shown in 4.2.3 however, this transaction was in fact in line with the MoU.

A further negative consequence of the Teff Agreement is that it created the impression that Ethiopia could not enter into other agreements on teff with other interested parties. Such an impression was false, as the agreement covered only the listed varieties and products, but it might have stopped potential new partners from contacting the IBC.[258]

As a result of their relationship with HPFI, the IBC has also become sceptical to botanical gardens. They believe the company accessed teff genetic material from such institutions, which they feel can function as gateways to biopiracy. Ethiopia has now become reluctant to share genetic material with botanical gardens.[259]

5.6 Implementation of the Teff Agreement seen from the user side

When asked what he regarded as the main achievements of the Teff Agreement, Mr Turkensteen replied that it constitutes a good example of how an ABS agreement could look like.[260] As such it could provide useful input for others involved in the negotiation of ABS agreements. Also, he noted, it shows that it is possible to negotiate such agreements: the problem was not in the agreement but in the implementation. Summing up his experiences, he remarked that the problems were not personal, but related to the political context in which this agreement was embedded. Ethiopia is a former communist state, and he felt that the involved people were afraid of making mistakes. He also found it to be very burdensome to have an agreement with a government entity under such conditions. Also, it was difficult to make plans with the Ethiopian counterparts. He could plan to meet certain people, write an e-mail stating which people he expected to see when, travel to Ethiopia for that purpose, and then they would not turn up. This he found provoking at times. There was too much suspicion, and communications were very troublesome.

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[256] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011

[257] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011. He also mentioned that with regard to the amount of seed given to the university, various figures have been cited in the media.

[258] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011

[259] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011

[260] Interview with Mr Hans Turkensteen, via telephone with Dr Regine Andersen, 16 May 2012.

Mr Turkensteen has stressed that the objective with the CBD in terms of benefit sharing is that benefit sharing is actively carried out in practical terms.[261] As such, the Teff Agreement was not an end in itself, but a means to reach the objective of benefit sharing. It contained the objectives, targets and tools required to get things moving and to prove to the international community and Ethiopia that benefit sharing was possible in practice. Further, according to Mr Turkensteen, the tools that were agreed upon by the parties to the Teff Agreement were an organizational structure (foundation co-managed by Ethiopia and HPFI), funding and project plans. Those were not objectives but all tools and means to let benefit sharing work for local farmers' societies, he emphasized. One of the tools was to be a shared foundation, but over time it became clear that it would be unfeasible to establish such a shared foundation. To make sure that benefit sharing would take place, S&C/HPFI started to circumvent the Teff Agreement in order to do what had been the objective of all parties involved: to share benefits with local farmers, Mr Turkensteen explained. This was the background of the benefit sharing project that was implemented in collaboration with Sequa on sustainable teff production in Ethiopia, he recalls.

According to Wynberg (2008), Hans Turkensteen had claimed that the problem regarding the export ban was not a shortage of teff, but resistance within Ethiopia to change the prevalent agricultural practices and thereby increase production. In Mr Turkensteen's view, Ethiopia was 'hindering private interests by overly regulating the market'; he felt that 'the small scale nature of farming in Ethiopia is a barrier to large scale commercial teff production in the country' (Wynberg 2008: 67).

In company self-presentations, HPFI tended to emphasize the ethical aspects and positive contributions of their work, for example by using the term 'corporate social responsibility' to describe their approach to teff production and sale, as well as to underline that Ethiopia was profiting from the agreement with the company.[262] These presentations also contain views similar to those expressed by Mr Turkensteen in interviews and e-mails; that it was time-consuming to work with African governments; that such an agreement did not offer the company sufficient protection (compared to patent rights); that it increased their costs in comparison with those of their competitors and what the company believed to be African mistrust of Western companies and interventions.[263]

According to Wynberg (2008), Mr Turkensteen and HPFI were not interested in involving the Dutch government even though the Ethiopian institutions would have preferred this. She cites Dr Tewolde Berhan Gebre Egziabher as saying that 'a providing country that does not ensure that the country of the recipient of the genetic resources is involved in any ABS will merely depend on the whim of the recipient once the

[261] E-mail from Mr Hans Turkensteen, 24 June 2012.
[262] See 'Background information map of Eragrain – Tef', a promotional brochure on S&C from January 2007 (www.abs-initiative.info/cases-ethiopia.html).
[263] See power point presentation from HPFI (undated, but perhaps from 2007) available at: www.abs-initiative.info/cases-ethiopia.html

genetic resources have left its territory' (Wynberg 2008: 65). This is also supported by the descriptions of the negotiations provided in the interviews conducted in Ethiopia in October 2011.

In response to the accusation of 'biopiracy', Mr Turkensteen also wrote an article for Tigray Online where he argued that this accusation was false, as HPFI had an agreement with the Ethiopian government and the full support of institutions like the IBC and EIAR. He also claimed that no traditional knowledge had been stolen in connection with the teff patent. In this connection he also argued that the company needed to protect its investments through patenting. He also claims that the company was involved in projects that supported farmers and farmers' associations, and emphasized that the owners of the company were scientists who believed in the potential of teff and whose goal was to contribute to improved nutrition in a way that would also benefit Ethiopian farmers.[264]

However, when discussing the views of the company on the implementation of the Teff Agreement we should also note that views differ among those who were involved in HPFI. According to Dr Mulder and Dr L. Turkensteen, the company directors did not respect the shareholders and the board and did not act honestly – and the consequences of this were harmful not only to Ethiopia, but also to the involved universities, businesses and farmers in the Netherlands, as well as the company shareholders and employees. Even though this is required by law, the directors, according to Dr Mulder and Dr L. Turkensteen, refused to present yearly reports to the board and shareholders.[265] One of the main negative consequences of the directors' behaviour, as these two scientists see it, is the damage done to relations between Ethiopia and the Netherlands.[266]

Although it has caused some friction in Dutch–Ethiopian relations, the Teff Agreement has also been positive in this respect. According to Dr Visser, one of the benefits of the Teff Agreement has been increased recognition at the Dutch Embassy in Ethiopia of the role of international agreements on conserving crop genetic resources, and greater interest in cooperating in projects related to the conservation and sustainable use of these resources in Ethiopia. Such projects were initiated some years ago and are now underway.[267]

According to Dr Ir Jan Vos, the production of teff has now almost come to a halt in the Netherlands.[268] This is partly because farmers are reluctant to get involved in teff business again, after their experience with the company over the past years, he recalls: They did not receive payment for their teff produce until several years later, and only after negotiations.

[264] See article in Tigray Online from 13 May 2008: http://tigraionline.com/sandc_respons.html
[265] Which might partly explain why the IBC received only one annual report.
[266] E-mail communication with Dr Arnold Mulder and Dr Lodewijk Turkensteen in May 2012.
[267] Interview with Dr Visser, Addis Ababa, 27 October 2011.
[268] In a telephone interview with Dr Regine Andersen, 27 June 2012.

Another reason is that teff grains of the early introduction ripen late in a northern country like the Netherlands, and there is a risk of crop failure (he adds that in the meantime much progress has been achieved by the plant breeders in developing earlier-maturing cultivars). In addition, wheat prices have risen, making wheat production more profitable, Dr Vos notes.

5.7 Possible explanations for the failed implementation

As this chapter has shown the implementation of the Teff Agreement failed on many fronts. It can be argued that while the IBC fulfilled its obligations, the HPFI mostly failed to do the same. The failure to implement the Teff Agreement can be summarized as follows: Only EUR 4,000.- reached Ethiopia in terms of monetary benefit sharing. A promising research agreement had been entered into, but was discontinued after a new shipment of teff seed had been sent to the Netherlands. A payment was made to Debre Zeit, to cover specified costs of the research project. HPFI claims to also have shared benefits with Ethiopia through a private-public partnership project, but severe irregularities in that project give raise the question of whether such benefits reached Ethiopia at all. Last, but not least, HPFI failed to fulfill the simple reporting requirements provided for in the Teff Agreement.

Looking back on the implementation period, a central question is therefore which factors that can be discerned that might help explain this failure.

5.7.1 Overestimation of the market potential and lack of experience

According to Dr Visser, one of the reasons for the implementation difficulties associated with the Teff Agreement may have been that Mr Hans Turkensteen and the company overestimated the market potential for teff and were overly optimistic about the potential profits. [269] In reality they were unable to fulfil the monetary obligations of the agreement. Mr Turkensteen and the company realized that they had been quite generous with regard to benefit sharing in the formulation of the agreement, especially compared to the profits they actually made and since the export ban caused quite big problems for the company and its plans (see 5.7.3). At least part of the reason for the mentioned miscalculations was the company's lack of knowledge and experience on the subject of ABS.

5.7.2 Communication problems and a lack of commitment

The overestimation of the market potential for teff does not alone explain why the company did not comply with simple information-sharing provisions, for example by providing IBC with annual reports in English. A better explanation for this is that the company's willingness to comply with the agreement ceased soon after it had been entered into. Mr. Hans Turkensteen points to communication problems as an important reason for that, and a gradual worsening of the relationship between the parties can indeed be seen during the implementation period. These problems

[269] Interview with Dr Bert Visser, Addis Ababa, 27 October 2011

started when the IBC asked for the up-front payment provided for in the Teff Agreement, and continued when the question of reporting was brought up. After the termination of the research agreement in April 2007, at which time the HPFI plant breeders involved were also fired from the company, the communication problems worsened significantly.

The communication difficulties between the IBC and the HPFI can be linked to the internal difficulties within the HPFI. Several shareholders left the company due to communication problems, and as we have seen, the HPFI had been established because of disagreements between the shareholders in the original company, S&C.

Perhaps most importantly, according to the HPFI Director the communication problems between the parties made the HPFI lose its commitment to implement the Teff Agreement as early as in 2006.

5.7.3 The export ban

As shown in 5.4, in May 2007 or earlier the HPFI had asked the Ethiopian government for permission to engage in teff cultivation in Ethiopia for the purpose of export. In line with the established Ethiopian position and the export ban on teff and other key cereals that had been put in place in January 2006, the Ethiopian response to this was that the processing of teff had to be done in Ethiopia, but if this could be agreed to, the government would be willing to facilitate the activities. However, the HPFI argued that the export ban constituted a substantial barrier to the implementation of the Teff Agreement as the company wanted to export teff for further processing in the Netherlands, and did not want this to be done in Ethiopia. One reason for this was that equipment deemed necessary for the processing of teff was available in the Netherlands. The Ethiopian negotiators, as well as IBC officials, maintain that teff export from Ethiopia was not relevant in an ABS context and was not part of the Teff Agreement. It can be assumed that as the export ban was introduced after the negotiation and signing of the agreement, the HPFI did not foresee that exporting teff from Ethiopia would end up being problematic. Nevertheless, as the HPFI Director claims that the company was not really committed to upholding the agreement from 2006, it can be argued that the export ban was after that partly used as an excuse and therefore not a central factor explaining the failed implementation.

5.7.4 Ethiopian distrust and dissatisfaction

At some point in 2007, the IBC grew increasingly concerned about the slow implementation progress, and initiated communication about this with the company in August 2007, outlining their areas of concern. The communication at this point reveals that both parties were experiencing dissatisfaction with the way things were developing. The HPFI was not happy about the response of the Ethiopian government regarding their wish to cultivate teff for export, and the IBC viewed the company's emphasis on this aspect as an excuse for not following up on commitments.

Matters did not improve when the IBC in December 2007 received what was to be the only report from the company, the annual report for 2006, in Dutch. This was not at all well-received in Ethiopia, and increased the distrust and dissatisfaction on the Ethiopian side.

5.7.5 Lack of coordination between Ethiopian institutions

Whereas there was a lack of coordination with regard to the MoU, as we have seen, most of the relevant Ethiopian authorities were involved in the process related to the Teff Agreement. Nevertheless, coordination failed with regard to the research agreement entered into in 2006. The IBC was not formally informed about the research agreement between the HPFI and Debre Zeit Agricultural Research Centre until almost one year after the agreement was signed. There was also a lack of consistency at the IBC with regard to who followed up the agreement. Lack of coordination might be an explanatory factor for why mediation efforts were attempted relatively late.

5.7.6 Unsuccessful mediation efforts

The increased distrust and dissatisfaction resulted in the efforts at mediation initiated by the IBC, first in September 2008 and then in August 2009. As was shown in 5.4.4 nothing came out of this, and when mediation was brought up the second time, the HPFI had already been declared bankrupt.

It has been argued that the IBC could have done more – and could have started earlier – to seek to force its counterpart to honor the agreement, by following up the agreement's excellent provisions on non-compliance. In fact, the IBC was quite active. The institute tried in different ways to further the implementation of the agreement, through letters and e-mails to the company, as well efforts to initiate mediation. The next step would probably have involved taking HPFI to court in the Netherlands, but the IBC did not have the institutional or financial capacity to do this.

5.7.7 The role of the Netherlands

An important question in this context is whether the Netherlands had any obligations with regard to the Teff Agreement. This is a much-discussed topic among the involved stakholders in Ethiopia, and many think that the Netherlands had an obligation in this regard. However, from a legal point of view, the Netherlands had no obligation to take any action. The ambassador had signed as a witness, but was not a party to the agreement. The Teff Agreement was an agreement between the Ethiopian state and a Dutch company. Nevertheless, the Embassy of the Netherlands did interact with the IBC, in providing the IBC with information and through some meetings. A question in this regard is whether the diplomatic channel could have been used to a greater extent, e.g. as an instrument for mediation. It is also worth noting that the last letter about mediation from the IBC was sent after the HPFI had been declared bankrupt: the IBC was evidently not aware of the bankruptcy process that was taking place in the Netherlands, and here the Embassy of the Netherlands could have had a role to play.

5.7.8 The lack of user country measures

According to Wynberg (2008), the lack of implementation of the Teff Agreement means that none of the provisions – for example on penalties, monitoring and follow-up, and dispute settlements – have been tested. However, she also underlines that compliance has been a major concern, and cites Dr Tewolde Berhan Gebre Egziabher as saying that 'We said that Ethiopian law would apply for compliance and we agreed on a procedure but we know it is feeble. If there is no international law on compliance it is a matter of a gentleman's agreement' (2008: 67). He also questioned which court they would go to in case of failure, and underlined that costs would be a barrier for poor countries such as Ethiopia. These are important arguments for user country measures.

5.7.9 In sum

How can the failure of the Teff Agreement be explained, on the basis of the implementation period? The point of departure is that the market potential for teff had been overestimated and that the company had committed itself to benefit sharing arrangements it could not meet. When the IBC demanded that the benefit sharing arrangements be met, this was received with irritation on the side of the HPFI, and became the start of a vicious circle of communication problems, causing the HPFI to lose its commitment to the agreement as early as in 2006. Later on, the relationship between the parties worsened when the IBC believed the HPFI to be using the export ban as an excuse for not implementing the Teff Agreement. The lack of reporting from the side of HPFI further provoked the IBC. Additionally, there was a lack of coordination and communication between the Ethiopian stakeholders. This helps explain why the IBC tried to initiate mediations relatively late. Nevertheless, when mediation efforts were initiated, the IBC tried in different ways to get such a process started without success. A part of the explanation here is that the IBC wished to involve the Embassy of the Netherlands in the mediation efforts. The Embassy however, did not consider such a role in line with their mandate and felt their role should be limited to information sharing. As the Ethiopian authorities expected more from the Embassy they were disappointed. Since no user country measures were in place, Ethiopia had to carry the burden of seeking to make the HPFI comply with its obligations on its own. Without the sufficient capacity and resources, it became impossible to follow-up as required, e.g. by taking HPFI to the court in the Netherlands.

6 HPFI bankruptcy and its aftermath

6.1 The short story: A time line (III)

2007: Prograin International BV/Ecosem established, probably in the first half of 2007[270]

2008: 21 May – HPFI sells its teff patent for EUR 60,000 to a partnership consisting of the HPFI directors

2009: 4 August – S&C and HPFI declared bankrupt by the court of Assen, the Netherlands

2010: 31 August – IBC sends a letter to the Dutch ambassador to Ethiopia, requesting information about the bankruptcy of S&C and HPFI, and claiming that the company has not fulfilled its obligations under the Teff Agreement

2010: 7 December – Mr R.A.A. Geene, public receiver in the Netherlands, sends a letter to the IBC, informing them about the bankruptcy and asking about the Ethiopian claims

2011: 15 November – the IBC sends a letter with the Ethiopian claims to the bankruptcy case to the public receiver in the Netherlands.

2012: 29 January – Dr Bert Visser, in his capacity of ABS focal point of the Netherlands, sends an e-mail to IBC with an update about the process relating to the bankruptcy case.

The bankruptcy of S&C and HPFI was not the end of the teff story for its directors. According to Mr Geene, the appointed public receiver of the S&C/HPFI bankruptcy case, the two directors of S&C/HPFI had set up a new company called Ecosem 'at least two years before the bankruptcy'[271] and this company had been cultivating teff in Spain during the growing seasons of 2009 and 2010. This means that in the summer of 2007, or before, the people behind HPFI set up a new company that, perhaps from the beginning, and at least from 2009, was involved in teff production. The timing of the establishment of a new company may indicate that the directors were not really interested in the success of HPFI any longer.

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[270] In a letter from the public receiver Mr R.A.A. Geene dated 7 December 2010, 2007 is given as the year Prograin International BV/ Ecosem were established. In presentations of Ecosem on the internet, however, the owners state that it was established in 2002. See for example:
www.tradezz.com/corpa_899522_Ecosem.htm,
www.alibaba.com/member/turkensteen/aboutus.html
www.tradekey.com/profile_view/uid/1229939/Ecosem.htm, and
www.agriculturesource.com/c-ecosem-124644.html. Prograin BV and Ecosem were not publicly known before 2007, and there is reason to believe that they were not established any earlier. Perhaps the HPFI directors wish to create the impression of continuity of the business itself since 2002, when S&C was established by some of the same individuals.

[271] Letter from Mr Geene to the IBC dated 7 December 2010

6.2 The Dutch bankruptcy case

In this sub-chapter the reasons for the bankruptcy will be sought explained. We will also look at what happened with the remains of HPFI, the new companies established by the HPFI directors and discuss the legality of the bankruptcy, before turning to its relevance for Ethiopia and the Teff Agreement in the next sub-chapter.

6.2.1 Why the HPFI went bankrupt

The public receiver of the bankruptcy case, Mr R.A.A. Geene of Dommerholt Advocaten, is currently working on this case. This is probably a story with several layers. Mr Hans Turkensteen himself stated that estimate errors as to the commercial potential of teff were partly to blame for the problems that eventually led to the bankruptcy of S&C and HPFI. The company had been overly optimistic about the potential market for their products, as many people are unaware they are gluten intolerant. In addition, the price of teff is considerably higher than that of other gluten-free alternatives, such as maize. As one of the direct contributing factors to the bankruptcy Mr Turkensteen has emphasized the miscalculation of the losses associated with cleaning teff, and how that in March 2009 meant that the inventory contained 70,000 kg less than expected. This severe blow to the cash flow was further exacerbated by the fact that relations between shareholders and directors had become difficult. These shareholders, on the other hand, have argued that in order to identify the cause of the bankruptcy, it is necessary to look at the history of the companies and what they call the 'un-businesslike' and overly-favourable conditions that had been agreed with the farmers.[272]

As stated in the official Dutch bankruptcy report of 27 August 2009, S&C/HPFI had a turnover of EUR 828,460 in 2007, EUR 566,726 in 2008, and EUR 32,371 up until 22 July 2009. And it is also reported that S&C/HPFI had a profit of EUR 96,270 in 2007, but experienced losses of EUR 306,716 in 2008 and EUR 158,091 up until 22 July for the year 2009. This decline in turnover and profit illustrates the financial difficulties of the company. However, there might be multiple explanations for this – not least since Prograin BV/Ecosem was set up at least two years before the bankruptcy, and for the same purposes as HPFI/S&C. An important question for the public receiver to clarify is whether values were transferred from the old to the new companies before the bankruptcy, and how the setting up of the new companies influenced the business of the old ones.

6.2.2 What happened with what was left of HPFI?

According to the bankruptcy report of 27 August 2009, HPFI sold the teff patent for EUR 60,000 to a partnership consisting of the HPFI directors on 21 May 2008. It is underlined in the report that the conflicting interests of the directors were not taken sufficiently into account with regard to this sale, and that company shareholders and partners had not been informed.

[272] Dutch bankruptcy report of 27 August 2009

Ecosem and related companies (Ancientgrain BV, Prograin International BV and Ecosem Europe), were, as mentioned, established in 2007.[273] The board of directors consists of Egbert Jan Sonneveld, Jans Roosjen and Hans Turkensteen.[274] As Mr Roosjen, who is listed as inventor on the patent application, is on the board of this company and it is stated on the website that 'Ecosem has protected its business by Port Vof patents on the application of teff-grain/flour'[275] and that this patent is based on 'an invention that only teff-grain within a defined range of Hagberg fall-numbers delivers acceptable human food products',[276] it can be assumed that the teff patent granted on 10 January 2007 is now in practice owned by Ecosem/Prograin. In connection with this patent, the Ecosem website states that mixing teff grain or flour with other types of flour and seed (except for the purpose of making *injera)*, milling teff to very fine flour, and mixing teff grain with different falling numbers are also protected by the patent.

It thus appears that on 21 May 2008, Ecosem/Prograin directly or indirectly bought the teff patent from the HPFI, and that the same individuals as before hold this patent, now under a new company name.

The reason given by Mr Turkensteen for the sale, according to the bankruptcy report, was that the HPFI could no longer afford the costs associated with maintaining the teff patent in North America, Germany and Japan. However, the bankruptcy report cites a Mr Van de Sand as claiming that this is not an accurate description of the situation, and that patent-related costs were not high. The bankruptcy report also mentions that some of the shareholders have formed a coalition for the purpose of challenging the sale of the teff patent.

The new companies established by the HPFI directors took over the activities of HPFI and related companies in 2008. Most of the values of the old companies were probably transferred to the new ones then, including the seed stocks.[277]

6.2.3 A company with many names

As shown by the bankruptcy transactions and the sale of the teff patent, several interrelated companies have been involved, directly or indirectly, with the Teff Agreement, the resulting production and sale of teff outside Ethiopia, and the teff patent. When the MoU was signed in March 2003, it was S&C that was the Dutch counterpart. However, when the Teff Agreement was signed in April 2005 after new negotiations, HPFI had been established and was the counterpart. When the research agreement was signed in 2006, both S&C and HPFI are mentioned.

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[273] According to the letter from Mr Geene, dated 7 December 2010.
[274] Ecosem website: www.teff-grain.com/
[275] Ibid.
[276] Ibid.
[277] In an interview with Dr Regine Andersen on 1 March 2012, Dr Arnold Mulder and Lodewijk Turkensteen claimed that this was the case.

This picture was to become even more complicated, as indicated. The Dutch bankruptcy report of 27 August 2009 reveals that this 'company group' consisted of five companies altogether: Health & Performance Food International (HPFI), Soil & Crop Improvement, Soil & Crop Research and Breeding, Soil & Crop Production Europe and Soil & Crop Milling and Sales. HPFI was responsible mainly for the development and sale of teff-based food products and beverages, whereas S&C Improvement was engaged in soil improvement and agricultural practices for the purpose of yield increases, S&C Research and Breeding gave agricultural advice and worked on varietal selection, S&C Production Europe worked on gluten-free cereals, and S&C Milling and Sales acted as wholesaler of agricultural products. According to the bankruptcy report, S&C Improvement was a daughter company of HPFI, while S&C Research and Breeding, S&C Production Europe and S&C Milling and Sales were daughter companies of S&C Improvement. All the companies of this group were declared bankrupt on 4 August 2009.[278]

The teff flour sold by HPFI was marketed under the brand-name 'Eragrain'. According to a promotion brochure from March 2008, the company wished to sell its products mainly to other businesses.[279] Eragrain was registered as a trademark in the United States on 24 April 2007, after an application had been filed 6 August 2004; 'S&C North America' was referred to as the applicant/owner and described as a limited liability company based in Idaho, together with a company referred to as 'AG'. The goods and services listed in connection with this trademark are flour and raw cereals.[280]

From the various documents written or published by these companies, it can be seen that even here distinctions are not always made among them. In his response to the charge in an Ethiopian online magazine that his company is involved in biopiracy, Hans Turkensteen writes about 'Soil and Crop' without specifying which of the companies in the group he is referring to, and no mention is made of HPFI.[281] On the other hand, in much of the promotional material for their teff products, it is HPFI that is in focus.[282]

The new company established by the directors of HPFI is called Prograin International, but it markets its products under the brand name 'Ecosem'.

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[278] Dutch bankruptcy report from 27 August 2009.

[279] 'Introduction to HPFI bv (Health & Performance Food International bv)' by Hans Turkensteen dated March 2008 (www.ecnc.org/file_handler/documents/original/view/198/turkensteen--introduction-to-health--performance-food-international-bvpdf.pdf?PHPSESSID=ba2441d02e93085dcee2718c1e9bc784)

[280] See information provided by the United States Patent and Trademark Office (USPTO): http://tarr.uspto.gov/servlet/tarr?regser=serial&entry=78463540

[281] Tigray Online, 13 May 2008 (www.tigraionline.com/sandc_responds.html)

[282] See for example' Introduction to HPFI bv (Health & Performance Food International bv)' by Hans Turkensteen dated March 2008 (www.ecnc.org/file_handler/documents/original/view/198/turkensteen--introduction-to-health--performance-food-international-bvpdf.pdf?PHPSESSID=ba2441d02e93085dcee2718c1e9bc784)

According to the company website, 'Ecosem is a trademark of Prograin International'.[283] However, the distinction is not entirely clear, as Ecosem also is registered as a company, owned by Jans Roosjen, whose main markets lie in North America and Europe; Hans Turkensteen is listed as the contact person.[284] In addition, there are also two other related companies, Ancientgrain BV and Ecosem Europe, registered as located at the same address, that of J.(Hans) Turkensteen.[285]

Through its subsidiary company 'Teff-Grain USA' Ecosem/Prograin is also present in the United States. According to the website of 'Teff-Grain USA', Royco International Inc. has been appointed 'Exclusive US Sales & Marketing Representative for Ecosem BV'.[286] This company 'also represents Ecosem in Australia, New Zealand and in some areas of Asia'.[287] Further, it is mentioned that Ecosem 'is currently growing Teff in The Netherlands, Spain, and South Africa', 'have new patents pending for the growing and use of Teff in the USA', and 'plan to grow teff in the USA when its volume growth in this market makes it economically feasible'.[288] According to the company website, 'Teff-Grain USA is mainly targeting food manufacturers.'[289] It is emphasized how teff grain is 'an exciting new ingredient' and 'and newly available to the North American market'[290] – whereas it has in fact been available there for more than 20 years. These exaggerations imply that the considerable plans and pending patents that are mentioned might also be more a part of a marketing strategy than a true reflection of reality.

Altogether, this makes for a quite confusing picture, and it is not easy for anyone with claims or interests in these companies to get a full overview of the group of companies, their activities and interconnectivity.

6.2.4 The legality of the bankruptcy

Whether the bankruptcy was legal, is a central issue dealt with by the public receiver of the bankruptcy case. The question depends on the Dutch legislation on bankruptcies. As investigating Dutch bankruptcy legislation would exceed the time limit for this report, we will here only highlight important aspects to be considered in this context.

In this chapter we have seen that the directors of S&C and HPFI established new companies only about two years before the bankruptcy. We have also seen that the financial performance of HPFI deteriorated after that. Furthermore, we have seen that properties of HPFI/S&C, such as the patent and the seed stocks were sold/transferred to the new companies. These are indications of irregularities which may be claimed to be illegal, depending on Dutch law.

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[283] See the company website: www.teff-grain.com/
[284] See Global Manufacturers website: www.gmdu.net/corp-841866.html
[285] Letter from Mr Geene to the IBC dated 7 December 2010.
[286] See the company website: http://teff-grain-usa.com/
[287] See the 'about' section of the company website: http://teff-grain-usa.com/about.htm
[288] http://teff-grain-usa.com/index.html
[289] Ibid.
[290] Ibid.

6.3 The bankruptcy as experienced in Ethiopia

In this sub-chapter we will look closer at the communication between Ethiopian and Dutch authorities regarding the bankruptcy, the termination of the Teff Agreement following from the bankruptcy, Ethiopia's claims in this regard, and its prospects that these claims will be met.

6.3.1 Interaction with the Dutch Embassy

As is clear from a letter to Mr Hans Blankenberg, the Dutch Ambassador to Ethiopia, from Dr Gemedo Dalle Tussie (with copies to the Director General Office and the Genetic Resources Transfer and Regulation Directorate, IBC), dated 31 August 2010, the IBC was not informed by HPFI of the bankruptcy. In this letter, Dr Gemedo Dalle Tussie refers to the Teff Agreement from 2005 and claims that HPFI has not fulfilled its obligations under the agreement. He goes on to state that it has come to the attention of the IBC that this company has gone bankrupt, but that the IBC was not formally informed about this bankruptcy and that the termination of the agreement did not take place according to its provisions.[291] The Embassy is requested to provide any official information that might exist related to this bankruptcy.

According to Dr Gemedo Dalle Tussie, the ambassador invited him to a meeting after having received this letter. At that meeting, which lasted for almost three hours, he showed him documents, translated and explained. The ambassador also promised to try to help Ethiopia get the benefits that might still be due, as there would still be resources left in the accounts after the bankruptcy.[292]

6.3.2 Interactions with the Dutch public receiver

Later the same year, on 7 December 2010, Dr Gemedo Dalle Tussie received a letter from Mr R.A.A. Geene informing him that 'the two companies Health and Performance Food International (HPFI) and Soil & Crop Improvement (S&C) have been declared bankrupt on August 4, 2009 by the court of Assen'. Mr Geene also wrote that he himself had been appointed as public receiver in connection with this bankruptcy, and requested the recipient to send him 'an overview of the claims to the above mentioned address with an explanation, for the registration'.

In addition, Mr Geene informed the IBC about the new company/ies created by the two directors of S&C/HPFI two years prior to the bankruptcy. He wrote that he had been informed that during the growing seasons of 2009 and 2010 this new company grew teff in Spain, on 'at least 1000 ha in 2010', and possibly also in Germany, Belgium, Romania and South Africa. This is how IBC came to know that immediately after, and even before, S&C and HPFI were declared bankrupt, the companies had been active in teff production.

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[291] According to Dr Gemedo Dalle (interview in Addis Ababa, 20 October 2011) the IBC never received any formal communication from HPFI about the bankruptcy, and has not been in touch with the persons involved since then.

[292] Interview at the IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011

6.3.3 Termination of the Teff Agreement

The news of the bankruptcy itself was also slow to reach all those who had been involved with the Teff Agreement. Even in October 2011, some of the persons interviewed for this report were not aware that S&C and HPFI had been declared bankrupt.[293] When informed about it, Mr Mesfin Bayou concluded that HPFI should have kept the IBC informed when they filed for bankruptcy and along the way, but as communication problems had started earlier it was perhaps not so strange that they had not done so. He also pointed out that if the company is now bankrupt, then one of the parties to the Teff Agreement has been dissolved and as a result the agreement is, for all practical purposes, terminated.[294] The IBC have also underscored that since learning of the HPFI bankruptcy, they have considered the agreement as terminated.[295]

Mr Mesfin Bayou was surprised to hear that the people behind S&C and HPFI had started a new company that was also working with teff. He added that this company's use of the teff genetic material received from Ethiopia after the bankruptcy and the resultant termination of the agreement represented a breach of the agreement.[296]

6.3.4 Ethiopia's Claims

In November 2011, Ethiopia sent a letter with its claims in connection with the Teff Agreement to the public receiver of the bankruptcy case.[297] In the following, we present the claims that were made.

Use of teff genetic resources: According to Article 12.5, starting with the day of termination of the Teff Agreement, HPFI should have stop using the genetic resources of teff. According to Article 6, the company was not entitled to transfer teff seed samples or any component of the genetic resources of teff to third parties without explicit prior written consent from the provider. As the IBC has never given such consent, it claims that any company established by the former owners of HPFI, including Ecosem, is prohibited from using teff genetic resources received through the Teff Agreement.

Rights over traditional knowledge related to teff: According to Article 4.5, HPFI was not permitted to claim any rights over, nor make commercial benefit out of, traditional Ethiopian knowledge related to teff,

[293] Mr Mesfin Bayou (interview, Addis Ababa, 26 October 2011) and Mr Eshetayehu Tefera (interview, Ethiopia, 24 October 2011) expressed surprise on hearing about this.
[294] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[295] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011.
[296] Interview with Mr Mesfin Bayou, Addis Ababa, 26 October 2011.
[297] Official letter of 15 November 2011 from the Director General of the Institute of Biodiversity Conservation Dr Gemedo Dalle to the public receiver of the HPFI bankruptcy, Mr. Rob Geene, Dommerolt Advocaten, Assen, The Netherlands. Copies were sent to the Ethiopian Ministry of Agriculture and the Royal Embassy of the Netherlands in Ethiopia.

without explicit written agreement from the provider. The IBC, as the designated provider in the Teff Agreement, has never given such written consent, the letter states. Nevertheless, it continues, the Dutch company has patented the processing of teff flour in Europe (EP 1646287 B1), which covers such traditional Ethiopian practices as seed storing after harvesting to improve the baking quality of the flour, and the making of dough. With reference to Article 4.5, the IBC claims that the teff patent constitutes a breach of the Teff Agreement and should be withdrawn, in particular if the patent has been transferred to a third party, i.e. Ecosem – or to any other company owned by the previous owners of HPFI.

Plant variety protection rights: In accordance with Article 5.2, plant variety protection rights over the varieties of teff developed on the basis of material from Ethiopia should be co-owned by HPFI and EARO (now EIAR). However, EARO was never made co-owner of the varieties, the letter states. Instead a foundation was set up by HPFI, Stichting SCEAR, and made owner of the varieties, the letter continues. EARO has not been involved in this process and has not received any benefits from licences. Thus, the IBC claims the Ethiopian share of any licence fees received for the registered teff varieties, as defined in Annex 2 of the Teff Agreement for the period from the agreement was signed and until its termination. Further, IBC claims that samples of these varieties are returned to EIAR (formerly EARO) as their sole remaining legitimate owner, and that the plant variety protection of these varieties is terminated.

Further monetary benefit sharing: The letter refers to the HPFI obligations provided for in Article 8 of the Teff Agreement: the company should pay a lump sum to the provider for the years 2007, 2008 and 2009 (Art. 8.1); annual royalties to the provider of 30% of the net profits from seed sales (Art. 8.2); license fee (Art. 8.3), and 5% of its net profits to the FiRST Fund to improve the living conditions of local farming communities and for developing teff business in Ethiopia (Art. 8.4 and 8.5). The letter further states that the IBC received EUR 4,000 in March 2007, and that this payment was made without any reference to which part of the agreement this transaction was related. As none of the other monetary benefits have ever materialized, IBC demanded that they should be realized.

Penalty for breaching the agreement: According to Article 11.1, a party that breaches the terms of the agreement shall pay to the aggrieved party a penalty of EUR 50,000 if so requested by the aggrieved party, the letter continues. According to Article 11.3, this penalty is applicable to HPFI if it breaches the terms of the agreement, particularly those set out in paragraphs 4.2, 4.3, 4.5, 4.6, 4.9, 5.1, 5.2, 5.3 and 6. As shown in the above, the letter states, it should be clear that the company has indeed breached central parts of the agreement, including several of those referred to in Art. 11.3. The letter provides examples with reference to the above: the company has breached Article 4.5 on traditional knowledge, Article 5.2 on plant variety property rights, and Article 6 on transfer to third parties (since the material is now used by Ecosem, as stated in the letter from the public receiver to IBC of 7 December 2010). HPFI has also breached most other provisions, including those set out in Article 4.7 and Article 8.11, acknowledging that the teff genetic resources it has

acquired are of Ethiopian origin; Article 8 on benefit sharing as stated above, in addition to all of the provisions on monitoring and follow-up (Art. 16). Therefore IBC claims EUR 50,000 as penalty from HPFI for its breach of the Teff Agreement.

Additional penalty for failing to fulfil financial obligations: According to Article 11.4 of the Teff Agreement, the provider, i.e. the IBC, may add a penalty of 5% of the due payment specified in Article 8, for any delay of between 90 and 180 days, and 25% thereafter, the letter states. As HPFI breached not only the provisions of Article 8, as stated above, but also the monitoring provisions of the Teff Agreement, the IBC is not in a position to calculate what such a penalty would amount to, the letter continues and concludes that instead, IBC demands that the Public Receiver calculates such an additional penalty on basis of Article 11.4.

6.3.5 Prospects for the realization of Ethiopia's claims

Even if these claims are based on the Teff Agreement, it is uncertain how much of them can be realized – due not least to the fact that there are several other parties with claims involved in this bankruptcy case. As there have been conflicts within HPFI, also former employees have raised claims against the directors.[298] Nevertheless, there is a potential scope for some compensation to Ethiopia.[299] If the public receiver has sufficient means and capacity to investigate the interlinkages between the former and previous companies, there is a possibility to give assistance to raise a personal claim against the people who are responsible for the violation of the rights of Ethiopia and thus solve the case in a fair and equitable way, provided that these people have sufficient assets to compensate the losses.

In an e-mail to IBC, the Director of the Centre for Genetic Resources, the Netherlands, Dr Bert Visser, in his capacity as ABS focal point of the Netherlands, provides an update on the bankruptcy case.[300] In reference to the public receiver, he writes that the expectations for rewarding any financial claims are low, given remaining assets. An expected report from the public receiver would be expected to provide information on what happened with the teff lots in possession of the company as well as with the patent and the plant breeders' rights. Dr Visser explained that he would receive a copy of that report, which would be in the Dutch language, and that he would inform IBC about relevant contents. Dr Visser writes that he believes that the report will provide all information needed for IBC to take any further steps against the new rights holders if IBC considers that appropriate. He also writes that he is at the disposal of IBC in case additional information or clarification is needed.

[298] Interviews with Dr Bert Visser, Addis Ababa, 27 October 2011 and with Dr Lodewijk Turkensteen and Dr Arnold Mulder 1 March 2012 by telephone

[299] Information from the Public Receiver Mr R.A.A. Geene in a telephone conversation with Dr Regine Andersen, 28 October 2011.

[300] The e-mail is dated 29 January 2012 and sent to Dr Gemedo Dalle Tussie, Director General of IBC. Copies of the e-mail were sent to *inter alia* the Royal Embassy of the Netherlands in Ethiopia.

At a seminar on the implementation of the Teff Agreement in Adama, Ethiopia, 16–17 March 2012,[301] Mr Geert Westerbrink from the Embassy of the Netherlands told the audience that the official letter from IBC to the public receiver of the bankruptcy case with Ethiopia's claims provided the Dutch side with a legal basis to follow up. He said that the Embassy would follow up through the ABS focal point Dr Bert Visser.

According to this information, the next steps for IBC are to await the report from the public receiver, and the communication of its relevant contents from Dr. Bert Visser, and then to consider whether further legal steps should be taken against the previous directors of HPFI from Ethiopia. It appears obvious that such steps cannot be taken unless Ethiopia can be supported from the Dutch side in terms of legal capacity and financial resources. Whether the Netherlands will provide such support is still uncertain, but the information above may indicate that such support could be considered upon request from Ethiopia.

6.4 The HPFI bankruptcy in summary

As this chapter has shown, the HPFI bankruptcy was surrounded with irregularities, which may, depending on Dutch law, prove to be illegal. Most importantly, the directors set up other companies for teff business at least two years prior to the bankruptcy. Not only were values transferred from HPFI to the new companies, but they may also have reduced HPFI's prospects for profit. The timing of the establishment of these new companies may indicate that the directors were not really interested in the success of HPFI any longer.

As reasons for the bankruptcy, the directors referred to erroneous assessments of the commercial potential of teff, combined with miscalculations of the losses associated with cleaning teff. A conflict with the shareholders may shed additional light on the reasons: some shareholders have stressed that the company was run in an 'un-businesslike' manner.

Prior to the bankruptcy, values were transferred from the old to the new companies. Most importantly, HPFI sold the teff patent for EUR 60,000 to a partnership composed of the HPFI directors, and seed stocks were taken over from HPFI by the new companies. As the directors of HPFI have set up a large number of companies, the interconnectivities between and among them are uncertain. It is difficult to draw up a clear picture of their interrelations in general, and with regard to the bankruptcy in particular.

The IBC was not officially informed about the bankruptcy until more than a year after the event. Nor was the Ethiopian institution aware of any impending bankruptcy, as the HPFI company had breached central reporting and monitoring provisions. Thus, the IBC had no possibility to terminate the Teff Agreement or take other actions as provided for in the agreement for the case of bankruptcy.

[301] See 1.5 on data gathering.

After a request sent by the IBC to the Royal Embassy of the Netherlands in Ethiopia, the IBC Director, Dr Gemedo Dalle Tussi, was invited for a meeting about the issue in 2010. In December that year the IBC received the letter from the public receiver officially informing of the bankruptcy and inviting Ethiopia to submit any claims. It was against that background that the IBC was enabled to terminate the Teff Agreement officially, and present claims with respect to the bankruptcy case.

The letter from the IBC to the public receiver in the Netherlands, sent in November 2011, highlighted severe breaches of the Teff Agreement. Citing the provisions of that agreement, the letter put forward the following claims:

- That any company established by the former owners of HPFI, including Ecosem, be prohibited from using teff genetic resources received through the Teff Agreement.
- That the teff patent be withdrawn, in particular if the patent had been transferred to a third party – Ecosem or to any other company owned by the previous owners of HPFI.
- That Ethiopia must receive its shares of any licence fees received for registered teff varieties, as defined in Annex 2 of the Teff Agreement for the period from the agreement was signed and until its termination
- That the plant variety protection of these varieties be considered terminated.
- That monetary benefits be shared according to the agreement: specifically, a lump sum that was expected to accrue based on financial performance in 2007, 2008 and 2009; annual royalties of 30% of the net profits from seed sales; license fees; and 5% of net profits (min. EUR 20,000 per year) to a fund to improve the living conditions of local farming communities and for developing teff business in Ethiopia.
- That a penalty of EUR 50,000 be paid to the IBC for HPFI's breach of specified provisions of the Teff Agreement.
- That an additional penalty be paid for HPFI's failure to fulfil its financial obligations, to be calculated by the public receiver, according to the relevant provisions of the Teff Agreement.

It is uncertain how much of these claims can be realized – not least as there are several other parties with claims in the bankruptcy case. Nevertheless, there is a potential scope for some compensation to Ethiopia. The IBC must await the report from the public receiver before deciding whether further legal steps should be taken from the Ethiopian side against the previous directors of HPFI. It appears obvious that such steps cannot be taken unless Ethiopia can count on support from the Dutch side in terms of legal capacity and financial resources. Such support is still uncertain – but the Netherlands has proven helpful with regard to the Teff Agreement in the past, as when the Dutch Ambassador to Ethiopia signed the Agreement as a witness. There are some indications that support could be considered, if so requested from Ethiopia.

7 Developments regarding the teff patent

As described in 4.3, the teff patent covers *inter alia* teff flour with falling number values above 250, to be milled after a certain period of after-ripening, the milling of fine flour, the dough or batter resulting from mixing this flour with liquid and a long range of non-traditional products resulting from baking such dough or batter. This is a far-reaching patent that covers most uses of teff, except for traditional Ethiopian teff-based food and beverages.

As we have seen in 4.3, the grant of the teff patent was published on 10 January 2007 by EPO, with patent owner listed as HPFI. The granting of a European patent by the EPO makes the patent valid in all the 38 member countries of the European Patent Organization, provided that the patent holder pays the annual patent fee in each of these countries within the prescribed time-limit. In practice, the company paid this fee only in those countries it deemed interesting for teff production,[302] so the patent is today valid in six countries: the Netherlands, Germany, France, Spain, Great Britain and Turkey.[303] In addition the patent application is still pending in the USA and in Japan.

Since the bankruptcy of HPFI, a frequently-asked question has been who owns the patent today. Whereas the original owner was S&C for the patent in the Netherlands, it was HPFI for the patent granted by EPO. As shown in 6.2.2 above (and referred to in a report from the public receiver), the patent was sold to a partnership composed of the directors of HPFI for the price of EUR 60,000 in 2008. This partnership is named Port V.O.F. V.O.F is the Dutch abbreviation for Vennootschap Onder Firma, meaning General Partnership. In the Netherlands this is special form of a company that can be established by two or more legal persons (e.g. individuals or companies), but which is not in itself a legal person.[304] It is based on a contract between the involved legal parties, which sets out the division of labor and responsibility between and among them. This means that any claim against such a company must be directed towards the legal persons behind the V.O.F. There are few requirements for the establishment of a V.O.F. except for the contract and that it is registered

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[302] In a telephone interview and mail correspondence with Dr Regine Andersen 27 June 2012, the teff expert Dr Ir. Jan Vos noted that among the countries in which the teff patent is valid today are the countries in which there has been interest in teff production. He added that such interest in growing teff was initially discouraged by S&C, HPFI and/or Millets Place, and perhaps not so much from actors in those countries.

[303] For an overview, see: The European Patent Register, Legal Status of EP 1647287 at: https://register.epo.org/espacenet/application?number=EP04774832&lng=en&tab=legal. For the legal status of the patent in the Netherlands, see Espacenet Patent Search, INPADOC legal status: NL1023977 (C2) — 2005-01-25 at http://worldwide.espacenet.com/publicationDetails/inpadoc?CC=NL&NR=1023977C2&KC=C2&FT=D&ND=3&date=20050125&DB=EPODOC&locale=en_EP

[304] See the Dutch Wikipedia: http://nl.wikipedia.org/wiki/Vennootschap_onder_firma#De_Nederlandse_vof

with the Chamber of Commerce. The Port V.O.F that is registered as owner of the teff patent is located in Beilen, the Netherlands,[305] which is also the place where S&C and HPFI were located since 2008.[306] On its homepage, Ecosem states that it has "protected its business with Port Vof patents".[307] It is also specified that Ecosem is a trademark of Prograin BV, which means that also the business of Prograin is protected by the patent(s).[308] We can derive from this information that the patent is not directly owned by Ecosem and Prograin, but indirectly through an intermediate body, the Port V.O.F. As Prograin and Ecosem are owned by the previous HPFI directors, the information above is sufficient to support the claim from the public receiver that the patent is now owned by a partnership composed of the previous directors of HPFI, as noted above.

Since the teff patent was granted, two German institutions have become engaged in questioning its validity. The German Gesellschaft für Technische Zusammenarbeit (GTZ) (now Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)) commissioned a legal opinion on the teff patent in 2008, which discussed its validity and potential prospects for challenging it. The Landwirtschaftskammer Hannover (later merged with Landwirtschaftskammer Oldenburg and renamed Landwirtschaftskammer Niedersachsen, LN (Chamber of Agriculture, Lower Saxony)), challenged the teff patent through the EPO, but without success. A new appeal is now being prepared to be brought to court in Germany. These developments, as well as the relevance of the patent for the Teff Agreement and Ethiopian views on the patent, are presented and discussed in the following, as a basis for further considerations. We begin by presenting the timeline and considerations as to the legality of the patent.

7.1 The short story: A timeline (IV)

2003: 22 July – S&C file a patent application in the Netherlands on the processing of teff flour

2004: 22 July – HPFI files a patent application on the processing of teff flour with the EPO

2005: 24 March – the patent application on the processing of teff flour is published internationally by WIPO, under the PCT

2006: 19 April – the patent application on the processing of teff flour is published by the EPO

2006: 21 December – the patent application on the processing of teff flour is published in the USA

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[305] The owner name is used in the Dutch patent (see source above), as well as in the US patent application, which also states that Port V.O.F. is located in Beilen. See Patent Buddy at: www.patentbuddy.com/Patent/20060286240

[306] See Intellectual Property Office of Great Britain: Patent status information, full details, register entry for EP 1646287 at: www.ipo.gov.uk/p-find-number?csbtype=F&csbpub=EP1646287

[307] See Ecosem, Patent at www.teff-grain.com/#

[308] See Ecosem, Organization at www.teff-grain.com/#. The use of plural (patents) probably refers to one and the same patent granted in several countries.

2007: 10 January – EPO publishes the granting of the teff patent (EP 1 646 287 B1)

2007: 8 October – Landwirtschaftskammer Hannover (LH) files a notice of opposition with EPO, calling for complete revocation of the teff patent

2007: 6 November – the opponent (LH) requests to be substituted with Landwirtschaftskammer Niedersachsen (LN), as LH has been merged with Landwirtschaftskammer Oldenburg; this request is judged admissible

2008: 21 May – HPFI sells its teff patent for EUR 60,000 to a partnership consisting of the HPFI directors

2010: 1 December – the opposition against the teff patent is officially rejected by EPO, but is open to appeal

2011: 1 February – the deadline for filing a notice of appeal with EPO expires. After this appeals can only be raised on a country by country basis among the EPO member countries.

When the patent application on the processing of teff flour was made internationally known under the PCT through WIPO on 24 March 2005, it was published together with an international search report. This international search report identified six sources which were relevant with regard to the patent. Four of these sources described recipes for coeliac food, including teff cookies, yoghurt pancakes with teff or buckwheat and teff muffins. One source described the acceptability of *injera* with stewed chicken and one source was a US patent already granted with reference to its claims 1 and 2. The latter reference from PCT was not addressed in the final document from the EPO granting the patent on the processing of teff flour.

Mr Hans Turkensteen has stressed that a patent is a legal means to benefit from the investments that a company has to undertake when it makes an invention and brings this invention to the market.[309] For HPFI, which invested heavily in research on how to better grow teff and ways to produce modern products with teff as an ingredient, it was vital to have such a patent, he maintains. Anyone who wants to produce anything relating to teff can do so, as long as it does not infringe on the patent, Ethiopia as well. After 2024, he adds, the patent will no longer be valid, and then everyone can use this innovation for free.

7.2 The legality of the teff patent

As we have seen in sub-chapter 4.3, there are serious reasons to question whether the patent claims meet the requirements for granting a patent – in particular the requirement that the patent claims should constitute a 'new' and 'inventive' step. When the patent was granted, this was because the applicants claimed that it did meet this requirement, and no information

[309] Interview with Mr Hans Turkensteen, via telephone with Regine Andesen, 16 May 2012 and e-mail from him, 23 June 2012.

was brought to the attention of the patent examiners which could indicate that this was not so. Even if the criteria are not met, patent examiners do not seem to be in a position to actively seek such information, but must rely on what is brought to their attention. If such information is not forthcoming before the patent is granted, one may still file an opposition within a certain period of time thereafter. This is the last chance to correct errors at the EPO level. Thus, the system hinges on the possibility of information reaching interested stakeholders in time, and that these stakeholders have sufficient capacity to challenge the patent if need be.

Based on the information that was available to the patent examiners as of 2007, it could be argued that the patent was granted on legal grounds. However, the information provided in the patent application was far from sufficient. Indeed, some of it was even not correct, as shown in sub-chapter 4.3. That information, as presented in 4.3, was readily accessible, and provides clear indications that the requirements of novelty and inventive step were not met. This gives rise to serious questions as to how the patent system functions in terms of checking the validity and reliability of the information presented in applications, as well as questions as to the burden of proof if the information provided is not correct.

Today, the only way to get the patent revoked is to bring the case to court and provide sufficient evidence that the criteria of novelty and inventive step have not been met. We will now look more closely at this option, based on a legal opinion commissioned by the then GTZ (now GIZ).

7.3 A legal opinion

On 15 March 2008, the GTZ published a document prepared by Ass. Jur. Ralf Henn, and commissioned by the GTZ. The document assesses the possibilities for opposing the granted teff patent, the effects of the patent, and the relationship between the patent and the Teff Agreement between the Dutch company and Ethiopian authorities (regardless of the fact that the patent application was filed before signing of the agreement). Henn found that the teff patent in principle could be opposed using two procedures – a central opposition hearing with the EPO, or a national court application to revoke the patent. The first option was no longer possible, as the nine-month period of notice for such an opposition had then already expired. Thus, only the second option was still available (and still is), meaning that separate applications for the revocation of the teff patent will have to be filed in all the EPO member countries, or, we may add, in the EPO countries where the patent is still valid.

Whether such applications can succeed will depend on the arguments used. Henn concludes that the only valid reason for revoking the teff patent would be non-patentability on the grounds of a lack of novelty. To prove non-patentability, Henn argues that a patent attorney with biochemical expertise would have to carry out a two-stage review to determine prior art before the filing date (22.07.2003) and how this compares to the claims covered by the teff patent. In this context, it is important to bear in mind that the teff patent covers both product and process. The procedure described by Henn does not seem to take into account that certain information in the patent application was wrong, and that there are other ways to prove prior art than by testing (see 7.2 above).

The teff patent is effective only in the European countries that have acceded to the European Patent Organization and where the company has paid its annual licence fee. It does not affect any teff production in Ethiopia or elsewhere. However, if companies in Ethiopia (or elsewhere) wish to export teff products covered by the teff patent to European countries in which the patent is effective, or to produce such products in these countries, it would be classified as an infringement of the patent, and the customs authorities of these European countries could halt import of such products. Henn argues that a possibility in this case could be to seek a contractual arrangement with the owner of the teff patent, e.g. to purchase it or to obtain a license to produce the products. There is also the possibility of obtaining a compulsory licence through a Patent Court order, subject to particular conditions.

Finally, Henn considers the relationship between the teff patent and the Teff Agreement, and finds that there is no conflict as such, since the Teff Agreement excludes only applications for patents concerned with plant genetic material of the teff varieties to which access was given. He finds that the teff patent cannot be described as a benefit in the sense of the Teff Agreement, and thus that there are no legal obligations to give Ethiopian actors a (free) licence, or to share the income from the patent with them in order to establish benefit sharing. Thus, he finds, the teff patent does not create contractual damages. Thereby he does, however, not discuss the use of traditional knowledge, as addressed in the Teff Agreement.

7.4 The teff patent is challenged

As mentioned in 4.3, the claims of the teff patent can be regarded as questionable because it is difficult to see how the novelty criterion for patents was fulfilled. In addition, the claims are problematic on ethical grounds, partly because of the MoU entered into by the applicants, and partly because of the new ABS agreement that was being negotiated. It can be argued that because of the nature of the patent application's claims and the lack of novelty and inventive step displayed, the teff patent should never have been granted by the EPO. The legality of this European patent has indeed been questioned by many. The first institution to formally challenge it was Landwirtschaftskammer Hannover in Germany (LH).[310]

From the time when the grant of a patent by the EPO is published, there is a nine-month period where a notice of opposition to the granted patent can be filed. As the notice of opposition filed by LH was dated 8 October 2007, it was filed before this nine-month period of notice of opposition expired for a central opposition hearing at the EPO, although it was not received before 13 October 2007. This opposition called for the complete revocation of the teff patent.

[310] LH was a public institution that offered advice to farmers in the region. This institution was then merged with the neigbouring 'Landwirtschaftskammer' (see text). The new institution, Landwirtschaftskammer Niedersachsen, is now in charge.

As LH had been merged with Landwirtschaftskammer Oldenburg, they then requested that the name of the opponent be replaced with Landwirtschaftskammer Niedersachsen (hereinafter LN)[311] on 6 November 2007. This opposition was deemed admissible.[312]

In its opposition to the teff patent, LN claimed that the invention underlying it had been insufficiently disclosed, because the phrasing in claim 1 would be understood by a knowledgeable individual to describe the falling number value of the grain, rather than that of flour, and that it would be impossible for grain as such to exhibit such falling number values.[313]

In response to this the proprietor argued that the invention had been sufficiently disclosed and that because of the term 'grain at the moment of grinding' it was implied that the falling number values referred to milled grain.[314]

The opposition division concluded that the invention had been sufficiently disclosed by the opposed patent, as it felt that the only meaningful reading of the disputed claim was to see it as referring to milled or ground grain, and observed that it therefore expected the opposition to be rejected and the teff patent to be maintained.[315]

The opposition against the teff patent was then officially rejected in a notification of the decision 1 December 2010.[316] This decision was open to appeal, but a notice of appeal had to be filed with EPO within two months of the notification of the decision.[317] This means that the deadline was 1 February 2011.

Looking back on this process, Regina Asendorf (LN), who participates in LN's EU-funded teff project,[318] says that when they challenged the teff patent they did not know enough about the subject of patenting and therefore trusted their lawyer. They now see that perhaps the wrong arguments were used and that they at the time did not have enough data to challenge the teff patent successfully.[319]

As they believed further challenging the EPO decision would have been unsuccessful, LN chose not to appeal and is as of August 2012 working on challenging the teff patent through the German courts. For this purpose they have started collecting evidence and plan to hire an experienced patent lawyer. As challenging the teff patent through the EPO cost them EUR 14,000 and the costs for the next challenge are

[311] Also known as Agricultural Chamber of Lower Saxony, Germany.
[312] See 'Outline of the opposition proceedings' from 7 April 2009.
[313] Ibid.
[314] Ibid.
[315] Ibid.
[316] See EPO document, ref 083/000 1 jh/dy.
[317] EPO report from 1 December 2010-
[318] This project has received tef genetic material from Wayne Carlson in Idaho, and has so far not used any Ethiopian material.
[319] Telephone interview with Ms Asendorf, 29 February 2012.

estimated at approx. EUR 50,000 LN has to start raising the necessary funding. If they gather enough data to be confident about the success of their appeal, they will need financial support to pay the lawyer's fees.[320]

The recent trends regarding biological patents in Germany give LN hope that, in the future, patents similar to the teff patent will not be as readily granted. All the political parties represented in the German Parliament have signed a petition to change the patent regulations with regard to so-called 'bio-patents'.[321]

LN is also interested in entering into an ABS agreement with Ethiopia, and as LN is a public institution, Ms Asendorf thinks this would be in Ethiopia's interest. However, so far she has mainly experienced scepticism from Ethiopian representatives due their bad experiences with such agreements. In her opinion, it would be essential to avoid making mistakes and to build any cooperation or agreement with the Ethiopian authorities on a foundation of trust. Ms Asendorf would also like to be able to share any teff material her institution might receive and develop as part of such an agreement with other stakeholders, on condition that it remains in the public domain. Ethiopian consent would of course be necessary to do this.[322]

7.5 Views on the teff patent in Ethiopia

Many of the Ethiopians interviewed for this study said that they feel Ethiopian traditional knowledge has been infringed upon in connection with the teff patent. It was underlined by these interviewees that it is very common in Ethiopia to store the teff grain after harvest, often for a long time, and that considerable traditional knowledge exists regarding the ideal storage time and making of flour.[323] According to Dr Kebebew Assefa, teff harvested in December will normally not be used until June or July the following year, and sometimes only after many years. At the markets in October it is, for example, possible to find teff from both the current year and the previous one, and the prices will vary according to harvest year (grain harvested the previous year will fetch higher market

[320] Ibid.
[321] Ibid.
[322] Ibid.
[323] This was mentioned by Dr Tewolde Berhan Gebre Egziabher (interview in Addis Ababa, 26 October 2011) and Dr Kebebew Assefa (interview in Debre Zeit, 24 October 2011). EIPO (presentation in Addis Ababa, 24 October 2011) indicated that they think traditional knowledge has been utilized in the teff patent without prior informed consent. Dr Girma Balcha (interview in Addis Ababa, 21 October 2011) also mentioned the existence of traditional knowledge on the storing of tef grains. Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu (interview in Addis Ababa, 20 October 2011) mentioned that it is possible to go to any rural area in Ethiopia and find that the farmers there store the tef grain for two or three months before they thresh it, and that this is very common in Ethiopia. Mr Abiyot Berhanu (interview in Addis Ababa, 26 October 2011) also mentioned that HPFI probably used Ethiopian traditional knowledge in connection with the patent.

prices than grain from the new harvest, chiefly due to high flour yield, high water intake ability and thereby high *injera* yield).[324]

It was also questioned how it could have been possible for anybody to seek patents related to teff without learning about teff from Ethiopians.[325] However, in Article 4.5 of the Teff Agreement it is specified that HPFI 'is not permitted to access the traditional knowledge of Ethiopian communities on the conservation, cultivation and use of teff' and that the company can therefore not 'claim any rights over, nor make commercial benefit out of, such traditional knowledge unless explicit written agreement is given' by IBC. The company was never granted any such permission, so if traditional knowledge has been used in the teff patent, that constitutes a breach of the agreement. This is also mentioned by Sertse (2008), who argues that instead of submitting its patent application to IBC to avoid the illicit use of traditional knowledge, HPFI tried to create confusion by discrediting the widely held and common traditional Ethiopian knowledge surrounding teff.

Sertse (2008) also underlines that the patent application does not include any specific mention of Ethiopia as the country of origin for teff, even though HPFI committed itself in the Teff Agreement to acknowledge this in all its publications and applications. Sertse further argues that the mention of other countries as areas of teff cultivation is an attempt to distance teff from Ethiopia.

As EIPO sees, HPFI has violated both the CBD and the Teff Agreement, because the teff patent is based on Ethiopian traditional knowledge without prior informed consent having been secured. As mentioned EIPO does not think that the teff patent fulfils the 'inventive step' criterion, and as a result cannot find it to be in line with patent laws.[326]

EIPO is now working on a database on Ethiopian traditional knowledge that can be used in connection with prior art searches.[327] This might make it easier to prevent patents that use such knowledge from being granted in the future.

7.6 Future prospects regarding the teff patent and lessons

As we have seen in this chapter, the teff patent is a far-reaching patent in force in six European countries, with applications pending in the USA and Japan. It is owned by a partnership called Port V.O.F., composed of the directors of the previous HPFI, to which it was sold from HPFI for EUR 60,000 in 2008. An important question in this regard is whether this sale was legal in light of the bankruptcy. This is in turn a question for the public receiver of the bankruptcy case. If the public receiver finds that the sale of the teff patent constituted an illegal transaction, a new question

[324] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011.
[325] Interview with Mr Regassa Feyissa, Addis Ababa, 24 October 2011.
[326] Interview with Mr Berhanu Adello, Mr Tamirie Haide and Mr Tedla Mamo in Addis Ababa, 25 October 20.
[327] Interview with Mr Berhanu Adello, Mr Tamirie Haide and Mr Tedla Mamo in Addis Ababa, 25 October 2011.

arises as to who the legitimate owners of this patent are and how this situation should be resolved.

Another central question is whether the patent is valid in terms of meeting the patent requirements of novelty and inventive step. As this shown in chapter 4.3, it can well be argued that the requirements of novelty and inventive steps were actually not med with the claims of the teff patent. Here we should note that it is the responsibility of the granting patent authority to ensure that patent criteria are met. The patent applicant is not to blame for the granting of a patent which does not fulfil the patent criteria. However, the patent owner may be to blame if the information provided is not correct.

The teff patent has already been challenged once, on the grounds of insufficient disclosure, based on the argument that the description of central claims was imprecise and partly wrong. This challenge was filed by Landwirtschaftskammer Niedersachsen through the EPO. The opposition was however rejected.

Attempts to revoke the patent are now only possible by bringing the case to court in those countries where the patent is still effective, and may only succeed if sufficient evidence can be presented documenting that the dual criteria for patentability of novelty and inventive step have not been met. Landwirtschaftskammer Niedersachsen is now preparing a challenge through the German courts taking these criteria as point of departure, provided that sufficient funding can be raised for the process.

The teff patent provokes engagement for various reasons. Landwirtschaftskammer Niedersachsen is interested in developing teff and providing German farmers with useful advice regarding the prospects of growing teff. For them, patents like this do not foster innovation, as patents are supposed to do, but instead hinder the development of a crop that could have great potential in Europe – without contributing any inventive step.

The Ethiopian stakeholders interviewed for this report were primarily concerned with the moral aspects of the teff patent. Teff is in their view an Ethiopian crop and the 'inventive step' in the patent is simply long-established Ethiopian traditional knowledge. As they see it, the company was welcomed in Ethiopia, but then failed not only in properly following up the agreement that gave them access to teff genetic resources but also in requesting permission regarding the use of traditional knowledge.

An important question in this regard is whether the teff patent violates the Teff Agreement. Opinion differs on this point. The legal opinion from GIZ concludes that there are no legal conflicts, whereas Ethiopian stakeholders claim that the teff patent violates Article 4.5 of the agreement, according to which the company is not permitted to access the traditional knowledge of Ethiopian communities on the conservation, cultivation and use of teff. Therefore, the company should not claim any rights over, or make commercial benefit out of, such traditional knowledge without explicit written agreement from the provider.

A central claim in the teff patent is that teff needs to after-ripen in order to be suited to baking, and the patent application claims that this is not practised in Ethiopia. As we have shown, that is not the case, so it can rightly be argued that the patent description is wrong on this issue. Because of the early history of the Teff Agreement it can also be argued that the patent owner was most probably familiar with the traditional after-ripening of teff in Ethiopia. Thus, there is reason to believe that the patent represents an infringement of Article 4.5. However, this as such does not provide any legal grounds for challenging the patent, as the Teff Agreement is not relevant for the legality of the patent: it is relevant only in terms of determining the extent to which the company has violated the Teff Agreement.

From the Ethiopian side, consideration is now being given with regard to steps against the patent, under the leadership of EIPO. What will come out of this is still uncertain as of this writing.

In any case, it must be stressed that Ethiopia never sold any patent rights to the Dutch company through the Teff Agreement, as some Ethiopians seem to believe. What happened was that the Ethiopian negotiators of the Teff Agreement found themselves confronted with a *fait accompli:* they had to accept the patent application in order to enter into an agreement with any prospects of sharing the benefits arising from the use of teff genetic resources. Thereby they accepted that the patent was a way of securing such benefits for mutual sharing.

With hindsight we can see the irony in this: benefit sharing was used as an argument for accepting the teff patent, but in the end resulted in a monopoly that made it impossible for Ethiopia to enter into ABS agreements on teff with other companies in countries where the patent is valid, even after the termination of the Teff Agreement.

An important lesson is to beware of benefit sharing being used as an argument for filing patent applications, unless the legal security for the expected benefit sharing arrangements is fully safeguarded. Furthermore it is important to ensure that the intention of keeping genetic material in the public domain cannot be circumvented by means of formulations which in practice make the genetic resources in question patentable.

8 Reflections from stakeholders in Ethiopia

Today, the Teff Agreement is generally regarded as unsuccessful by the involved parties in Ethiopia. Many of the respondents interviewed for this study mentioned that the agreement had failed. As Dr Tewolde Berhan Gebre Egziabher sees it, neither this agreement nor the other ABS agreement entered into by Ethiopia, the Vernonia Agreement, worked, and the important thing is thus what can be learned from the experience.[328]

8.1 The limits of ABS and the need for a better system

Dr Tewolde Berhan Gebre Egziabher underlined that he is not really sure that ABS will ever work in practice, and that as he sees it the whole process with regard to the Teff Agreement illustrates the futility of such an approach. If ABS agreements are to be entered into, he would prefer a government-to-government approach. He has difficulties seeing any other ways it would work, although problems would still be caused by bankruptcies and the dissolving of companies.[329] The preference for a government-to-government approach was also shared by other involved parties in Ethiopia.[330]

However, if it were possible to go back to the drawing-board when it comes to these issues Dr Tewolde Berhan Gebre Egziabher would prefer to get rid of the existing system, including the use of IPRs on biological material, and have a free flow of biodiversity to where it is needed. Mentioning the example of maize, a crop originally from Latin America which was distributed to Africa during the old system of free seed exchange and which can now be considered a main staple of the continent, he asked how Africans now would be able to get along without it. Dr Tewolde Berhan Gebre Egziabher also mentioned that climate change necessitates increased movement of genetic resources. His personal opinion is that there should be no restrictions on the movement of genetic material, and that if farmers in for example Germany want to grow teff they should be able to do so. 'Wherever life grows it should be allowed to grow.'[331] In his opinion it does not come naturally to most

[328] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.
[329] Ibid.
[330] Dr Kebebew Assefa (interview in Debre Zeit, 24 October 2011) emphasized that it is better to enter into agreements with government institutions rather than with private companies. In his opinion, that will increase the accountability on the user side. This view was also shared by Mr Regassa Feyissa (interview in Addis Ababa, 24 October 2011), who thinks that the Dutch government, and in particular the Dutch competent authority with regard to ABS, should have been involved in the ABS agreement on tef. IBC (represented by Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu in interview in Addis Ababa, 20 October 2011) also noted that to ensure that ABS agreements are respected in the user country it would be useful if the relevant authorities in the user country declared that they would enforce them.
[331] Interview with Dr Tewolde Berhan Gebre Egziabher, Addis Ababa, 26 October 2011.

people to question the transfer of seed from country to country as this 'is the natural way and it is only those that have worked on ABS that question it'[332]. However, that would make it even more crucial to ensure that IPRs were used to foster innovation and not allowed on genetic material.[333]

Dr Tewolde Berhan Gebre Egziabher's sentiments were partly shared by Dr Kebebew Assefa, who mentioned the necessity of *using* genetic resources if they are to bring any benefits. In his opinion it is important not to be too prohibitive with regard to distributing such material. The important thing, as he sees it, is to be capable of mining the country's wealth of genetic resources while still protecting Ethiopia's rights with regard to ABS. He also considers it essential to have a good overview of the country's genetic resources, their location and properties, in order to be able to prevent bio-piracy.[334]

8.2 The enforcement challenge

The difficulties related to enforcing ABS agreements and the importance of good faith and honesty from both parties, as well as mutual trust, was another issue mentioned by many of the involved Ethiopians.[335] A central lesson noted in this context was the need to focus more on moral obligations in addition to legal ones.[336] The rationale here was that legal provisions will not be of any use if the other party is not committed to them. This illustrates that to a certain extent there is a lack of confidence in the legal system and its potential usefulness with regard to ABS among the involved parties in Ethiopia.

According to Dr Girma Balcha, the lack of results and the compliance problems in connection with the Teff Agreement, and also the vernonia agreement, illustrate the need for stronger enforcement. As he sees it, future ABS agreements should contain stronger guarantees, as having the Dutch ambassador sign the Teff Agreement as a witness proved to be not enough of a guarantee, and heavier penalties for violations.[337] It was also mentioned that the public could play a role by putting pressure on the parties. This would mean that if the problem is on the user-side, the public in the user-country could influence the outcome, as companies are sensitive to how they are perceived. If repeatedly criticized, they might be

[332] Ibid.
[333] Ibid.
[334] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011.
[335] This was mentioned by Mr Mesfin Bayou (interview in Addis Ababa, 26 October 2011), who also underlined that strong support from the user country is needed; by Dr Tewolde Berhan Gebre Egziabher (interview in Addis Ababa, 26 October 2011), who underlined that good will is central to international interactions; by Dr Kassahun Embaye (interview in Addis Ababa, 20 October 2011) and IBC representatives (interview with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu in Addis Ababa, 20 October 2011).
[336] This was mentioned by IBC representatives (interview with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu in Addis Ababa, 20 October 2011) and Dr Kassahun Embaye (interview in Addis Ababa, 20 October 2011).
[337] Interview with Dr Girma Balcha, Addis Ababa, 21 October 2011.

motivated to change their behaviour. The civil society could play an important role in this context by informing the public.[338]

8.3 Communication among Ethiopian stakeholders

Another lesson drawn in Ethiopia concerns the need to include all relevant institutions in the negotiation process. Dr Girma Balcha mentioned that perhaps representatives of the Ethiopian ministries of justice and foreign affairs should have been present during the negotiations of the Teff Agreement.[339] EIPO indicated that they should have been more involved when the agreement was negotiated and that the agreement should have specified that EIPO was responsible for handling any IPR issues. EIPO also underlined that a larger role should have been given to Ethiopian embassies with regard to the implementation of IPR issues in the Teff Agreement.[340]

A related lesson is that communication among and between the relevant Ethiopian institutions should probably be improved. According to Dr Kebebew Assefa there is currently a lack of communication between IBC on the one hand and EIAR and Debre Zeit Agricultural Research Centre on the other hand.[341] This was also confirmed by the IBC, who said that coordination, for example between EIAR and the IBC, has been lacking. It was concluded that the IBC and EIAR should have had more contact earlier to discuss transfer of teff genetic material. It was also underlined that communication with the Ethiopian Embassy in the Netherlands could have been better.[342]

8.4 Capacity building and protection of traditional knowledge

The need for capacity building in provider countries like Ethiopia constituted another important lesson drawn by central Ethiopian stakeholders. Capacity building was seen as central to achieve successful ABS negotiations and agreements in the future.[343] In this context it was noted by the IBC that both legal and technical assistance and capacity building would be useful, as well as assistance from accounting experts, and that it would be ideal if such assistance could be neutral and international.

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[338] This was mentioned by Dr Tewolde Berhan Gebre Egziabher (interview in Addis Ababa, 26 October 2011), who also thought such a strategy would be more likely to succeed if the parties were states, as states might be easier to shame.

[339] Interview with Dr Girma Balcha, Addis Ababa, 21 October 2011.

[340] Meeting at the EIPO offices with Mr Berhanu Adello, Mr Tamirie Haide and Mr Tedla Mamo, Addis Ababa, 25 October 2011.

[341] Interview with Dr Kebebew Assefa, Debre Zeit, 24 October 2011.

[342] Interview at IBC (with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu) in Addis Ababa, 20 October 2011. Mr Mesfin Bayou (interview in Addis Ababa, 26 October 2011) also mentioned that someone at the Ethiopian Embassy in the Netherlands should have been assigned to follow up on the implementation of the ABS agreement on tef from there.

[343] This was mentioned by Dr Kassahun Embaye (interview inAddis Ababa, 20 October 2011) and IBC representatives Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu (interview in Addis Ababa, 20 October 2011).

Another lesson drawn in Ethiopia concerns the need for improved protection of traditional knowledge. This issue is now high up on the EIPO agenda, and, as mentioned in 7.4, a database on such knowledge is being created. This database will be accessible to patent examiners of various international, regional and national patent offices that are investigating issues of prior art.[344] In the future it might therefore be easier for Ethiopia to document the existence and misappropriation of Ethiopian traditional knowledge regarding teff and other crops.

8.5 Specific lessons regarding the Teff Agreement

When it comes to the more specific lessons that the negotiation and implementation of the Teff Agreement might have to offer with regard to future ABS agreements, it was noted that upfront payments should be included in such agreements and that the products covered should be more narrowly defined. Probably this is based on the assumption that the Teff Agreement did not have provisions on up-front payments and on lack of knowledge as to how narrow the Teff Agreement actually was.

In addition, it should be specified that all reporting should be conducted in English, and where meetings should be held. Dispute settlement procedures should also be clearer and simpler, it was noted.[345] The importance of ensuring good communication between the parties was also noted.[346] One of the Ethiopian interviewees also emphasized that the Teff Agreement should have been information-based to a larger extent, and that for future ABS negotiations it might be wise for the negotiators to collect more information about the market potential of the products in question and other relevant factors. The importance of specifying in future ABS agreements that all affiliated companies of the signatory are also bound by the agreement was also noted as a central lesson. A further lesson learned was that to better identify various possible interpretations and loopholes, negotiators of future ABS agreements should read through the draft text even more thoroughly, with that specific purpose in mind.[347]

One of the lessons drawn by the IBC is that the article on traditional knowledge in the Teff Agreement should have been included under

[344] This was mentioned during the meeting at EIPO offices with Mr Berhanu Adello, Mr Tamirie Haide and Mr Tedla Mamo, Addis Ababa, 25 October 2011.
[345] These issues were raised by Mr Mesfin Bayou in an interview in Addis Ababa, 26 October 2011. The IBC also underlined that the varieties and products covered by the Teff Agreement should have been more narrowly defined. According to Mr Mesfin Bayou, the lessons drawn from the Teff Agreement were incorporated into the second ABS agreement entered into by Ethiopia, the vernonia agreement, and as a result that agreement was better. He said that among other things the vernonia agreement specifies that meetings between the parties should take place in Addis Ababa, and that the company should cover the expenses if that is not possible.
[346] The IBC representatives (interview with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu in Addis Ababa, 20 October 2011) noted that the communication between Ethiopia and the users, S&C and HPFI, should have been more frequent.
[347] Interview with Dr Kassahun Embaye, Addis Ababa, 20 October 2011

Article 5 on intellectual property ownership in this agreement. Further, in the future it is important to specify even more clearly that patents incorporating Ethiopian traditional knowledge cannot be filed. [348]

When it comes to the bankruptcy and the lessons to be learned from it, the IBC mentioned that perhaps it would have been better if they had sent a letter to HPFI that officially terminated the Teff Agreement as soon as they heard about the bankruptcy, and then initiated legal action.[349]

There might be a need for an international third party to follow up on any violations of future ABS agreements, Dr Girma Balcha suggested.[350]

[348] This was mentioned by Mr Abiyot Berhanu (interview in Addis Ababa, 26 October 2011) and in the group interview at the IBC with Dr Gemedo Dalle, Mr Kebu Balemie and Mr Abiyot Berhanu (Addis Ababa, 20 October 2011).
[349] Interview with Mr Abiyot Berhanu in Addis Ababa, 26 October 2011
[350] Interview with Dr Girma Balcha, Addis Ababa, 21 October 2011.

9. Conclusions and recommendations

In this report we have analysed the Agreement on Access to, and Benefit Sharing from, Teff Genetic Resources (Teff Agreement). This agreement attracted considerable attention when it was signed in 2005, and gave rise to great expectations for its potential to spearhead how future ABS agreements could be, not least in terms of benefit sharing. And yet, on the whole these expectations did not materialize. Whereas Ethiopia complied with the agreement and provided access to the teff genetic resources in question, the Dutch commercial counterpart, Health and Performance Food International BV (HPFI), failed in large part to comply with its obligations under the agreement. The company was declared bankrupt in 2009, by which time its directors had already established other companies and transferred values to these companies. These companies continued to produce and sell teff flour and teff products, and to expand their activities to other countries and continents. Since it was HPFI that had been the party to the agreement, and HPFI was now bankrupt, these new firms, even though operating under the same directors and partly the same owners, could continue selling teff flour and teff products without being bound by the obligations of HPFI towards Ethiopia.

A patent on the processing of teff flour – which in practice covered all ripe teff grain, fine flour made of that grain, dough or batter made of the flour as well as a long range of non-traditional products – made the situation particularly difficult for Ethiopia. The company had argued that such a broad patent was necessary in order to secure the investments in teff and thereby also the prospects of benefit sharing with Ethiopia. In fact, however, the teff patent excludes all others, including Ethiopia itself, from utilizing teff for most forms of relevant production and marketing in the countries where it is granted. Thus, Ethiopia found itself squeezed out of position to utilize its own teff genetic resources – for example, through collaboration with other foreign companies – in Europe and wherever else the teff patent might be granted, while at the same time losing all prospects of sharing the benefits from the use of these genetic resources in these countries.

How was this possible? What actually happened? How to explain the failure of the Teff Agreement? What prospects are there for justice after this failure? What lessons can be drawn in terms of potential success factors for similar agreements in the future? These were our main questions in this report. In this final chapter, we draw conclusions and derive for the countries involved, as well as with regard to the implementation of the Convention on Biological Diversity and the Nagoya Protocol.

9.1 Overall conclusions

The **bargaining position between the parties** to the Teff Agreement can be seen as an explanatory factor for the negotiation of the Teff Agreement. Important genetic teff material had already been sent from Ethiopia to the Netherlands under the MoU, and Soil and Crop Improvements (S&C), the original Dutch company, had already applied for a patent. Thus, the company was in a relatively stronger bargaining

position than the Ethiopian side prior to the second round of negotiations which led to the Teff Agreement. That made it important for the Ethiopian side to achieve an agreement. The Dutch company, on the other hand, was under pressure to arrive at an acceptable ABS arrangement after it had suffered the dubious honour of being awarded the Captain Hook Award of Biopiracy at the Conference of the Parties to the CBD in 2004. This might partly explain the relatively generous benefit-sharing arrangements that were included in the agreement.

An important factor in explaining the failure of the Teff Agreement was the fact that the Dutch company had **overestimated the market potential for teff** and was overly optimistic about potential profits. These miscalculations, combined with the company's lack of knowledge and experience on the subject of ABS, resulted in benefit sharing provisions which the company later found itself chiefly unable to fulfil.

Communication problems were a further important factor. They began to appear shortly after the Teff Agreement had been signed, although there had also been signs during the negotiations. These problems started when the Ethiopian Institute of Biodiversity Conservation (IBC) asked for the up-front payment provided for in the Teff Agreement, which they did not receive; problems continued when IBC requested annual reports from HPFI, also according to the agreement, which were not provided – except for one annual report, in Dutch. When it became clear to the IBC that HPFI did not intend to comply with its obligations under the Teff Agreement in 2007, this situation worsened significantly. The communication difficulties between the IBC and the HPFI can be linked to the internal difficulties within the HPFI. Several shareholders left the company due to communication problems – moreover, the HPFI had originally been established because of disagreements among shareholders in the original company, S&C.

A central factor in this context is the **HPFI commitment to the Teff Agreement**. According to its director, much of this commitment to the Teff Agreement had dwindled already in 2006. He cites communication problems, and in particular the fact that IBC demanded up-front payment from the Dutch company in a situation where no benefits had yet been generated. This was indeed a difficult situation, as the agreement provided that a fixed minimum amount was to be transferred to IBC in advance, without any mention of the prospects of benefit generation. On the other hand, the company had miscalculated the prospects for benefits and thus found it difficult to comply with this provision in the agreement. Nevertheless, the IBC in Ethiopia had reason to expect that payments would be forthcoming according to the Teff Agreement. When the HPFI realized that the company was in no position to implement the provision on upfront payment, it could have done more to create a mutual understanding of this situation. Instead, HPFI appeared irritated by the demands from Ethiopia.

Coordination problems on the Ethiopian side were a complicating factor. When the Dutch company (then S&C) first contacted Debre Zeit Agricultural Research Centre, the Ethiopian Agricultural Research Organization (EARO) was brought in. A Memorandum of Understanding

was negotiated by EARO, without involving the IBC, which was the authority that had been authorized to provide access to genetic resources. This can be explained because the IBC was a subordinate body to EARO at that time, and EARO might have deemed it unnecessary to ask a subordinate institution for permission to provide access to teff genetic resources. There was also very limited flow of information at this juncture. Nevertheless the IBC was brought in for the Teff Agreement, and from this point onwards most of the relevant institutions were consulted. Nevertheless, coordination failed with regard to the research agreement entered into in 2006. The IBC was not formally informed about the research agreement between the HPFI and Debre Zeit Agricultural Research Centre until almost one year after the Teff Agreement was signed. Due to the communication problems that worsened in 2007, the directors of the IBC and of HPFI did not communicate directly with each other, but through an IBC employee. This too may have contributed to lack of coordination, which may help to explain why mediation efforts were not attempted until relatively late (see below).

HPFI argued that **the export ban on teff** constituted a substantial barrier to implementation of the Teff Agreement: the company wanted to export teff for further processing in the Netherlands, which they argued could not be done in Ethiopia. The Ethiopian negotiators, as well as IBC officials, maintained that teff export from Ethiopia was not relevant in an ABS context and was not part of the Teff Agreement. They also stressed that the HPFI was welcome to produce and process teff in Ethiopia, after which it could be exported. Since the export ban was introduced in 2006, it can be assumed that the HPFI had not foreseen that exporting teff from Ethiopia would prove problematic when negotiating the Teff Agreement. Nevertheless, it can be argued that the export ban was used partly as an excuse, and was not a central factor explaining the failed implementation. This is because HPFI did not accept the offer from Ethiopia to produce and process teff in Ethiopia and because communication problems had already been identified as a major problem in the collaborating by HPFI.

A further explanatory factor has to do with **professionalism**. Due to the miscalculations and the communication problems, several stakeholders have argued that HPFI and S&C did simply not appear to be professional companies. For instance, S&C was unable to identify the entity entitled to negotiate an access agreement on the Ethiopian side, to ensure a minimum of information flow and to report to IBC as provided in the agreement. Also the continuous internal conflicts, first in S&C and then in HPFI, indicate a lack of professionalism. This could be seen as a warning signal, but these circumstances were probably not known to the Ethiopian side.

The fact that the **teff patent and the Teff Agreement were not interlinked** may have contributed to the negative effects of the teff patent for Ethiopia. The teff patent was meant to secure the production chain of teff and thus enable benefit sharing under the Teff Agreement. This was the argument from the side of HPFI, and it was accepted by the Ethiopian negotiators. However, the patent application had already been filed by then. The problem here is that the Ethiopian counterparts were not involved in the patent application process, and that the topic was not

covered in the MoU. Thus, the Ethiopians found themselves confronted with a *fait accompli*, since the patent application had already been filed when they negotiated the Teff Agreement. This said, Ethiopian negotiators of the Teff Agreement found the patent acceptable – because it was said to be merely a process patent, and was seen as necessary to secure the benefits to be shared. However, they did not know the details of the patent claims and where not aware of how far-reaching it was. Had the MoU and the later Teff Agreement contained sufficient provisions regarding a teff patent, it might have been possible to avoid the situation whereby Ethiopia lost access to benefit sharing from the patent. A requirement would have been that S&C informed openly about its intentions during the MoU negotiations, and that the negotiating parties integrated into the MoU provisions concerning a possible patent that were acceptable to all parties. Furthermore, similar provisions would have had to be included in the Teff Agreement. How much legal security such provisions would have established for Ethiopia remains, however, an open question.

With hindsight we can see that **benefit sharing was used as an argument for getting the Ethiopian side to accept the teff patent**, but in the end resulted in a monopoly that made it impossible for Ethiopia to enter into ABS agreements on teff with other companies in countries where the patent is valid, even after termination of the Teff Agreement. An important lesson here is to beware of benefit sharing being used as an argument for filing patent applications, unless the legal security for the expected benefit-sharing arrangements is fully safeguarded.

The Teff Agreement did not prohibit the patenting of methods for processing teff flour, but it **prohibited the patenting of teff genetic resources.** This was problematic. Probably the negotiators of the Teff Agreement, unaware of the details of the patent claims, felt that the formulation on this in the agreement would be sufficient to keep teff genetic resources in the public domain. However, the teff patent shows that this formulation on its own was easy to circumvent, as the patent in practice covers all ripe grain, all genetic resources of teff – in addition to relevant products. Here we see the importance of ensuring that the intention of keeping genetic material in the public domain cannot be circumvented by formulations which in practice make the genetic resources in question patentable.

The **teff patent claims can hardly be said to contain any new or inventive step**. Therefore it is difficult to understand on what grounds the patent could be granted. Part of the explanation is that the patent examiners at the EPO tend to be pressed for time and generally assess the patent applications by purely technical criteria. The system is based on opposition procedures, which in turn requires that relevant stakeholders become aware of the patent within the time scope for such opposition. We must ask whether EPO as it functions today is up to the task of properly handling patent applications of this kind, often referred to as bio-patents.

Whether the teff patent violated the Teff Agreement is an open question. The legal opinion from the German GIZ has concluded that

there are no legal conflicts. By contrast, Ethiopian stakeholders claim that the teff patent violates Article 4.5 of the Teff Agreement, according to which the company is not permitted to access the traditional knowledge of Ethiopian communities on the conservation, cultivation and use of teff: the company should not claim any rights over, or make commercial benefit out of, such traditional knowledge without explicit written agreement from the provider. In particular this goes for the after-ripening of teff in order to make it suited to baking, which the patent application claims is not practised in Ethiopia. As we have shown in this report, that is not the case, so it can rightly be argued that the patent description is wrong on this issue. Because of the early history of the Teff Agreement it can also be argued that the patent owner was most probably familiar with the traditional after-ripening of teff in Ethiopia. Thus, there is reason to believe that the patent represents an infringement of Article 4.5. Whereas this could provide a basis for challenging the patent, the Teff Agreement as such is not relevant for the legality of the patent: it is relevant only in terms of determining the extent to which the company has violated the Teff Agreement.

This report has documented **grave irregularities surrounding the public private partnership project** on teff production initiated by the Dutch company. This project was initiated and presented as an alternative approach to benefit sharing in Ethiopia. Whereas the HPFI/S&C director claims that the project made good progress, this report shows that most goals were not achieved, and it documents severe irregularities. This gives rise to questions of whether the project benefited Ethiopia at all. Moreover, why were the funds that the Dutch company claimed to have used for the project not transferred directly to the IBC as part of the benefit-sharing arrangements under the Teff Agreement? Why was the IBC told that benefits which could be shared had not yet been generated, whereas a considerable amount of money was reportedly spent for the public–private partnership project? We must conclude that the project cannot be seen as a benefit-sharing measure under the Teff Agreement, and that any benefits to the Ethiopian side were probably minimal.

Unsuccessful mediation efforts cannot explain why implementation failed in the first place, but they are important in explaining the difficulties faced by the Ethiopian side in seeking to get the Dutch counterpart to comply with their joint agreement. Several efforts were made at getting mediation started, but without success. In particular, the IBC tried to activate the Embassy of the Netherlands.

This leads to the next factor: the **role of the Netherlands** in this context. Whether the Netherlands had any obligations with regard to the Teff Agreement is a much-discussed topic among the involved stakeholders in Ethiopia, and many think that there was an obligation in this regard. However, from a contractual point of view, the Netherlands had no obligation to take any action. The ambassador had signed the Teff Agreement as a witness, but was not a party to the agreement. The Teff Agreement was an agreement between the Ethiopian state and a Dutch company. Nevertheless, the Embassy of the Netherlands did interact with the IBC, in providing information and through some meetings. Here we may ask whether the diplomatic channel could have been used to a

greater extent, e.g. as an instrument for mediation. It is also worth noting that the last letter about mediation from the IBC was sent *after* the HPFI had been declared bankrupt: the IBC was evidently not aware of the bankruptcy process that was taking place in the Netherlands, and here the Embassy of the Netherlands could have provided information at an earlier stage. On the other hand, the Focal Point for ABS in the Netherlands has been quite active in sharing information with the IBC, especially on developments in the bankruptcy case.

This in turn leads to another important factor, the **lack of user-country measures**. The burden of seeking to ensure that the Dutch company complied with its obligations under the Teff Agreement rested completely with the IBC, on behalf of Ethiopia. However, neither the IBC nor the Ethiopian Consulate in the Netherlands had the capacity or financial resources to follow up on this towards HPFI in the Netherlands. Language was a central barrier, as well as understanding the legal system. Hiring legal expertise is costly; moreover, Ethiopia had already suffered substantial losses connected with the agreement and the prospects for getting these losses covered were low. A financially poor developing country has few prospects of achieving justice, as long as there are no support measures from the side of the user countries. In such a case, an ABS agreement rests entirely on the mutual trust between the parties.

In any case, the **question of mutual trust** is central to ABS agreements. Despite all possible measures to force a recipient of genetic resources to comply with an ABS agreement, such measures cannot truly replace this essential factor. Mutual trust is built on mutual respect and good faith. According to most stakeholders in Ethiopia, that is what it all boils down to in the end. As they see it, only when true mutual trust is in place can a truly collaborative ABS project be realized. One important challenge is therefore to identify the factors that are decisive for mutual trust in ABS relations.

9.2 Recommendations for the countries involved

Based on the conclusions above, we offer some recommendations for Ethiopia and the Netherlands that will also be relevant for other provider and user countries.

9.2.1 Recommendations for Ethiopia and other provider countries

Ethiopia has already derived lessons from the negotiation and implementation of the Teff Agreement, as reflected in its legislation on bioprospecting presented in sections 3.2.4 and 3.2.5 of this report. Important further recommendations for Ethiopia and other provider countries with regard to future ABS arrangements are presented below. Thereafter we turn to recommendations regarding the particular situation related to the Teff Agreement.

Coordination and information flow: The IBC may consider inviting all institutions relevant for bioprospecting activities and agreements to a meeting where the division of labour between and among these institutions is clarified and procedures for information flow in the event of

bioprospecting initiatives and the implementation of such projects is to be agreed. Such meetings could be organized annually, also for mutual exchange of information on the status of bioprospecting initiatives and projects. The agreed procedures could then be distributed to all involved parties in writing.

Checking professionalism of bioprospecting actors: For future bioprospecting agreements, the IBC should carefully investigate the professionalism of the applying institution(s). It is important to check the history, achievements, experience with overseas collaboration as well as with ABS, reputation and references.

Establishing language and venues of meetings for ABS agreements: ABS agreements should make clear the language of reporting and communications. Furthermore, such agreements should state clearly where meetings are to take place, and establish a minimum frequency of meetings to which the parties are obliged.

Including provisions in ABS agreements on affiliated companies: The IBC may consider including in future ABS agreements provisions specifying that all affiliated companies of the signatory are bound by the agreement, thereby specifying what is to be considered as an affiliated company. It is important to clarify in the ABS agreement what is to happen in the case the signatory is declared bankrupt and affiliated companies are not.

Safeguarding against misappropriation of genetic resources: In the event of new bioprospecting agreements, IBC should seek to establish whether the applicant has applied, or intends to apply, for a patent related to the material to be covered by the agreement. In such a case, the parties to the agreement should consider arrangements to ensure that Ethiopia will participate in the benefits derived from the patent, either through co-ownership or by means of benefit sharing arrangements directly related to the patent. Specific provisions in the agreement regarding its termination could provide for continued benefit sharing derived from the patent also in the event that the ABS agreement is terminated, or in case the patent is sold (as encumbrance). Particular attention should be given to precise formulations against the patenting of genetic resources, to prevent patents limiting the use and development of the genetic resources covered under the agreement.

Ensuring more effective provisions in ABS agreements on the protection of traditional knowledge: The IBC may in future ABS agreements ensure that provisions on the protection of traditional knowledge are linked with provisions on intellectual property rights in such a way that the agreement protects Ethiopian traditional knowledge against misappropriation, e.g. in the form of patents.

Ensure that efficient mediation efforts are initiated at an early stage: IBC should establish internal routines based on the ABS agreements it has entered into relating to when mediation efforts should be initiated. Mediation procedures should identify a third party for mediation: this must be a party which has the capacity to do so, explicitly agrees to this

responsibility and is ready to take on the task when requested. Consideration should also be given to the possibilities of using diplomatic channels through the Ethiopian Ministry of Foreign Affairs and the relevant Ethiopian embassy or consulate overseas in investigations regarding alleged violations of an ABS agreement.

In the context of the actual situation after the bankruptcy of HPFI and the termination of the Teff Agreement, the following recommendations may be of help:

Develop a project to follow up the Ethiopian claims in the Netherlands: Depending on the results of the bankruptcy case, the IBC may wish to develop a project for which it may seek funding from bilateral sources in the Netherlands, from other countries, or through CBD/GEF, aimed at realizing the Ethiopian claims to the HPFI bankruptcy case by taking the case to court in the Netherlands. The project could involve the Ethiopian consulate in the Netherlands and specialized Dutch lawyers, in addition to the IBC, and possibly Ethiopian lawyers.

Challenging the teff patent: EIAR may wish to establish alliances with relevant organizations in the countries where the teff patent is still valid, in order to challenge the patent on the grounds that it does not represent a *new and inventive step*. It is recommended to start such a process in Germany, by establishing contact with Landwirtschaftskammer Niedersachsen for this purpose, as they are in the process of preparing such a case. Bilateral development agencies and/or NGOs engaged in the patent issue may also be approached, in order to raise the needed funds to engage a specialized lawyer and to prepare the case.

Considering an alternative path for teff: Due to the negative experiences with the Teff Agreement, and if the teff patent remains valid after being challenged, the IBC may wish to consider an alternative path for teff, by including it in the Annex 1 of the International Treaty on Plant Genetic Resources for Food and Agriculture. In such a case, the IBC should carefully compare the comparative advantages of bilateral agreements under the CBD with the Multilateral System on ABS under the Treaty. In this context, the system of the Third Party Beneficiary (the FAO) that is obliged to follow up any claims of alleged violations against standard material transfer agreements should be considered, as compared to the possibilities available under bilateral agreements. Furthermore, the possibility for Ethiopia to apply for funds from the Benefit Sharing Fund under the Treaty to projects on teff should be considered (these funds are directed to projects related to Annex 1 crops), as compared to the prospects for benefit sharing from any future ABS agreements on teff – in particular with a view to the effects of the teff patent. And finally, if teff were to be added to the Annex 1, Ethiopia would then be in a position to seek funding from the Global Crop Diversity Trust for the conservation and sustainable use of teff and its wild relatives. Careful consideration should be given to this possibility, as compared to the prospects of benefit sharing under potential future ABS agreements on teff.

9.2.2 Recommendations for the Netherlands

The relevant authorities in the Netherlands have no contractual obligation to undertake any activities with regard to the bankruptcy case. The Focal Point for ABS in the Netherlands ensures information flow to Ethiopia. The Embassy of the Netherlands in Ethiopia maintains contact with IBC. Thus we ask: could the Netherlands do more?

Facilitating financial and technical support for a project to follow-up the Ethiopian claims in the Netherlands: Depending on the results of the bankruptcy case, the ABS Focal Point could act to facilitate access to financial and technical support for Ethiopia to follow up the Ethiopian claims under the bankruptcy case. Specifically, the ABS Focal Point could approach relevant funding agencies and facilitate access to experts in the field, in particular lawyers who could take on the case. The ABS Focal Point could assist IBC in developing a project for this purpose.

9.3 Recommendations for implementation of CBD and the Nagoya Protocol

Based on the lessons from the Teff Agreement, we finally offer recommendations for the implementation of the CBD and the Nagoya Protocol in terms of ABS.

Clearing house mechanism to assist provider countries in assessing bioprospecting applicants: The Parties to the CBD may consider strengthening the Clearing House Mechanism by a separate entity in charge of assisting provider countries in providing information on bioprospecting applicants. The aim would be to ensure that bioprospectors entering into ABS agreements with provider countries are professional and trustworthy. In this context, the Clearing House Mechanism may also identify and provide information on factors that are decisive for developing mutual trust in ABS relations.

Establishing an ombudsman facility under the CBD to assist and support provider countries in cases of alleged violations against ABS agreements: The Parties to the CBD may consider establishing an ombudsman-facility[351] to assist and support provider countries in cases of alleged violations against ABS agreements. Such an ombudsman facility should have the technical expertise and financial resources to investigate such alleged violations on the request of relevant authorities in provider countries. It should also have the technical expertise and financial resources to support provider countries in taking relevant cases to court, thereby facilitating access to competent lawyers and providing financial support.

A third party beneficiary: As an alternative option to the ombudsman facility suggested above, the Parties to the CBD may consider establishing a Third Party Beneficiary, inspired by the model of the Third Party

[351] The option of establishing an ombudsman was discussed in Young and Tvedt, 2009, p. 52–53.

Beneficiary under Multilateral System on ABS of the International Treaty on Plant Genetic Resources for Food and Agriculture. In this case the Parties would establish an independent body vested with the responsibility for investigating alleged violations of ABS agreements and taking cases to court on behalf of the provider countries – upon their request.

Providing provider countries with access to the legal system in user countries: Focal points on ABS in user countries should be vested with the responsibility for providing access to the legal system in their countries, e.g. by having the capacity to get relevant legislation translated into a language that is understood by relevant authorities in the provider country, and by facilitating contact with lawyers and other experts who may guide and assist representatives from the provider country in the user country, as needed.

Capacity building in user countries for ABS agreements: The Parties to the CBD may consider organizing national workshops on ABS in user countries for companies working with genetic resources. Such workshops could also focus on intercultural understanding and the importance of establishing mutual trust between the parties, as well as providing advice regarding the negotiation of realistic ABS agreements, with provisions on benefit sharing that are suitably adjusted to the economic potential of the relevant products.

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Annex 1: List of documents

Documents on the process:

1. Proclamation No. 98/1994, a Proclamation to ratify the Biodiversity Convention, from 31 May 1994 (front page only, not the entire publication)
2. Proclamation No. 120/1998, a Proclamation to provide for the establishment of the Institute of Biodiversity Conservation and Research, from 25 June 1998
3. Memorandum of Understanding ('Research & Development of international markets for Teff-based products') between the Ethiopian Agricultural Research Organization (EARO), Larenstein Transfer (of Larenstein University) and Soil and Crop Improvement (S&C) from 26 March 2003, signed by Hans Turkensteen (Director of S&C) on 26 March 2003, Henk Dijk (Director, Larenstein Transfer) on 1 June 2003 and Demel Teketay (Director General, EARO) on 12 April 2003
4. Proclamation No. 330/2003, Proclamation to provide for the ratification of the International Treaty on Plant Genetic Resources for Food and Agriculture, from 29 April 2003
5. Letter to 'to whom it may concern' from Solomon Assefa (Centre Manager, Debre Zeit Agricultural Research Centre) dated 21 August 2003
6. Letter (in Amharic) to the Institute of Biodiversity Conservation and Research (IBC) (with copies sent to EPA, Ministry of Trade and Industry, Ministry of Agriculture, Ethiopian Science and Technology Commission and the Ethiopian Embassy in Brussels) from the Ethiopian MFA, dated 19 September 2003 (with two attachments: an article by Loentien Braakman from the Dutch magazine Vakblad from August 2003 (presumably an unofficial translation) and an article from Leeuwarden Courant dated 18 July 2003), translated for us by Mr Teshome Hunduma Mulesa
7. Letter to the Ethiopian MFA from the Dutch Embassy in Ethiopia dated 2003 (no specific date)
8. Tentative Agenda for a meeting held at the Ministry of Rural Development regarding the 'research and development of teff in the Netherlands' dated 6 November 2003
9. Document on 'Global Trends in Teff Culture' (presumably pertaining to item 1 on the above listed agenda and therefore from November 2003)
10. Letter (in Amharic) to the IBC (with copy to the Ethiopian MFA) from the Consulate General of Ethiopia in the Hague dated 3 December 2003, translated for us by Mr Teshome Hunduma Mulesa
11. Proclamation No. 381/2004, a Proclamation to amend the Institute of Biodiversity Conservation and Research Establishment Proclamation, from 13 January 2004

12. News article by Joris Tielens of Wageningen University (a student newspaper called WISPR) titled 'Wageningen involved in conflict over teff. The charge is biopiracy: is the claim nonsense or justified?' from 18 March 2004
13. Minutes (in Amharic) of the negotiations regarding access to and benefit sharing from the use of teff genetic resources (23–28 March 2004), which were attended by Dr Tewolde Berhan Gebre Egziabher (Director General, EPA), Mr Fikre Markos (MoARD), Dr Tsedeke Abate (Director General, EIAR), Dr Girma Balcha (Director, IBC), Dr Solomon Assefa (Director, EIAR- Debre Zeit), Dr Kassahun Embaye (Deputy Director, IBC), Dr Hailu Tefera (Researcher, EIAR-Debre Zeit), Dr Getachew Belay (Researcher, EIAR- Debre Zeit), Mr Tesema Tanto (Head Dept. of Crop Genetic Resources Dept., IBC), Mr Mesfin Bayou (lawyer, IBC), Mr Hans Turkensteen (Director, S&C) and Dr L.J. (Lodewijk/ Lo) Turkensteen (board member, S&C), translated for us by Mr Teshome Hunduma Mulesa
14. Final version of the Teff Agreement signed 5 April 2005 by Dr Girma Balcha of the IBC, Mr J (Hans) Turkensteen from S&C/HPFI, the Dutch Ambassador to Ethiopia and Dr Tewolde Berhan Gebre Egziabher (the latter two signed the agreement as witnesses; Dr Tewolde Berhan Gebre Egziabher signed one month later than the others, on 5 May 2005)
15. Letter to Dr Girma Balcha from J. (Hans) Turkensteen (Financial Director, HPFI), Dr Arnold Mulder and Dr Lodewijk Turkensteen dated 27 January 2006
16. Letter to Dr Girma Balcha from J. (Hans) Turkensteen (Financial Director, HPFI), Dr Arnold Mulder and Dr Lodewijk Turkensteeen dated 27 January 2006
17. Letter to Dr Girma Balcha from Dr Arnold Mulder and Dr Lodewijk Turkensteen dated 27 January 2006
18. Agreement Between the Ethiopian Institute of Agricultural Research (EIAR (formerly EARO)) and S&C/Health & Performance Food International (S&C/HPFI) on 'Collaborative Teff Breeding Project', signed 25 April 2006 by J. (Hans) Turkensteen (Managing Director, HPFI) and Dr Solomon Assefa (Deputy Director General for Research, EIAR)
19. Letter (in Amharic) to the Director of Debre Zeit Agricultural Research Centre from the teff research project dated 22 September 2006 requesting the opening of an account (attached: the agreement between EIAR and S&C/HPFI on 'Collaborative Teff Breeding Project' from 25 April 2006 and a bank receipt for an amount in Birr equal to EUR 4,070.00), translated for us by Mr Teshome Hunduma Mulesa
20. United States Patent Application Publication on the processing of teff flour published 21 December 2006 (PCT Filed 22 July 2004 and Foreign Application Priority Data 22 July 2003 (NL))

21. Letter to Dr Girma Balcha (Director General, IBC) from Kebebew Assefa (Centre Director, Debre Zeit Agricultural Research Centre) (and copied to the Deputy Director General for Research, EIAR, and the Coordinator, National Teff Research Project), dated 28 March 2007 (attached: the research agreement signed 25 April 2006 by J. (Hans) Turkensteen and Dr Solomon Assefa)
22. E-mail to Mr Hans Turkensteen from Ms Feaven Workeye dated 30 April 2007
23. E-mail to Ms Feaven Workeye from Hans Turkensteen (and copied to Jans Roosjen) dated 30 April 2007
24. Letter (in Amharic) to the Ministry of Agriculture and Rural Development from the IBC from 2007 (probably May), translated for us by Mr Teshome Hunduma Mulesa
25. Letter to Mr Hans Turkensteen from Dr Girma Balcha dated 16 August 2007
26. E-mail to Ms Feaven Workeye (with copies to Mr Jans Roosjen and Mr Geert Westenbrink) from Mr Hans Turkensteen (Director, HPFI) dated 17 August 2007 (the date is written by hand on the print-out, but seems correct in context)
27. E-mail to Mr Hans Turkensteen from Ms Feaven Workeye dated 24 August 2007
28. E-mail to Ms Feaven Workeye from Mr Hans Turkensteen dated 25 August 2007
29. Letter to Mr Hans Turkensteen from Dr Abera Deresa (State Minister at the Ethiopian Ministry of Agriculture and Rural Development) (with copy to Dr Girma Balcha of the IBC) dated 29 August 2007
30. E-mail to Ms Feaven Workeye from Mr Hans Turkensteen (with copies to Dr Girma Balcha and Dr Kassahun Embaye) dated 3 December 2007
31. E-mail to Mr Hans Turkensteen from Ms Feaven Workeye dated 5 December 2007
32. E-mail to Ms Feaven Workeye from Mr Hans Turkensteen dated 5 December 2007
33. E-mail to Mr Hans Turkensteen from Ms Feaven Workeye dated 5 December 2007
34. E-mail to Ms Feaven Workeye from Mr Hans Turkensteen dated 5 December 2007
35. Letter (in Amharic) to the IBC from Bekele Mekuria, Head of Section for Research and Quality Control at Kaliti Food Share Company, dated 23 June 2008 (attachment: document describing 'Falling Number Analyses of Ethiopian Teff Varieties'), translated for us by Mr Teshome Hunduma Mulesa

36. Letter to the Dutch Ambassador to Ethiopia and Dr Tewolde Berhan Gebre Egziabher from Dr Girma Balcha (with copies to Mr Hans Turkensteen and the Ethiopian Ministry of Agriculture and Rural Development) dated 24 September 2008
37. E-mail to Mr Eshetayehu Tefera from Mr Hans Turkensteen (with copy to Mr Roosjen) dated 27 December 2008
38. E-mail to Dr Girma Balcha and Dr Kassahun Embaye (with copies to Jans Roosjen and Hans Turkensteen) from Mr Eshetayehu Tefera dated 28 December 2008
39. E-mail to Ms Feaven Workeye (with copy to Mr Mesfin Bayou) from Mr Eshetayehu Tefera dated 20 February 2009
40. Letter to the Dutch Ambassador to Ethiopia and Dr Tewolde Berhan Gebre Egziabher from Dr Girma Balcha (with copies to the Ethiopian Ministry of Agriculture and Rural Development and the Ethiopian MFA) dated 24 August 2009
41. Council of Ministers Regulation No. 169/2009, Council of Ministers Regulation to Provide for Access to Genetic Resources and Community Knowledge, and Community Rights, from 9 November 2009
42. Letter to Mr Hans Blankenberg, the Dutch Ambassador to Ethiopia, from Dr Gemedo Dalle Tussie (with copies to the Office of the Director General and the Genetic Resources Transfer and Regulation Directorate (IBC) dated 31 August 2010
43. Letter to Dr Gemedo Dalle Tussie from Mr R.A.A. Geene dated 7 December 2010

Other documents:

- Print-out of slide show presentation held by Mr Tamirie Haide, Legal Study and Dissemination Senior Expert, at the Ethiopian Intellectual Property Office, 25 October 2011
- IBC brochure from June 2011
- Leaflet from Ethiopian Intellectual Property Office on the 'Ethiopian Fine Coffee Initiative'
- IP Newsletter from the Ethiopian Intellectual Property Office from October 2011
- Final report from Mr Hans Turkensteen on the project 'Förderung des nachhaltigen Tef Anbaus in Äthiopien', 23 September 2009, titled *Anlage zum Weiterleitungsvertrag 384/056, A10. Abschlussbericht.*
- Final report from Sequa, written by Mr Daniel Thomann, then project manager of the project 'Förderung des nachhaltigen Tef Anbaus in Äthiopien', project no. 384-056 of Sequa GmbH, Partner of German Business. The final report is undated, written after the finalization of the project on 3 August 2009.

Annex 2: List of interviews

Interviews conducted in Ethiopia:

1. 20 October 2011 in Addis Ababa, group interview:
   - Dr Gemedo Dalle Tussie, Director General, IBC
   - Mr Abiyot Berhanu, Head of the Information and Documentation Service, IBC
   - Mr Kebu Balemie, Researcher of the Biodiversity Conservation and Sustainable Use Directorate, IBC
2. 20 October 2011 in Addis Ababa: Dr Kassahun Embaye, now Senior Research Fellow at the Ethiopian Institute of Agroforestry; during the negotiations of the Teff Agreement and the first phase of implementation period he was Deputy Director of the IBC, then its Acting Director from 2009 until early 2011
3. 21 October 2011 in Addis Ababa: Dr Girma Balcha, now Executive Director of Climate Change Forum – Ethiopia; during the negotiations of the Teff Agreement and the implementation period up to 2009 he was Acting Director of the IBC
4. 24 October 2011 at Debre Zeit Agricultural Research Centre: Mr Kebebew Assefa, Senior Researcher and Breeder/Geneticist, Debre Zeit Agricultural Research Centre
5. 24 October 2011 at Debre Zeit: Mr Eshetayehu Tefera, formerly employed at the IBC
6. 24 October in Addis Ababa: Mr Regassa Feyissa, Director, Ethio-Organic Seed Action (EOSA)
7. 25 October 2011 in Addis Ababa, group interview:
   - Mr Berhanu Adello, Director General, EIPO
   - Mr Tamirie Haide, Legal Study and Dissemination Senior Expert, EIPO
   - Mr Tedla Mamo, Director, Copyright and Community Knowledge, EIPO
8. 25 October 2011 in Addis Ababa, group interview:
   - Dr Gemedo Dalle Tussie, Acting Director General, IBC
   - Mr Abiyot Berhanu, Head of the Information and Documentation Service, IBC
   - Mr Kebu Balemie, Senior Research Fellow of the Biodiversity Conservation and Utilization Directorate, IBC
9. 26 October 2011 in Addis Ababa: Dr Tewolde Berhan Gebre Egziabher, Director General, Environmental Protection Authority of Ethiopia
10. 26 October 2011 in Addis Ababa: Mr Mesfin Bayou, legal consultant
11. 27 October 2011 in Addis Ababa: Dr Bert Visser, Director, Centre for Genetic Resources, the Netherlands
12. 16 March 2012 in Adama, Ethiopia: Mr Geert Westerbrink, Agricultural Counsellor, Embassy of the Kingdom of the Netherlands in Ethiopia.

Interviews conducted by telephone:

13. 28 October 2011: Mr R.A.A. Geene, Public Receiver of the HPFI and S&C bankruptcy, lawyer, Dommerholt Advocaten, Assen, the Netherlands.
14. 29 February 2012: Ms Regina Asendorf, Landwirtschaftskammer Niedersachsen, Germany
15. 1 March 2012: Dr Arnold Mulder and Dr Lodewijk Turkensteen, former employees/shareholders of S&C and HPFI, currently among the partners in a new teff-oriented company, Millets Place BV
16. 16 May: Mr Hans Turkensteen, former Director of S&C and HPFI, now *inter alia* Director of Prograin International bv.
17. 27 June 2012: Dr Ir Jan Vos, Associate Professor, Crop and Weed Ecology, Wageningen University, Centre for Crop Systems Analysis, the Netherlands
18. 27 June 2012: Ir Loes Terlouw, independent consultant, the Netherlands.

E-mail communication:

19. February 2012: Dr Anne Hulst, Dr Arnold Mulder and Dr Lodewijk Turkensteen, former employees/shareholders of S&C and HPFI, at that time partners in the new teff-oriented company Millets Place BV
20. February 2012: Ms Regina Asendorf, Landwirtschaftskammer Niedersachsen
21. March 2012: Susanne Sattlegger, Programme Coordinator and Daniel Thomann, Head of EU Division, Sequa GmbH, Partner of German Business
22. May 2012: Dr Arnold Mulder and Dr Lodewijk Turkensteen
23. May 2012: Mr Jostein Sandvik, Senior Advisor, Norwegian Industrial Property Office
24. June 2012: Mr Hans Turkensteen, former Director of S&C and HPFI, now *inter alia* Director of Prograin International bv.
25. June 2012: Dr Ir Jan Vos, Associate Professor, Crop and Weed Ecology, Wageningen University, Centre for Crop Systems Analysis, the Netherlands
26. June 2012: Ir Loes Terlouw, Independent Consultant, the Netherlands
27. June 2012: Mr Misrak Aklilu, Programme Director for Agricultural Scale-up and Market Development, Facilitator for Change, Ethiopia (FCE), Addis Ababa
28. July and August 2012: Dr Getachew Belay, former Researcher at Debre Zeit Agricultural Research Centre, now Senior Biotechnology Policy Advisor at the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA) under the Common Market for Eastern and Southern Africa (COMESA), Lusaka, Zambia

Annex 3: Agreement on Access to, and Benefit Sharing from, Teff Genetic Resources (Teff Agreement) (attached)

Annex 4: Memorandum of Understanding on Research and Development of International Markets for Teff-based Products (MoU) (attached)

Annex 5: Patent on the processing of teff flour (teff patent) (attached)

Agreement on access to, and benefit sharing from, Teff genetic resources

Signed for the Provider

Date 05/04/05

Signed for the Company

Date 5 April 05

Signed for Embassy of The Netherlands as a witness

Date 05-04-05

Dr. Tewolde Berhan Gebre Egziabher as a witness

Date 5/5/2005

Addis Abeba
December 2004
Version 5 final

Institute of Biodiversity Conservation,
Ethiopian Agricultural Research Organization
Health and Performance Food International bv. (HPFI)

1 Table of contents

2 Parties

This **agreement** is signed between:

The Institute of Biodiversity Conservation, whose address is Yeka Kifle Ketema, Kebele 08, P.O.Box 30726; telephone 251-1-627504/612244, fax: 251-1- 627730/613722; e-mail: ibcar@telecom.net.et or Biod@telecom.net.et, Addis Ababa, Ethiopia, hereafter referred to as the "**Provider**"

The Ethiopian Agricultural Research Organization, whose address is Bole Kifle Ketema, Kebele 12/13, P.O.Box 2003; Tel: 251-1-462270; fax: 251-1-461251; e-mail: dg@earo.org.et; Addis Ababa, Ethiopia, hereafter referred to as "**EARO**"

And

Health and Performance Food International bv. (HPFI), whose registered address is P.O. Box 427, Azieweg 4, 9407 TG Assen, NL-9400, the Netherlands, Tel: +31 (0) 6 53 413847, e.mail j.turkensteen@soilandcrop.com, hereafter referred to as the "**Company**".

3 Preamble

3.1 Whereas Teff (*Eragrostis tef)* is a crop species of Ethiopian origin and has various attributes of interest to the food industry.

3.2 Whereas the **Company** has come up with new applications of Teff and thus wants to have access to Teff varieties to be used for producing Teff-based food and beverage products and to develop new Teff varieties more suitable for producing such products.

3.3 Whereas the **Company** acknowledges that the genetic resources of Teff the **Company** has acquired or will acquire irrespective of the source are of Ethiopian origin and thus belongs to Ethiopia, and it agrees to respect this fact.

3.4 Whereas the **Provider** is a national institution in Ethiopia with the authority to grant and regulate access to genetic resources of Teff and other species and is responsible for effecting the sharing of the benefits from those genetic resources.

3.5 Whereas the **EARO** is a national research institution responsible for the coordination of national agricultural research on Teff in Ethiopia and has developed various Teff varieties.

3.6 Whereas Articles 1 and 15-19 of the 'Convention on Biological Diversity' and the 'Bonn guideline on access to genetic resources and fair and equitable sharing of the

benefits arising out of their utilization,' which "are a useful first step of an evolutionary process in the implementation of relevant provisions of the Convention", require that the benefits arising out of the utilization of genetic resources be shared fairly and equitably between the **Provider** and the **Company**; and whereas the access to genetic resources and the fair and equitable sharing of the benefits arising from the utilization thereof is to be determined by terms mutually agreed by the two parties.

3.7 Whereas the **Company** wants to use the genetic resources of Teff and is willing to share with the **Provider** the benefits arising out of the use; and whereas the **Provider** has consented to the use of the genetic resources of Teff by the **Company**.

3.8 Therefore, in witness thereof, the following **agreement** on access to Teff genetic resources and the fair and equitable sharing of the benefits arising from the access has been concluded by the two parties.

4 The scope of access

4.1 The **Provider** agrees that the **Company** accesses and uses the genetic resources of Teff specified in Annex 1 to this **agreement**.

4.2 Under this **agreement**, the **Company** is permitted to use the genetic resources of Teff only for the purpose of developing non-traditional Teff based food and beverage products that are listed in Annex 3 to this **agreement**.

4.3 The **Company** cannot use Teff for any other purposes (e.g. chemical, pharmaceutical etc.) whatsoever unless explicit written consent is given by the **Provider**.

4.4 The **Provider** shall not grant to other parties access to Teff genetic resources for the purpose of producing the products of the **Company** listed in Annex 3 of this **agreement** unless it secures the consent of the **Company**.

4.5 The **Company** is not permitted to access the traditional knowledge of Ethiopian communities on the conservation, cultivation and use of Teff. Therefore, the **Company** shall not claim any rights over, nor make commercial benefit out of, such traditional knowledge unless explicit written **agreement** is given to it by the **Provider**.

4.6 To avoid possible confusion between the traditional knowledge of Ethiopian local communities and inventions made by the **Company**, the **Provider** shall, upon submission by the **Company** of its research proposals, inform the **Company** of the

existing traditional knowledge of relevance to the research areas proposed by the **Company**.

4.7 The **Company** acknowledges that the genetic resources of Teff it has acquired or will acquire, irrespective of the source, is of Ethiopian origin and thus belongs to Ethiopia. It agrees to respect this fact.

4.8 Should there arise any claim challenging the origin or ownership of Teff, the **Provider** shall take the responsibility to defend the parties against that claim, and the **Company** shall assist the **Provider** in the defence.

4.9 The **Company** shall assist in identifying and bringing to court infringers upon the rights of Ethiopia over Teff.

5 Intellectual property ownership

5.1 The **Company** shall neither claim nor obtain intellectual property rights over the genetic resources of Teff or over any component of the genetic resources. However, plant variety protection may be obtained over Teff varieties.

5.2 The plant variety protection rights over new Teff varieties the **Company** will develop shall be co-owned by the **Company** and **EARO**. Such varieties shall be used by **EARO** and the **Company** in such a way as not to damage the business interests of the **Company** in so far as the products listed in Annex 3 or the interests of **EARO** or the **Provider** are concerned.

5.3 The Teff varieties that are not developed by the **Company** shall be owned by the **Provider** on behalf of the Teff farming local communities of Ethiopia. If it is found to be in the interest of the **Provider** or the **Company,** such varieties may be registered in the name of **EARO**. The **Company** shall handle and cover the cost of such registration outside of Ethiopia, provided that it has the finances in the given budget year.

6 Transfer to third parties

The **Company** shall not transfer Teff seed samples or any component of the genetic resources of Teff to third parties without first having explicit written consent from the **Provider**.

7 Effect of the agreement

7.1 The **agreement** shall not affect the sovereign rights of Ethiopia over the genetic resources of Teff and the **Provider** shall always retain the authority to grant other parties access to any genetic resources of Teff.

7.2 This **agreement** shall not affect whatsoever any traditional products of Teff, be it in Ethiopia or abroad.

7.3 This **agreement** shall not affect whatsoever any non-traditional products of Teff, be it in Ethiopia or abroad, except for those the Company has specified in Annex 3 to this agreement.

7.4 This **agreement** shall not prohibit the exporting of Teff from Ethiopia to other parties. However, if an importer or anyone who buys Teff from that importer wants to use or uses Teff for making any of the products specified in Annex 3 to this agreement and this fact is brought to the attention of the **Provider**, Ethiopia will refuse to export Teff to that importer.

8 Benefit sharing

The **Company** has agreed to share the benefits that arise out of the utilization of the genetic resources of Teff.

8.1 The **Company** agrees to pay to the **Provider** a lump sum equal to the amount

$$1\% \times \frac{\text{Gross net income in the years 2007 + 2008 + 2009}}{3}.$$

This payment shall be made immediately after the publication of the annual account of the **Company** for the year 2009 (i.e. shortly after publication and shareholder approval in June 2010).

8.2 The **Company** agrees to pay to the **Provider** annually a royalty of 30% of the net profit from the sale of basic and certified seeds of the Teff varieties specified in column 3 of Annex 1 to this **agreement**.

8.3 The **Company** agrees to pay to the **Provider** annually a license fee equal to the amount defined in Annex 2.

8.4 The **Company** agrees to contribute 5% of its net profit, which shall not be less than 20,000 Euro per year, to the **Financial Resource Support for Teff,** hereafter referred to as **FiRST**. The **FiRST** shall be used for improving the living conditions of local farming communities and for developing Teff business in Ethiopia.

8.5 The **FiRST** shall be administered jointly by the **Provider** and the **Company**. The University of van Hall/Larenstein will participate in the administration of the **FiRST**. The role of van Hall/Larenstein University in the administration of the **FiRST** will be to ensure that Dutch scientific knowledge and experience with product innovation are transferred into Ethiopia in the process of using the **FiRST**. Other details of the administration of the **FiRST** shall be specified by another agreement of the parties.

8.6 The **Company** agrees to share with the **Provider** and **EARO** the results of research it will undertake on Teff. Accordingly, the **Company** shall share with the **Provider** and **EARO** the knowledge or technologies it may generate using Teff except when it constitutes Undisclosed Information to the **Company** according to Article 39 of the Agreement on Trade-related Aspects of Intellectual Property Rights of the World Trade Organization.

8.7 The **Company** agrees to involve Ethiopian scientists in the research it will undertake. The kinds of research on which Ethiopian scientists will participate and the mode of participation shall be specified by mutual agreement of the parties in the research plan of the **Company.** As appropriate, the **Company** will contract out research to Ethiopian research institutions.

8.8 The **Company** will take the **EARO** as the most preferred institution to breed Teff varieties.

8.9 By way of contributing to the Ethiopian local economy in connection with the access to Teff genetic resources, the **Company** agrees to establish profitable Teff businesses in Ethiopia, such as establishing Teff farming, cleaning and milling enterprises, bakeries, etc. The **Company** will therefore create joint ventures with Ethiopian counterparts.

8.10 Furthermore the **Company** will find funding that will augment the **FiRST** specified in paragraph 8.3 using the opportunity created by the joint ventures.

8.11 The **Company** shall acknowledge, in all its publications and application for the registration of Teff varieties and other intellectual property rights over products it will develop from Teff, that Ethiopia is the country of origin of that Teff.

9 Ownership and confidentiality

9.1 Results of any joint research conducted on Teff materials shall be owned by both parties and shall be released only upon written consent of both parties.

9.2 Information that is identified by either party as confidential shall be kept as such by both parties.

10 Duration of the agreement

The **agreement** shall remain in force for a period of 10 years. The parties may renegotiate the **agreement** at the end of that period.

11 Penalty

11.1 A party that breaches the terms of this **agreement** shall pay to the aggrieved party a penalty of 50,000 Euro if asked to do so by the aggrieved party.

11.2 The penalty that is specified in paragraph 11.1 is applicable on the **Provider** if it breaches the terms of this **agreement**, particularly those given in paragraphs 4.1, 4.4, 4.6, 4.8, 5.2, 7.3 and 7.4

11.3 The penalty that is specified in paragraph 11.1 is applicable on the **Company** if it breaches the terms of this **agreement**, particularly those given in paragraphs 4.2, 4.3, 4.5, 4.6, 4.7, 4.9, 5.1, 5.2, 5.3 and 6.

11.4 If the **Company** fails to fulfil its financial obligations as specified in part 8 of this **agreement** on 'Benefit sharing', the **Provider** may add a penalty of 5% of the due payment for any delay of between 90 and 180 days, and 25% thereafter.

12 Termination

12.1 If the company is in the process of bankruptcy, the **Provider** can immediately terminate the **agreement**.

12.2 If one of the parties repeatedly fails to fulfil or repeatedly violates its obligations under this **agreement,** then the aggrieved party may terminate the **agreement** upon 30 days notice given in writing to the other party.

12.3 Termination of this **agreement**, except in the case of bankruptcy, will be done through mutual agreement by both parties.

12.4 The termination of this **agreement** shall not affect the rights and obligations that were due to accrue to either party prior to the effective date of termination.

12.5 Starting with the day of termination of the agreement, the **Company** shall stop using the genetic resources of Teff. However, the **Company** is entitled to continue

the use of co-owned Teff varieties upon payment of royalties to be mutually agreed upon by both parties.

13 Dispute settlement

13.1 If any dispute arises in connection with the interpretation or application of this agreement, both parties shall seek solution by negotiation. If the dispute cannot be resolved by negotiation, it shall be submitted to an arbitration body in accordance with the procedure laid down in part I of Annex II of the Convention on Biological Diversity.

13.2 For the purpose of Paragraph 13.1, the word "party" in Part I of Annex II of the Convention on Biological Diversity shall mean "**Provider**" or "**Company**".

13.3 The decision of the arbitral tribunal shall be final and binding on the parties without appeal.

13.4 If either of the parties fails to comply with the award of the arbitral tribunal, the aggrieved party may, in accordance with Paragraph 16 (d) (iv) of the Annex to Section A of Decision VI/24 of the 6th Conference of the Parties of the Convention on Biological Diversity, UNEP/CBD/COP/6/20, the Hague, 7-19 April 2002, ask the Government of the Federal Democratic Republic of Ethiopia or the Government of the Netherlands to enforce the award given by the arbitral tribunal.

14 Guarantee

Each year, the **Company** shall pay a sufficient sum of money in advance from which the requests by the provider for payment will be subtracted.

15 Applicable laws

15.1 The Convention on Biological Diversity (CBD) and the relevant decisions, guidelines and laws that emanate from it, including the International Treaty on Plant Genetic Resources for Food and Agriculture, in particular but not restricted to, its Article 9 on Farmers' Rights, the Bonn Guidelines, decisions of the various Conferences of the parties as well as those provisions of the Union for the Protection of New Plant Varieties (UPOV) that are consistent with the CBD and the relevant decisions, guidelines, and laws that emanate from it shall apply to matters not addressed in this agreement.

15.2 The CBD and the decisions, guidelines or laws that emanate form it shall prevail over the UPOV in cases on which the two do not agree.

16 Monitoring and follow-up

16.1 The **Company** shall submit to the **Provider** annual research and financial reports.

16.2 The **Provider** has the right to review at any moment, through an independent accountant if it so wishes, the bookkeeping as well as the relevant administrative details of the items covered by this **agreement.**

16.3 Meetings between the two parties will be held as required to exchange information.

17 Annexes to the agreement

The following Annexes shall form part of this **agreement.**

17.1 Annex 1: Varieties of Teff accessed by S&C. This Annex shows the different varieties of Teff and the authorization of use given by the **Provider** to the **Company**. This Annex may be updated by mutual agreement of the parties as needed.

17.2 Annex 2: Annual payments of licence fee per hectare for growing Teff. The annual payment of the licence fee provided for in Paragraph 8.3 will be determined after each harvest season based on this Annex.

17.3 Annex 3: List of products of the **Company.** This Annex shall be updated by mutual agreement of the parties as needed.

Annex 1 - Teff Varieties that the **Company** Can Use to Make Food and Beverage Products

		EARO owned		co-owned EARO and HPFI		
official name	HPFI name	registered	applied for registration (date)	registered	applied for registration (date)	planned to be registered in year
DZ-0-1681	-	yes		no	no	no
DZ-Cr-358	S&C2	yes		no	no	no
DZ-Cr-255	S&C3	yes		no	no	no
DZ-Cr-44	S&C6	yes		no	no	no
DZ-Cr-82	S&C7	yes		no	no	no
DZ-Cr-37	S&C12	yes		no	no	no
DZ-01-354	S&C5	yes		no	no	no
DZ-01-974	S&C8	yes		no	no	no
DZ-01-787	S&C9	yes		no	no	no
DZ-01-196	S&C11	yes		no	no	no
DZ-01-99	S&C10	yes		no	no	no
DZ-01-1285	-	yes		no	no	no
-	S&C101	no		no	no	2004
-	S&C105	no		no	no	2004
-	S&C106	no		no	no	2004
-	S&C107	no		no	no	2004
-	S&C111	no		no	no	2004
-	S&C117	no		no	no	2004
-	S&C112	no		no	no	2004
-	S&C109	no		no	no	2004

Annex 2 - Annual payments to be made by the **Company** to the **Provider** according to Paragraph 8.3 on per hectare basis for growing Teff by the **Company** and by anybody supplied seed by the **Company**

official name	HPFI name	Ownership	area	annual payment < 2500 kg per hectare	annual payment 2500 - 3499 kg per hectare	annual payment 3500 and more per hectare
DZ-0-1681	-	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-Cr-358	S&C2	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-Cr-255	S&C3	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-Cr-44	S&C6	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-Cr-82	S&C7	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-Cr-37	S&C12	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-01-354	S&C5	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-01-974	S&C8	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-01-787	S&C9	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-01-196	S&C11	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-01-99	S&C10	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-01-1285	-	EARO	Europe	€ 10.00	€ 20.00	€ 25.00
DZ-0-1681	-	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-Cr-358	S&C2	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-Cr-255	S&C3	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-Cr-44	S&C6	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-Cr-82	S&C7	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-Cr-37	S&C12	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-01-354	S&C5	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-01-974	S&C8	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-01-787	S&C9	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-01-196	S&C11	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-01-99	S&C10	EARO	North America	$ 10.00	$ 20.00	$ 25.00
DZ-01-1285	-	EARO	North America	$ 10.00	$ 20.00	$ 25.00
-	S&C101	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C105	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C106	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C107	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C111	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C117	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C112	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C109	EARO/S&C	Europe	€ 5.00	€ 10.00	€ 15.00
-	S&C101	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C105	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C106	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C107	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C111	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C117	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C112	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00
-	S&C109	EARO/S&C	North America	$ 5.00	$ 10.00	$ 15.00

Annex 3 - Prodcuts that the **Company** Can Make from the Teff Varieties in Annex 1

List of products of HPFI

				markets										
product group	**product name**	**subproducts**	**category**	**general**	**gluten free**	**sport food /beverages**	**natural food**	**performance food**	**organic food**	**no wheat**	**medicines**	**coatings**	**beverages**
flour	gluten free flour	100% teff	white		y	y	y	y	y	y			
			brown		y	y	y	y	y	y			
		premix	white		y	y	y	y	y	y			
			brown		y	y	y	y	y	y			
		breadmix with Teff	white		y	y	y	y	y	y			
			brown		y	y	y	y	y	y			
seeds	gluten free beverages	beer	pilsener		y								y
		distilled drinks	liquors				y						y
			genever				y						y

MEMORANDUM OF UNDERSTANDING

Research & Development of international markets for Teff-based products

Author:
Date: March 26, 2003
Version: final

Table of content

29/07/05

1 Preamble

Ethiopia is the main Teff (*Eragrostis tef*) producing country in the world. Much of the produce, however, is consumed locally and at a household level. The Ethiopian Government is pushing towards market-based agricultural research more than ever. For Ethiopia, therefore, product development from tef other than *injera* is an important feature. An indigenous cereal like Teff, can benefit from this approach by breeding for value-added traits and commercialize their products at an industrial scale, and at international level. The expected manifestations are promoted investment, better market to the Teff farmer and increased Teff export. This can be practically achieved by working in partnership, as the case may be, with foreign or local establishments towards mutual benefits.

In the Netherlands, at research level, field production of Teff has been taking place since the year 2000 through Larenstein University, a major university in professional agricultural education. For almost 100 years it is involved in tropical agriculture. Many professionals in Ethiopia have been educated at Larenstein University in diploma, bachelors or masters courses.

Since 1997 Larenstein University is participating in two Teff projects with the Mekelle University and Alemaya University.
Early 2002 a commercial organization was founded, called Soil & Crop Improvement (S&C), that initiated organized research on agricultural scale in the interest of Dutch farmers who are looking for alternative crops. S&C found production promising and is targeting interesting niche markets. These markets are found with top-sportsmen, organic & health food, and especially for celiac patients (who are intolerant/allergic, in different degree, to gluten from most other cereals – wheat, rye, barley, oats).

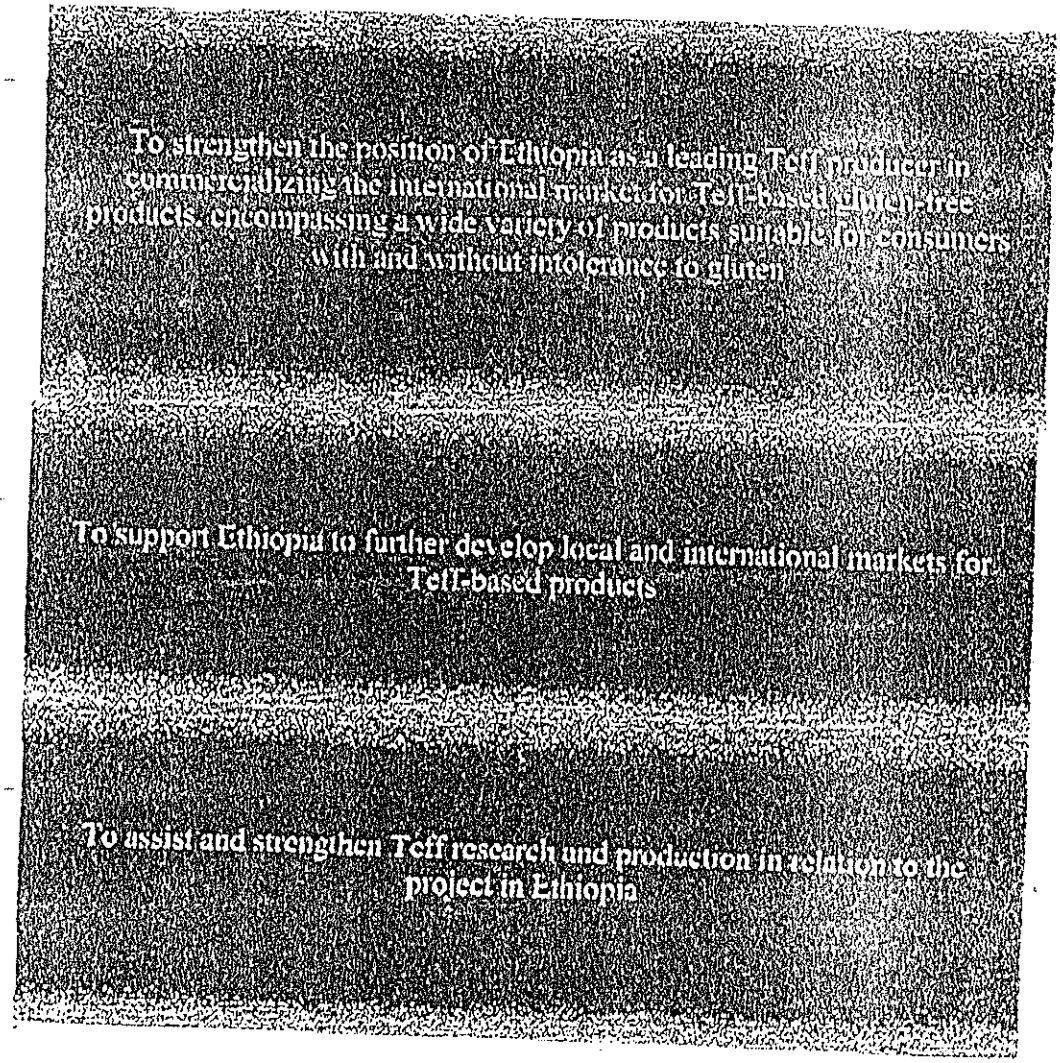
Gluten intolerance is typically found in all those countries where wheat is used as an ingredient in many food products. Researchers estimate this market to be halve to two percent of the population in those countries. Based on a research program of S&C, scientists have confirmed the absence of any gluten in teff..

Based on research by S&C (and partners) on baking quality, Teff proved to be very promising. S&C is aiming to introduce bread, cake, cookies, beer, binding agents, and different type of premixed flour.

In order to secure the required scientific support for its ambitious plans and to benefit from the long lasting relationship that Larenstein University has with Ethiopia, S&C has proposed to Larenstein University to enter into a formal relationship, which Larenstein is willing to accept.
In recognition of principles of ethics and equity for nations over genetic resources Larenstein University has agreed with S&C on the establishment of tef-fund for improvement of Ethiopian agricultural infrastructure (TFIET, see Article 6 hereunder). Contribution to the fund will come from S&C and Larenstein University will be responsible for the management of the

fund. The people behind S&C sincerely believe that Ethiopia should benefit from the international developments of this indigenous cereal.

2 Objectives



23/07/03

3 Partnership

3.1 Ethiopia

a. Ethiopian Agricultural Research Organization (EARO)
Address: P. O. Box, 2003, Addis Ababa

EARO, through the Debre Zeit Agricultural Research Center, is responsible for the coordination of the National Tef Research Project in Ethiopia. It has developed and released more than a dozen teff varieties and maintains the initial seed material (breeders seed). It is envisaged that, in the future, National Agricultural Inputs Authority (NAIA), Institute of Biodiversity Conservation and Research (IBCR), Ethiopian Science and Technology Commission (ESTC), and Licensed Private Grain Exporters will be included as deemed necessary.

3.2 The Netherlands

a. Larenstein Transfer , a fully owned subsidiary of Larenstein University, further referred to as Larenstein University ("LU")
Address: P.O. Box 9001
NL-6880 GB Velp

LT is a major university in professional agricultural education. For almost 100 years it is involved in tropical agriculture. Many professionals in Ethiopia have been educated at Larenstein in diploma, bachelors or masters courses. Since 1997 Larenstein is participating in two similar projects with the Mekelle University and Alemaya University.

b. Soil and Crop Improvement (S&C)
Address: P. O. Box, 427
NL-9400 AK Assen

S&C is a commercial organization with as target to sell Teff-flour to the industry for the production of gluten free baking products and other food components, mainly targeted to niche markets in Europe, North America, Australia and Oceanië and the Far East.

4 Cultivars

4.1 Registration of Ethiopian and S&C cultivars

It is important to register Ethiopian Teff cultivars outside Ethiopia, in the name and on behalf of the Ethiopian Agricultural Research Organization, not to loose breeder rights and the benefits of the intellectual property of the varieties. Initially it concerns Europe, USA, Canada and Australia for which direct action is needed. S&C will take action to register Ethiopian cultivars outside Ethiopia as far as possible concerning the regulations of UPOV and comparable administration authorities (for example in the USA). In addition to the phenotypic cultivar description the possibilities of AFLP or RFLP fingerprinting will be considered and if relevant implemented by S&C.

The registration however will not be implemented until a renegotiated settlement is reached between S&C, EARO and other relevant institutions in Ethiopia, and possibly, in the Netherlands.

4.2 Deployment of Ethiopian Varieties by S&C

As long as the breeder rights last, S&C has the right to use Ethiopian released varieties worldwide under the conditions of payment of property rights to EARO as indicated below. S&C states, that all rights of Ethiopian cultivars and germplasm is owned by Ethiopia and will actively make sure that the Ethiopian interests are safeguarded. S&C shall not pass the seeds of varieties to third parties without the knowledge of EARO.

4.3 Deployment of new Varieties

New varieties, developed by S&C, will be co-owned by EARO and S&C. EARO and S&C can use such varieties for their own purposes under the condition that one party should not damage the interest of the other party while doing so.

Any new varieties bred in corporation between EARO, Larenstein and S&C will be first presented to S&C to strengthen its market position.

5 Research program

5.1 *Research by and through S&C (outside Ethiopia)*

5.1.1 Baking quality

Baking quality is an important feature concerning the production of bread. S&C has gained a lot of experience on this subject and knows how to proceed with Teff grain from different origins to obtain flour for the production of good quality bread.

As Ethiopia could be an important provider of high quality Teff seed, S&C will research, using the Ethiopian cultivars, the following topics:

- Determination of baking quality of Ethiopian Teff cultivars grown in Ethiopia;
- Determination of baking quality of Ethiopian Teff cultivars grown in The Netherlands and elsewhere.

The information gathered in this research will be shared and can be used for mutual interests.

5.1.2 Product development

Teff has an enormous potential for many different products in many different markets. Each and every country / market has it own standards for taste, color and texture. As a consequence a broad and extensive program is defined and in future will have to be extended to understand the international markets and its needs.

Currently S&C focuses on product development for the local markets in the Netherlands, Sweden, Germany France, Italy and the USA. It is expected that this year this program will have to be extended to Australia, New Zealand as well as the Far East.

For this purpose in Ethiopian produced grain will be used. The information obtained about what variety delivers which results will be shared with Ethiopian counterparts.

5.1.3 Adaptation

Experience so far shows that the baking quality of Teff is excellent if different breeds, coming from different climate zones, are specifically mixed. This is one of the trade marks used by S&C.

To further extend the value in the international food industry of Teff it is important to investigate the adaptation of different varieties to different climate zones and their specific growing conditions.

5.1.4 Breeding

Important breeding topics are earliness, starch quality, resistance to lodging, seed size, seed color (whiter flour and bread for the South-European market).

5.2 *Research in Ethiopia in collaboration with Larenstein University*

5.2.1 Production of certified gluten-free Teff for export

Investigate the feasibility to grow Teff in Ethiopia and deliver it according to the norms and standards of the gluten free market demands. This encompasses not only the production of Teff, but also the distribution, storage, preparation and packaging.

5.2.2 Mechanization of Teff production and processing

Experience gained with Teff shows that there are excellent possibilities to increase yield and farmers revenues through selection of varieties combined with agricultural measures, such as mechanization of production and processing. The experienced gained outside Ethiopia can be matched with the excellent scientific knowledge in and of the Ethiopian EARO for use within Ethiopia.

5.2.3 Other research programs

Other Teff related research and development will be released later, based on an agreement reached between researchers working for EARO and LU

5.3 *Training*

LU will assist in soliciting scholarships for Ethiopian students.

6 Funding

6.1 Funding R & D in the Netherlands.

S&C is funded through private capital input of shareholders, bank loans based on farmers' participation with land to cover risk and limited support by the local government.

6.2 Funding R & D in Ethiopia

The Foundation Larenstein Ethiopia Teff (FLET) has been established in recognition of principles of ethics and equity for nations over genetic resources. Contribution to the fund will come from S&C and Larenstein Transfer will be responsible for the management of the fund. The objective of the fund is specifically to contribute to the constant improvement of Ethiopian agricultural infrastructure. The main focus for this fund will be in strengthening Teff research in Ethiopia for further improvements of the Teff-production in Ethiopia.

The funding of the foundation:

- A donation to this foundation through a five percent profit sharing (of the net profit after taxation) coming from S&C, with a minimum of Euro 20.000 per year;
- (Up to decision of EARO): the payment of property rights (royalty) by S&C for Teff production under S&C contracts (following the UPOV regulations). This payment will be 10 Euro per hectare for Ethiopian varieties and 5 Euro for new varieties co-owned by EARO and S&C.
- Any other additional financial support from the Netherlands Government, European Union, World Bank, UN and/or other sources. Under certain conditions, development funds double private funding to encourage investments for innovations. Larenstein will examine this possibility and the conditions. Bringing the property royalties in the funds could under such conditions be extremely rewarding.

7 Short term action

In the previous two seasons research has been done with seeds from the seed bank at Larenstein University and imported seeds from USA.

In future S&C is planning the production using Ethiopian Teff varieties and make sure that the related royalties start flowing to Ethiopia. For this purpose S&C requires seeds for multiplication for the production of 2004. The sowing will have to take place before May 2003.

For the 2003 season (March-September) it is the intention to continue further research and start working now with the Ethiopian released Teff varieties within this project.

For both purposes, between 60 and 150 kgs of each released Teff variety will be made available (upon purchase) by EARO for activities mentioned in 4.1" Registration of Ethiopian and S&C cultivars" and 5.1" Research by and through S&C (outside Ethiopia)" in the Netherlands and in other parts of the world under S&C supervision. S&C shall not pass the seeds of these varieties to a third party for research purposes without a written consent of EARO.

8 Information release

Results of any research information conducted on Ethiopian Teff materials and generated from the project shall be owned by both EARO and S&C, and shall be released only upon agreement between the two parties.

9 Approval

For Ethiopian Agricultural Research Organization

Name and Signature _____

Title: DEMEL TEKETAY (D...
DIRECTOR GENERAL

Dated: 12/04/03

For Larenstein University
Name and Signature_ Henk Dijk

Title: __Director_of Larenstein Transfer

Dated: 1 April 2003

For Soil & Crop Improvement

Name and Signature__Hans Turkensteen

Title: __Director

Dated: ___March, 26 th 2003

DZ/110/2003
August 21, 2003

To Whom It May Concern

On the basis of the memorandum of understanding signed between the Ethiopian Agricultural Research Organization (EARO) and Larenstein University "Research and development of international markets for tef-based products", the Debre Zeit Agricultural Research Center (DZARC) of EARO has sold the following tef seeds to Larenstein University for research and development purposes.

No.	Variety	Quantity (kg)
1	DZ-01-1681	120
2	DZ-Cr-358	120
3	DZ-Cr-255	120
4	DZ-Cr-44	120
5	DZ-Cr-82	120
6	DZ-Cr-37	120
7	DZ-01-354	120
8	DZ-01-974	120
9	DZ-01-787	120
10	DZ-01-196	120
11	DZ-01-99	120
12	DZ-01-1285	120

Sincerely,

Solomon Asscfa (Phd)
Center Manager

(19) Europäisches Patentamt
European Patent Office
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(54) **PROCESSING OF TEFF FLOUR**

VERARBEITUNG VON TEFF-MEHL

TRAITEMENT DE FARINE TEFF

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(73) Proprietor: **Health & Performance Food International B.V.**
9407 TG Assen (NL)

(72) Inventor: **ROOSJEN, Jans**
NL-9414 AB Hooghalen (NL)

(74) Representative: **Winckels, Johannes Hubertus F. et al**
Vereenigde
Johan de Wittlaan 7
2517 JR Den Haag (NL)

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EP 1 646 287 B1

Description

[0001] The invention relates to flour of *Eragrostis tef* and to products comprising this flour. The invention particularly relates to flour of *Eragrostis* which can well be processed into *inter alia* gluten-free food products and to methods for preparing these food products.

[0002] It has already been known for tens of years that gluten (or similar compounds such as hordeins in barley and secalins in rye) in the food, often coming from flour of wheat, barley, rye, oat and spelt, is not suitable for a large number of people, *inter alia* for babies in the first months of their lives. Many people develop hypersensitivity, which results in patients with a gluten intolerance, or celiac disease.

[0003] Celiac disease and dermatitis herpetiformis (celiac disease of the skin) are caused by a hypersensitivity to gluten. When a celiac disease patient eats or drinks something which has been prepared from or with one or more gluten-containing types of grain or has been in contact therewith, the mucous membrane of the small intestine is affected. A healthy small intestine has a large number of intestinal villi on the inside which together form an enormous surface for food intake. The intestinal villi of celiac disease patients cannot tolerate gluten - or rather, gliadins and glutenins, the building blocks of gluten. As a result of an immune response initiated by gluten, the intestinal villi are affected. Consequently, not all required nutrients can be taken in by the body. This may cause a deficit of *inter alia* vitamins, calcium and iron.

[0004] In the Netherlands, there are an estimated 75,000 celiac disease patients. Celiac disease can be discovered in people of all ages, but two peaks can be distinguished. The first peak is between the sixth and tenth year, the second between the twentieth and fortieth year. Possibly, the second group already has celiac disease from childhood, but the symptoms do not show more clearly (recognizable) until later.

[0005] There is no medicine for gluten intolerance. The only way for a celiac disease patient to prevent or treat symptoms is following a strict diet in which there are no (products of) gluten-containing grains or other crops. This is the gluten-free diet. The diet is sometimes supplemented for some time with iron tablets and extra vitamins and minerals.

[0006] There is wheat starch or wheat flour which has been made gluten-free. This can officially be called gluten-free, but is not 100 percent free of gluten. The content of gluten needs to meet the standard of the Codex Alimentarius. For (wheat) flour made gluten-free, this is 200 parts per million (ppm). However, for some celiac disease patients this is still too much: they have symptoms after eating the flour made gluten-free. Therefore, these people had better opt for the use of products which are naturally gluten-free. For naturally gluten-free products, the set standard is maximally 20 ppm. However, naturally gluten-free products can be contaminated with gluten from other sources during the processing.

[0007] Rice, corn, tapioca, soy, buckwheat, arrowroot, potatoes and chestnuts are known crops which yield gluten-free flour, with which a variety of gluten-free food products can be prepared. Another source for a gluten-free flour is *Eragrostis tef* (also called Teff). This crop has been cultivated for human consumption in mainly Ethiopia and Eritrea for more than 5000 years. In addition, Teff is used more and more often for hay in countries such as South Africa and the United States. Teff flour is traditionally used for preparing injera, a spongelike, gray pancake with a somewhat sourish taste. Injera is usually made from a flour mixture consisting of equal parts of Teff flour and wheat flour diluted with water and yeast. The diluted flour mixture is usually fermented for three to four days before it is baked.
XP 002276233 discloses the preparation of injera from Teff grains.

[0008] Teff grain is in principle suitable to be cultivated on a large scale in large parts of the world. The crop does not make high demands on the nutrient medium and the climate. It is particularly well resistant to drought.

[0009] Compared to other grains, such as wheat, barley and sorghum, Teff has a higher nutritional value. The high nutritional value of Teff is largely due to the fact that the proportion of germ and brans is large compared to the rest of the seed (endosperm). Another reason is that, due to the small size of the seed, the flour is mainly made from the whole kernel, so that no parts are lost (National Research Council, Lost crops in Africa, vol. 1, Grains, 1996). The nutritional value of 100 grams of Teff flour is approx 10 grams of protein, 2.5 grams of fat, 70 grams of carbohydrates and 5 grams of dietary fiber. The caloric value of 100 grams of Teff flour is about 1400-1500 kJ.

[0010] In summary, *Eragrostis* offers an attractive source of (gluten-free) flour. However, it has been found that the preparation of a food product with traditional Teff flour (for instance Teff flour which is mixed with wheat flour for preparing injera) often causes problems. A known problem is the instability of the product, particularly of baked products. In other cases, the product has an unattractive taste and/or structure.

[0011] The invention provides the insight that the above-mentioned problems surprisingly do not occur if Teff flour with a particular falling number is used. The invention provides flour with a grain belonging to the genus *Eragrostis,* characterized in that the flour comprises grain whose falling number at the moment of grinding is at least 250, preferably at least 300, more preferably at least 340, most preferably at least 380. A great advantage of flour with such a falling number resides in the fact that it can, virtually without any problems, be processed into a stable, gluten-free product with an attractive taste and structure. Fig. 1 shows the correlation between the falling number of Teff flour and the baking quality of a dough prepared from Teff flour. Different Teff varieties have been tested in different after-ripening stages and under different cultivation conditions (such as climate, soil type, fertilization) on test and cultivation fie lds. Samples

hereof have been collected and analyzed for *inter alia* falling number and baking quality (with test breads prepared according to the formulation and method of Example 1). This shows that a falling number of at least 250 is needed to obtain a baking product with an acceptable quality, that is, a product that is awarded at least a grade 5 (on a scale of 1-10) by a test panel. A falling number of 300 results in a significantly improved product (assessment: 6), while a product of Teff flour with a falling number of 380-390 is, on average, awarded the grade 7. It can be gathered from Fig. 1 that, for a product which meets the 'market standard' of 7.5, the use of Teff flour with a falling number of at least 400 is required.

[0012] The finding that, for obtaining a good and tasty product, Teff flour with such a falling number needs to be used is unexpected. This is because, for baking bread of wheat flour, the optimal falling number for wheat is between 200 and 250. Conversely, wheat flour with a falling number lower than 120 or higher than 300 is not suitable for processing into (yeast-leavened) a baked product. For instance, with wheat with such high falling numbers, an enzyme preparation (for instance malt flour) is added to the flour to obtain an acceptable product. In contrast with this, Teff flour according to the invention preferably has a falling number which is generally higher than the optimal range of falling numbers of wheat.

[0013] The falling number (also called "Hagberg falling number", abbreviated to HFN) of a grain or ground grain is usually determined according to the Hagberg method. This method gives a measure for the activity of the enzyme alpha-amylase. Alpha-amylase degrades starch to sugars (maltose and glucose). The falling number obtained relates to the amount of undigested sugars in the starch. The higher the falling number, the lower the alpha-amylase activity and the fewer digested sugars are present in the grain. In the Hagberg analysis method, usually, exactly 7 grams of starch with a moisture content of 14% are brought into a tube with 25 ml of water. After vigorous shaking, an agitator is brought into the tube and the whole is placed in a boiling water bath. After this, the agitator is moved up and down 55 times, then to be released in the highest position. Due to its own weight, the agitator falls down through the firmed mixture and the duration thereof, measured with the aid of a second counter (for instance a stopwatch), determines the falling number. The falling number can vary from 61 to 600 seconds.

[0014] The traditional Teff flour, which is obtained by grinding the grain directly after the harvest, still causes problems with the processing thereof in baked products, as elaborated upon in the introduction. The invention now demonstrates that the reason for this is that, directly after harvesting, Teff grain of known Teff varieties has too low a falling number (that is, lower than 250) to be processed into an attractive product.

[0015] It is generally known that grain goes through an after-ripening process after harvesting, in which the falling number of the grain increases. Preferably, a flour according to the invention is obtained by storing the harvested grain kernel and/or having it after-ripen for some time and only grinding the grain after the falling number has reached a value of at least 250. The invention provides a flour of a grain, with the grain belonging to the genus *Eragrostis,* preferably grain of *Eragrostis tef,* characterized in that the falling number of the grain at the moment of grinding is at least 1.01 times higher (usually higher than 250) than at the moment of harvesting the grain, preferably at least 1.05 times higher (usually higher than 300), more preferably at least 1.20 times higher (usually higher than 320), and most preferably at least 1.30 times higher (usually higher than 380). As indicated hereinabove, the falling number of a flour according to the invention has a theoretical maximum of 600. Fig. 1 shows that flour with a falling number between 500 and 600 has very good baking qualities. The invention provides flour of *Eragrostis* spp. grain, with the grain having been ground at least 4, preferably at least 5, and more preferably at least 8 weeks after harvesting. Such a period is usually sufficient to obtain grain which has after-ripened sufficiently and has a falling number which meets the above-mentioned conditions. Particularly with larger amounts, in practice, the grain will virtually always be stored for some time before it is processed (ground). Teff can be stored in standard manners used for the storage of grains, for instance in (temperature-controlled) silos or towers or in a different suitable storage room such as a shed or barn. However, flour with a falling number according to the invention does not always need to be obtained by means of after-ripening. For instance, a Teff variety (or mixtures thereof) can be selected or generated whose grain already has a falling number of at least 250 at the moment of harvesting.

[0016] For making a gluten-free product, of course, during the process of harvesting, drying, transport, storage, grinding, mixing and packaging, adequate precautions need to be taken to prevent any mixing of Teff grain with non-gluten-free crop/seeds and/or flour. Thus, preferably, equipment and material (harvesting machines, transport means, storage rooms, millstones) are used which do not come into contact with gluten-containing crops. In order to be able to store grain so as to be free from decay, the grain preferably has a moisture content of at most 12%. It is therefore advisable to after-dry Teff grain before storage, preferably for a few days. The Teff grain is preferably stored in a closed storage room free from vermin. During after-ripening of Teff grain in cold areas, the falling number goes from an average of 230 immediately after harvesting, to 260 after four to five weeks to 330 two or three months after harvesting. In warmer areas, the after-ripening effect is different and, starting with an average falling number of 230 immediately after harvesting, a falling number higher than 420 may eventually be achieved.

[0017] The invention further provides the insight that traditional Teff flour does not only have a too low or a too high falling number to be processed into a good baking product, but that, in addition, it is usually not ground fine enough. The finer the flour, the better the flour can be baked. Flour according to the invention is preferably ground so fine that an essential (see below) part of the flour can pass through a sieve with a pore size of at most 150 microns, preferably at

most 120 microns, more preferably at most 100 microns. The grinding of Teff grain to a flour according to the invention can be carried out according to standard procedures for the preparation of flour. Preferably, a so-called pin mill with integrated cooling is used, so that the flour does not burn during grinding. For instance, of a flour according to the invention, 0% is blocked by a sieve with a pore size of 250 microns. Maximally 15% remains behind on a sieve with a pore size of 150 microns and maximally 20% when the pore size is only 100 microns (cumulatively approx 30%). So, minimally 70% of the Teff flour according to the invention passes a sieve with a pore size of 100 microns. Such a fine flour has been found to be particularly suitable for processing into a baking product. Without wishing to be bound to any theory, it is conceivable that the good baking qualities of such finely ground Teff flour are related to the fact that, due to the fine grinding, a relatively large surface is available for the absorption of water or a different liquid used for the preparation of a dough.

[0018] An additional advantage of flour according to the invention resides in the fact that, compared to other starch sources, *Eragrostis tef* is rich in minerals, such as calcium, zinc, magnesium, iron, phosphor and potassium. Flour according to the invention preferably contains at least 0.14%, preferably at least 0.15% calcium. Calcium is the most common mineral in our body. It is indispensable to the skeleton: bone contains 99% of the calcium in the body in the form of calcium phosphate and crystals which ensure the strength of the skeleton and the hardness of the teeth. Calcium also plays a role in numerous metabolic functions in the body.

[0019] A flour according to the invention contains at least 0.003% iron, preferably at least 0.004% iron, more preferably at least 0.005% iron. Iron is one of the most important elements in our body, particularly because it is a building block of hemoglobin and myoglobin. Hemoglobin is the red pigment of blood; myoglobin is mainly found in muscles. Hemoglobin is the substance in the blood which binds oxygen and transports it from the lungs to the cells. Further, iron is a component of various enzymes needed for a variety of metabolic processes in our body.

[0020] The consumption of food with a high iron content does not automatically result in an increase of iron in the body. This is because the intake of iron from food is a complex process and strongly depends on the form in which the iron is present in the food. Vegetable iron (Fe^{2+}) is usually taken in more poorly than animal iron (Fe^{3+}). In addition, the intake of iron is negatively affected by various other substances in our food. These are mainly mineral/metal-binding substances, such as tannins (*inter alia* in tea and walnuts), phytates (in grains), oxalates (*inter alia* in rhubarb), phosphates, caffeine (in coffee), polyphenols (in fruit), soy proteins, egg albumin and casein (in milk) which reduce the intake of iron from food. Flour according to the invention surprisingly contains relatively few if any of such mineral-binding substances. Hence, the invention provides flour which is suitable for preparing food, with the flour containing at most 0.8%, preferably at most 0.3%, more preferably at most 0.2% of a mineral-binding substance. Thus, compared to flours of frequently used other grains, a flour according to the invention contains only little (0.1 to 0.75%) phytic acid (myo-inositol hexa-kis-phosphate). Studies by Gies et al (S. Gies et al, *Comparison of screening methods for anaemia in pregnant women in Awassa, Ethiopia,* Tropical Medicine & International Health, 8 (4), 2003) have shown that anemia hardly occurs in those populations where Teff is an important part of the diet (S. Ketema, Tef *(Eragrostis tef): Breeding, genetic resources, agronomy, utilization and role in Ethiopian agriculture,* IAR, Addis Abeba, Ethiopia, 1993). The study found that the hemoglobin content of the blood of Ethiopian people who eat Teff was higher than that of non-Teff eaters. This is in all probability due to the high content of available iron in Teff.

[0021] In a preferred embodiment of the invention, at least two batches of different lots of Teff with different falling numbers are mixed and ground to obtain a flour with falling number in the optimal range, for instance with a falling number of at least 380-390 for preparing a backed product in accordance with the 'market standard'. The grain is preferably mixed such that it comprises different after-ripening stages, while, with material which has after-ripened for a long time, some addition of material which has after-ripened for a short time results in a better baking quality. Flour according to the invention can be obtained by grinding a mixture of grains, such as a mixture comprising Teff grains coming from different *Eragrostis* varieties. A mixture preferably comprises grains with different falling numbers. A grain mixture according to the invention preferably consists for 5-99% of a grain with a falling number higher than 400, more preferably higher than 420, most preferably higher than 450. For the remaining part, such a flour mixture may consist of a grain with a falling number lower than 400, preferably lower than 350. It has been found that flour mixtures comprising flour with a high falling number (approx 450-500) and a relatively low falling number (approx 300-350) have very good baking qualities. Thus, of a Teff mixture according to the invention consisting of approx 20% flour with falling number 450 and approx 80% flour with falling number 320, a bread can be baked which has risen and has been cooked well and has a flexible and elastic structure. The mixing of flours has a favorable effect on the stability of the flour and on the taste of the product (for instance bread) into which the flour mixture has been processed. The invention also provides a flour which has a stable falling number of at least 250, preferably at least 300, more preferably at least 340, most preferably at least 380 for a minimum of 3 weeks.

[0022] Further, a flour according to the invention may consist of a mixture of Teff flour according to the invention and flour of a different gluten-free crop or grain, such as potato, rice, corn, arrowroot, buckwheat or quinoa. A mixture can be obtained by grinding a grain mixture or by mixing flours of different, already ground grains or crops. This flour mixture can preferably be used for preparing (gluten-free) products. Further, a flour according to the invention can consist of a

mixture of Teff flour according to the invention and mixture of a gluten-containing grain, such as for instance wheat, barley, rye or oat. A mixture according to the invention can consist of flour of two, three, four, five or even more than five different (gluten-free or gluten-containing) grains or crops. The invention further provides the use of a flour or a mixture of flour (baking mix) according to the invention, for instance for preparing a dough or a batter. The invention provides dough or batter and use of dough or batter comprising Teff flour or a flour (mixture) according to the invention, characterized in that the falling number of the Teff grain at the moment of grinding is at least 250, preferably at least 300, more preferably at least 340, most preferably at least 380. Preferably, the falling number of the Teff grain at the moment of grinding is at least 1.01, preferably at least 1.05, more preferably at least 1.20 or even 1.30 times higher than at the moment of harvesting the grain. A very suitable flour (mixture) according to the invention has a falling number between 400 and 550 since this results in a dough or batter with very good baking qualities. Preferably, such a flour (mixture) consists of very finely ground grain kernels (e.g. >50% with a kernel size of maximally 100 microns) since this also has a positive effect on the baking qualities. Batter is a mixture of flour and liquid. Dough is a kneaded mixture of flour and a liquid, such as water, milk, beer or (olive) oil, and optionally other ingredients such as eggs, a leavening agent (such as yeast or baking powder) and a flavoring, such as salt. The mixture can be kneaded both manually and mechanically. A dough according to the invention comprises dough for the preparation of a wide range of (baked) food such as bread, pastry, cookies, pizza, pasta, noodles, etc. The invention also provides risen dough comprising a flour according to the invention. For this purpose, a mixture comprising flour according to the invention, a liquid and a leavening agent is kneaded to a dough according to the invention. Then, the dough is stored for some time under conditions which are favorable to rising, for instance in a draft-free, warm place. It has been found in practice that the amount of liquid which needs to be added to Teff flour in order to eventually obtain a good baking product is larger than normally used with different grains or flours (also see examples hereinbelow). Therefore, the processing of Teff will involve batter rather than dough.

[0023] A gluten-free dough according to the invention can be prepared from the Teff flour described hereinabove. A mixture of this Teff flour and flour of one or more other gluten-free crops, such as a mixture of Teff flour and buckwheat flour, rice flour, potato flour, arrowroot flour and/or corn flour is also suitable. The invention thus provides a flour which is gluten-free and which meets the demands on flour products of the modern western consumer. These products are suitable for all consumers and particularly for people with gluten intolerance. Such products contain less than 20 ppm, preferably less than 5 ppm, more preferably at most 1 ppm of gluten.

[0024] In addition, the invention provides a method for baking a product comprising the steps of: a) preparing a dough or batter by mixing a flour according to the invention with a liquid (for instance water, milk, beer or oil) and optionally a leavening agent; b) kneading this dough in a desired shape and c) heating the dough for some time.

[0025] With the use of a gluten-free flour according to the invention, and if, during preparation, contamination with a gluten-containing product is prevented, the invention further provides a method for baking a gluten-free product.

[0026] The invention provides a food product or a luxury food product comprising a flour according to the invention. A food product or luxury food product according to the invention may be both gluten-free and gluten-containing. The Teff flour component in such a flour comprises preferably at least 0.005% iron, at least 0.14% calcium, and at most 0.8% mineral (iron)-binding substances. The eventual concentration of these substances will depend on the amount of Teff flour used relative to the other components used. The food product or luxury food product may have a solid or a liquid form.

[0027] A food product according to the invention is, for instance, a baked product prepared according to a method of the invention, such as bread, pastry, cookies, crackers, biscuit, food bars, cornflakes, breadcrumbs, or a drink prepared from flour according to the invention. A food product or luxury food product according to the invention may also be prepared from unground grain belonging to the genus *Eragrostis,* preferably *Eragrostis tef,* characterized in that the falling number of the grain is at least 250, preferably at least 300, more preferably at least 340, most preferably at least 380. Such grain can be obtained by letting the grain after-ripen. An example of such a product is a(n) (alcoholic) drink such as beer prepared from Teff grain with a falling number of at least 250. Depending on the food application of the grain, grain with a particular falling number can be chosen.

[0028] Other examples are extruded products or dry dough products comprising dough according to the invention, for instance pastas (for instance macaroni, spaghetti, tagliatelle, lasagna, etc.) and noodles (vermicelli, thin Chinese noodles, chow mein, etc.). Due to the specific character of the Teff starches (it contains a large proportion of starch which is slowly digestible), the flour or a food product according to the invention is excellently suitable for the stimulation of the natural and thus desired flora in particularly the large intestine.

[0029] The invention further provides a pre-baked product comprising a flour according to the invention, such as pre-baked bread which can be baked off at home by the consumer. This pre-baked product is usually marketed as a (deep-) frozen product.

[0030] An advantage of food comprising a flour according to the invention is that Teff contains relatively high contents of health-promoting nutrients compared to other grains, such as wheat, barley and millet. This is *inter alia* due to the fact that the proportion of germ and brans in Teff grain is relatively large. For grains, carbohydrates form the most prominent component in the food. Sports nutrition consists preferably at least for 60% of carbohydrates in the form of

glucose (this is because they are most easily converted into energy). Carbohydrate sources can be categorized on the basis of their Glycemic Index (GI). The GI expresses itself in the elevation of the blood sugar level with a predetermined amount of a particular food product. Food products reach a GI reaction value of between 0 and 100, where white bread with a GI of 70 is used as a reference. Food products with a long absorption time (lower intake rate) are called 'low GI' food products (low GI means a GI lower than 55). Food products with a GI which is higher than 70 are called 'high GI' food products according to this method. For sportspeople, food with a high GI is, on the one hand, attractive, since it quickly results in available glucose. On the other hand, this initial elevation stimulates the secretion of insulin, so that the glucose level also quickly drops again. This problem is particularly known after eating pasta products, a source of carbohydrates which is very popular with sportspeople.

[0031] An unexpected advantage of food prepared from Teff flour according to the invention is that, although this food has a high GI, the glucose level remains high. These favorable properties of after-ripened Teff flour according to the invention are possibly the result of the relative proportions of free sugars and undigested sugars (starch) in Teff. It has been found that approx 20% (10-30%) of the carbohydrates in Teff belong to the rapidly degradable type, so that an initially high blood sugar level is obtained. However, about half (35-65%) of the carbohydrates belong to the slowly degradable type, causing a prolonged, constant conversion from starch into glucose. In this manner, the invention hence provides a food (such as pasta or a sports bar) which is very suitable for people, such as (endurance) sportspeople, who have a quick and prolonged need for carbohydrates. Such products are also referred to as "slow release energy" products. Such a food is also excellently suitable for people with overweight problems who want to control their weight by postponing the appetite. The invention also provides a food or luxury food containing Teff flour according to the invention which, *inter alia* thanks to the low content of mineral-binding substances and the 'slow carbohydrates' in Teff, has a positive effect on health. For instance, a food according to the invention has a positive effect on the prevention or treatment of (the symptoms of) anemia, diabetes and obesity. Particularly patients who suffer from diabetes type II have a need for slowly, gradually releasing carbohydrates/glucose.

[0032] The remaining amount of carbohydrates in Teff flour (approx 20-40%) are referred to as 'resistant' carbohydrates, because they are not converted into glucose by the digestive system. However, it has been found that these resistant carbohydrates are used as a food by microorganisms present in the intestine (intestinal flora), so that consuming products prepared from Teff flour has a favorable effect on the composition and vitality of the intestinal flora, such as it is, for instance, also obtained by consuming probiotics.

[0033] The above-mentioned percentages of the different types of carbohydrates in Teff flour are only indications, and the eventual content in products prepared with Teff flour will depend on the type of flour (which Teff varieties the grain comes from, how long it has after-ripened), whether mixtures of flours (with different Teff flour, with different gluten-free or gluten-containing flour) have been used and how the preparation of the product has taken place (baking time, temperature, additives).

[0034] The flour according to the invention, or the starch obtained therefrom, may also be used for different other applications. This is because the invention further provides a coating comprising flour according to the invention and food products which are at least partly provided with such a(n) (edible) coating, such as for instance cheese, French fries or peanuts.

[0035] In a further embodiment of the invention, a method is provided for binding a composition of at least two components, comprising the step of mixing these components with starch according to the invention. In relation to food, such thickening agents may, for instance, be used in soups and sauces. However, such a composition may also be used as a binding agent in a pharmaceutical composition such as a tablet, a capsule or a coated tablet. It is known that some medicines with binding agents based on gluten-containing starch cause problems for some celiac disease patients. By using starch of a gluten-free flour according to the invention (Teff flour optionally mixed with a different gluten-free flour), a method is now provided to obtain a composition which is also suitable for persons with a gluten intolerance. Also, such a starch can be used with advantage for binding a cosmetic composition, such as a facial powder.

[0036] In summary, it can be stated that the products and methods of the invention make it possible to provide food products with an eating value (taste, smell, texture, structure) acceptable in the western world which can be used as functional food. Particularly important are:

a) the gluten-free aspect, so that celiac disease patients have a whole new range of food products at their disposal;
b) the unique composition of the carbohydrates, so that the food products are excellently suitable as food for diabetes type II patients, endurance sportspeople and as diet food (postponing appetite);
c) the relatively large amount of 'resistant carbohydrates', so that the food products stimulate the intestinal flora;
d) the great amount of iron and the virtual absence of mineral-binding substances, so that anemia is prevented; and
e) the large amount of free minerals, such as Ca, Mg, Mn and K, which help with the rapid recovery of the body after a great physical achievement.

LEGEND

[0037]

Fig. 1 shows the relationship between the falling number of Teff flour and the quality of bread prepared with the flour as described in Example 1.

EXAMPLE 1

[0038] The relationship between the falling number of Teff flour and the baking quality was investigated by preparing a series of breads of Teff flour with different falling numbers in the range of 150 to 580 and then assessing the properties of the bread.

[0039] The standard baking test of Teff bread was carried out as follows, where the Teff flour was ground fine in a pin mill until minimally 70% of the Teff flour passed a sieve with a pore size of 100 microns:

Recipe:

[0040]

INGREDIENTS	WEIGHT PERCENTAGES	WEIGHT IN GRAMS
Teff flour	100.00	500.00
Citric acid	0.20	1.00
Chicken egg white powder	4.50	22.50
Water (30°C)	110.00	550.00
Yeast	6.00	30.00

Method:

[0041]

- Mix dry components
- Combine water and yeast in basin
- Add dry components to water/yeast mixture
- Make batter in beating machine
- Beat for two minutes in lowest acceleration
- Beat for approx three minutes in high acceleration
- Scoop batter into two cake tins of 450 grams
- Let batter rise to edge of cake tin
- Bake in oven of approx 235°C for approx 20 minutes
- Remove and cool

[0042] **Assessment of baking product:** Each dough/bread was assessed for color, batter firmness, rising speed, rising height, oven rise, baking nature, bread height, bread structure, smell and taste. The assessment is a weighed average on a scale of 1 to 10.

EXAMPLE 2

[0043] By way of illustration of the invention, this example show two formulations for the preparation of bread from a flour mixture of Teff flour and other flours.

White bread

[0044] 5000 g of Teff Bread Mix White, 3500 g of water (approx 30°C), 275 g of yeast, 275 g of margarine, 275 g of

olive oil. Ingredients of Teff Bread Mix White: Teff flour (41 wt.% with a falling number of 380 or more), corn starch, whole egg powder, tapioca flour, maltodextrin, soy flour, dextrose, salt, leavening agents (E500a, E450 or other stabilizers), citric acid (E330), emulsifiers and thickening agents (E412, E440, E466, E482).

Brown bread

[0045] 5000 g of Teff Bread Mix Brown + seeds, 3250 g of water (approx 30°C), 300 g of yeast, 300 g of margarine, 250 g of olive oil. Ingredients of Teff Bread Mix Brown + seeds: Teff flour (36%), corn starch, sunflower seeds, whole egg powder, linseed, sesame seed, tapioca flour, maltodextrin, soy flour, dextrose, salt, leavening agents (E500a, E450), citric acid (E330), emulsifiers and thickening agents (E412, E440, E466, E482).

[0046] **Method:** A batter was prepared in a planetary mixer with butterfly. The yeast was dissolved in water. All ingredients were slowly mixed for approx 2 minutes and intensively mixed for approx 7 minutes (highest acceleration). The batter was dosed in a tin and, after approx 35 minutes of after-rising, baked for approx 30 minutes at a temperature of approx 230°C. Rising time, oven temperature and baking time are indicative.

Example 3

TEFF GLUTEN-FREE 'SPRITS' (DUTCH SHORTCAKE COOKIE) PIECES

Recipe:

[0047]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff flour (Teff Flour White)	100.00	1000.00
Margarine	95.00	950.00
Soft brown sugar	42.00	420.00
Grated lemon	5.00	50.00
Egg	30.00	300.00
Xanthan gum (E415)	0.50	5.00

Method:

[0048]

- Make a ground piping dough
- Stir butter until creamy
- Add soft brown sugar, grated lemon and egg and beat until smooth
- Mix Teff flour with xanthan gum and add in parts
- Pipe directly onto lightly greased plate, approx 4 cm wide
- Bake at approx 180°C
- Baking time approx 25-30 minutes
- Cut at approx 9 cm
- Remove
- Result approx 60 pieces, baked weight approx 30 grams per piece

[0049] The given oven temperature and baking time are indicative.

Example 4

TEFF BREAD ORIGINAL

Recipe:

[0050]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff flour (Teff Flour White or Dark)	100.00	2000
Milk powder	4.00	80
Baking powder (karam Dethmers)	2.00	40
Salt	1.50	30
Sugar	2.00	40
Xanthan gum (E415)	0.50	10
CMC	1.00	20
Lecithin	1.00	20
Citric acid	0.30	6
Eggs	70.00	1400
Water (approx 30°C)	50.00	1000
Yeast	6.00	120
Margarine	7.00	140

Method:

[0051]

- Make a batter
- Mix dry components
- Combine water, eggs and yeast in basin
- Add dry components thereto
- Add margarine
- Beat for two minutes in lowest acceleration
- Beat for approx seven minutes in high acceleration
- Scoop or pour batter into tins
- Rising time approx 30 minutes (to just below the edge)
- Bake in oven of approx 235°C
- Baking time approx 25 minutes
- Remove and cool

[0052] The given rising time, oven temperature and baking time are indicative.

Example 5

TEFF GLUTEN-FREE CAKE, FILLED

Recipe:

[0053]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff Flour (Teff Flour White)	100.00	1000
Margarine	100.00	1000
Granulated sugar	100.00	1000
Eggs	100.00	1000
Karam (baking powder Dethmers)	2.50	25
Grated lemon	8.00	80
Raisins (washed)	80.00	800

Method:

[0054]

- Method cold batter
- Beat margarine, sugar and grated lemon until light and fluffy
- Mix sieved baking powder through Teff flour
- Gradually admix eggs
- Spatulate raisins
- Fill cake tins approx 380 grams
- Bake at approx 160°C
- Baking time approx one hour
- Remove and cool

[0055] The given baking temperature and baking time are indicative.

Example 6

TEFF GLUTEN-FREE CAKE

Recipe:

[0056]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff Flour (Teff Flour White)	100.00	1000
Margarine	100.00	1000
Granulated sugar	100.00	1000
Eggs	100.00	1000
Karam (baking powder Dethmers)	2.40	24
Grated lemon	8.00	80

Method:

[0057]

- Method cold batter

- Beat margarine, sugar and grated lemon until light and fluffy
- Mix sieved baking powder through Teff flour
- Gradually admix eggs
- Spatulate Teff mixture
- Fill cake tins approx 380 grams
- Bake at approx 160°C
- Baking time approx one hour
- Remove and cool

[0058] The given baking temperature and baking time are indicative.

Example 6

TEFF GLUTEN-FREE SPONGE CAKES

Recipe:

[0059]

INGREDIENTS	PERCENTAGES	WEIGHT
Teff Flour (Teff Flour White)	50.00	250.00
Corn starch	50.00	250.00
Granulated sugar	100.00	500.00
Eggs	80.00	400.00
Egg yolk	20.00	100.00
Grated lemon	4.00	20.00
Vulkaan (baking powder)	1.10	6.00

Method:

[0060]

- Method warm batter
- Stir sugar, eggs and grated lemon lukewarm and then whip until light and fluffy
- Mix sieved baking powder, Teff Flour and corn starch well
- Spatulate Teff mixture
- Pipe (nozzle 2) onto greased and floured plates
- Flour sponge cakes with powdered sugar
- Bake at approx 240°C on bottom plate!
- Baking time approx 5 minutes
- Remove and cool

[0061] The given oven temperature and baking time are indicative.

Example 7

TEFF GLUTEN-FREE 'KANO'S' (DUTCH ALMOND FINGERS) AND 'RONDO'S' (DUTCH ALMOND TARTLETS)

Recipe:

[0062]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff Flour White or Dark	100.00	1000.00
Margarine	80.00	800.00
Soft brown sugar	65.00	650.00
Grated lemon	3.00	30.00
Egg	40.00	400.00
Karam (Dethmers)	0.60	6.00
Vulkaan (Dethmers)	0.40	4.00
Xanthan gum (E415)	0.50	5.00

Method:

[0063]

- Make a pastry
- Mix butter, soft brown sugar, grated lemon well
- Add egg
- Mix baking powders and xanthan gum with Teff Flour and add
- Mix the whole to a cohesive dough
- Cool well and process
- Dough is less suitable for mechanical processing
- Process into almond tartlet or almond finger
- Thickness of slices approx 5 mm
- Oven temperature approx 210°C
- Baking time approx 25-30 minutes

[0064] The given oven temperature and baking time are indicative.

Example 8

TEFF PANCAKES

Basic recipe:

[0065]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff Flour	100.00	500.00
Vanilla sugar	3.00	15.00
Salt	1.00	5.00
Baking powder (karam Dethmers)	1.00	5.00
Xanthan gum (E415)	0.50	2.50
Milk	300.00	1500.00
Egg	20.00	100.00
Citric acid	0.20	1.00

Method:

[0066]

- Make a batter
- Mix dry components
- Milk and egg in a basin
- Add dry components
- Make lump-free batter
- Bake in desired shape
- Many variations possible!

Example 9

TEFF GLUTEN-FREE 'PORTUGEESJES' (DUTCH FRANGIPANE CAKES)

Recipe:

[0067]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff Flour (Teff Flour White)	100.00	1000.00
Margarine	90.00	900.00
Soft brown sugar	90.00	900.00
Grated lemon	4.00	40.00
Xanthan gum (E415)	1.00	10.00
Egg	67.00	670.00
Egg yolk	33.00	330.00

Method:

[0068]

- Make a warm cake batter
- Whip eggs, egg yolk, soft brown sugar and grated lemon until light and fluffy
- Slowly mix the melted margarine through egg mass
- Mix xanthan gum through Teff Flour and spatulate well through mass
- Scrape down and spatulate again
- Pipe with a piping bag into lightly greased tins to just below the edge
- Bake in a oven of approx 220° C
- Baking time approx 10 to 12 minutes
- Remove and cool

[0069] The given oven temperature and baking time are indicative!

Example 10

TEFF BREAD, FILLED

Recipe:

[0070]

INGREDIENTS	PERCENTAGES %	WEIGHT IN GRAMS
Teff Flour (White or Dark)	100.00	2000
Milk powder	4.00	80
Baking powder (karam Dethmers)	2.00	40
Salt	1.50	30
Sugar	2.00	40
Xanthan gum (E415)	0.50	10
CMC	1.00	20
Lecithin	1.00	20
Citric acid	0.30	6
Eggs	70.00	1400
Water (approx 30 °C)	50.00	1000
Yeast	7.50	150
Margarine	7.00	140
Raisins	15.00	300
Currants	15.00	300
Browned pieces of hazelnut	10.00	200

Method:

[0071]

- Make a batter
- Mix dry components
- Combine water, eggs, and yeast in basin
- Add dry components
- Add margarine
- Beat for two minutes in lowest acceleration
- Beat for approx seven minutes in high acceleration
- Slowly admix raisins, currents and browned pieces of hazelnut
- Scoop or pour batter into tins
- Rising time approx 30 minutes (to just below the edge)
- Bake in oven of approx 235° C
- Baking time approx 25-30 minutes
- Remove and cool

[0072] The given rising time, oven temperature and baking time are indicative.

Example 11; composition, after-ripening and baking behavior of flour mixtures

				blends in percentages												
variety	after-ripening	falling number	assessment of bread	1	2	3	4	5	6	7	8	9	10	11	12	13
1	short	264	poor										10			
2	long	493	good									80	90			
3	short	184	v.poor									20				
4	medium	302	good	50	70											
5	long	473	good											70		
6	very long	529	good												60	
7	short	250	poor											20		
8	long	408	mediocre	50	30			60						10		
9	medium	331	mediocre						20							
10	short	287	mediocre						20						10	
11	long	265	good						30							
12	long	405	good						30							
13	long	409	good							85	70					
14	short	138	poor							15	30				20	
15	long	529	good			38	38									65
16	long	473	good			8										
17	short	250	poor			8	16									
18	medium	432	good			46	46									
19	medium	302	good					20								
20	long	267	mediocre					20							10	20
21	short	229	v. poor													15
			bread assessment	good		good					good					

Claims

1. A flour of a grain belonging to the genus *Eragrostis,* preferably *Eragrostis tef,* **characterized in that** the falling number of the grain at the moment of grinding is at least 250, preferably at least 300, more preferably at least 340, most preferably at least 380.

2. A flour according to claim 1, **characterized in that** the grain has after-ripened.

3. A flour according to claim 2, **characterized in that** the falling number of the grain at the moment of grinding is at least 1.01 times higher than at the moment of harvesting the grain, preferably at least 1.05, more preferably at least 1.20 and still more preferably at least 1.30 times higher.

4. A flour according to any one of the preceding claims, **characterized in that** the grain is gluten-free.

5. A flour according to any one of the preceding claims, wherein the grains has been ground at least 4, preferably at least 6, more preferably at least 8 weeks after harvesting.

6. A flour according to any one of the preceding claims, wherein the falling number of the grain at the moment of grinding is substantially stable for at least 2-3 weeks.

7. A flour according to any one of the preceding claims, wherein the grain is so finely ground that an essential part of the flour can pass through a sieve with a pore size of at most 150 microns, preferably at most 120 microns, more preferably at most 100 microns.

8. A flour according to any one of the preceding claims, wherein the grain contains at least 0.005% iron, and/or at least 0.14 % calcium, and/or at most 0.8% mineral-binding substance.

9. A flour according to any one of the preceding claims, wherein the flour comprises 10-30% rapidly degradable carbohydrates, 35-65% slowly degradable carbohydrates and 20-40% resistant carbohydrates, said percentages calculated relative to the total content of carbohydrates.

10. A flour according to any one of claims 1-9, wherein the grain comprises a mixture of grains.

11. A flour according to claim 10, wherein the mixture consists for 5-99% of flour of a grain with a falling number higher than 400, preferably higher than 420, more preferably higher than 450.

12. A flour according to claim 11, wherein, for the remaining part, the mixture consists of flour of a grain with a falling number lower than 400, preferably lower than 350.

13. A flour according to claim 10, wherein the mixture consists for 5-99% of grain which has after-ripened for a long time, preferably more than 4 weeks, more preferably more than 8 weeks, and, for the remaining part, consists of grain which has after-ripened for a short time, preferably fewer than 4 weeks, more preferably fewer than 2 weeks.

14. A flour comprising a flour according to any one of claims 1-13 mixed with flour of a gluten-free crop, preferably selected from the group comprising potato, corn, rice, arrowroot, buckwheat and quinoa.

15. A flour comprising a flour according to any one of claims 1-14 mixed with flour of a gluten-containing crop, preferably selected from the group comprising wheat, barley, rye and oat.

16. A dough or batter comprising flour according to any one of claims 1-15.

17. A gluten-free dough or batter comprising flour according to any one of claims 1-14.

18. A food product comprising flour according to any one of claims 1-15.

19. A method for baking a product comprising the steps of: a) preparing a dough or batter by mixing a flour according to any one of claims 1-15 with a liquid and, optionally, a leavening agent; b) kneading said dough in a desired shape; and c) heating the dough for some time.

20. A method for baking a gluten-free product, comprising: a) preparing a dough or batter by mixing a flour according to any one of claims 1-14 with a liquid and, optionally, a leavening agent; b) kneading said dough in a desired shape; and c) heating the dough for some time.

21. A baked product prepared according to the method of claim 19 or 20.

22. A gluten-free baked product according to the method of claim 20.

23. A baked product according to claim 21 or 22, wherein the product contains at least 0.005% iron, at least 0.14% calcium and at most 0.8% mineral-binding substance.

24. An extruded product comprising dough according to claim 16 or 17.

25. A coating comprising flour according to according to any one of claims 1-15.

26. A food product at least partly provided with a coating according to claim 25.

27. A food product or luxury food product prepared from unground grain belonging to the genus *Eragrostis,* preferably *Eragrostis tef,* **characterized in that** the falling number of the grain at the moment of the preparation is at least 250, preferably at least 300, more preferably at least 340, most preferably at least 380.

28. A method for binding a composition, preferably a pharmaceutical or a cosmetic composition, of at least two components, comprising the mixing of said components with starch of a flour according to any one of claims 1-15.

29. Use of a flour according to any one of claims 1-15 or a dough or batter according to claim 16 or 17.

Patentansprüche

1. Mehl eines Korns, das zur Gattung *Eragrostis* gehört, vorzugsweise *Eragrostis tef,* **dadurch gekennzeichnet, dass** die Fallzahl des Korns zum Zeitpunkt des Mahlens wenigstens 250, vorzugsweise wenigstens 300, besonders bevorzugt wenigstens 340 und am meisten bevorzugt wenigstens 380 beträgt.

2. Mehl gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das Korn nachgereift ist.

3. Mehl gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Fallzahl des Korns zum Zeitpunkt des Mahlens wenigstens 1,01-mal so groß ist wie zum Zeitpunkt des Erntens des Korns, vorzugsweise wenigstens 1,05-mal, besonders bevorzugt wenigstens 1,20-mal und ganz besonders bevorzugt wenigstens 1,30-mal so groß.

4. Mehl gemäß einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das Korn glutenfrei ist.

5. Mehl gemäß einem der vorstehenden Ansprüche, wobei die Körner wenigstens 4, vorzugsweise wenigstens 6 und besonders bevorzugt wenigstens 8 Wochen nach dem Ernten gemahlen wurden.

6. Mehl gemäß einem der vorstehenden Ansprüche, wobei die Fallzahl des Korns zum Zeitpunkt des Mahlens wenigstens 2-3 Wochen lang im Wesentlichen stabil ist.

7. Mehl gemäß einem der vorstehenden Ansprüche, wobei das Korn so fein gemahlen ist, dass ein wesentlicher Anteil des Mehls durch ein Sieb mit einer Porengröße von höchstens 150 μm, vorzugsweise höchstens 120 μm und besonders bevorzugt höchstens 100 μm treten kann.

8. Mehl gemäß einem der vorstehenden Ansprüche, wobei das Korn wenigstens 0,005% Eisen und/oder wenigstens 0,14% Calcium und/oder höchstens 0,8% mineralbindende Substanz enthält.

9. Mehl gemäß einem der vorstehenden Ansprüche, wobei das Mehl 10-30% schnell abbaubare Kohlenhydrate, 35-65% langsam abbaubare Kohlenhydrate und 20-40% resistente Kohlenhydrate umfasst, wobei die Prozentwerte relativ zum Gesamtgehalt an Kohlenhydraten berechnet sind.

10. Mehl gemäß einem der Ansprüche 1-9, wobei das Korn ein Gemisch von Kornsorten umfasst.

11. Mehl gemäß Anspruch 10, wobei das Gemisch zu 5-99% aus einem Mehl eines Korns mit einer Fallzahl von über 400, vorzugsweise über 420 und besonders bevorzugt über 450 besteht.

12. Mehl gemäß Anspruch 11, wobei der Rest des Gemischs aus Mehl eines Korns mit einer Fallzahl von weniger als 400, vorzugsweise weniger als 350, besteht.

13. Mehl gemäß Anspruch 10, wobei das Gemisch zu 5-99% aus Korn besteht, das während einer langen Zeit, vorzugsweise mehr als 4 Wochen, besonders bevorzugt mehr als 8 Wochen nachgereift ist, und der Rest aus Korn besteht, das nur kurze Zeit, vorzugsweise kürzer als 4 Wochen, besonders bevorzugt kürzer als 2 Wochen, nachgereift ist.

14. Mehl, das ein Mehl gemäß einem der Ansprüche 1-13 umfasst, das mit Mehl einer glutenfreien Feldfrucht gemischt ist, die vorzugsweise aus der Gruppe ausgewählt ist, die aus Kartoffel, Mais, Reis, Pfeilwurz, Buchweizen und Quinoa besteht.

15. Mehl, das ein Mehl gemäß einem der Ansprüche 1-14 umfasst, das mit Mehl einer glutenhaltigen Feldfrucht gemischt ist, die vorzugsweise aus der Gruppe ausgewählt ist, die aus Weizen, Gerste, Roggen und Hafer besteht.

16. Teig oder Rührteig, der Mehl gemäß einem der Ansprüche 1-15 umfasst.

17. Glutenfreier Teig oder Rührteig, der Mehl gemäß einem der Ansprüche 1-14 umfasst.

18. Nahrungsmittel, das Mehl gemäß einem der Ansprüche 1-15 umfasst.

19. Verfahren zum Backen eines Produkts, das die folgenden Schritte umfasst: a) Herstellen eines Teigs oder Rührteigs durch Mischen eines Mehls gemäß einem der Ansprüche 1-15 mit einer Flüssigkeit und gegebenenfalls einem Treibmittel; b) Kneten des Teigs in einer gewünschten Form; und c) Erhitzen des Teigs während einer bestimmten Zeit.

20. Verfahren zum Backen eines glutenfreien Produkts, umfassend: a) Herstellen eines Teigs oder Rührteigs durch Mischen eines Mehls gemäß einem der Ansprüche 1-14 mit einer Flüssigkeit und gegebenenfalls einem Treibmittel; b) Kneten des Teigs in einer gewünschten Form; und c) Erhitzen des Teigs während einer bestimmten Zeit.

21. Backware, hergestellt nach dem Verfahren von Anspruch 19 oder 20.

22. Glutenfreie Backware, hergestellt nach dem Verfahren von Anspruch 20.

23. Backware gemäß Anspruch 21 oder 22, wobei das Produkt wenigstens 0,005% Eisen, wenigstens 0,14% Calcium und höchstens 0,8% mineralbindende Substanz enthält.

24. Extrudiertes Produkt, das Teig gemäß Anspruch 16 oder 17 umfasst.

25. Beschichtung, die Mehl gemäß einem der Ansprüche 1-15 umfasst.

26. Nahrungsmittel, das wenigstens zum Teil mit einer Beschichtung gemäß Anspruch 25 versehen ist.

27. Nahrungsmittel oder Luxusnahrungsmittel, das aus ungemahlenem Korn hergestellt ist, das zur Gattung *Eragrostis* gehört, vorzugsweise *Eragrostis tef*, **dadurch gekennzeichnet, dass** die Fallzahl des Korns zum Zeitpunkt der Herstellung wenigstens 250, vorzugsweise wenigstens 300, besonders bevorzugt wenigstens 340 und am meisten bevorzugt wenigstens 380 beträgt.

28. Verfahren zum Binden einer Zusammensetzung, vorzugsweise einer pharmazeutischen oder kosmetischen Zusammensetzung, von wenigstens zwei Komponenten, umfassend das Mischen der Komponenten mit Stärke eines Mehls gemäß einem der Ansprüche 1-15.

29. Verwendung eines Mehls gemäß einem der Ansprüche 1-15 oder eines Teigs oder Rührteigs gemäß Anspruch 16

oder 17.

Revendications

1. Farine d'un grain appartenant au genre *Eragrostis,* de préférence, *Eragrostis tef*, **caractérisée en ce que** l'indice de chute du grain au moment du broyage est d'au moins 250, de préférence, d'au moins 300, plus préférablement, d'au moins 340, et de manière préférée entre toutes, d'au moins 380.

2. Farine selon la revendication 1, **caractérisée en ce que** le grain est au stade d'après-maturation.

3. Farine selon la revendication 2, **caractérisée en ce que** l'indice de chute du grain au moment du broyage est au moins 1,01 fois supérieur à celui au moment de la récolte du grain, de préférence, au moins 1,05, plus préférablement, au moins 1,20 fois et plus préférablement encore, au moins 1,30 fois supérieur.

4. Farine selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le grain est sans gluten.

5. Farine selon l'une quelconque des revendications précédentes, dans laquelle les grains ont été broyés au moins 4, de préférence, au moins 6, plus préférablement, au moins 8 semaines après la récolte.

6. Farine selon l'une quelconque des revendications précédentes, dans laquelle l'indice de chute du grain au moment du broyage est essentiellement stable pendant au moins 2-3 semaines.

7. Farine selon l'une quelconque des revendications précédentes, dans laquelle le grain est si finement broyé qu'une partie essentielle de la farine peut passer à travers un crible ayant une taille de mailles d'au plus 150 microns, de préférence, d'au plus 120 microns, plus préférablement, d'au plus 100 microns.

8. Farine selon l'une quelconque des revendications précédentes, dans laquelle le grain contient au moins 0,005 % de fer, et/ou au moins 0,14 % de calcium, et/ou au plus 0,8 % d'une substance se liant à un minéral.

9. Farine selon l'une quelconque des revendications précédentes, dans laquelle la farine comprend de 10 à 30 % de glucides à dégradation rapide, 35 à 65 % de glucides à dégradation lente et 20 à 40 % de glucides résistants, lesdits pourcentages étant calculés par rapport à la teneur totale en glucides.

10. Farine selon l'une quelconque des revendications 1 à 9, dans laquelle le grain comprend un mélange de grains.

11. Farine selon la revendication 10, dans laquelle le mélange se compose de 5 à 99 % de farine d'un grain ayant un indice de chute supérieur à 400, de préférence, supérieur à 420, plus préférablement, supérieure à 450.

12. Farine selon la revendication 11 dans laquelle, pour le reste, le mélange se compose de farine d'un grain ayant un indice de chute inférieur à 400, de préférence, inférieur à 350.

13. Farine selon la revendication 10, dans laquelle le mélange se compose de 5 à 99 % d'un grain récolté longtemps après maturation, de préférence, plus de 4 semaines, plus préférablement, plus de 8 semaines, et pour le reste, se compose d'un grain récolté peu après maturation, de préférence, moins de 4 semaines, plus préférablement, moins de 2 semaines.

14. Farine comprenant une farine selon l'une quelconque des revendications 1 à 13 mélangée avec une farine d'une culture sans gluten choisie, de préférence, dans le groupe comprenant la pomme de terre, le mais, le riz, l'arrow-root, le sarrasin et le quinoa.

15. Farine comprenant une farine selon l'une quelconque des revendications 1 à 14 mélangée avec une farine d'une culture contenant du gluten choisie, de préférence, dans le groupe comprenant le blé, l'orge, le seigle et l'avoine.

16. Pâte comprenant la farine selon l'une quelconque des revendications 1 à 15.

17. Pâte sans gluten comprenant la farine selon l'une quelconque des revendications 1 à 14.

18. Produit alimentaire comprenant la farine selon l'une quelconque des revendications 1 à 15.

19. Procédé de cuisson d'un produit comprenant les étapes consistant à : a) préparer une pâte en mélangeant une farine selon l'une quelconque des revendications 1 à 15 avec un liquide et, éventuellement, un levain ; b) pétrir ladite pâte pour obtenir une forme souhaitée ; et c) chauffer la pâte pendant un certain temps.

20. Procédé de cuisson d'un produit sans gluten, comprenant les étapes consistant à : a) préparer une pâte en mélangeant une farine selon l'une quelconque des revendications 1 à 14 avec un liquide et, éventuellement, un levain ; b) pétrir ladite pâte pour obtenir une forme souhaitée ; et c) chauffer la pâte pendant un certain temps.

21. Produit cuit préparé selon le procédé de la revendication 19 ou 20.

22. Produit cuit sans gluten selon le procédé de la revendication 20.

23. Produit cuit préparé selon la revendication 21 ou 22, dans lequel le produit contient au moins 0,005 % de fer, au moins 0,14 % de calcium, et au plus 0,8 % d'une substance se liant à un minéral.

24. Produit extrudé comprenant la pâte selon la revendication 16 ou 17.

25. Enrobage comprenant la farine selon l'une quelconque des revendications 1 à 15.

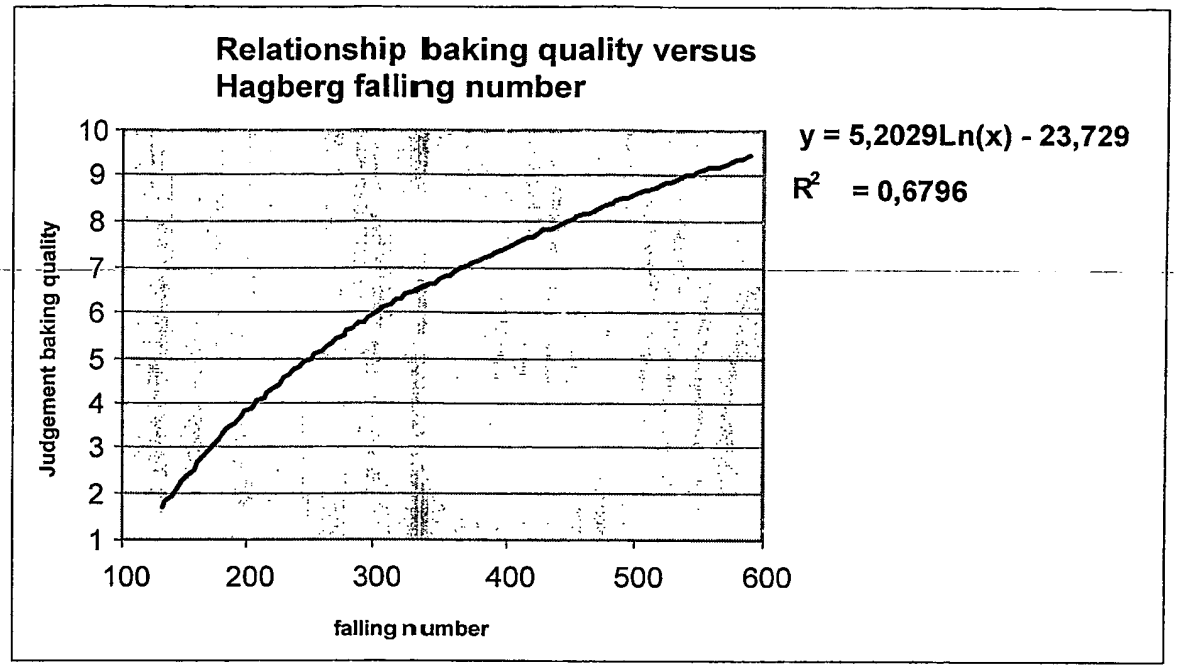
26. Produit alimentaire au moins partiellement pourvu d'un enrobage selon la revendication 25.

27. Produit alimentaire ou produit alimentaire de luxe préparé à partir d'un grain non broyé appartenant au genre *Eragrostis,* de préférence, *Eragrostis tef*, **caractérisé en ce que** l'indice de chute du grain au moment de la préparation est d'au moins 250, de préférence, d'au moins 300, plus préférablement, d'au moins 340, et de manière préférée entre toutes, d'au moins 380.

28. Procédé pour lier une composition, de préférence, une composition pharmaceutique ou cosmétique, d'au moins deux composants, comprenant l'étape consistant à mélanger lesdits composants avec l'amidon d'une farine selon l'une quelconque des revendications 1 à 15.

29. Utilisation d'une farine selon l'une quelconque des revendications 1 à 15 ou d'une pâte selon la revendication 16 ou 17.

Figure 1


Relationship baking quality versus
Hagberg falling number
y = 5,2029Ln(x) - 23,729
R2 = 0,6796
Judgement baking quality
falling number
10
9
8
7
6
5
4
3
2
1
100
200
300
400
500
600

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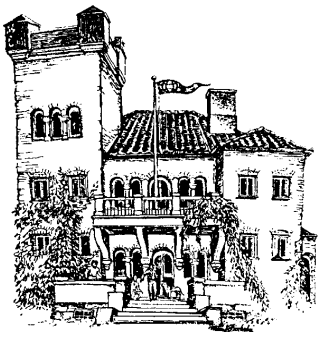

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Fridtjof Nansens vei 17, P.O. Box 326, NO-1326 Lysaker, Norway
Phone: (47) 67 11 19 00 – Fax: (47) 67 11 19 10 – E-mail: post@fni.no
Website: www.fni.no