

# **ANNEX 10**

## **Minutes of the final conference**



Federal Ministry  
of Food  
and Agriculture



THÜNEN

### ITTO project PD 620/11 Rev.1 (M)

## **“Development and implementation of a species identification and timber tracking system with DNA fingerprints and stable isotopes in Africa”**

1<sup>st</sup>-2<sup>nd</sup> July 2015

Douala, Cameroon

### **The final conference minutes**

**(Reporters: Dr. Henri-Noël Bouda, Dr. Céline Blanc-Jolivet and Dr. Bernd Degen)**

This document summarizes the discussions that took place in Douala (Cameroon) at the final conference of the ITTO project “Development and implementation of a species identification and timber tracking system with DNA fingerprints and stable isotopes in Africa”. It is presented in minute’s format with discussions reflecting the exact order of the agenda.

**Attendees:** Seventy participants including representatives from eighteen countries attended the conference (Annex 1).

The meeting started with the opening session. The meeting’s facilitator was Mr. David Abouem A. Tchoyi, international consultant and former Minister in charge of Higher Education and Scientific Research in Cameroon.

#### **Objectives of the meeting**

The objectives of the meeting were:

- a) To present the results of the project
- b) To discuss strategies for better use of the projects results
- c) To discuss the perspectives of DNA and Stable Isotopes technologies for timber tracking

**Wednesday July 1<sup>st</sup>, 2015**

**Opening session: 10:30-11:15**

The opening session was marked by five speeches:

- A welcome note of the project Coordinator and Director of the Thünen Institute of Forest Genetics (PD. Dr. Bernd Degen),
- A welcome note of the representative of German Federal Ministry of Agriculture and Food (BMEL) (Thorsten Hinrichs),
- A welcome note of the representative of US Forest Service (Shelley Gardner),
- A welcome note of the ITTO representative and project manager from the ITTO headquarters in Japan (Dr. Gerhard Breulmann). During his speech, Dr. Breulmann presented an overview of the various initiatives of ITTO on timber tracking.
- The opening speech of the representative of the Cameroonian Ministry of Forests and Wildlife (Assan Gomse).

**Introduction session:**

The introduction session started with a short self-introduction of all participants, and then the chairman has presented the agenda of the conference. As an overview, three presentations were made during this introduction session.

- 1) Background information to the problem of illegal logging and timber regulations (EU, USA, Australia) (Shelly Gardener, USA)

Mrs Gardner presentation was focused on the three main new legal acts concerning illegal logging:

- The [Australia Illegal Logging Prohibition Act](#)
- The [E.U. Timber Regulation](#)
- And the [U.S. Lacey Act](#)

She concluded her speech with some information on the Global Timber Tracking Network, GTTN ([www.globaltimbertrackingnetwork.org](http://www.globaltimbertrackingnetwork.org))

- 2) Practical application of timber tracking methods (genetics, stable isotopes, wood anatomy) (Bernd Degen, Marcus Boner, Volker Haag; Germany). This presentation was divided into 3 parts and presented by 3 experts to cover the important technologies of timber tracking included in the project.
  - Genetics: the control with genetics are on different scales:
    - control of species identity
    - control of geographic origin

- tree by tree approach to check the chain of custody
  - Wood anatomy: this method is to identify the species, but for some cases it is only accurate at genus level
  - Stables isotope: Stable isotopes are commonly used to track back the origin of various goods like food. In the context of illegal logging the method is used to verify the declaration of the timber geographic origin.
- 3) Overview of the ITTO project: objectives, work plan and expected results (Henri Bouda, Germany). This presentation was focussed on: the objectives and outputs, the target countries, the target species and the project partners.

### **Discussion session:**

The discussion following the introduction session was focussed on:

- The robustness of the genetic and isotope methods. While genetics investigates the intrinsic characteristics of the tree to answer the question of the identity and origin, the stable isotope method looks at the differentiation due to the environmental conditions. The two methods are rather complementary.
- The problem related to genetic testing material from plantations (trees from Congo planted in Ivory Coast will have the genetic composition as Congolese trees, even being in Ivory Coast). But generally, such plantations are of less concern in terms of illegal logging. The current project is focussing on natural forests.
- The measurements conducted in the case of stable isotopes analysis.
- What will be the future of the collaboration with the African reference labs after the project is finished and how will the regional collaboration between the African genetic reference labs and the different African timber producer countries work? At the end of the project we made a ring tests including all laboratories. Those laboratories which have successfully participated in the ring tests are good candidates for further support in order to strengthen their skills. Also a regional collaboration among the different African countries and the regional laboratories needs to be stimulated and supported.
- What is the link between the project and the VPA / FLEGT? How could the technologies developed in the project be integrated in the existing tracking systems? How to make these technologies relevant at local level for timber used at the national markets? => The VPAs include the commitment of the timber producer countries to assure the legality of exported timber. For this the techniques developed and data collected for tree species identification and tests on tree origin are very useful. This knowledge can be applied via the three regional genetic reference labs and by direct consultation of the involved western laboratories.

- What are the perspectives for the African countries after this project finishes, especially for countries without a genetic reference lab? => These countries need to find arrangements with the regional genetic reference labs on the application of test techniques (e.g. by sending experts from their countries to the reference labs or by developing service agreements among each other).
- What is the precision of the tracking technologies at borders between countries? => This depends on the spatial pattern of the reference data and the declared position to be verified. For the genetic and stable isotope reference data of the project the precision is on average between 200 to 350 km.

### **Session 2a: Presentation of the project results:**

During this session, the presentations were focused on the genetics and the stable isotopes results

#### 1. Genetics results

- Genetic structure in *Entandrophragma cylindricum* (Céline Blanc-Jolivet) : the goal is to find molecular markers with strong geographical structure. The distribution of the nine identified genetic groups was presented. It was also possible to distinguish *Entandrophragma* species with the newly developed molecular markers, which raised the problem of species misidentification in the field. The team of Andrew Lowe was also able to identify the occurrence of several species with new generation sequencing.
- Genetic structure in *Triplochiton scleroxylon* (Andrew Lowe, Australia; and presented by Céline Blanc-Jolivet, Germany) : three genetic groups could be identified, including West Africa (Ghana), Western part of Central Africa (Cameroon) and Eastern part of central Africa (DR Congo).
- Identification of reference populations for *Milicia* species (iroko) and adaptation of the protocol for African laboratories (Serge Kasso Dainou, Belgium): the work was held by Nature+, in collaboration with the University of Brussels and was focused on 3 main points:
  - Identify reference populations for wood tracking based on genetic markers (SNP)
  - Assess assignment scores in these reference populations and identify a set of most discriminant genetic markers
  - Develop a protocol applicable in African laboratories

The follow outputs can be drawn from the work done:

- Clear distinction between *M. exelsa* and *M. regia*
- Identification of 6 different *Milicia* gene pools
- Increase of the number of markers for a better spatial resolution: **next step**
- 15 reference populations could be improved with more loci
- Assignment scores are generally good for well differentiated gene pools

- Training of 4 African researchers who are now able to contribute to local genetic works

## 2. Stable isotopes

- Verifying the declared origin of timber using stable isotopes (Gareth Rees, FERA/UK): the work allowed to establish a reference library (n = 210) using stable isotopes of authentic tropical timber samples from Ghana, Ivory Coast, DRC, Congo, Gabon and Cameroon, to develop novel techniques to classify timber origin, and to develop and optimise the sample extraction methods. Three isotope ratios (D/H, 18O/16O, 13C/12C) have been used and the work was on Sapelli.
- Stable isotope investigation of *Triplochiton scleroxylon* -Ayous-(Micha Horacek): using the same method and the same isotope ratios as FERA/UK, Mr. Horacek's institute (Josephinum Research/Austria). The outcomes are quite similar, allowing discriminating timber from different provenances.

Project results: Iroko -*Milica Excelsa*- (Markus Boner, Germany): Agroisolab worked with six isotope ratios (D/H, 18O/16O, 13C/12C, 15N/14N, 34S/32S, Sr),

### **Discussion on the project results**

The discussion following the session A of the project results presentation was focussed on:

- The cost-effectiveness of the different methods
- Intellectual property issues concerning the reference data and availability through a database
- Time needed to investigate and have the final result to verify the declaration (time from the collection to the result). It could be done in a couple of weeks for all analysis together (anatomy and confirmation by genetics). The stable isotopes method may take at most a week.
- How to make such technology efficiently useable in the producer countries. It would be useful if for example customs could conduct such analysis. This was identified as a topic to be further discussed during the group work in the afternoon.
- Who is charged for the costs of the analysis? Is it the producer country, the importer country, the company seller or the company buyer? Is it cost-effective? It seems to be clear that the cost will be indirectly charged to the buyer through increase of the price of unit cubic meter.
- What is the progress and effectiveness of the training? After 3 months in the skilled labs, are the trainees able to make the analysis by themselves? => Yes, but the problem will be at equipment level as there are only 3 reference labs in Africa. Also this subject needed to be discussed further during the group work session this afternoon.
- What about the other species (except Iroko, Sapelli and Ayous)? Threatened species are more likely to be abused. The project coordination group explained why the selection of target species

has been done: The selection of target species has been made during an international workshop in Yaoundé in 2011. All countries were involved and the selection has been effective after long discussion and agreement of all participants. Anyway, the door is not closed for other species, as we are running another project on other 7 African species and 7 Latin American species. We are trying to cover most exported species timber in few years.

- What kind of conclusion can be drawn from the tests on origin? Just if the claim is correct or false Or also an indication of the true origin? For the producer countries it is interesting to increase the resolution e.g. more information about the concession of origin

### **Session 2b: Presentation of the project results**

During this session, the presentations were focused on the wood anatomy and the blind tests results, and the technologies transfer matter.

3. Wood anatomy: a microscopic wood identification and verification of the declared botanical nomenclature have been done for 178 solid wood samples in most cases it is possible to get down to the genus level
4. Blind test

The blind tests were organised by 2 different partners: WWF/Germany and G2S/Cameroon. Both operators sent samples to tree species testing and tests on origin to the involved labs. Part of the samples had a correct declaration on species and origin and another part was false. By comparing the laboratories feedback with the true species and true origin conclusions on the performance of the testing technologies were drawn.

5. Technology transfer for genetic timber verification in Africa (Emmanuel Opuni-Frimpong, Ghana). With this presentation, Mr. Opuni-Frimpong displayed the list of trainings held in the genetic reference labs in Africa, and also the complete list of 11 trainees who have spent 3 months in a skilled genetic lab in Europe and/or Australia. He mentioned also the equipment that the reference labs received from the project.
6. Main project outcomes and Conclusions (Bernd Degen, Germany)

In this presentation, Degen summarized the outcomes of the project and drew some conclusions

#### **Main outcomes:**

- Pre-project in 2011: discussion on work programme and methods, selection of species
- Samples: over 5000 samples collected for the analysis. The collection has been made by the University of Liège (Belgium), and organized by Dr. Nils Bourland who coordinated many teams in Cameroon, Congo, Ivory Coast, DR Congo, Ghana and Kenya.
- Reference data on tree species identification (21 taxa)
- Pilot study on genetic species identification of *Khaya* on a forest concession in Ghana:

- Clear identification of two genetic clusters (species): *Khaya anthotheca* and *Khaya ivorensis*
- Very strong genetic differences among the two species (very little evidence for hybridisation)
- 5% of the *Khaya ivorensis* are classified genetically as *Khaya anthotheca*
- 40% of the *Khaya anthotheca* are classified genetically as *Khaya ivorensis*
- Development of new gene marker (SNPs) useful to improve power of tree by tree CoC tracking
- Reference data on geographic origin for 3 species (Sapelli, Iroko and Ayous)
- Blind tests
  - Species identification
    - Wood anatomy => good results => maximal technical resolution reached in many cases
    - DNA-Barcoding => moderate results, much room for improvement
  - Claims on geographic origin (country) analysed with reference data of the project
    - Isotopes: Results for 95 to 100% of the samples. From all samples 65% correct
    - Genetics: Results for 78% of the samples. From all samples 50% correct. From samples with sufficient DNA amplification => 64% correct
- Reference labs in Africa in place: three labs with additional equipment and training for genetics
- Training completed: three training workshops in Africa labs, and 11 trainees in genetic labs in Brussels, Edinburgh, Grosshansdorf and Adelaide

## Conclusions

- Sampling: the spatial distribution was not ideal, as some regions are underrepresented. For the future we need:
  - more geographic different sampling points (transects)
  - less individuals per sampling point
  - more information collected per individual (more gene markers, more isotopes)
- DNA-Barcoding. For the future, the following points have to be carefully observed:
  - Preference for approaches using multiple gene region (combination of nuclear and plastid genes)
  - More attention for assignment of “non-target species” => change sampling design
  - More controls to avoid DNA-contamination
- Tools to control claims on geographic origin: Confirmation that both methods: isotopes and genetics are very useful tools to control declarations on origin. In the future, we have to pay attention on the following points:

- Need to increase the resolution
- Adding reference samples from low coverage areas
- Collecting more information per reference sample (more isotopes, more gene markers)
- Applying both methods
- African genetic reference labs
  - Self-organisation needed to implement control services on national and regional level
  - Participation in future ring and blind tests
  - Support need to be prolonged and efforts should be merged

### **Discussion on the project results**

- What about the use of local knowledge for the species identification? It has not been mentioned during the presentations. How do we draw experience from local knowledge? The answer is that during the sampling, local people have been involved and the local knowledge on species is the 1<sup>st</sup> mean to identify species that have been sampled.
- Necessity to combine methods: It is clear that combining the methods will improve the results
- There are different types of errors in the blind test: Not finding a mis-declaration is less critical than not confirming a true declaration.
- Automatic analysis should be available in the database to check the origin of a timber sample
- Genetic and isotopic verification could be complementary to existing traceability systems.
- Project results should be more disseminated to the respective decision makers in the countries (forest ministries)

### **Session 3a: round tables (group discussions)**

The participants were divided in two groups to discuss on the following 2 topics:

- Group 1: Application of the new technologies and project results in frame of timber regulations (Chair: Thorsten Hinrichs, Germany)
- - Group 2: Technology transfer – future work of the African regional reference labs (Chair: Joseph Machua, Kenya)

The day ended with these group discussions.

### **Thursday July 2<sup>nd</sup>, 2015**

The results of the discussions have been presented on the 2<sup>nd</sup> day of the conference before the closing ceremony and the field trip.

### **Session 3b: Presentation and discussion of group results and recommendations**

### **Presentation of group 1 results and recommendations**

The group raised the list of five questions to discuss, including:

- How would you apply the new technologies?
- What steps to take forward? What improvements do we need to make?
- How do we support the existing regulatory frameworks on certification, tracking and combating illegal logging?
- What are these regulations? What is illegal?
- What is the level of interest among producer and consumer countries in the new technologies?

The discussions came out with the following recommendations:

- The timber producer countries see the need for a training and establishment of an isotope centre in the region. The feasibility and practicability needs further discussion (FERA, Agroisolab and Josephinum research are positive about this possibility)
- Need to make the methods available and affordable, as the new technologies are complementary (and not in competition with) to existing methods being used, e.g. SGS & proper records/documentation
- Need of further training for national/regional experts of the methods requested by several country representatives
- Proposals/suggestions for more reference labs discussed
- Suggestions to expand the list of priority species, at country and regional level. Example given on the global initiative of most target species - 50 each for Africa, South America and Asia. In Africa, the 50 species may well include the list of species mentioned at the beginning of the project
- Improve database by increasing the spatial representation

### **Presentation of group 2 results and recommendations**

The group discussed the following topics:

- Labs equipment
- Trainings
- Collaboration
- Future funding

The following recommendations have been made:

- To maintain collaboration within Africa and with Europe
- To seek funding to reinforce the labs
- To further develop the techniques to get reduce the costs
- To establish isotopes technology labs in Africa

- To take advantage of the training opportunities available from ITTO fellowships
- Thünen Institute (TI) to initiate PHASE II of this project to enhance and promote the use of the developed techniques

**Closing session: 10:30-11:15**

The speakers thanked the donor of the project, the project partners and co-ordinator and the participants and the people who organized the conference for all the efforts.

**Field trip**

The field trip consisted of 2 visits:

- The group visited ALPICAM, a timber exporting company with different stages of wood processing and variable wood products (sawing, peeling and slicing).
- At the timber yard of the harbour, the participants saw the last steps of the timber export process before leaving the territory of Cameroon

**Annex 1:** List of participants to the final conference of the ITTO project – Douala/Cameroon 1<sup>st</sup>-2<sup>nd</sup>/07/2015

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