

2010

Global Study on CBM and Empowerment- Brazil Exchange Report



Global CBM Study Exchange Programme
Brazil, India and Nepal
7/30/2010

Wageningen University and Research Centre/Centre for Development Innovation
P.O. Box 88, 6700 AA, Wageningen, the Netherlands;

In collaboration with:

Post Graduate Programme on Plant Genetic Resources, and Post Graduate Programme on Ecology
Federal University of Santa Catarina (UFSC), Florianópolis-SC, Brazil

and

the Brazilian Agricultural Research Corporation (Embrapa) Semi-Arido, Petrolina-PE; and Embrapa
Clima Temperado, Pelotas-RS

Wageningen University and Research Centre /Centre for Development Innovation ©

The current document is the result of the Exchange Programme within the Global Study on Community Biodiversity Management and Empowerment, coordinated by Wageningen University and Research Centre/Centre for Development Innovation, in cooperation with Ethio Organic Seed Action (Ethiopia); MS Swaminathan Research Foundation (India); Local Initiatives for Biodiversity, Research and Development (Nepal); the Federal University of Santa Catarina (Brazil); the Brazilian Agricultural Research Corporation, Embrapa (Brazil); and Bioversity International. The study is financed through Wageningen University and Research Centre – Directorate General for International Cooperation Partnership Programme.

Editorial support: Walter Simon de Boef, Nivaldo Peroni and Natalia Hanazaki

Copy-editing: Elizabeth O’Keeffe

Citation:

Assis, Ana Luiza, Rachana Devkota, Vasudeva Ramesh, Abishkar Subedi, Saujanendra Swain and Sofia Zank, 2010. Global Study on CBM and Empowerment - Brazil Exchange Report. Wageningen, Wageningen University and Research Centre/Centre for Development Innovation.

Contents

1. Introduction	4
2. Methodology and process.....	5
3. CBM Sites characterization	7
3.1 Porteirinha site	7
3.1.1 Context:	7
3.1.2 CBM process:	7
3.1.3 CBM practices:	8
3.1.4 Reflection:.....	8
3.2 Tavares site.....	8
3.2.1 Context:	8
3.2.2 CBM process:	9
3.2.3 CBM practices:	9
3.2.4 Reflection:.....	10
3.3 Imbituba site.....	11
3.3.1 Context:	11
3.3.2 CBM process:	11
3.3.3 CBM practices:	12
3.3.4 Reflections:	12
3.4 Guaraciaba site	13
3.4.1. Context:	13
3.4.2 CBM process:	13
3.4.3 CBM practices:	14
3.4.4 Reflections:	15
3.5. Iratí site	15
3.5.1 Context:	15
3.5.2 CBM process:	16
3.5.3 CBM practices:	16
3.5.4 Reflection:.....	16
4. Diversity of sites - impact on empowerment.....	18
5. Historic drivers for empowerment.....	20
6. Cultural drivers for empowerment.....	22
7. Drivers for CBM	24

8. Definitions of empowerment.....	26
9. Community within the term CBM: is this collective management?.....	27
10. Inclusion, equity and gender	29
11. Competing claims: land ownership, CBM and empowerment.....	30
12. Governance and CBM	32
13. Sustainability of CBM.....	34
14. CBM and genetic resource policies.....	36
15. CBM and farmers' rights	38
16. Relation between customary rights and custodianships	40
17. CBM and access and benefit-sharing over genetic resources.....	41
18. CBM, empowerment and <i>in situ</i> conservation.....	43
19. General synthesis	44

1. Introduction

The Global Community Biodiversity Management study project began in 2009 with the objective of analyzing the contribution of Community Biodiversity Management (CBM) as a methodology for empowerment, for strengthening the scientific basis of CBM, and for analyzing the experiences of community management of agrobiodiversity in four countries that are known for the critical role they play in the global plant genetic resources (PGR) debate: Brazil, Ethiopia, India and Nepal. Ethio-Organic Seed Action (EOSA), Ethiopia; MS Swaminathan Research Foundation (MSSRF), India; Bioversity International, Tropical Fruit Genetic Resources Project, India; Local Initiatives for Biodiversity, Research and Development (LI-BIRD), Nepal; the Brazilian Agricultural Research Corporation (Embrapa) and the Federal University of Santa Catarina (UFSC), both in Brazil, collaborate with Wageningen University and Research Centre/Centre for Development Innovation (Wageningen UR/CDI) on this study.

As part of the study, an exchange visit was organized to Brazil, 3 July to 2 August 2010, by the Post Graduate Programme for Plant Genetic Resources and for Ecology at UFSC, in collaboration with Embrapa (Embrapa - Semi Arido, Petrolina; and Embrapa - Clima Temperado, Pelotas), and Wageningen UR/CDI.

Participants of the exchange tour included the hosts, representing national partner organizations (UFSC and Embrapa), and the visitors, representing international partners, from India (MSSRF and the Department of Forest Biology, College of Forestry, Sirsi on behalf of the Tropical Fruit Genetic Resources Project) and Nepal (LI-BIRD). The objective of the exchange programme was capacity-building of professionals involved in CBM, for understanding and working with CBM in different social, political, ecological and economic contexts. It was also hoped that the exchange of knowledge, experiences and ideas would contribute to developing a global, shared understanding of 'CBM and empowerment'.

This report is the outcome of a collective process where participants expressed their observations and lessons learned. The report has been organized into nineteen different chapters to define, analyze and provide general reflections on components, processes and practices of CBM in Brazil. Each CBM site is characterized and a concise profile is provided. The report covers a wide range of key issues of relevance to CBM, for example, the historical, cultural, ecological and economic drivers of each site are outlined in order to understand the major drivers of CBM. The underlying issues of cooperation and empowerment are analyzed to see whether the CBM process facilitates autonomy or dependency in farming communities. How CBM addresses issues related to gender, social inclusion and equality is discussed. Since the issue of land ownership is highly political and has an impact on genetic resources conservation, the scope of public institutes in managing the genetic resources of such areas of conflict is highlighted. The different policies or laws that can affect small farmers in managing their genetic resources are discussed in both global and local contexts. The use of different CBM practices as policy options to facilitate implementation of access and benefit-sharing, and farmers' rights is identified as a future priority. At the end of the report a general synthesis is provided, which reflects on the general views of participants and future priorities of the CBM study.

2. Methodology and process

Background material:

Prior to the exchange programme, terms of reference (ToRs) were developed and circulated among all members of the CBM community. These ToRs consisted of five steps and provided an outline for the exchange programme process. The exchange programme team was divided into groups to address the series of topics indicated in the ToRs, in a comprehensive and empirical manner, through interactions with communities, farmers, community leaders and stakeholders.

Formation of working groups:

Five working groups were formed to assess a number of topics, as listed in the ToRs:

1. Site characterization;
2. Diversity of sites, historic and cultural drivers;
3. Collective nature of CBM, resources and sustainability;
4. CBM and genetic resource policies; and
5. General synthesis.

Orientations by coach:

In order to clarify the methodology, a coaching session was held at the beginning of the exchange programme, led by Dr Walter de Boef of UFSC/Wageningen UR/CDI. Before the field visits began, as an output of this coaching session, a document was developed to address the modality of working, the clustering of topics and the division of responsibilities. After three field visits, a mid-term coaching session was carried out.

Division of roles & responsibilities:

A detailed schedule of the programme was given to the team members. In this way, the members understood their responsibilities, the timeframe they had for gathering information, how to achieve their goals, who their partners were in each topic or group, and the time available for discussing and writing the report.

Pre & post visit discussions:

Briefings were given by the host team to provide visiting members with an overview of each site to be visited. These briefings were carefully balanced to avoid influencing the visiting teams in any way. Brainstorming sessions were carried out prior to each site visit to clarify details and to reach a common understanding. These sessions were very important as they provided context and history, and valuable information for a deeper understanding of the sites, which would later be very important in the analysis.

Data collection:

Each person, as well as working group, was responsible for gather information on an assigned topic.

Visits to field sites:

One whole day was spent in each site, for discussing and understanding the CBM activities of that site. The activities included a farm visit, community dialogue, formal presentations, and the gathering of primary data.

Mid-term analysis:

A mid-term analysis and discussion of findings was conducted just after the completion of three site visits. This enabled the team to carry out any necessary mid-term corrections of the information gathered.

Travelling seminars:

A travelling seminar was held at Embrapa Semi Arido, in Petrolina, for researchers; and an international conference was held at Embrapa Clima Temperado, in Pelotas, for researchers and diversity guardians gathered from Brazil and other South American countries. A seminar was also given at UFSC, to an audience of postgraduate students. Travelling seminars were also organized in each of the CBM sites with the participation of the communities; representatives of state extension services (for example, the State Agricultural Research and Rural Extension Enterprise of Santa Catarina, EPAGRI); and NGOs. CBM experiences from Nepal and India were shared with their Brazilian counterparts.

Consultation with experts:

A one-day consultation was organized with Dr. Nivaldo Peroni and Dr. Natalia Hanazaki of UFSC, Florianópolis, to clarify a few points in the ToRs for several sites following the field visits. This consultation included topics on the different laws related to PGR in Brazil, policy issues etc.

Sharing of information, brainstorming & data analysis:

A two-day rigorous exercise of information-sharing, brainstorming and data analysis was carried out in Florianópolis, in order to synthesize the data collected by group members.

Final Reporting & submission:

Writing the report was another opportunity for analysis and discussion. For developing the final report, specific sections were allocated to individuals, pairs or small groups. On finishing a section, or on encountering difficulties, the authors shared the text with other team members for feedback or assistance. Each section of the report was reviewed at least once by someone other than the author(s). The team assisted the authors with useful insights and in resolving any issues of doubt.

Coach and expert review, and copy-editing

The coach of the Brazilian team, Dr Walter de Boef and his UFSC colleagues, Dr Nivaldo Peroni and Dr Natalia Hanazaki reviewed the text for consistency with the local and national contexts. However, they did not modify the content of the report. Elizabeth O’Keeffe carried out copy-editing, consulting with the coach.

3. CBM Sites characterization

3.1 Porteirinha site

3.1.1 Context:

“Furado da Onça” is a community located in the municipality of Porteirinha, in the northern part of the state of Minas Gerais. This is a semi-arid region with an average annual rainfall of 400-800 mm and low humidity throughout the year. Based on the Human Development Index (HDI) this area is classified as the state’s poorest (0.54), comparable to Brazil’s Northeast. The vegetation is typical ‘Caatinga biome’, which is characterized by thorny and shrubby forests.

The “Furado da Onça” community consists of about 80 households. The main sources of livelihood are agriculture and animal husbandry. The landholding per family varies from 1 to 50 hectares (ha). About 60% of households belong to small and marginal farmers with about 3 ha of land; 30% of the families possess 3 to 25 ha, and 10% possess more than 25 ha of land. Predominant plant genetic resources of the region include maize, sorghum, beans, pumpkin, cassava and pigeon pea. A few cash crops have been introduced such as *Jatropha* for biofuels and *Opuntia* for animal feed.

3.1.2 CBM process:

In 1991, the Association of Smallholder Farmers of Tamboril was established by members of the Furado da Onça and Tamboril Communities. Today, the association has 80 members, of which about 70 reside in Furado da Onça. The association meets at least once a month, on the first Sunday. The community have been growing cassava at individual, household level. Initially they were unable to process the cassava due to the lack of a cassava-flour processing centre and this led to a loss in production for two years. In 2000, the association set up a community processing centre, donated by the municipal government, for processing cassava flour. The association also established an area of communal land for cultivating cassava.

In 2004, a collaborative project, the Brazil-Italy Biodiversity Programme (PBBI), was developed in a partnership, which include the Brazilian Institute of Environment and Renewable Natural Resources – IBAMA, and Embrapa. The main objective of the project was to meet some of aspirations of the Convention on Biological Diversity (CBD) i.e. *in situ*/on-farm conservation of plant genetic resources. Furado da Onça was chosen as one of the communities for the implementation of the project. A survey on the status of the region’s cucurbitaceous species was carried out by Embrapa, with the help of the community, before the implementation of the project; and project activities commenced in 2005. Activities were continued upon this PBBI Programme.

The first project meeting was held in 2006 between the local labour union (*Sindicato de Trabalhadores Rurais*) and the community (linked to the CBM component, enhance community awareness¹). Embrapa suggested that the community cultivate sponge gourd (*Luffa*) as an alternative source of income, and they carried out a survey of the sponge gourd that occurred spontaneously in the community (CBM component: understand local biodiversity). In 2006, Embrapa secured additional financial support through the National Council for Scientific Research (CNPq) for the

¹ The underlined text refers to the components of the CBM process as to be assessed by the ToR.

REPARTIR Project (Participatory research for conservation, value addition and sustainable use of genetic resources of Cucurbitaceae) for installing a structure for sponge gourd cultivation in the community, and for a capacity-building course on sponge gourd production (CBM component: initial awareness and capacity-building of community institution). The training in sponge gourd value addition through artisan work was carried out in the city of Bonfim (CBM components: capacity-building of community institution; and value addition).

Since 2007, farmers in the community have been cultivating sponge gourd every year in an area that is considered communal land. They also cultivate sponge gourd in household backyards. Pumpkins are always cultivated for food in the community as well as for livestock. Other crops are also grown in the communal land, such as beans, pigeon pea, and cassava.

In 2007 and 2008, Embrapa, together with the community, carried out an evaluation of the sponge gourd and pumpkin production (CBM component: enhance community awareness) in an Embrapa-funded project that succeeded PBBI. The production of sponge gourd was high, but the community was unable to sell them, which discouraged community members. The Embrapa project will end in 2010 and the community must make a decision on whether to continue with the project.

3.1.3 CBM practices:

The following CBM practices are followed at Furado da Onça:

Diversity block

A diversity block was carried out as a group activity, facilitated by Embrapa, in 2006. More than 30 pumpkin and sponge guard varieties were planted, of which 14 were landraces collected by the community, and 17 accessions were provided by Embrapa. After the first year of cultivation, community members decided to plant pumpkins in their backyards, since the yield and quality on the communal land were not good. The community carried out varietal selection with technical inputs from scientists at Embrapa.

3.1.4 Reflection:

The CBM process in Furado da Onça seems to be driven by Embrapa research and conservation interests. The aspirations were to contribute to its mandate to realize conservation activities in a participatory manner. However this process is in its initial stage and it was not continued by building local capacities and follow up in other steps required for CBM sustainability and continuity, deemed necessary for sustaining *in situ*/on-farm conservation. The community's interest in working with the sponge gourds is decreasing basically because community members, or their association, lack the awareness, skills and resources to develop market linkages. We could learn from this important experience that institutions like Embrapa for sustaining a CBM process at a community level require to link community conservation activities with market demands.

3.2 Tavares site

3.2.1 Context:

We were not able to visit the Tavares community site, so the information that we have gathered regarding the characterization of this site is based on meetings with Dr Rosa Lia Barbieri (Curator of Cucurbitaceae; Embrapa Clima Temperado) and Gustavo Chaves Alves (Municipal Extension Officer, Rio Grande do Sul State Rural Extension Service, Emater-RS, Tavares).

Tavares is a municipality located in the state of Rio Grande do Sul, consisting of 5000 inhabitants, and with an area of 604 km². Out of these 5000 inhabitants, 3000 live in urban areas and the rest in rural areas. Most of the population are descendents of immigrants from Portugal and, to a lesser extent, from the Azores, Germany and Italy. The Portuguese arrived in this region in 1737 and replaced local indigenous tribes. By 1750, immigrants from the Azores had settled in the region. Currently, the population is of Azorean and African descent (Quilombolas).

Of the 2000 rural inhabitants, 80% of the population has an average land holding size of 20 ha; 10 % have more than 200 ha; 10-15% have 10 ha; and 1% has less than 1 ha (Quilombolas). Farmers with the largest size of land generally grow rice, rear livestock and cultivate pine forests. Out of 700 farmers, 500 are involved in the commercial production of onion. 80 farmers grow rice, but of these, 34 are commercial growers and the rest of them grow rice for their own consumption. 80 % of these farmers have below high school level of education, most of the old people are illiterate, and there is a higher rate of literacy amongst women than men.

The economy of Tavares is linked to the production of rice, onions, livestock and the cultivation of pine for timber and resin. Small-scale farmers are engaged in the production of vegetables, maize, beans and cassava. There are 10 farmers' associations, most of which are related to machinery. Up until 100 years ago, the farmers cultivated landraces of rice. Since then they have lost almost all of these landraces due to the introduction of high yielding varieties. A key issue that we discussed with Rosa Lia and Gustavo was that every year four or five male farmers die as a result of depression-related causes and diseases like cancer, or heart problems. There is an assumption that these deaths are related to the high doses of fertilizers (1500 Kg. Urea/ Ha) and pesticides used.

3.2.2 CBM process:

In 2007, the Federal University of Pelotas carried out a project, funded by Petrobras for working with the communities on environmental education. The project targeted the conservation of local varieties of crops like maize, bean, pumpkin, cassava, sweet potato and several cucurbitaceous species. The project aimed to contribute to the maintenance of local diversity, increase food security and support cultural diversity. Embrapa Clima Temperado approached Tavares, with the help of Emater (Rio Grande do Sul), in order to collect local varieties for ex *situ* conservation at the Embrapa genebank. Since 2007, Embrapa and Emater have been organizing an annual seed fair in Tavares (CBM components: enhancing community awareness and understanding local biodiversity). As a result of the first seed fair, the community now organizes a food fair once a week (CBM component; value addition).

3.2.3 CBM practices:

There are two CBM practices in the Tavares CBM site: a seed fair and a food fair. CBM is in its initial stages in the site. In addition to the fairs, Embrapa, in collaboration with Emater, is in the process of supporting diversity guardians in Tavares.

Seed fairs

The community has been organizing an annual seed fair since 2007. Embrapa became involved in the seed fairs by promoting the exchange of seeds between farmers, as a way of contributing to *in situ*/on-farm conservation of local varieties. Community members are becoming increasingly interested in this seed-exchange. The first time the seed fair was organized, only a few farmers exchanged seed. Raising awareness on the diversity of varieties gave community members a sense of pride. At the

most recent seed fair in 2010, a greater number of farmer households participated in the exchange; 27 farmers were involved in the fair.

Food market:

During the seed fair, farmers exhibited local food items, which inspired such an interest in local consumers that a number of households started a weekly food market. Because the initiative was taken by Tavares community members, we consider this to be a truly collective process. The market is an indirect outcome of the seed fair. Emater facilitated the process, when consulted by some of the female farmers. Emater is now supporting these women and they plan to supply local schools with their food produce, purchased by the local government. Institutions involved in seed fairs are Embrapa, Emater and associations. The food fair is organized mainly by local women, with support from Emater.

Diversity guardians:

In Tavares, three farmers have been identified as diversity guardians: one woman (60 years old) and two men (70-80 years old). These guardians work at individual level and are not related to the other community members. Emater collects the seed from the guardians and records information related to both the seed and the guardians (for cultural purposes). The seeds are then reproduced, labelled and distributed to others. The guardians from whom the seeds were obtained are recognized on the label. The guardians receive no financial benefits from this work. Emater does not have a policy for protecting the traditional knowledge and seeds of guardians but Embrapa may now work towards such ends. Embrapa has just started the process of acknowledging the important role of guardians e.g. the organization of an international seminar on local varieties in which the CBM exchange team participated. Emater plans to set up a separate association for the families who are working with local varieties.

3.2.4 Reflection:

The continuity of CBM work in Tavares depends greatly on the partnership of Embrapa and Emater. Since local extension services are well qualified and work closely with the community, facilitating support for Embrapa, the potential for CBM to work exists. At the community level, the entire CBM process should be structured and guided, raising awareness on the importance of landraces and biodiversity to the social organization of the community, until the unique diversity of local varieties still existing in Tavares is maintained at community level, in a manner that is complementary to the *ex situ* activities already being carried out by Embrapa. The existence of the guardian project is an opportunity to support the guardians in Tavares. However, the challenge is to conduct this in a structured way, strengthening the linkages between the guardians and institutions responsible for conservation, recognizing their role in the community and supporting their sharing of valuable genetic resources with community members. In conclusion, it is necessary to reiterate that all the information gathered relating to the CBM site at Tavares is based on interviews with Embrapa and Emater representatives; we were not able to meet community members, but met with various guardians from other parts of the state. Therefore the information collected regarding the Tavares site, and the conclusions drawn have a fragile basis.

3.3 Imbituba site

3.3.1 Context:

Imbituba is a municipality in the state of Santa Catarina, 100 km from Florianópolis, the state capital. Imbituba is a port with unique seashore. Before urbanization, the main economic activity of Imbituba was whale hunting; its inhabitants were fishermen and farmers. *Areais da Ribanceira* is a unique ecological site, formed by shifting sand dunes; the native vegetation of this area is restinga, where natural populations of Butiá (*Butia capitata*) grow. This very unstable environment is traditionally used for agricultural practices in a slash and burn system, and for extraction of some native plant resources such as Butiá and medicinal plants. Today, farmers from five neighbourhoods (bairros) surrounding *Areais* still use the area for agriculture.

In the 1970s, farmers in *Areais* had their lands expropriated, in order to prepare the area for the establishment of industries. Since these industries have still not materialized, farmers have continued with their farming activities. The community in this context is an assembly of farmers from several bairros surrounding *Areais* that have continued their traditional farming lifestyle. In order to sustain its access to the land, i.e. to obtain land rights, this community is in the process of transforming *Areais* into a conservation unit, or settlement of agrarian reform. Important plant genetic resources are local cassava varieties and the natural population of Butiá palm. Farmers cultivate approximately 37 cassava varieties. Community members, as well as outsiders, collect Butiá from the wild in *Areais*, for the preparation of cachaça and ice cream.

The farmers range between 37 and 85 years of age; most of them are retired from regular jobs, and a retirement benefit is the main income of their households. Fishing and agriculture provide extra household income. The average landholding varies from 0.5 ha to 4 ha. Because *Areais* community members do not actually own the land, the Rural Extension and Rural Development Service of Santa Catarina State, EPAGRI, is not allowed to provide extension services.

3.3.2 CBM process:

The issues associated to the land rights of the farmers belonging to the *Areais* farming community have been going on since the 1970's. They formed the Rural Community Association of Imbituba, (*Associação Comunitária Rural de Imbituba* - ACORDI). ACORDI was established by a very strong leader Marlene Borges, who was a biology student at the time (and has since graduated from the University of Campinas with an MSc). Today, 35 families are members of the association. Land issues are an important part of the process for the formation and establishment of the association. Land issues are considered part of the CBM process because land is the primary resource necessary for CBM to be able to operate at collective level in the maintenance of biological resources. Land issues are driving ACORDI's actions; they direct CBM components and practices.

At the time of the exchange visit, ACORDI members were living with uncertainty; the land they use for cultivation is currently under judicial review and the farmers are prohibited from accessing and using the land. This situation has led to tremendous social learning, scaling-up of awareness and social organization (which are all advanced components of the CBM process), reinforcing the role of the practices in the community. The annual cassava fair has contributed to the CBM process by enhancing awareness and capacity-building. ACORDI has operated its structure and organization among leadership and members. Since 2009, the partnership with the Federal University of Santa Catarina (UFSC) has been important for understanding local biodiversity and helping the community

to monitor and evaluate CBM processes. The Departments of Ecology and Geography at the university are partners of ACORDI. The Department of Ecology is doing ethno-botanical research and the Department of Geography is working with participatory resource mapping. Both activities support ACORDI in its struggle to protect access to land and, in the long term, if the current threats of displacement are halted, obtain land rights. Such activities contribute to policy and legal frameworks related to CBM.

3.3.3 CBM practices:

Cassava Fair:

An annual Cassava Fair has been organized by ACORDI, in June, since 2003. The fair takes four days. The aim of the fair is not to promote diversity. The main aim of the fair is to create awareness among the community members on the uses of cassava, and associated farming lifestyles. The fair is an important means of generating income for the association. Community activities and structures (eg. the cassava-processing centre) are financed with the proceeds of the fair. The fair programme includes seminars, with invited lecturers, on subjects chosen by ACORDI's members. During the fair, regional food (cassava) products are sold and the main event is the Sunday collective lunch. People from the whole municipality and from other neighbouring municipalities come to visit the event, contributing to the self-esteem of ACORDI's members, which, due to their vulnerable position in relation to land issues, is crucial.

Community cassava-processing centre:

The community cassava-processing centre was built last year, with proceeds from the cassava fair and external financial support raised by ACORDI. The centre is used at the time of year when cassava is harvested. Farmers cover the costs of processing their cassava in the unit with 30% of their produce (under conventional conditions this would be 50%). The processing centre share (30%) is then divided between farmers working in the processing unit (15%); ACORDI (15%), for maintenance of the processing unit; and farmers, who retain the largest amount, 70% of the production.

3.3.4 Reflections:

The cassava fair has been held for the last seven years consecutively and has become a forum for activist groups with similar agendas. The number of organizations participating in the cassava fair increases from year to year, strengthening the self-determination, and boosting the self-esteem of ACORDI members. This is a direct product of the CBM process. Other key issues are:

- Land tenure insecurity, political instability, the high degree of urbanization, and other developmental issues have contributed to creating a sensitive and fragile environment for CBM.
- Its unique ecological habitat, Restinga forest in a dune landscape; proximity to the Atlantic Ocean where other conservation activities are undertaken; Butiá extraction; and the high degree of social organization of the *Areais* community are important features supporting the continuation and strengthening of CBM in *Areais* and neighbouring communities in the future.
- We support the role that UFSC plays in this site; it should continue to characterize the vegetation, landscape, traditional knowledge and plant genetic resources, and support the community, seeking ways to maintain their livelihoods through linking conservation and development. UFSC is in a position to develop scientific-based documents and provide them to environmental activist groups. It has the potential to be an intermediary in attracting regional, national or perhaps international attention to Imbituba, a place that is characterized by competing and highly charged

land claims over valuable lands and biological resources, and people's associated traditional lifestyles.

3.4 Guaraciaba site

3.4.1. Context:

Set amidst a beautiful landscape, the Guaraciaba municipality is located in the west of Santa Catarina state. The team visited the Linha Tigre community of this municipality and several farmhouses within the community. Guaraciaba is situated in a Mata-Atlantica type forest characterized by semi-deciduous species. However, much of the forest landscape has been converted into agricultural landscapes.

In the 1940s, the region was colonized by Germans and Italians, migrating from Rio Grande do Sul. The colonies were established after killing, or driving away, most of the indigenous people. Simultaneously, the forest cover was removed by European timber industries, which led to the loss of native plant species. The agricultural practices used by these colonists were based on the landraces of local food crops such as maize and beans. With the advent of the green revolution there was a gradual reduction in the number of landraces grown by these farmers as they turned towards growing 'high-yielding varieties', accompanied by pesticides and fertilizers. For instance, during 1978, every family grew landraces only; by 1990 landraces of major crop species had vanished from most households. Dependency on high-yielding varieties increased the cost of cultivation; and consequently, food sovereignty was at stake.

Concomitantly there were also changes in the family structure. Initially the families were bigger in size, with up to ten children, but the numbers started declining in the 1960's. In the 1970's, people started to divide their land between family members. Last year, Guaraciaba suffered a natural calamity, brought on by climate change, when it was hit by a tornado, severely affecting the farmers' livelihoods and the agrobiodiversity of the area.

3.4.2 CBM process:

We consider the communities in the Guaraciaba sites to be well advanced in their CBM process. In relation to the CBM components, they have reached a high level of awareness on practices and of understanding local biodiversity. They are also concerned with the loss of biodiversity that took place during the green revolution and have prioritized the need to revive the use of agrobiodiversity. As a result, the communities participate well in most CBM practices (consolidating community roles, monitoring and planning). In addition, external agencies, universities and the municipal government provide very good support. Technically sound CBM practices are being applied, including maize participatory varietal selection, rice participatory varietal selection, and diversity kits. There is widespread participation from many communities. These technical activities are facilitated by Epagri, the Santa Catarina State Enterprise for Rural Development and Extension, within the context of the joint State Government/Worldbank Micro-watershed Rural Development Project (in short, MB2). The Micro-watershed Development (community) Associations (in short ADMs) were established through the MB2 project. They hired facilitators, including Mr. Adriano Canci, who already had a strong Agrobiodiversity record from his previous work in another municipality, to assist the process of social learning and further advancement in community management of agrobiodiversity. Institutional working modalities required for implementing CBM have been developed through the MB2 project, at micro-watershed and community levels.

3.4.3 CBM practices:

CBM practices at Guaraciaba are the product of MB2, facilitated by Epagri/MB2 in some cases in collaboration with UFSC. The following practices of CBM are carried out at Guaraciaba.

Maize Participatory Varietal Selection (PVS):

Participatory plant breeding, using a gradual process of selection, began in 2006, with 16 varieties of maize (10 hybrid and 6 landraces). The main purpose was to identify a variety better suited to rain fed/dry situations and with a higher yield. Altogether, 10-12 families were involved in the process. Epagri provided seeds and initial technical support, which was continued by UFSC. This process has been institutionalized within the farming communities, who now have the necessary technical capabilities and a strong commitment.

Rice Participatory Varietal Selection (PVS):

Participatory varietal selection was carried out to identify rice landraces suitable for dry places. The process was started in 2008. Altogether 19 rice varieties were used in the trials, in four replications. Of the 19 varieties, 14 were landraces from Guaraciaba, three were from Anchieta, one was from Embrapa, and one was from another institution. UFSC was involved in the design and implementation of this experiment. The other partners were the local community, the MB2 committee and Epagri. Now they are interested in starting more advanced selection and participatory plant breeding.

Diversity kit:

In 2004, one of the female farmers in Guaraciaba suggested producing vegetables for home consumption and it was from this suggestion that the issue of food security, and the responding practice to enhance food security through the diversity kit, emerged. The diversity kit idea was influenced by an external experience when, in 2005, several farmers, along with Mr. Canci, participated in an agrobiodiversity training programme in Chapecó, where Dr. Bhuwon Sthapit (Bioversity) shared LI-BIRD's experiences in Nepal, including the use of diversity kits. A major objective of the diversity kit in Guaraciaba is to provide incentives for farming families to produce food for home consumption. Other objectives are to rescue local varieties of several crops, increase farmer household income and promote organic cultivation. The diversity kit has resulted in an increase in the number of families growing potatoes, rice and beans for home consumption. About 16 farming families were engaged in the seed production required to multiply materials for the kit. About 16 species and 52 varieties were multiplied to cater for 300 families; each community defined the composition of its kit. The process was driven by collective action. In a later version of the kit, the communities included fruit crops. The process seems self-organized and sustainable. More and more families are joining the process of organizing the diversity kit. One of the innovative aspects of the diversity kit is that the communities have recorded traditional knowledge in a package of practices, which they have distributed, as flyers, to the farmers. In doing so they are helping to conserve and promote traditional knowledge among the communities.

Quality seed production:

To support the diversity kit, a group of 16 farmers have shown interest in producing seed. The seeds were multiplied at individual household level but some were sold in a collective way to Epagri for distribution. For sustainability, formal mechanisms should be developed to organize such mechanisms of seed production, including, perhaps, the organization of such farmers for that purpose under the same CBM umbrella.

Other practices:

Individually, farmers are conducting value addition such as processing vegetables and fruits for selling at the local market. However, such value addition is not conducted in a collective manner to be able to consider such activities as CBM practices. The communities engaged in the MB2 project are planning a diversity fair of rice, beans and popcorn in 2011 to raise awareness on agrobiodiversity, on a wider scale.

3.4.4 Reflections:

This is a site where the community has internalized CBM. The interest in sustaining CBM among the communities and their members contributes to its sustainability. Innovative improvisation concerning the diversity kit is an example of how the CBM process has become a part of their farming lifestyle and culture. It could be replicated in other sites in Brazil, for example in Porteirinha, where a diversity kit would be more useful than the current work in promoting the cultivation of sponge gourd. The diversity kit has proved to be a good entry point for CBM. The next step for the diversity kit is to address the forest tree species and landscape issues exclusively. It would create awareness and capacities for reforestation. The diversity kit is still externally supported, to make it sustainable a CBM trust fund or a community fund could be installed, for which the associations established through the MB2 project may serve as a basis.

3.5. Iratí site

3.5.1 Context:

Iratí is a municipality located in the southern part of the Paraná state. The Global CBM Study is working with faxinal communities. These traditional communities were, until recently, found throughout the Araucaria forests of the Paraná state, in the South of Brazil. Today, their presence is scarce and they are located almost exclusively in the southern part of Paraná. The faxinal system is associated with the slash and burn system of agriculture and extensive use of common forest lands to raise animals through a communal fencing activity. The farmers also have their own lands within a common forest patch. Land ownership is complicated because of local unwritten laws and the lack of clarity regarding land use. The residential areas are located inside of the regions of “criadouro”, the forest lands where animals are raised; each household has its own property or land.

The community extracts yerba-maté (*Ilex*) and harvests timber/firewood. Informal agreements among the communities are established in order to control the access to natural resources. Some of these agreements are recognized by formal municipal laws, which help to ensure compliance. Faxinal management has contributed to the use and conservation of several species. Faxinais is a kind of conservation unit in Paraná State. However, not all faxinal communities follow all the requirements of this specific system of production anymore.

The CBM study site, “Faxinal dos Marcondes”, is located in the municipality of Prudentópolis. “Faxinal dos Marcondes” has a collective area of 200 ha, populated by about 45 families. The community is predominantly of Ukrainian, Polish and “Caboclo” origin. Caboclos are an ethnic group of mixed native and European/African descent. The main income generating activities are cultivation of tobacco and animal husbandry. Additional activities include yerba-maté extraction, though in a smaller quantity, since large numbers of animals are threatening the forest. Key plant genetic resources of the region are *Araucaria* and *Ilex*. A few of the households have genuine land records but the majority are small and marginal farmers; legally most households are landless. Major issues

include the loss of traditional lifestyles and external pressure from the agribusiness community, which affects local biodiversity and land ownership.

3.5.2 CBM process:

Since 2000, some faxinal communities have been organizing themselves, in a process that is supported by NGOs and Universities, to fight for their traditional land rights. In 2005, the communities founded the Puxirão Network of the Faxinal Peoples (*Articulação Puxirão dos Povos Faxinalenses*). This movement was set up to promote the struggle of traditional peoples in the state of Paraná, for recognition of their rights. In the same year, the faxinal communities were officially recognized as traditional people in a law passed by the State of Paraná. Today there are 227 faxinal communities, 33 of which participate in the Puxirão Network. The Puxirão Network organizes a meeting of faxinal communities every two years. The first meeting was in 2005. Faxinal dos Marcondes has been associated with the network since 2007.

UFSC's activities in Faxinal dos Marcondes are still in their initial stages. In July 2009, the UFSC team made the first contact with local organizations, including the Puxirão Network coordinator, Hamilton José da Silva, and other members. The various organizations involved in CBM at Iratí include: UFSC; the Federal University of the Central West Parana (UNICENTRO); two NGOs (Institute for Popular Education (IEEP), and the Centre for Environmental Studies, Evaluation and Research (CEMPA); and the federal government institute responsible for biodiversity conservation, the Chico Mendes Institute for Biodiversity Conservation (ICMBIO).

Identifying CBM practices at "Faxinal de Marcondes" was not easy. Since CBM is embedded in the traditional structures of common property management, we could not identify specific CBM components based on our discussions with community leaders, community members and stakeholders.

3.5.3 CBM practices:

The only collective action the community is involved in is the conservation of community land for collective use by faxinais.

Community Conservation Reserves:

The community has 200 ha of communal land, where economic plants like *Araucaria*, *Ilex* and other rare flora grow. 10% of the land is used privately, and 90% is for collective use. The reserve is a repository of various kinds of fruits for human as well as animal consumption. Yerba-maté leaves, firewood, and the nuts and timber of *Araucaria* (*Araucaria angustifolia*) are collectively managed. The community is well aware of environmental issues and have placed severe restrictions on the exploitation of exotic plants. This aspect of community resource management is perhaps unique to this site. There are lots of opportunities to refine the collective structures for using such forest resources, for the benefit of the poor families. The exodus of young people from these faxinal communities to nearby cities and selling off of their ancestral property to people who no longer recognize the traditional land rights have resulted in violent land conflicts. Out of the 200 ha of community land, 70 ha are now under dispute. This conflict has brought the faxinal communities together and spurred them to form a movement to get back their traditional land records.

3.5.4 Reflection:

- During discussions with the communities, the Indian model of Joint Forest Planning and Management (JFPM) and the establishment of Village Forest Committees to micro plan and

manage the resources was explained by the Indian CBM representatives to the communities, and suggested as a possible option to strengthen community faxinal management.

- Value addition to yerba-maté by the community as micro-enterprises is another option to be explored.
- More research and awareness-raising activities could support the establishment of conservation units and the legalization of the faxinais (Sustainable Development Reserve) by the Ministry of Environment.
- Value addition to *Araucaria* nuts for bread, flour, baby food, health food and ice cream is also an option for further exploration.

4. Diversity of sites - impact on empowerment

Is CBM a methodology or a practice? In several of the sites that we visited, CBM is considered a methodology, as seen in Guaraciaba, while in other sites CBM is considered a practice, as seen in Porteirinha. We also noticed a huge variation among sites concerning historic drivers. Land issues are driving forces for the Imbituba and Iratí communities. In Porteirinha and Guaraciaba, reversing the green revolution, in terms of food security and autonomy are considered a driver for CBM. We observed some cultural aspects that were common to most sites, for example most of the sites were colonized by Europeans, who brought with them their own ways of living, and integrated with indigenous people from the localities. Gender issues are quite similar in all the sites, where male farmers play the dominant role in most processes. In Tavares, female farmers appear more scholarly than male farmers. There are a number of institutions working with CBM in all the sites, through research, extension services and conservation.

Embrapa began working in Tavares and Porteirinha for its own interests in conservation rather than for the community interests. In Porteirinha, this process did not work the way Embrapa expected. The CBM process became stuck with the production of sponge gourd and this was because of the specific local context and attitude of the people. A lesson learned at this site is that we need to embed the CBM process in the community before beginning a project for conservation. On the other hand, Emater, together with Embrapa, started the seed fair in Tavares. The community adopted this strategy well and started exchanging seed. The seed fair has inspired community members to set up a food fair. This result is site-specific, as Tavares was isolated until the recent construction of a road, and this isolation contributed to the maintenance of several varieties and particular food habits. At the same time, community members showed they were open to the new ideas. We should consider that this work is still in its early stages and, in order for it to be a success, we are counting on the efforts of local extension services, Gustavo Chaves Alves, who could be supported through linkage with Embrapa and the local university, and PhD student Alice Tempel Costa.

UFSC is working with the communities of Imbituba and Iratí. Although the involvement of the university in both sites is research and development driven, it has led indirectly to an increase in the confidence of the community. While the university is not actually responsible for the CBM process in the two sites, it sustains the process. On a social level, the university has been providing the communities of both Imbituba and Iratí with scientific inputs in their complex legal processes. In line with its academic role, the university contributes to a process of empowerment in both sites, within the context of CBM.

Epagri, through the MB2 project, is working at Guaraciaba with a participatory approach. This programme operates within a larger, conventional rural extension and development programme, which, in general terms, maintains those dependencies associated with the technology transfer paradigm, resulting in a limited autonomy of the community over the process. Epagri contributes to maintaining local varieties and raising awareness on the importance of diversity. However, the communities, and to an extent, the organizations responsible for making decisions on behalf of the communities, depend upon the innovative and creative drive of their MB2 facilitator, Adriano Canci. Mr. Canci has a strong motivating role in the community, attracting the attention of Epagri and external stakeholders; but through this role he also is creating some dependency.

We noticed that the degree of empowerment, the type and quality of community association and, most importantly, farmers' interest, are increasing in those sites where local technicians or extension services follow a process approach, rather than the more conventional transfer of technology approach, for encouraging the communities to manage their biodiversity. In Tavares, Embrapa works directly with Emater and, since the local extension services are able to facilitate the process towards some community empowerment; this has proved to be a positive combination. The local technician has a solid understanding of the local context and the community trust in him. In Guaraciaba, the MB2 project enabled the most advanced CBM process encountered, through a local technician that took on the roles of driver, innovator and facilitator of the empowerment processes, even though the larger institutional context was within a conventional setting. A similar situation was observed in Imbituba, where a local leader with relevant, higher-level education, facilitated and motivated the community in their struggle for land rights, and in sustaining traditional lifestyles and associated biodiversity. In Iratí, similarly, leaders associated with the Puxirão movement took on the role of facilitator and motivator. In Porteirinha, the technicians involved are from outside the region and, since Embrapa representatives are geographically distant, they were not able to construct a full profile of the site and, consequently, were unable to progress with the CBM process and practices. A key lesson we have learned is that the communities in the Brazilian CBM sites accepted new ideas really well, in particular the ideas of local technicians, who use a process approach towards empowering the communities in their strategies to manage and benefit from agrobiodiversity.

5. Historic drivers for empowerment

The colonization of Brazil by European immigrants, the green revolution and rapid industrialization are important historic drivers that have resulted in the loss of indigenous peoples, their cultures, indigenous crop biodiversity and its associated traditional knowledge. The green revolution and industrialization also resulted in an increase in the price of seeds. We observed that farmers' health was affected by the intensive use of chemicals. Ultimately, this agricultural development path has forced many small-scale farmers to search for alternatives to reduce their production costs.

Brazil's relatively recent military dictatorship (1964 – 1985) could be an important factor contributing to the reluctance of small-scale farmers to organize themselves into community organizations; this factor may also still be embedded in existing institutions; despite the fact that several current policies at federal and state level that promote the organization of communities into farmers' organizations. These factors could impede 'collectiveness' among the farming communities in most of the sites. This collective nature within communities is crucial for CBM to be a success.

In Porteirinha, the past cultivation and related production of the cash-crop cotton which is implemented in strong contract-farming arrangement could be considered a driver for disempowerment. Farmers in any system of contract farming become fully dependent on the contracting industries. The cotton cycle impacted negatively on the autonomy of the communities in any decision-making. Contract farming has a strong push for technology transfer and adoption, the impact of such a history should be taken into consideration. However, current government policies that promote the use agricultural subsidies and loans encouraged farmers, like those in Porteirinha, may motivate farmers to organize themselves. In order to receive some direct benefits, farmers are organized, which can result in unsustainable associations, serving political, rather than community, interests. From our perception, such public policies and structures have been crucial historic drivers impacting on the state of empowerment of this site, and as such impeding the CBM process.

Tavares is located in a most particular place, between a lake and the ocean and, until recently, untouched by urbanization and modernization. This relative isolation contributed to farmers maintaining a lifestyle in which a surprising degree of crops and varieties are used. Nowadays, the municipality has become better connected, bringing an end to its isolation. Farmers in the Tavares communities are not well organized. Embrapa and Emater have shown an interest in the biodiversity and seeds of the site but the farmers have a long way to go towards getting the community to organize themselves in order to make CBM work.

In Imbituba, the farmers we met have a history of land disputes, which appears to be typical in relation to agricultural development in Brazil. In the 1970s, the government expropriated farmers' lands for industrialization, compensating those farmers dispossessed. However the land expropriated was never used and so the farmers continued to use it in their traditional ways. In 2001, a leader of this community created the Rural Community Association of Imbituba, ACORDI, initiating the whole process and organizing the farmers to fight to recover their land rights. At the same time, fishermen-farmers began their struggle to legalize and protect the areas traditionally used by them. In conclusion, the main historic driver for empowerment in Imbituba is the struggle for land rights. This struggle not only encouraged the farmers to set up their association, it also created a common cause to work towards collectively. Owing to the current dramatic nature of the situation in Imbituba, and also because this type of struggle is symptomatic of the dominant development model, external

stakeholders (including UFSC) have made a commitment to assist the community in fighting for its cause.

The CBM community of Guaraciaba is made up of German and Italian immigrants. The process of 'colonization' of the Mata Atlantica landscape was aggravated by the simultaneous extraction of timber, by European industries. During the green revolution, agricultural practices changed from using traditional to modern methods. Immigrant farmers, with only a short history in the area, actively adopted modern technologies in their agricultural practices, resulting in an increased cost of production, as well as that of seed, fertilizer and so on. Consequently, the farmers in Guaraciaba entered the cash economy. Small-scale farmers were greatly affected and were forced to search for ways to reduce their costs. The need to regain their autonomy; identify methods of development different to those promoted by the green revolution, better suited to meet the needs of small scale-farmers; and the need to improve their livelihoods, provided the basis for the MB2 project to encourage small-scale farmers to establish associations at community level and work together in a participatory approach. The development of an alternative model that meets the needs of these small-scale farmers is a major historic driver for empowerment for CBM in this region.

Iratí is inhabited by descendents of Ukrainian and Polish immigrants, and the Caboclo ethnic group. Together, they have their own collective way of managing and using the environment, as a result of several generations of agricultural practice. Now, the communities are collectively managing land for animal husbandry. However, they face many conflicts motivated by modernization (agricultural development), despite their expressed interest to maintain their traditional lifestyle. Land issues with neighbouring, big land-owners and uncontrolled hunting reflect the lack of respect shown towards their communal agreements, undermining the collective management of the forest. The need to legalize their traditional system of land and forest resource management is a major historic driver for empowerment.

In conclusion, we observed that each site has a different historic driver for empowerment within the context of CBM. The communities understand CBM in different ways, depending on their background or, more specifically, their ethnicity and the history of agricultural development. Small-scale farmers are still struggling with government policies that promote the industrialization of agriculture rather than support the development of small-scale farmers' livelihoods. In this context, CBM has the potential to facilitate a process of empowerment. From our interactions in the CBM sites, we learn that existing community associations may form platforms from which CBM practices will emerge. Such associations were established following an autonomous process to protect land rights or lifestyles, or were facilitated by external agents seeking development models that are more appropriate to the needs and reality of small-scale farmers.

6. Cultural drivers for empowerment

Cultural drivers in Brazil today are directly related to ethnicity. The Brazilian blend of ethnic diversity and cultures has resulted in the lifestyles and traditions that make up the country's culture, or rather, cultures. Modern day Brazilians are descendents of a variety of different migrant groups, including Portuguese, German, Italian, African, Polish and so on. Brazilian society emerges as a mixture of these cultures in an evolution of ethnic diversity.

That said, it is difficult for us, as foreigners with our own cultural biases, to understand and differentiate between the cultural differences that exist in Brazil, within its culture of co-existence and blending. Brazilian culture appears to be so well blended that it is difficult to identify those cultural differences that influence the way communities approach collectiveness.

In Porteirinha, there is a mix of ethnicities i.e. African, Portuguese and indigenous people. Nowadays, their livelihoods depend mainly on agriculture and livestock. Within the common agricultural development model, and particularly in situations of contract-farming of cash-crops, like the cotton cycle in Porteirinha, agro-industries and the government provide seed, fertilizers, and so on, and farmers sold their produce directly to the industry with no need for marketing. This type of contractual system, which follows predominant technology transfer models of rural extension, has created a situation of disempowerment. A passive attitude or culture of dependency has been created, which should be considered independent from ethnicity.

In Tavares, we found a population made up of migrants from the Azores and Africa. This site remained isolated for a long time, supporting the maintenance of traditional lifestyles and associated agricultural systems. Recently, following improvements in transportation, several industries began to invest in the area and people have become more interested in producing cash crops on a commercial scale. However, as part of their traditional subsistence economy, local diversity can still be found in beans, sweet potato, maize, cucurbitaceous, and cassava. The maintenance of this local diversity in Tavares is linked to the subsistence lifestyle of the community prior to the construction of the road. The population, with its roots in the Azores and Africa, has particular food habits. Their traditional lifestyles and food habits may be considered the cultural drivers for maintaining diversity. These cultural drivers however still need to be transformed into drivers for empowerment when approaching the community to support the continued use of biodiversity for the purposes of conservation.

Imbituba is located in a semi-urban, semi-rural setting. The population are descendents of Azorean immigrants who established themselves in the region in the 18th century. Up until recently, the community was fully dependent on fisheries and small-scale farming. However, from the 1980's, as the focus shifted towards the port, the population began to concentrate more on urban activities and tourism, treating agriculture and fishing as hobbies. Farmers in Imbituba are currently engaged in collective practices for cassava cultivation and processing. They are also involved in a complicated dispute over land rights, already mentioned in the previous chapter. The dispute and management of the land contributed to the collective nature of their involvement in the dispute and, as such, empowered the community, despite the fact they are extremely vulnerable in the land dispute.

German and Italian migrants arrived in Guaraciaba in 1940s and 1950s from the South of Brazil. At the same time, almost all the indigenous people of that region migrated, due to the clearing of forest areas, or were killed. The process of transforming of the 'wild forest' into agricultural lands was

promoted by the government and led to a great loss of cultural and traditional knowledge associated with indigenous people. Nowadays, the livelihoods of these small-scale farmers in Guaraciaba, depends on agriculture and livestock. Most of the farmers have a strong entrepreneurial spirit that is rooted in their ethnicity. In seeking development, they are increasingly dependent on inputs from, and marketing that is dominated by, agro-industries. This has increased their dependency and deters them from defining their own social, economic and cultural aspirations, i.e. impeding their empowerment.

In Iratí, 78% of the inhabitants are decedents of Ukrainian migrants, the rest are mainly of Polish origin with a small percentage of Caboclos. Ukrainians and Poles arrived in the region 100 years ago, fleeing poverty and the feudal systems that existed before communist rule. These people left their countries with limited skills in autonomy, owing to the feudal systems from whence they came. They sought to do the best they could with their own traditions in the new areas where they established themselves. Similarly, the Caboclos also have the traditional practice of working together, to avoid poverty, making the best out of the resources available. All of these traditions and practices blended over the years and now the communities use good communal forest management practices. The faxinal community's desire to be recognized as traditional people is a key cultural element for empowerment in Iratí.

In our visits to the sites, we noticed that the inhabitants of all the sites are undergoing a number of changes in their lifestyles and practices and, at this moment in time, with the dominant forces leading towards the modernization of Brazilian society and agriculture, their traditional knowledge, practices and biodiversity are at stake. Consequently, the sites have one thing in common: they are all trying to maintain, to some degree, their lifestyles. The communities achieve this in different ways in each of the sites, for example, by conserving traditional crops and varieties, like in Tavares; or by returning to the use of local varieties, and establishing autonomy by producing seeds, as in Guaraciaba; and by maintaining and safe-guarding communal practices and resource management, as in Iratí and Imbituba.

7. Drivers for CBM

The dominant development model of Brazil is based on the unsustainable use of resources through agricultural practices and this must be taken into consideration when looking for a major driver for the CBM processes. This unsustainable use of resources began before the onset of the green revolution, with the transformation by European colonizers of forest landscapes into cash crop and/or animal-based agricultural production systems. Those changes mediated by the green revolution led to a huge inequality in land acquisitions. For instance, today 3% of the total number of landowners in Brazil are categorized as “large holding owners” (over 500 ha). However, this small group holds more than 50% of agricultural lands. Today, Brazil has the dubious distinction of ranking third in the world with respect to social inequality.

This disparity in landholdings has infiltrated national policies. There are two different Ministries for Agriculture, one related to the large (agro-industrial) sector and the other to small-scale agricultural holdings. Obviously, the Ministry of Agriculture associated with the large land-holders is more influential than the latter. The lack of attention shown by the federal government to small-scale farmers has driven processes towards collective decision-making and, hence, towards the CBM process. In addition, since modern agriculture is franchise-based, farmers have been reduced to agricultural contract labourers. The pace of modern agriculture has not only fuelled the loss of genetic diversity, but has reduced food sovereignty. In a few cases, the worst ill effects of the green revolution resulted in pesticide-induced suicides. This growing realization of the ill effects of modern agriculture has also resulted in the evolution of CBM practices, to counteract these developments.

Broadly speaking, the above are the major drivers of CBM activities; the following paragraphs provide an account of site-specific drivers. Since each site is unique in terms of landscape, lifestyle, ethnicity and local setting, the drivers may vary.

In Porteirinha, the huge variation in the price of cotton, brought on by US sanctions and pest infestations, resulted in heavy losses for cotton-growing families (cotton cycle). This was a rude awakening for those families dependent on agriculture and was perhaps the impetus for collective decision-making. In response to the national commitment to the CBD processes, Embrapa started a project of *in situ*/on-farm conservation of Cucurbitaceae in this site. Commitment to this international instrument has been a major driver for CBM practices in this site.

The Tavares site was isolated from the outside world until the recent construction of a road. With this loss of isolation, the influence of modern agriculture and the green revolution have already left their mark on the site. We witnessed the more dramatic ill-effects of modern agriculture in Tavares, in the excessive use of agro-pesticides, which has led to depression amongst farmers and, on a few occasions, suicide. Emater organized the seed fair in order to introduce changes in agricultural practices in the site. This activity is the most important driver for the CBM process in the site, and has led to the organization of food fairs.

In Imbituba, the struggle for land has been a key factor in uniting and organizing communities and for initiating the CBM process. The CBM process in Imbituba seems, for the most part, to have been internalized by the communities, with local leader, Marlene Borges, promoter of this association, as the source of external influence. The support provided to ACORDI by other institutes has further strengthened the commitment of the community. The initiation of the CBM study by the university,

and the visit of the foreign experts, instilled a sense of belonging and community spirit in community members. Several related organizations have started to come out openly in support of the communities, transforming the CBM process into a kind of a forum. This is one of the positive aspects of the CBM process in this site.

In Guaraciaba, the State/Worldbank-funded micro-watershed project (MB2 project) promoted the formation of farmers' associations. The MB2 project provided the communities with a good forum for collective decision-making processes. Epagri and UFSC contributed to the conservation of local crop diversity, especially in maize and beans, through collective actions. The decision to grow household food on their farmland, and share their experiences of CBM processes with others, demonstrates the CBM process of empowerment, both in technical as well as economical terms.

In Iratí, the unique ethnicity and landscape of the community, and the cultural identity crisis being faced by its inhabitants, have been major drivers for CBM. Faxinal is the predominant style of landscape management in the site. Attempts by the community to obtain traditional rights over the land and their lifestyle, has united the community in collective activism. Ethnic identity is the key issue driving CBM in this site.

8. Definitions of empowerment

General definition of empowerment:

Since the team members could not reach a common consensus on the general definition of empowerment in Brazil, mainly due to the inadequate time available for thorough discussion, we are including a summary of those definitions proposed for individual reflection.

- “Empowerment is a collective process that facilitates building a dynamic system that is self-reliant, independent, autonomous and inclusive, for achieving the sustainable management of genetic resources to give quality of life to the Brazilian people.”
- “Empowerment is a process of system-building and collective decision-making, in order to obtain autonomy, self-reliance and inclusion, which contribute to conservation of biodiversity for securing the livelihoods of Brazilian people.”
- “Empowerment in the Brazilian context is a process that starts with awareness, not only by the community, but also by external stakeholders. This stage then passes on to collective decision-making, in order to achieve self-reliance, inclusion and social quality. In my opinion, the ideal empowerment is to have all these things, but in the Brazilian context it can be considered when these have been partially achieved”.
- “Empowerment is a collective process in building autonomy, in which everyone is aware and included in the decision-making, in order to get financial self-reliance and quality of life”.
- “It is largely a process of system-building to make a collective decision on the rightful use of resources to achieve financial self-reliance”.
- “It is a process of system-building and collective decision-making, in order to achieve autonomy, self-reliance and inclusion, which contribute to the conservation of biodiversity for securing the livelihoods of Brazilian people”.
- “Empowerment is achieved by reaching self-reliance and recognition, in an inclusive way”.

Definition of empowerment in the context of CBM:

[The process follows the same as above]

- “Empowerment in a CBM context, in Brazil, is a process where not only the community is aware about the local crops, cultivation-system and welfare, but where the external stakeholders are also aware about the community. The process allows for decision-making in a collective way, and the goal is to have autonomy from agro-industries, and achieve a sustainable way to cultivate their lands in order to maintain them for future generations”.
- “Empowerment is largely a collective process of system-building to secure the livelihoods of people and biological diversity”.
- “Empowerment: Community practices in collective ways to conserve and manage the biodiversity in a sustainable way for a better way of life”.
- “Empowerment can be reached through access, autonomy and the self-reliance of the community on genetic resources into a collective way”.
- “In the CBM context of Brazil, empowerment is defined as the collective process by which communities can make their own decisions on how to manage their biodiversity in the landscape, in a sustainable way, in order to conserve, use and exchange their genetic resources for their livelihoods and financial reliance”.

9. Community within the term CBM: is this collective management?

Empowerment from the CBM perspective is largely an organizational (system) building process for safeguarding livelihoods and conserving diversity. We have attempted to address the element of collectiveness, by considering the processes that lead to decision-making in the communities. In Brazil, most of the time, decisions are collective whenever a CBM process is followed in the true spirit of a participatory approach; however, there is always an element of ‘influence’ from an individual or a group of people (with good intentions for the community). We have also considered how well collective decisions are institutionalized. Sites with internalized CBM practices, such as Guaraciaba, Imbituba, and Iratí, have shown such institutionalized decision-making processes.

Historically speaking, the ending of the military dictatorship in Brazil, and the election of a democratic government, created enabling environments for farmers to unite themselves and form ‘associations’ again. This process facilitated the re-emergence of ‘collective decision-making processes’ among the farming communities. Small-scale farmers are still deprived of many facilities by the government and we feel CBM can facilitate the empowerment process in this context. We observed that existing structures of ‘formal associations’ (i.e. associations that are set up for responding to a specific public policy) are often platforms from which CBM has emerged as an autonomous methodology, or as facilitated by external agencies such as Emater, Embrapa and universities. However, a critical review is necessary of the operational modalities, and how they deal with gender and social inclusiveness. The quality of decision-making processes in those ‘associations’ is a matter of concern; this should be addressed to facilitate their evolution towards social structures that are more favourable towards empowering small-scale farmers and enhancing their livelihoods.

The following is a description of how the decisions are collective in each site:

In Porteirinha, collectiveness has been promoted by a local labour union that works with several stakeholders, such as the Brazilian Service for Supporting Micro and Small Enterprises, SEBRAE, the church, and Embrapa. However, it seems that only a few of the farmers are involved in the decision-making bodies/processes. The establishment of a cassava-processing centre is the result of a collective decision-making process. Several households are economically empowered through this centre. Nonetheless, we also realized that the interests and priorities of external stakeholders have in fact resulted in disempowering the collective process in the farming community. For instance, the diversity block of sponge gourd was initiated at the behest of the research institute in the interest of conservation rather than for the good of the community.

In Tavares, Emater was instrumental in organizing a seed fair and this increased awareness among farming families on the values of local crops and varieties. As a demonstration of this awareness, some farmer households collectively, in an autonomous practice, made the decision to promote their own traditional crops through organizing a food fair. This collective avenue has now been institutionalized within the local context, contributing to the exchange of knowledge on local crop diversity and generating a small income as well.

In Imbituba, we are of the opinion that the struggle for land rights is a key factor that has united and organized communities, thus strengthening collective action as a component of empowerment. Despite the external influence of the leader, as a promoter of this association, the decisions of the

community seem to be collective/agreed on, and can be considered collective in nature. This collectiveness has in fact contributed towards increasing their self-determination and sense of ownership.

In Guaraciaba, the MB2 project organized the farmers, which provided the communities with a good forum for collective decision-making processes. This also provided a basic institutional-like structure where farmers discovered the power of collective decision-making. The decision to grow household food on their farmland and share their experiences of the CBM process with others, have demonstrated the empowerment process of CBM both technically as well as economically.

In Iratí, the predominant faxinal community has turned to activism in their attempts to secure their traditional rights over the lands. Decisions on any activity are taken by a hierarchal, structured faxinal group. The group is trying to set up a community conservation reserve in this area, recognized by the federal government, with an aim to restoring local/traditional land rights. The sustainable development reserves (SDRs) of the community forest management systems, once operational, will play a pivotal role in planning and managing the forest areas collectively.

10. Inclusion, equity and gender

In most of the sites, male household members are responsible for outside activities like working in the agricultural fields and rearing livestock, while female members are busy with household activities and taking care of the children. Male members hold key positions in the household and influence the whole process of decision-making except in few cases. However, women are the seed keepers in the households in all of the sites. Men are responsible for agricultural inputs, such as pesticides.

With regards to education, the government policy is to provide free education to both male and female students. As such, male and female farmers can have the same level of education. However, first and foremost the men have to take care of agricultural lands and livestock and so, in some of the sites, male farmers appear to leave school before female farmers.

In Imbituba, Iratí and Tavares, middle-aged and elderly people are more interested and involved in agriculture. A common feature of all the sites is that these people are also more interested in collective activities. We observed that the younger generations usually leave the village for education and they do not return, most likely because of urban job opportunities, and this creates a problem for the continuation of agriculture in the community. However, several people, like Gustavo Chaves Alves in Tavares, Marlene Borges in Imbituba, and Adriano Canci in Guaraciaba, are actively involved in empowering the community, having returned to their communities after graduating in the city. As representatives of a young generation who have chosen to return, they play a key role in facilitating the collective process and promoting an agricultural future. Key observations for the five sites are summarized in the table below:

CBM sites	Gender inclusion in decision-making process	Gender and education	Generation, in the context of agriculture and CBM
Porteirinha	Men dominate key positions and greatly influence the decision-making process.	Same level of education.	Mainly middle-aged people are interested in conservation and collective processes.
Tavares	Men dominate key positions and greatly influence the decision-making process.	Women have more years (on average, 3 years) of education, and are as such less likely to return after their studies. There is a high male-female ratio.	Middle-aged people are involved in agriculture; few are engaged in collective processes.
Imbituba	Several women like Marlene, are really influential and play an important role in motivating and empowering the people to obtain land rights. Men dominate decision-making but women also contribute and speak up when they have something to say.	Same level of education.	Elderly people, and people that have retired, are involved in collective activities. However, the leaders are young and energetic.
Guaraciaba	Only a few of the women are active but these women initiated the household food concept of the diversity kit programme; men dominate decision-making.	There is very little difference in the levels of education.	Middle-aged to elderly people are involved.
Iratí	Men dominate decision-making; women are still content to be inside the home.	Relatively equal levels of education.	Middle-aged to elderly people.

11. Competing claims: land ownership, CBM and empowerment

The colonization of Brazil by Europeans, which led to the transformation of original primary forest-landscapes into animal-based and agricultural production landscapes, can be seen as the most important historic driver in changing the landscape. This process resulted in a massive loss of native flora. Recent efforts to modernize agriculture by research and extension services made a tremendous impact on the traditional lifestyles and the associated wealth of knowledge. The combination of colonization, the transformation of landscapes, and the modernization of agriculture, resulted in the loss of biodiversity, traditional knowledge and indigenous peoples. The scale of this change has been vast, covering almost every region in Brazil. The onset of the 'green revolution' and the rapid industrialization of agriculture meant intense competition for land purchase in some of the prime locations; this process further aggravated the inequality of land ownership mentioned previously. This has been a major issue in working with CBM in Brazil. In a few of the sites, people organized themselves to fight against land seizures in their struggle to maintain traditional land ownership as a means to maintain their lifestyle and the biodiversity associated with it.

In Porteirinha, land ownership is not a major issue as the farmers are engaged in agriculture on their own land. However, it is worthwhile mentioning that in the recent past contract agriculture had a major impact on the community with intensive cotton cultivation. During the cotton cycle, the farmers were linked to an international commodity chain and intensive agriculture and, as such, were disempowered, lacking in self-organization and development aspirations. Consequently, the farmers lost the opportunity, and did not have the capacity, to take up a CBM activity.

In Tavares, land ownership is not a major issue. The conversion of land to the intensive cultivation of onion has resulted in some land degradation. The proximity of Tavares to a national park has raised issues of conservation which could lead to pressure being exerted on farmers involved in intensive forms of agriculture to cut back on the use of pesticides and chemicals and perhaps change their agricultural practices to those more suitable to the CBM approach. CBM could effectively address this problem in the near future. Because of the former isolation of site, we can still find many local varieties of several crops i.e five species of Cucurbitaceae have been maintained by farmers in Tavares.

Imbituba is unique among the CBM sites because of its semi-urban, cultural background and because of its burning land issues. We witnessed a long-drawn-out legal battle, fought by the communities to secure their land ownership. We consider this struggle to be the key factor in uniting and organizing the communities. The cooperative cassava-processing centre has become a central point in benefit-sharing. However, if the farmers lose their land in the legal battle, the CBM process may be forced to take the back seat, thus jeopardizing the sustainability of CBM and destroying the traditional lifestyle of the community, which is associated to the landscape.

In Guaraciaba, the farmers are well organized, and use highly evolved, technically-strong CBM processes such as participatory varietal selection and diversity kits. Epagri and UFSC have contributed to the conservation of local crop diversity, especially maize and beans, through collective actions. There are no major land issues in this site.

Iratí is a very different site ethnically, with more than 70 % of the community of Ukrainian descent. The site is characterized by forest resource /communal land based production systems rather than by private animal husbandry areas. This ethnic group seems to have imbibed or developed a practice of using communal land and its resources, and raising rare animals. This communal land was needed because many farmers hold small land holdings and hence communal land and resources became more crucial for their survival. The fencing of common lands to raise animals has been an important CBM process in Iratí. However, communally used of forests (usufructs) are now being converted into private lands. Unfortunately, this has created tensions and disbelief in the community. Furthermore, the situation has resulted in violent clashes. Land issues, and conflicting claims over communal land are of central importance to CBM at this site.

12. Governance and CBM

In Brazilian CBM sites, we found two kinds of agents that are responsible for initiating CBM processes, external and internal. The external agents are government institutions like Embrapa, Emater, and Epagri (through the MB2 project). The internal agencies are mainly the associations (CBOs) within the community; they are established for a specific issue, for example, land ownership, traditional identity, etc. We observed varying degrees of community participation in decision-making in the CBM sites. The communities are more active in decision-making in those sites where the CBM practices are internal initiatives (mostly issue-based), for example, in Imbituba and Iratí. In sites where the CBM process is facilitated externally, the decision-making processes are mostly influenced by the individual, external facilitator. A reason for this could be that the community is still not fully involved, and has not quite reached the stage of autonomy in decision-making. Decision-making in most sites appears to be a less structured or rather informally structured process. It can be assumed that before the site visits we had not fully understood the informal, flexible nature of the decision-making process that prevails. Decision-making is not restricted to a specific time and place and may take place at any given moment, in any place, from a general meeting involving everyone, to a spontaneous meeting with a couple of people, during some day-to-day activity. The process of decision-making depends on the kind of decision that has to be made, by whom and in which context.

We discovered that community level organization for managing biodiversity in a collective way, in Brazilian sites, is completely different to its counterparts in India and Nepal. In Iratí, collective agreements could be considered the most collective way of management, which focuses on grazing resources for animals, and non-timber forest produce for humans. In Imbituba, where farmers are joining hands to confront land issues together, they manage the land used for planting cassava in an informal manner; and the Butiá forest areas are also managed in an informal and communal way. In order to make CBM more sustainable in these sites in Brazil, more community level institutions that focus on the actual needs and realities of the communities, could be developed. However, such organizations would probably need to be very different to those that have been established in Asia.

The division of roles between the institutions depends on their physical distance from the community and the frequency of their visits. Institutions that are based far away from the community have to take on more of a consultative role, while those that are closer are more involved in planning and monitoring in a more collaborative approach. In several sites, decision-making is carried out by community leaders because community members respect the quality of their leadership. We noticed a difference in the ways that the university (UFSC) and the government research institutes (Embrapa) support collective action. There is a need to enhance the capacity of research and development organizations, in order to establish and strengthen community-based organizations, building their capacity towards CBM practices that can build up sustainable structures in communities. The table below summarizes governance and CBM for the five sites.

Governance & CBM	Porteirinha	Tavares	Imbituba	Guaraciaba	Irati
Which organization initiated the process?	Embrapa (external)	Embrapa (external); Emater, through the Petrobras project.	ACORDI (internal).	Epagri, State/Worldbank Micro-watershed Rural Development Project (external).	Puxirão Network of the Faxinal Peoples (internal).
Who makes the decisions?	Embrapa with the Association of Small Farmers of Tamboril	Embrapa - Emater. Community members (food fair).	ACORDI.	Epagri, and the Micro-watershed Development Associations (MDAs), through the leadership of facilitator (Adriano Canci).	Puxirão Network of the Faxinal Peoples.
Regarding what kind of issues are decisions made?	PVS, diversity block, community-processing centre	Seed fair & food fair	Cassava fair; community cassava-processing centre; land ownership.	Desired traits in the PPB of Maize; desired traits in the PVS of rice; diversity kit of crop varieties.	Management of community land for grazing animals; extraction of Ilex, araucaria, firewood etc.
Are decision-making processes being gradually embedded in community structures?	No.	No (except in the case of the food fair, yes).	Yes. The processes work without the presence of the leader.	Yes, but decision-making is depends highly on the external consultant.	Yes, but at times decision-making depends on the leaders.
How are roles & responsibilities divided?	Embrapa - technical support. Community-participation. Union-building-up links. Association-processing & marketing.	Embrapa - Research. Emater-organization of the seed fair. Community-organization of the food fair.	UFSC- technical support and information. MST- political. ACORDI- organization, cultivation, processing & marketing of cassava.	UFSC- technical support & information regarding PPB and PVS. EAPGRI- diversity kit. MDAs- ideas & field implementation.	UNICENTRO-research. Institute for Popular Education, IEEP (NGO)- capacity-building on laws. Centre for Environmental Studies, Evaluation and Research, CEMPA, (NGO)- organization of a traditional community. Chico Mendes Institute for Biodiversity Conservation, ICMBio (govt. dept)- technical support for a conservation unit (environmental).
Division of work to make CBM sustainable	Incorporation of farmers' preferences into Embrapa project activities.	Organization of farmers and establishment of an association.	Work is divided well in a collective way but land issues dominate.	The work is divided among community members, but mostly depends on the facilitator & external funds.	Division of work is more sustainable land issues dominate the area.

13. Sustainability of CBM

For historical, cultural and economic reasons, the CBM processes were initiated autonomously by communities in some of the Brazilian sites. Public research and conservation programmes contributed to the start of CBM processes in the other sites. However, the sustainability of these practices is central to the long-term empowerment of the communities. Sustainability is related to how autonomous communities are concerning those CBM practices. CBM activities are more autonomous whenever they are emerged within communities, or when they are internalized by communities. Further economic empowerment, through collective activities, can ensure the sustainability of CBM. Considering these criteria it appears that CBM practices in most sites are on their way to achieving sustainability. External funding for activities and the availability of future external (public) funding, influence community attitudes, and as such there is a long way to go to reach autonomy. In spite of this, it could also be argued that the autonomy is emerging in some communities that access public resources for CBM types of activities, which is a means of empowerment. However, in conventional extension and development models, communities tend to be patronized by public entities and such relationships delay the process of autonomous decision-making. Furthermore, in some sites, dependency on a few individuals has also resulted in limited autonomy. In several sites, land issues and legal battles may eventually render the CBM process unsustainable. Perhaps it is time to think of an exit strategy for every public-funded, NGO-supported CBM activity, and inject an element of sustainability into CBM activities. Below, we share highlights of the sustainability component in some of the sites and the role of the university in enabling and enhancing the capabilities of the communities towards sustainable CBM processes. Some suggestions may also be used for future research strategies, in particular to the three UFSC sites.

In Imbituba, the cooperative cassava-processing centre has been a central point for benefit-sharing. While this is a good model for long-term sustainability, CBM may have to take a back seat if the farmers lose their land in the current legal battle, thus jeopardizing the sustainability of the centre. In this scenario, UFSC has taken on a major role in preserving and contributing to the continuity of CBM in site. We feel that issues related to the conservation of biodiversity hotspots should be actively considered to enable the communities to retain their lands. Specific action plans to be undertaken by the University include:

- Providing more ecological and conservation-based reasons (arguments) for retaining land rights.
- Raising awareness on the issue of land seizures in Imbituba, in publications and the international conservation forum to make it more visible.
- Characterizing the landscape's ecologically sensitive biota, and documenting the traditional knowledge on cassava varieties and their production and use.
- Providing a landscape approach to a sustainable development regime, eg: whale reserve, restinga forests, cassava cultivation and sustainable Butiá management.

In Guaraciaba, the MB2 project promoted the organization of farmers, with the result that farmers in the site are now well organized. The diversity kit is a tool that, we feel, can support long-term sustainability. It is a good entry point for restoring local varieties and rediscovering local traditions. The decision to restore sovereignty by growing their own food, and exchanging knowledge on CBM processes with others, has demonstrated the strength of the empowerment process. Guaraciaba is one of the CBM sites where a further increase in social learning can happen. The following suggestions emerged for making the diversity kit more sustainable in the long term, within a larger CBM process:

- Expansion of the species net in the diversity kit to include local forestry and animal species.
- Expansion of the information net to include traditional knowledge tips, value – addition/processing techniques.
- Development of diversity kits for specific land and agricultural situations.
- Organization of voluntary contributions in cash or seeds in the communities.
- Establishment of a CBM fund.

In Iratí, conflicting claims regarding communal land is the central issue. The Puxirão Network is seeking to set up a community conservation reserve in this area, recognized by the federal government, with the aim of restoring local/traditional land rights. Such a sustainable development reserve (SDR), once operational, would play a pivotal role in planning and managing forest areas, thus contributing to the long-term sustainability of the CBM. The team identified yerba-maté plant (*Ilex*) as one of the most important forest resources available in Iratí. Traditionally, this resource is harvested, converted into a value-added product and sold in the market. Yerba-maté has the potential to be a good model for a long-term CBM activity. This value chain has a significant income-generating potential. Unfortunately, today, these resources are harvested and sold without value-addition at community level. Efforts could be made to further develop agroforestry systems supporting this species and develop a value-added chain that ensures economic empowerment for sustaining CBM. The team feels that the following interventions by the university are necessary:

- Support for the formulation of public policies that recognize traditional rights.
- Facilitation of, and support for, cultural rescue programmes, motivating younger people to appreciate traditional lifestyles.

14. CBM and genetic resource policies

Brazil has ratified several international policy instruments, and developed national mechanisms for the conservation and sustainable use of biodiversity and genetic resources. In 1992, Brazil signed the Convention on Biological Diversity (CBD), ratifying it in 1998. The CBD is regulated by a provisional act (“Medida Provisória nº 2186) that was passed in 2001. In 1999, Brazil joined the 1978 Act of the International Union for the Protection of New Varieties of Plants (UPOV), concerning breeders’ rights. This act led to the development of a *sui generis* system for cultivar protection in Brazil, regulated by Law nº 9456/1997, which will go towards meeting the obligations set by the World Trade Organization’s Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was signed by Brazil in 2001, and ratified in 2006. The objective of the ITPGRFA is ‘the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use, in harmony with the CBD, for sustainable agriculture and food security’. The ITPGRFA acknowledges the importance of farming communities and is committed to promoting farmers’ rights.

Regarding national legislation, Brazil has several policies, laws and regulations that affect CBM. A comparative analysis is provided in the table below. Concerning access to genetic resources, traditional knowledge and benefit-sharing, Brazil follows a provisional act that was passed in 2001 (MP 2186-16/2001). No other law has since been passed to replace it. This act and its related mechanisms address issues on access to genetic resources and associated traditional knowledge, but contain many gaps with regards to benefit-sharing.

Brazil addresses issues related to traditional peoples with a specific decree (Dec. 6040/2007) and has modalities for the establishment of conservation unit that promote the sustainable use of biodiversity by those people (Law nº 9985/2000 – SNUC). These units are called ‘sustainable development reserves’.

Regarding cultivated crops, Brazil has a *sui generis* system that includes a national seeds law (Law nº10711/2003), a variety protection law (Law nº9456/1997), and also an industrial property rights law (Law nº 9.279/1996). These laws protect the breeders’ rights through DUS (distinctness, uniformity and stability) requirements which are favourable to plant breeders and seed companies. Farmers’ varieties are restricted, owing to limitations on the large-scale exchange and sale of local seeds.

The Brazilian intellectual property law nº 9279/1996 forbids the patenting of plant and animal varieties, “*unless those which express, through direct human intervention in their genetic composition, a characteristic not normally attainable by the species under natural conditions.*”

The impact of the various genetic resources policies and rights on CBM are summarized in the table below.

	Policy instrument	Opportunities for CBM	Threats to CBM
International	CBD 1992	<ul style="list-style-type: none"> Promote conservation, sustainable use, access and benefit-sharing mechanisms. Protect traditional knowledge and customary rights. 	<ul style="list-style-type: none"> The emphasis is mainly on wild and forest biodiversity. The emphasis is on facilitating access rather than protecting traditional knowledge.
	ITPGRFA	<ul style="list-style-type: none"> Promote <i>in situ</i> conservation of PGRFA. Recognize farmers' rights. Provide mechanisms for financing. 	<ul style="list-style-type: none"> The emphasis is on promoting the <i>ex situ</i> approach (e.g. genebanks and multilateral systems).
	UPOV 1978	<ul style="list-style-type: none"> Provide for breeders' rights. Promote private investment in research. 	<ul style="list-style-type: none"> Farmers' varieties cannot be protected because of DUS requirements.
	WTO (TRIPS)	<ul style="list-style-type: none"> Provide a <i>sui generis</i> mechanism to protect breeders' rights. 	<ul style="list-style-type: none"> The patenting of genetic resources relevant to food and agricultural crops (which can lead to the loss of farmers' rights over their genetic resources). Its contradiction with the CBD regarding access and benefit-sharing, and prior informed consent requirements. The lack of mechanisms to ensure the legitimacy of the registration of products arising out of genetic resources and traditional knowledge.
National	Provisional act for CBD MP 2186-16/2001	<ul style="list-style-type: none"> Regulate access, through prior informed consent mechanisms. 	<ul style="list-style-type: none"> The lack of benefit-sharing mechanisms (and as such the regulation is not complete). Access to PGR is regulated because genetic resources are perceived as being static and not dynamic.
	<i>Sui generis</i> system Seeds Law n°10711/2003 Variety Protection Law n°9456/1997 Intellectual Property Law n° 9.279/1996	<ul style="list-style-type: none"> Use of local varieties by small-scale farms (family farms, established land reform settlements, and indigenous/traditional people) does not need registration. Local varieties are excluded from public policies relating to financial support (insurance, credit), seed distribution or exchange. Small-scale farms are allowed to produce their own seeds and exchange them with one another. 	<ul style="list-style-type: none"> For registration, varieties must follow DUS requirements but farmers' varieties are highly variable. The registration of a variety is expensive (characterization, <i>ex situ</i> conservation, etc.) and therefore is often not a realistic option for varieties developed by farmers. A number of public policies still require methods of production that date back to the green revolution in terms of the use fertilizer, pesticides, credit etc.
	Conservation Unit System Law n° 9985/2000 Decree for the protection of indigenous people Dec. 6040/2007	<ul style="list-style-type: none"> Includes types of conservation units that allow people to inhabit and use the areas in different ways according to its management plan (SDR). 	<ul style="list-style-type: none"> It has not yet been used for the <i>in situ</i>/on-farm conservation of crops or domesticated plants.

15. CBM and farmers' rights

Farmers' rights are generally recognized as a precondition for the maintenance of crop genetic diversity, which is the basis of all food and agricultural production in the world. Basically, the term 'farmers' rights' means enabling farmers to maintain and develop crop genetic resources as they have done since the dawn of agriculture, and recognizing and rewarding them for their indispensable contribution to the global pool of genetic resources. According to Article 9 of the ITPGRFA, governments are obligated to protect and promote farmers' rights, but can choose the measures to do so according to their needs and priorities. Measures may include the protection of traditional knowledge, equitable benefit-sharing, participation in decision-making, and the right to save, use, exchange and sell farm-saved seeds and propagating material. Furthermore, a new resolution of the ITPGRFA has invited contracting parties to consider reviewing and, if necessary, adjusting those national policy measures affecting farmers' rights under Article 9, i.e. commitment to protect and promote their implementation.

However, understanding farmers' rights, and the modalities for their implementation, is still not clear and is still being debated at global and national levels. The situation became clearer after a resolution was passed during the Third Session of the Governing Body of the ITPGRFA, under Agenda item 14, acknowledging the uncertainty regarding how to implement farmers' rights, and recognizing that the challenges related to obtaining farmers' rights are likely to vary from country to country.

We in general understood from the farmers in CBM project sites that they perceive farmers' rights as 'the pre-conditioned rights on their own crop varieties and its associated landscape to meet the quality standard of life for present and future generations'².

At same time, how we define the term 'farmers', in Brazil, is probably an issue for debate and a common consensus is required owing to the vast divide between the highly commercial and subsistence contexts. Visiting the various sites, the same question was raised, regarding how we can ensure the rights of farmers in Imbituba, where they do not have any land rights, and in Porteirinha, where the farmers hold over 50 ha of land? The right to land creates a dilemma that is intrinsically associated to farmers' rights in Brazil. Important, key issues in this debate include: how small-scale farmers can be empowered to have easy access to quality seeds of the traditional varieties desired; mechanisms for safeguarding farmers' varieties and associated traditional knowledge from possible misappropriation; technology transfer; and financing mechanisms.

In this diverse context, CBM as collective methodology where farmers make collective decisions in a process that follows through with the conservation and use of their dynamic plant genetic resources, could be a model project to exercise farmers rights' in Brazil. In a national context, no formal public policy exists on implementing farmers' rights. However, several CBM practices, such as participatory plant breeding and seed banks could be considered mechanisms for exercising farmers' rights (Santilli, 2009). We consider this project to have paved the way towards obtaining farmers' rights in Brazil. The uniqueness of this project facilitates the development of a model on implementing farmers' rights, as follows:

² Note that the wording of this is phrased by the authors of the report, based on their informal discussion with farmers.

- i) Wide-coverage of the major agro-ecosystems of the country in CBM sites means that CBM is highly exposed to the diverse historical, cultural, and political contexts of farmers.
- ii) Participation of landless farmers, wealthy farmers and traditional communities in the management of local crop genetic resources.
- iii) The development, in the field, of several participatory practices, such as diversity kits, seed fairs and participatory plant breeding, contributing to seed security, food sovereignty and making farming communities more self-reliant in their management of local crop diversity.
- iv) Collective action of public and non-governmental sectors to empower farming communities. There is a unique sense of partnership between formal programmes (Embrapa, Epagri), academics (UFSC), local government (municipalities), extension services (Emater, Epagri), civil society organizations, farmers associations and several others.
- v) Global linkages and partnerships with other leading countries that have been exposed to farmers' rights. The government of India was the first to develop a national law on farmers' rights with the "Protection of Plant Varieties & Farmers Rights Authority (PPV&FR Authority). The law provides for farmers to register their varieties (which must have a certain degree of uniqueness and stability) and obtain rights over them. In Nepal, several practices of CBM, for instance, participatory plant breeding, community biodiversity registers, community seed banks and community biodiversity funds, have been studied for possible development as mechanisms to implement farmers' rights.

In conclusion, our reflection is that even though the project has advantages, and opportunities, for developing formal mechanisms to implement farmers' rights, stakeholders have yet to identify this as a priority.

16. Relation between customary rights and custodianships

Customary Rights:

Customary rights are one of the major institutional components for achieving the sustainable use and management of biological diversity and the equitable distribution of the benefits from its use. Development interventions that fail to acknowledge customary rights can have serious implications on traditional management and knowledge systems and their sustainability, as well as on cultural integrity and welfare. Even though CBM is an autonomous practice, which is developed within the framework of farmers' livelihoods, the influence of external agents should be carefully considered to ensure the promotion of existing customary rights. We observed that exercising customary rights may be applicable to all CBM project sites but Iratí deserves special attention. For many years, the traditional faxinal communities have been harvesting yerba-maté leaves and *araucaria* fruits, and rearing particularly rare pigs, guided by customary rights. Within their territorial communal land, the cultivation of crops is forbidden. In some cases there have been external influences to cultivate the crops and this has resulted in violent conflicts.

Custodianship:

Individual farmers who maintain specific plant genetic resources and have related knowledge concerning its management can hold custodian rights. For example, throughout the project sites, we discovered that female farmers hold enormous knowledge concerning the conservation of local seeds. Farmers in Imbituba hold knowledge on how to produce Butiá fruit juice. They have also developed an autonomous practice of cultivating cassava in a complex common land system which includes mixtures of many varieties of the two cassava types (aipim and manioc). The aim of this custom to mix varieties is to protect their crop harvest from possible theft. Only the local farmers know how to distinguish the varieties. Though there is no proper documentation regarding such custodianship in the CBM project sites, we can assume that several examples can be found once they are studied in detail. Our short visits have shown that these custodians are partially embedded in collective processes but their full potential has yet to be explored. Another important issue is how we can facilitate the development of mechanisms to protect custodians' rights through public-policy regimes.

Guardianships:

We observed that guardians play an important role in maintaining a rich local crop-diversity and hold a wealth of knowledge on managing local genetic resources. They can be considered informal genebanks. However, guardianships is now under threat in Brazil, mainly because of the social-economic pressures resulting in a generation gap for continuing the guardianships. On other hand, existing guardianship moves in an individualistic way. The national PGR programme has not yet formalized public policies to recognize the role and reward the guardians. In this context, CBM as a process can play a facilitating role to fill these gaps. A study to carry out an inventory of crop diversity and document traditional knowledge held by guardians is the most immediate priority. At the same time, a challenge will be to explore how these guardians can be embedded in the collective process. These guardians can play an intermediary role between the formal genebank and the informal farmers' seed systems.

17. CBM and access and benefit-sharing over genetic resources

Brazil ratified the Convention on Biological Diversity (CBD) in 1998. Access and benefit-sharing (ABS) is regulated by a provisional act (MP2186-16), through the Ministry of Environment. ABS was first regulated by a provisional act in 2000, which was replaced in 2001, by another provisional act ("Medida Provisória nº 2186) and a Decree (Decreto nº 3.945/2001). Following this Decree no other law related to ABS has been passed, but the country has developed mechanisms within the sphere of legislation. Access mechanisms are well established: prior informed consent is required; a part of the sample must be deposited in a reliable institution; and if there is any potential economic benefit from the material or information, a contract of use and benefit-sharing must be signed. The benefit-sharing can be achieved through sharing profits; the payment of royalties; access and technology transfer; free licensing of products and processes; and even human resources training. To harmonize ABS with the CBD, the ITPGRFA has provisions for accessing plant genetic resources (through a standard multilateral transfer agreement) and benefit-sharing mechanisms through a global fund.

CBM as a methodology has been contributing to an increase in the capacity of each community to manage their local genetic resources. Many CBM practices contribute towards an increase in access to, and choice of, genetic resources, within and between the communities. This access mechanism is promoted through various CBM practices, such as a local seed fair, diversity blocks of traditional crops, participatory varietal selection in maize and rice, and the organization of awareness-raising programmes. All the practices are implemented in informal and, in some instances, collective ways. During discussions with farmers we realized that they have not yet fully understood the concept of having a formal mechanism for accessing genetic resources at community level.

To harmonize the various CBM practices with the ABS law, suitable mechanisms should be developed within communities. An important component of ABS is the documentation of local varieties and traditional knowledge, which will provide a legal basis for regulating access and, in case of commercialization, the equitable distribution of any benefits. However, we could not identify any mechanisms that would facilitate the documentation process in the CBM project sites. This is an immediate priority for facilitating the implementation of ABS at community level. CBM experiences in Nepal could be used as a reference for designing such a provision. The draft bill of the ABS law in Nepal has endorsed the development and use of Community Biodiversity Registers for documenting genetic resources and traditional knowledge. These registers are managed by farmers. Similar registers could be community-friendly in a Brazilian context as well. Another priority is developing community-friendly mechanisms for prior informed consent that are consistent with existing national systems, and building relevant capacity at community level.

Access mechanisms have implications on how we develop equitable benefit-sharing mechanisms since rights over biodiversity and the source of origin are complex social, political and ecological/geographical issues. In the field, CBM has been promoting some monetary benefits for project farmers, such as value-addition of cassava crops, the sale of local seeds (not for large-scale, commercial purposes) and the sale of local food products. Furthermore, we observed that non-monetary benefits have also been provided to project farmers, through CBM initiatives, such as training and capacity-building; and technology transfer in seed production, breeding and selection. The universities (UFSC), Embrapa, Emater, and associations, are important stakeholders who provide

such services. However, these are all experiences based on individual CBM practices and a collective and sustainable mechanism is severely lacking in the CBM sites.

In comparison to the CBD's benefit-sharing mechanisms, the ITPGRFA mechanism has progressed and the ITPGRFA Secretariat has already announced the second round of calls for proposals. However, there have already been a number of criticisms related to easing mechanisms of access and setting priorities for this fund. Small-scale farmers have been disempowered with regards to accessing such a fund, since they would need to go through a complex, bureaucratic process and would require sophisticated, technical skills to write proposals. As such during the first round, funding is given mainly to *ex situ* conservation and government research institutes and this undermines *in situ* conservation.

In this context, CBM can play an important role in devising a farmer-friendly, benefit-sharing mechanism that promotes *in situ* conservation and enhances the livelihoods of small-scale farmers. Establishing a biodiversity trust fund, possibly at municipal level, could play a pivotal role in attracting sufficient interest at national level. However, this needs further study, consultations and harmonization with existing national provisions under the CBD and the ITPGRFA.

18. CBM, empowerment and *in situ* conservation

Throughout our exchange programme we witnessed the existence of positive linkages between CBM, empowerment and *in situ* conservation. CBM as a methodology for empowering communities is in its initial stage in sites like Tavares and Porteirinha. We witnessed the power of the CBM process to socially empower communities in Imbituba, Guaraciaba and Iratí. CBM has led to economic empowerment in Guaraciaba where the cost of cultivation decreased in using local seeds of varieties identified through participatory varietal selection. Perhaps legal empowerment is less focused in the CBM sites and thus communities appear to be less empowered for dealing with legal issues related to plant genetic resources.

We explored CBM, looking at the achievements of the CBM components. In the Brazilian context, there has been a successful raising of awareness in the communities as well as among participating institutes. However, we were unable to meet with policy-makers in order to understand the level of commitment to implement CBM beyond research organizations and local communities engaged in the process. Understanding local biodiversity, and the documentation of local varieties/land races/traditional knowledge is being achieved in terms of community-awareness but projects can facilitate the exchange of the experiences with Community Biodiversity Registers in other CBM countries, like Nepal and India. There is a huge disparity between sites with regards to the capacity-building of local institutions. For instance, farmers in Guaraciaba have developed a technically-robust PVS and seed production process, while in the Iratí, capacity-building has not yet started, maybe because of the different context and different priorities. No formal institutional modalities have been established to conduct CBM at local level and, in many instances, the influence of external agents play pivotal roles, such as in Porteirinha and Guaraciaba.

We generally agreed that CBM, *in situ* conservation and empowerment are interlinked, and as such CBM can only be achieved in a dynamic process. However, there is the curious case of guardians that may not completely fit into this model. Guardians are the main, “individually empowered elements” involved in the *in situ* conservation of genetic resources. They are not a part of the CBM process as the decisions made, and the conservation actions taken, are not collective. However, we recognize that these guardians could act as a starting point for the CBM processes. When guardians distribute the seeds of important local landraces, the process itself will empower the communities in their biodiversity management. This could potentially snow-ball into major empowerment and could lead to a CBM process. Perhaps this case could be viewed as a novel idea emerging from the exchange process.

In addition, we also identified a novel driver for empowerment *and* CBM. The tragic situation in Imbituba - competing claims for land; urbanization and industrialisation versus conservation and small-scale farmer livelihoods - and the ill-effects of the green revolution in Guaraciaba, could potentially trigger self-recognition and self-organizing activities leading to CBM processes. This can perhaps be seen as a novel link, identified in the exchange programme in Brazil, for stimulating CBM processes in India and Nepal.

19. General synthesis

The general reflections of the group on CBM, and its meaning in the Brazilian context, are outlined below:

- CBM as a means of empowering communities in the conservation of plant genetic resources is slowly gaining importance in Brazil. CBM activities in Brazil are inspired by achievements in India and Nepal, but because of the dissimilar situations, CBM as methodology has to develop its own pathway in Brazil.
- The ways to adapt, or rather develop, CBM within the Brazilian context, are greatly influenced by the history of colonization, the mosaic of ethnicity prevailing in the country, and the fact that Brazil became a democracy, in which the community can freely organize themselves, little more than two decades ago.
- The team strongly felt that the central axiom of CBM in the Brazilian context should be ‘to include all sections of this mosaic society (including indigenous people) and bring them all together in the main stream of empowerment’.
- We identified the basic drivers for CBM activities, and the empowerment process, as being similar in India and Nepal. Land issues; the ill effects of modern/intensive production systems; food insecurity; the undermining of ethnic rights; and social inequality, are likewise drivers for CBM and empowerment in Brazil.
- Issues of benefit-sharing and fair and equitable distribution possess system-building problems.
- Globally recognized issues such as ‘farmers’ rights’ are complex and greatly influence the CBM processes, even in the local context, in Brazil.
- Brazilians are open to innovations, independent of their origin, and as such any new ideas that could be used in the empowerment process, from any part of the globe, will be accepted by the Brazilian community as long as they address local issues. This openness was exemplified by the diversity kit, which was adapted to the local context in Guaraciaba, and this version of the diversity kit is now again ready for its return journey, to be re-introduced in Nepal.

Newer insights on exchange practices:

- Seed bank: The idea of having a seed bank inside the community is a very good way of ensuring food security. This idea was shared with all the Brazilian study sites.
- Diversity kit with flyers: The idea for the kit started in Nepal and was well accepted in Brazil (Guaraciaba). Now, more varieties and flyers have been added to the kit, and it has been linked to the issue of sovereignty over food and genetic resources. Community members learn to cultivate those species, and some knowledge about them, as means to enhance their sovereignty. This experience now can be started in other countries.
- Biodiversity register: The experiences of CBM in Nepal, in setting up a biodiversity register, can be easily replicated in Brazil, and we should start to think about how to document the knowledge of the guardians and other farmers.
- Food fair: The food fair was implemented in Tavares and the farmers adopted the practice really well.

Suggestions and future strategies for the CBM study partners:

- Farmers need their own legal entity, at community level, to manage CBM practices. Empowering such local institutions will lead to future sustainability.
- Brazil has suffered a massive loss in indigenous knowledge. It is therefore very important that a special CBM process be started to revive the 'relict form of indigenous knowledge' that is present in about 1 million indigenous people. It is essential that the process be initiated as soon as possible as indigenous knowledge is fading very fast among the elderly generation of indigenous people.
- The focus on native forest species, both from the point of CBM processes and for their *in situ* conservation, needs to be extended. The link between CBM and the management of forest landscapes could be a research topic.
- CBM as a methodology can facilitate the implementation of ABS and farmers' rights, through empowering local communities and developing several community practices. Therefore, experiences from India, Nepal and other countries might be of relevance for the Brazilian context.
- Efforts should be undertaken to recognize the guardians and their linkage with CBM.