



Seventh framework programme  
Food, Agriculture and Fisheries, and Biotechnology

Specific International Co-operation Actions  
Small or medium scale focused research project



# Sweet Sorghum an alternative energy Crop



**SWEETFUEL / Grant Agreement n° 227422**

**WP8**

**Deliverable 8.9:**

*Ex ante analysis of ethical issues in  
Sweetfuel*

*Marcel Bursztyn* – consultant for ethical issues

Composition of the consortium

**CIRAD**

ICRISAT

EMBRAPA

KWS

IFEU

UniBO

UCSC

ARC-GCI

UANL

WIP

## **SweetFuel Project**

### **First Report on Ethical Implications**

**July 30, 2009**

Prof. Marcel Bursztyn<sup>1</sup>  
Independent consultant for ethical issues

Ethical issues concerning SweetFuel Project have been discussed during the KO Meeting, on March 16-18, 2009. All members of the Consortium were informed about both the EC demand for the inclusion of such aspect as a question to be considered thru an independent approach to the project, and the strategy to deal with it along the whole research process.

As a follow-up to the meeting, two documents were sent to all members:

1. a questionnaire aiming at an initial overview of the perceptions of the members on the ethical implications of their work, as a way to ENABLE a baseline view on the subject; and
2. a model for a Consent Form to be applied to the stakeholders involved in the research, in which some overall information about the Project is provided (as presented in the Annex, at the end of this report).

Among the members of the Consortium, five have answered to the first document (questionnaire). Their views and opinions are presented in the following pages.

Comments:

1. My first impression is that the inclusion of ethical issues as a matter to be part of the process and not only just an episode has been a surprise to the researchers involved with the Project. However, it seems that they have understood and assimilated the idea.
2. By analyzing their answers, it becomes clear that their initial view is rather unworried about ethical risks.
3. The possibility of conflicts food vs. fuel is understood as a minor issue, possible to be avoided.
4. In cases such as Brazil (in spite of the non response to the questionnaire) it is clear that most of the ethical implications (such as property rights) tend to be inexistent, as sweet sorgum is not an usual crop in the country.

Some aspects pointed out by teams leaders deserve to be highlighted:

---

<sup>1</sup> University of Brasilia - Center for Sustainable Development  
Email: [marcel@unb.br](mailto:marcel@unb.br)

1. A huge effort will have to be put in place to ensure that the developing farmers in extended rural areas have access to the knowledge which will come forth from this Sweetfuel Programme. – South Africa
2. A quota system will have to be in place to ensure that all farmers get his rightful opportunity to enter the market. – South Africa
3. Disposal of secondary products from the ethanol factory, such as melass and bagass than can contaminate water streams if no actions are taken before a safe disposal for these products – Mexico
4. Risks of sweet sorghum adoption for food/feed production are minimized if the crop is grown on marginal and degraded lands. For the cultivation of sweet sorghum on agricultural lands thorough assessment and comparison with existing land use for food and feed production shall be performed. Policymakers shall be informed about risks and opportunities of sweet sorghum production. Germany
5. Cultivation of sweet sorghum monocultures poses a risk for biodiversity. – Germany
6. As the sweet sorghum gives more biomass than grain sorghum, it require more water and nutrients. Presently, in the pilot sites farmers are growing sweet sorghum under rainfed conditions like grain sorghum. However, under post rainy season sweet sorghum would have to be grown under supplemental irrigation. Environmental implications of growing sweet sorghum need to be studied in detail. - India

Finally, a recommendation: strategies of payment for licenses, as suggested by the Indian team, should be a matter to be discussed in the general body meeting.

# SweetFuel Project

## Ethical Issues – *ex ante* analysis

Prof. Marcel Bursztyn  
Independent consultant for ethical issues  
April, 2009

As agreed in the KOM at Montpellier (16-18 March 2009), I am now presenting the initial questions concerning the elaboration of the baseline report on ethical implications of the SweetFuel Project - SFP.

I would appreciate if you could spend a few minutes in order to state your views on some of the aspects that have been raised during our meeting. Your responses will be compared with those provided by the other members of the consortium and will serve as reference to:

- (i) understand the state of the art of the ethical implications foreseen for the SweetFuel Project, in order to guide ongoing adjustments in the research process;
- (ii) orient the final verification of the actual impacts;
- (iii) provide guidelines to recommendations to be made to decision makers about the adoption of the results reached by the consortium, especially those concerning environment and agricultural policies; and
- (iv) the presentation of an analytical report identifying potential risks to the EU, as part of the formal obligations of the Project.

Please express your views, no matter if they are affirmative statements or just doubts, in a direct and concise way.

### 1. SOUTH AFRICA

1. Do you see the risks/opportunities from the adoption of the results of SFP on the actual production of **food** (for people) or **feed** (for animals)? Which? How to prevent or mitigate them?

In South Africa sweetstem sorghum (SSS) will not be utilized as a food crop as such. Only if and when a dual purpose cultivar is developed the majority of people might plant it and then land for foodcrops might be utilized.

Presently SSS is used for feed, especially dairy farming. The majority of people in rural areas are developing farmers and can utilise SSS bagasse for grazing and silage.

2. How do you see the risks/opportunities of the adoption of the results of SFP on the **employment** and local **income**? How to mitigate the negative effects?

When the industry is running a lot of job opportunities will be created which will lower werkloosheid.

Risk at the moment is that initially there will not be adequate facilities for syrup extraction and ethanol production.

A system will have to be developed to avoid the “overflooding” of the market with SSS producers in excess of the ethanol production capacity. Avoid the problem of farmers with a product with a limited market – especially in production areas where irrigation/high rainfall is available.

The mitigation thereof can be through the development of a strong ethanol-gel market.

How will the newly developed cultivars’ seed be distributed – what about IP and royalties ? (eg. ICRISAT supply seed for free as long as you become a member of their institute / ARC and KWS claim royalties).

What will the price of the seed be ? When it is multiplied by private companies - the seed will be expensive and not to the dispensation of all the farmers. Should subsidies be investigated ?

Will seed companies be prepared to sell the seed at different prices to different levels of development of the farmers?

If the consortium develop the seed then the consortium will be the license holder – what about the beneficiaries position ?

3. Are there, according to your view, implications concerning **environmental** assets (soil, water, air etc)? Which?

The gel industry can replace paraffin through which a cleaner burning fuel can be supplied to the especially people in rural areas whom are using non-electrical appliances for heaters and stoves for food preparations. A healthier environment can be the result.

Grasslands might be utilized for sweet stem sorghum production when it becomes a more viable proposition for farmers. The livestock fodderflow in South Africa can be jeopardized, which will have an effect on food security.

4. In spite of respecting the Convention of Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO), do you see any risk concerning:

- the **repartition of benefits?**

The producers of ethanol will get a higher income than the producers of the sweet stem sorghum.

Due to telecom and financial constraints the rural area might not receive the necessary information to get involved in sweet stem sorghum production.

People involved will most likely be the people who will gain information and therefore benefit from this programme.

- the unfair appropriation of **local knowledge**?

A huge effort will have to be put in place to ensure that the developing farmers in extended rural areas have access to the knowledge which will come forth from this Sweetfuel Programme.

National and Provincial extension officers will have to be trained to disseminate the knowledge to the relative stakeholders. They have the mandate to do such work, but the training will have cost implications

- challenges to **social and cultural patterns** at the level of the communities that originally cultivate sweet sorghum?

Ways and means will have to be developed to put developing farmers in a position to adapt to new agricultural practices forthcoming from the Sweetfuel Programme to ensure high quality sweet stem sorghum production needed for the ethanol industry. It will have an effect on their social and cultural pattern, due to the fact that most developing farmers are still using very primitive ways of agricultural practices.

Cultural differences exist in how the farmers apply agricultural practices to produce sorghum. To acquire a uniformed product for the ethanol industry will be a major challenge and an expensive exercise.

Value adding will have to be investigated to make the industry more viable for farmers to get involved. Clean burning ethanol or gel can be utilized in lamps in houses for decorative purposes, apart from the daily use to supply heat and processing food.

5. Do you think precautions should be adopted within SFP in order to prevent further risks when the results of the research will be **disseminated**? Which?

A regulated market will have to be implemented to control the demand and supply, to prevent over production of raw material which the industry cannot process in time.

A constraint on growing will have to be implemented.

A quota system will have to be in place to ensure that all farmers get his rightful opportunity to enter the market.

A very clear policy will have to be in place regarding the “blending-in” of ethanol into fossil fuels.

Precaution will have to be taken that this project does turn out to be a project where only a selective few involved will benefit.

6. How do you see the idea of disseminating the new material according to different strategies of payment for **licenses** considering the level of development of each user? Do you think this issue is clear and precise enough to all partners, and will be clear for those who will collaborate (directly or indirectly) with the SFP?

Owners of ethanol producing industries will have to contract specific farmers whom can meet the specific ethanol refinery’s needs.

A specific document will have to drawn up to indicate how the flow of money will be executed.

A clear document on who will benefit will have to be drawn up.

What will happen if the movement in the Bio-ethanol industry is very slow ?

In South Africa there is at present no policy document in place regarding the biofuel – ethanol production industry.

Where will this Sweetfuel Programme ends – identifying the best cultivars / breeding new cultivars / producing ethanol / involved in “blending – in” process ?

Whether the biofuel – ethanol shows to be a viable proposition, the implementation and success of such a programme will depend on the government of the day.

The ARC will have IP queries regarding the dissemination of the information and seed developed by the ARC during the extend of the Sweetfuel Programme.

## 2. MEXICO

In the following comments I am trying to answer the questions regarding to the Ethical issues to the *ex ante* analysis. I am going to consider only what I know for México.

1. Do you see the risks/opportunities from the adoption of the results of SFP on the actual production of food (for people) or feed (for animals)? Which? How to prevent or mitigate them?

Sorghum in Mexico is used only for feed. The adoption of the result of SFP will help to increase productivity in some areas which are not being used now due to the low profitability of the common crops such as corn, soybeans and vegetables such as green pepper, tomato, onions, etc. This low profitability is because these crops need to apply high inputs which farmers can not afford to do it. Sorghum is a crop less sensitive to high inputs and in some areas can grow well even under dryland conditions, where the precipitation is good enough for the crop.

During the dry season the sorghum crop can compete with other crops for irrigation water; however, by using drip irrigation or other irrigation systems more efficient than the flooding irrigation (used in almost 90 % of the area) can avoid such disadvantage.

One of the opportunities that I see by using sorghum is that some areas that use to be for crop production and because of the low profitability, these areas were abandoned, could return them to the crop production. Another aspect is that by growing sweet sorghum there are more choices for the farmers to grow a crop in their land.

2. How do you see the risks/opportunities of the adoption of the results of SFP on the employment and local income? How to mitigate the negative effects?

In Mexico, sweet sorghum can be grown as a raw material for the ethanol industry only. If that is going to happen, then farmers can be considered as a employees of the ethanol industry, by establish a “contract” between them and the industry to provide the sweet sorghum. If that happen then the farmers can get a more stable situation because the market for their product will be safe. And if the ethanol price rise then the chances to get more income will be available. The ethanol industry will have an impact in the local community because other kind of jobs will open and more opportunities for local people. These jobs will related with the industry such as workers in the factory, drivers to move the raw material from the fiel to the factory, workshops to repair tractors and vehicles, agroindustry, etc.

3. Are there, according to your view, implications concerning environmental assets (soil, water, air, etc.)? which?

The environmental concerns are more related with: 1) high fertilization to produce high yielding crop; fertilizer than can contaminate soil and deep water sources, 2) disposable of secondary products from the ethanol factory, such as melass and bagass than can contaminate water streams if no actions are taken before a safe disposable for these products and 3) if a electricity cogeneration is considered by burning the bagass, then some environmental concerns will be on air pollutions.

4. In spite of respecting the Convention of Biological Diversity and the International Treaty on Plant Genetics Resources for Food and Agriculture (FAO), do you see any risk concerning:
  - a) The repartition of benefits? I do not see any risk for Mexico in this crop.
  - b) The unfair appropriation of local knowledge. I do not see any risk for Mexico in this crop.
  - c) Challenges to social and cultural patterns at the level of the communities that originally cultivate sweet sorghum. I do not see any risk for Mexico in this crop.
5. Do you think precautions should be adopted within SFP in order to prevent furthers risks when the results of the research will be disseminated? Which?

The new varieties should be wide adapted in order to have the same genotype for a wide range of environments. With this farmers in a particular region, will have to grow the same genotype, this can prevent to change genotypes more frequently among farmers because all will use the same genotype. If more than one genotype are grown, farmers will tend to change varieties by knowing that his neighbour get better yield in one year than he one he got.

The new varieties should be good for the purpose of the ethanol production in the factory otherwise the varieties will be rejected by them to keep growing the sweet sorghum.

6. How do you see the idea of disseminating the new material according to different strategies of payment for licenses considering the level of development of each user? Do you think this issue is clear and precise enough to all partners, and will be clear for those who will collaborate (directly or indirectly) with the SFP?

I agree with this idea and the payment for licenses should consider the level of the development of each user? But it is important to be sure who will be the user, the farmer? or the industry that will buy the crop to the farmer?. If the farmer will use part of the crop and then sell the rest to the factory, then the farmer will be the user; however, the farmer just grow the crop and sell it to the factory, then the factory will be the user.

I think the issue is clear and precise to all partners or at least it should be.

### 3. GERMANY

#### Comments on Ethical Issues by Partner WIP Renewable Energies

1. Do you see the risks/opportunities from the adoption of the results of SFP on the actual production of **food** (for people) or **feed** (for animals)? Which? How to prevent or mitigate them?

#### *Comments*

- Adoption of the results of SFR (i.e. improved sweet sorghum varieties) on poor soils and in drought prone areas will provide opportunities for enhanced food and/or feed production, as these lands are often currently not used for food/feed production.
- For production of sweet sorghum on agricultural lands thorough assessment and comparison with existing land use for food and feed production has to be performed. Sweet sorghum should only be cultivated if not causing major impact on food/feed production.
- Land use in developing countries will be crucially influenced by market forces and policies in place (e.g. policies providing priority of food production). Results from the SFP shall be used to enable policymakers to take informed decisions to guarantee sufficient food production.
- As “dual-purpose” crop sweet sorghum can be used for fuel AND food production, and the residues may be used as feed. Therefore, in general the risks linked to sweet sorghum cultivation are regarded to be lower than for other energy crops.

#### *Recommendations*

- Risks of sweet sorghum adoption for food/feed production are minimized if the crop is grown on marginal and degraded lands.
- For the cultivation of sweet sorghum on agricultural lands thorough assessment and comparison with existing land use for food and feed production shall be performed.
- Policymakers shall be informed about risks and opportunities of sweet sorghum production

2. How do you see the risks/opportunities of the adoption of the results of SFP on the **employment** and local **income**? How to mitigate the negative effects?

### *Comments*

- Adoption of the results of SFR (i.e. improved sweet sorghum varieties) on poor soils and in drought prone areas will provide opportunities for employment and local income.
- For production of sweet sorghum on agricultural lands comparison with existing land use for food and feed production has to be performed. Sweet sorghum should only be cultivated if contributing to increased employment and local income.
- Results of the SFP need to be available for all potential users, with priority and beneficial conditions provided for smallholder farmers.
- If cultivating sweet sorghum for ethanol production for export, care needs to be taken to ensure sufficient local value creation. Foreign owned large monoculture structures pose risks for employment and local income.
- It has to be ensured that no undue dependencies of local farmers from seed providers are created.

### *Recommendations*

- Elaboration of a dedicated Exploitation Plan providing priority and beneficial conditions for smallholder farmers.
- Promote sweet sorghum adoption on marginal and degraded lands.
- Support policies that avoid large monocultures for export with little local value creation.
- Support policies that avoid undue dependencies of local farmers from seed providers.

3. Are there, according to your view, implications concerning **environmental** assets (soil, water, air etc)? Which?

### *Comments*

- Cultivation of sweet sorghum monocultures poses a risk for biodiversity.
- Cultivation of sweet sorghum on marginal and degraded soils (e.g. cerrado) may also cause a reduction of biodiversity and the soil carbon content.
- The lower use of water and fertilizer for sweet sorghum cultivation (as compared with other crops) may reduce the pressure on soil and water resources.
- Processing sweet sorghum for ethanol production may cause water pollution problems.
- Environmental sustainability criteria for feedstock used to produce biofuels to be exported to Europe will be governed by the new EU RES Directive. Thereby, minimum environmental standards are set.

- Furthermore, most developing countries have in place environmental legislation. However, often the enforcement of this legislation needs to be improved.

### ***Recommendations***

- Allocate a sufficient percentage of land (also for marginal and degraded land) to be excluded from cultivation. Thereby, biodiversity losses can be minimized.
- Promote the enforcement of existing environmental legislation.

4. In spite of respecting the Convention of Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO), do you see any risk concerning:

- the **repartition of benefits?**
- the unfair appropriation of **local knowledge?**
- challenges to **social and cultural patterns** at the level of the communities that originally cultivate sweet sorghum?

### ***Comments***

- see comments under 2.
- Monocultures need to be avoided and smallholder farmers need to be involved in order not to cause negative impacts on community patterns.
- The risk of exploiting local knowledge (including existing varieties) for the benefit of large international players has to be minimized.

### ***Recommendations***

- Elaboration of a dedicated Exploitation Plan providing priority and beneficial conditions for smallholder farmers.

5. Do you think precautions should be adopted within SFP in order to prevent further risks when the results of the research will be **disseminated**? Which?

***Recommendations***

- There is the need to adopt precautions to prevent risks!
- Elaboration of a dedicated Exploitation Plan providing priority and beneficial conditions for smallholder farmers.

6. How do you see the idea of disseminating the new material according to different strategies of payment for **licenses** considering the level of development of each user? Do you think this issue is clear and precise enough to all partners, and will be clear for those who will collaborate (directly or indirectly) with the SFP?

***Recommendations***

- Different strategies are needed to disseminate new material to smallholder farmers and to large-scale commercial users!
- If possible the material shall be given for free to smallholder farmers, whereas licenses should be given to large-scale commercial users.
- Details to be presented in a dedicated Exploitation Plan providing priority and beneficial conditions for smallholder farmers.
- Continuous information and involvement of all partners is needed on this issue. All dissemination means (newsletter, info mails) shall be used.

#### 4. INDIA

1. Do you see the risks/opportunities from the adoption of the results of SFP on the actual production of **food** (for people) or **feed** (for animals)? Which? How to prevent or mitigate them?

The risks are minimum and opportunities are plenty. The adoption of sweet sorghum in traditional grain sorghum areas should have negligible effect on food production i.e. grain yield. Secondly, the bagasse after extraction of juice from the stalk is still a nutritive animal feed for animals and thus contributes to feed security. The preliminary results from on-station crop experiments at ICRISAT-Patancheru and on farm pilot scale testing of sweet sorghum indicated comparable grain yields and use of bagasse after extraction of juice for animal feed in Medak district of Andhra Pradesh.

2. How do you see the risks/opportunities of the adoption of the results of SFP on the **employment** and local **income**? How to mitigate the negative effects?

Based on data from on-station experiments it is found that sweet sorghum cultivation is more profitable and leads to 23% higher returns compared to grain sorghum. Preliminary on farm trials indicate that the stover/ bagasse is equally palatable to the livestock compared to sorghum stalk. Sweet sorghum production is more labor intensive and the extraction of juice and conversion into ethanol promotes employment generation directly and indirectly. In areas where farm labor is in short supply mechanization of key operations related to SFS production needs to be looked into and options identified. Since the crushing capacity would be limited staggered sowing as well as planting cultivars with varied maturity periods has to be looked into to increase the harvest window.

3. Are there, according to your view, implications concerning **environmental** assets (soil, water, air etc)? Which?

As the sweet sorghum gives more biomass than grain sorghum, it require more water and nutrients. Presently, in the pilot sites farmers are growing sweet sorghum under rainfed conditions like grain sorghum. However, under post rainy season sweet sorghum would have to be grown under supplemental irrigation. Environmental implications of growing sweet sorghum need to be studied in detail.

4. In spite of respecting the Convention of Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO), do you see any risk concerning:

- the **repartition of benefits**?

No

- the unfair appropriation of **local knowledge**?

No

- challenges to **social and cultural patterns** at the level of the communities that originally cultivate sweet sorghum?

Sweet sorghum production would involve linkages with the industry and input suppliers etc and the crop would have to be grown on commercial lines. For some small scale farmers this would be a new way of farming but is not an issue since past experience indicates that farmers adapted to commercial production of vegetables, fruits etc from purely subsistence oriented production. Preliminary pilot scale testing of sweet sorghum also corroborates this aspect.

5. Do you think precautions should be adopted within SFP in order to prevent further risks when the results of the research will be **disseminated**? Which?

The required precautions have already been integrated in the different work packages of the SFP. For instance on farm demonstration trials are to be undertaken before commercialization.

How do you see the idea of disseminating the new material according to different strategies of payment for **licenses** considering the level of development of each user? Do you think this issue is clear and precise enough to all partners, and will be clear for those who will collaborate (directly or indirectly) with the SFP?

This aspect may be required to be discussed in the general body meeting.

## 5. ITALY

1. Do you see the risks/opportunities from the adoption of the results of SFP on the actual production of **food** (for people) or **feed** (for animals)? Which? How to prevent or mitigate them? *No I don't.*
2. How do you see the risks/opportunities of the adoption of the results of SFP on the **employment** and local **income**? How to mitigate the negative effects? *I don't see any risks or negative effects.*
3. Are there, according to your view, implications concerning **environmental** assets (soil, water, air etc)? Which? *The replacement of intensive crops such as maize with sweet sorghum may entail positive environmental effects due to minor water and fertilizer requirements of sweet sorghum.*
4. In spite of respecting the Convention of Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO), do you see any risk concerning:
  - the **repartition of benefits**?
  - the unfair appropriation of **local knowledge**?
  - challenges to **social and cultural patterns** at the level of the communities that originally cultivate sweet sorghum?

*No, I don't*

5. Do you think precautions should be adopted within SFP in order to prevent further risks when the results of the research will be **disseminated**? Which?

*No, I don't*

6. How do you see the idea of disseminating the new material according to different strategies of payment for **licenses** considering the level of development of each user? Do you think this issue is clear and precise enough to all partners, and will be clear for those who will collaborate (directly or indirectly) with the SFP?

*Overall, I think it is quite clear but possibly it could need further explanations to collaborators with the SFP.*

## ANNEX

### Consent Form

Researcher's Copy  
 Participant's Copy

Project "Sweet sorghum: an alternative energy crop"

SWEETFUEL

Sweet sorghum, as a source of either fermentable free sugars or lignocellulosics, has many potential advantages, including: high water, nitrogen and radiation use efficiency; broad agro-ecological adaptation; rich genetic diversity for useful traits; and the potential to produce fuel feedstock, food and feed in various combinations. Fuel-food crops can thereby help reconciling energy and food security issues.

This project will breed for improved cultivars and hybrids of sorghum for temperate, tropical semi-arid and tropical acid-soil environments by pyramiding in various combinations, depending on region and ideotype, tolerance to cold, drought and acid (Al-toxic) soils; and high production of stalk sugars, easily digestible biomass and grain. Molecular-genetic and physiological breeding support as well as agro-ecological adaptation and sustainable practices are developed by 2 specific work packages. Other WPs provide for integrated technology and impact assessments including economics, dissemination and coordination.

The Consortium is composed of 10 members from France (leader), Italy, Germany, Brazil, India, Mexico and South Africa, including a seed company. Research involves

structured participation of stake holders, including policy makers. The project is co-financed by partners and European Union, and will last 5 years.

Project outcomes will be new germplasm, sustainable practices and commodity chain concepts adapted to each target region. Such plant material will be available in the market through licenses with variable levels of royalties, based on the degree of economic development of each country. Rural populations in developing countries will benefit from preferential rates, while full rates will be applied to those economically developed.

You have been chosen to collaborate with this research and we wish to have your consent. For your participation in the study we expect \_\_\_\_\_.

Your participation in this study is purely voluntary, and you may withdraw your participation or your data at any time without any penalty to you.

I have read the description of this study, my questions have been answered, and I give my consent for my family to participate.

Signature \_\_\_\_\_

Name (printed): \_\_\_\_\_

Local/Date \_\_\_\_\_

**Note:** *Both the researcher and the participant should receive a signed copy of the consent form.*

Questions about this study should be directed to Serge Braconnier, [serge.braconnier@cirad.fr](mailto:serge.braconnier@cirad.fr)

Any complaint or need to clarification of ethical issues concerning this research, particularly those related to the use of human subjects in research, genetic manipulation or property rights concerning the use of local resources may, and should, be reported to the IPUDC if they arise. Committee email: [anne-marie.schelstraete@cirad.fr](mailto:anne-marie.schelstraete@cirad.fr) with copy to [serge.braconnier@cirad.fr](mailto:serge.braconnier@cirad.fr)