

**South – South Knowledge Exchange on planted forests in Brazil,  
with Ethiopia e Mozambique**

**February, 23-27th, 2015**



**Final report from the SSKE**

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**The World Bank**

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## 1 Executive Summary

As part of World Bank forestry operations in Mozambique and in Ethiopia, stakeholders in both countries have demonstrated interest in increasing their understanding of different aspects of planted forests. Therefore, the WB organized a South-South Knowledge Exchange (SSKE) in form of a study tour to Brazil, to strengthen their understanding of how to attract private (small and large) investments into new planting, timber and charcoal processing, how to ensure socially and environmentally sustainable timber management and how to finance planted forests. For this tour a delegation of 5 Ethiopians and 5 Mozambicans were invited and financed by The World Bank, along with 5 other participants who traveled on their own funds, and three more supporting World Bank technical staff.

Brazil was chosen as host country given its well-developed planted forest sector. Brazil since 1960's has developed an aggressive and effective policy to promote planted forests with incentives and regulations. Such policies, allied to other public and private initiatives, have led the country to become the largest producer of charcoal in the world, the fourth largest producer of pulp and the ninth largest producer of paper, and as well supply much of the domestic market, with planted forests. Due to intense and effective research, Brazil has today the highest forest productivity in the world.

The tour which happened between February 23<sup>rd</sup> to 27<sup>th</sup>, 2015, visited different companies and institutions in the state of São Paulo and Espírito Santo, and as well talked with different forest experts. The companies and institutions includes FIBRIA, PLANTAR, IPEF, FARESP, AMATA, SÃO MANOEL CHARCOAL, and government institutions as the State Secretary of Environment and Water Resources of Espírito Santo, and the Federal Secretary of Strategic Affairs of the Presidency.

Among the most appreciated topics observed and discussed by the participants, were: forest incentives and protection policies, smart financing, payment for environmental services, forest replacement associations among small wood consumers, forest reserves and protection regulations, smallholders integration in the forest business, relationship between larger forest industries and surrounding communities, forestry research and development, tree nurseries, clonal forests, forestry innovation, modern charcoal production, agroforestry and silvopastoral systems.

At the end African participants highlighted that among the most valuable aspects learned from this SSKE were: i) Policy and strategies; ii) Research cooperation between companies and universities; iii) Interaction between forest companies and smallholders; iv) Simple technology for charcoal production; v) Forest Replacement Associations; and vi) Watershed management strategies.

Also they highlighted what knowledge they would like to apply at their work back home, and among all, the most cited were: i) Motivate policy and decision makers in their country about revising the legal framework to better address forest incentives and replacement; ii) Promote smallholders program; iii) improve tree nursery technology; iv) change the view about eucalyptus in their country; and v) Improve community engagement with forest companies.

Nevertheless, the participants stressed that the success of the knowledge transfer to their countries, in order to foster the development of planted forests, will be in function of three crucial issues: i) political support from policy and decision makers, ii) availability of financial resources, and iii) technical assistance.

The World Bank plans to continue to provide financial resources and technical assistance to both countries, in order to move forward with a positive agenda to enable the development and growth of planted forest sector.

## 2 Background

As part of World Bank forestry operations in Mozambique and in Ethiopia (Forest Carbon Partnership Facility Grant for REDD+ Readiness, The Forest Sector Review as part of Technical Assistance to Ethiopia's Climate Resilient Green Economy Facility, Oromia Forested Landscape Project, the IFC Portucel Mozambique, and Improve Business Climate for Planted Forests) stakeholders in Ethiopia and Mozambique have demonstrated interest in increasing their understanding of different aspects of planted forests. Therefore, the WB organized a South-South Knowledge Exchange (SSKE) in form of a study tour to strengthen their understanding of how to attract private (small and large) investments into new planting and timber processing, how to ensure socially and environmentally sustainable timber management and how to finance planted forests.

Ethiopia's growth and transformation agenda critically depends on how natural resources and climate risks are managed. The impacts of natural resource degradation on the economy and people's livelihoods are significant, complex, and amplifying with increasing climate risks. To improve the understanding of the contribution of Ethiopia's forest and trees in landscapes to economic development, contribution to energy supply, growth and employment, the government is preparing a Forest Sector Review, which complements the ongoing national REDD+ Readiness initiative.

Mozambique has favorable conditions for fast growing forest plantations. Relatively low human population density, adequate soil conditions, sufficient rainfall and low cost for long term land leases are attracting plantation investments. The Government has estimated that 7 million ha of land is available and suitable for fast growing tree plantations in the country. At the moment almost 1 million ha of such areas are either fully legalized, or in the process to receive land leases for plantation establishment mainly by international companies. The World Bank is currently collaborating with the Mozambican government on an analytical study of the "business climate for planted forests" in the country.

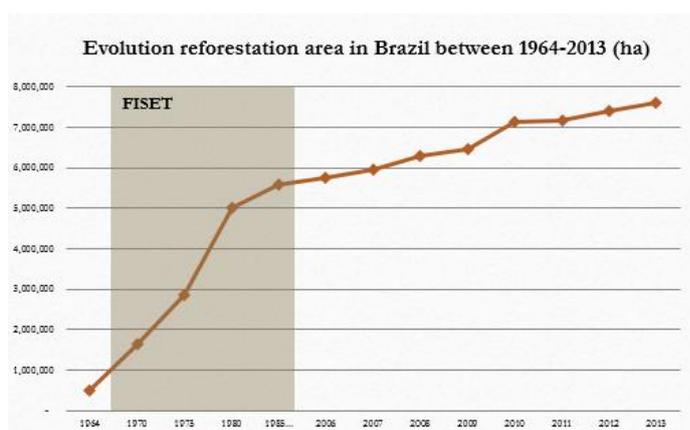


Figure 1: FISET fiscal incentives from Brazilian federal government and its impact on reforestation efforts in Brazil.

Brazil stands out internationally in the planted forest sector, and therefore was selected as the host country given its dynamic and diverse forest plantation. Brazil has about 7.6 million of planted forests, and contributes to 17% of all harvested timber worldwide. Much of these plantations were planted with government fiscal incentives during the 60's and 80's (Figure 1).

Furthermore, knowledge in forest management, harvesting and wood transport and processing is advanced and used for benchmarking by other tree growing companies all over the world.

Forestry productivity is the highest in the world due intense and cooperative research among forest companies and local universities (Figure 2).

Brazil is the largest producer of charcoal in the world, the fourth largest producer of pulp and the ninth largest producer of paper. Forest plantations can play a significant role in diversifying the national economy, particularly in rural areas. There are several potential markets for forest products – fuelwood, charcoal, pulp and paper, packaging, poles for rural electrification and fencing, rural and urban construction, furniture, etc., both domestic and international.

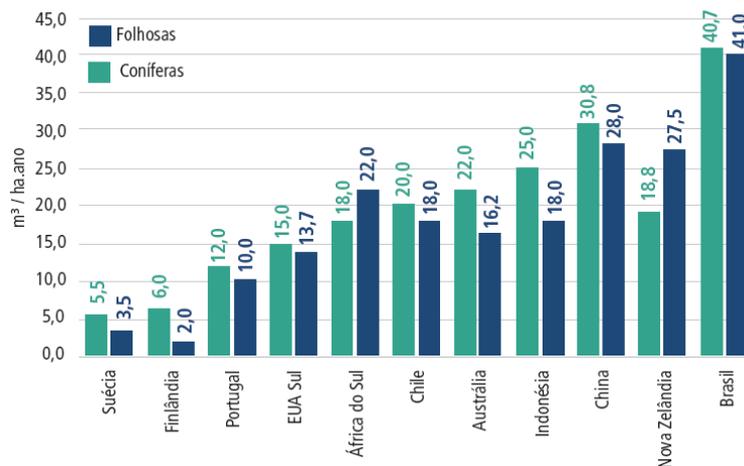


Figure 2: Productivity of broad-leaved and conifer plantations in Brazil compared with that of other forest-planting countries

The participants were warmly hosted by private companies, research institutions, government officials and community forest associations.

This SSKE provided an opportunity for Ethiopian and Mozambique's leaders in the sector to be exposed to and learn from the private sector; government and civil society on successful examples of deforestation free supply chains.

### 3 Objectives

This SSKE tour intended to:

- Increase participants' knowledge on how re/afforestation activities and planted forests can contribute to poverty reduction, focusing on smallholders in the timber supply chains, organization of small producers to participate in plantations activities, extension and support services and public-private partnerships;
- Increase awareness on; the latest advances on silviculture and technologies on fast-growing species with particular emphasis on applicability for smallholder forestry; environmental sustainability in forest plantation, including relation between forest plantations and the reduction of pressure over native forest;
- To enable participants to bring home skills and transferable knowledge on public policies and incentives to foster forest plantations by the private sector (large, small, domestic and international) that could be applied in their country contexts and used to formulate concrete recommendations actions
- Provide participants with knowledge on tools to access to finance, smart subsidies and innovative sources of financing for forest activities and how to create a positive investment climate for forest activities and wood industry.
- To establish and strengthen lasting partnerships with Brazilian entities and agencies working in the forestry sector that can sustain after the study tour

### 4 Organization team and funding

This SSKE was an initiative of Andre Rodrigues Aquino, Senior Natural Resources Management Specialist, Environment and Natural Resources Management Global Practice, based at the World Bank office in Maputo, who also led the team. Karin Kaechele, Carbon Finance Specialist at the Carbon Finance Unit at the World Bank headquarters in Washington, DC, also coordinated the organization, and the team counted with further logistical backstopping in Washington, DC from Claudia Koerbler. The agenda and technical guidance was provided by the senior forestry consultant Rogério Carneiro de Miranda, as STC from Brazil.

Funding for this SSKA came from the Biocarbon Fund, the Forest Carbon Partnership Facility and from PROFOR.

The World Bank covered the costs for 10 participants from Ethiopia and Mozambique, which were:

From Ethiopia

- Yigremachew Seyoum Lemma, Director for Forest Policy and Strategy Directorate Ministry of Environment and Forest,
- Yimeslal Tefera, Acting Director of Production Forest Directorate, Ministry of Environment and Forest,
- Didha Dirriba, general Director, Oromia Forest and Wildlife Enterprise,
- Feleke Tesma, Deputy manager of Amhara Forest Enterprise, and
- Samuel Assefa, Director at Ethiopian Investment Commission.

From Mozambique

- Darlindo Ernesto da Conceição Pechisso, Chief of the Forest Department, National Directorate for Lands and Forests, Ministry of Agriculture and Food Security,
- Osvaldo Manuel Gonçalves Manso de Sousa, Technical Officer from the Forest Department, Ministry of Agriculture and Food Security,
- Joao Machel - Technical Officer of Forest and Fauna Services from Zambezia Province,
- Belmiro Filipe Traquinho – Technical Officer of Forest and Fauna Services from Manica Province, and
- Francisco Nobre -, Sustainability Manager from Portucel/Mozambique.

Furthermore, five other experts participated in the tour, which were:

- Gregor V. Wolf, Program Leader, The World Bank Group, Brasilia
- Tuukka Castren, Sr Forestry Specialist at PROFOR, The World Bank Group, and
- Øyvind Dahl, Senior Adviser, Norway's International Climate and Forestry Initiative, Royal Norwegian Ministry of Climate and the Environment.
- Raul Matos, from Portucel/Mozambique
- Jorge Avelino Santos, from Portucel/Mozambique
- 

And the World Bank supporting staff for this SSKE

- Andre Rodrigues Aquino,
- Karin Teixeira Kaechele, and
- Rogério Carneiro de Miranda (STC).

Additionally, during the visit a portuguese-english translator (Tereza Braga) was available to non-portuguese speakers

## **5 The Agenda and discussed topics, and key messages**

The SSKE took place between February 23<sup>rd</sup> and 27<sup>th</sup>, 2015. The participants traveled by bus and by plane through the states of São Paulo and Espirito Santo. The following is the agenda, and summary and key messages from the presentations:

## **Monday, feb 23<sup>rd</sup>, 2015 Mini conference in Guarulhos with Plantar, The Secretary of Strategic Affairs of the Presidency, and AMATA.**

At this day, the participants stayed in Guarulhos, and there was a mini-seminar at the hotel with invited speakers.

### **8-10:00 h Internal meeting**

The participants from Mozambique, Ethiopia and The World Bank met at the conference room. They were introduced to each other, and shared their expectations about the study tour. They also prepared a summary presentation from each country, with an overview of the forest sector, and the needs and expectations from the planted forest sector that could benefit from the exchange.

The presentation from Mozambique highlighted their limiting factor for development of planted forests, which is the indefiniteness regarding land use in the country, preventing private sector to invest more heavily in forest plantations. Given that in Mozambique all land belongs to the government, and that rural communities have the right to use the forest resources, then whenever the government gives concession to a private forest company to operate and establish plantations, the local communities commonly refuse to accept the forest operations. One of the expectations from the Mozambique delegation during the SSKE, was to learn how Brazilian forest companies interact with local communities, and as well the technologies being used in forestry operations and how to include smallholders.

Ethiopians also highlighted the challenges faced by their country to develop planted forests. Among many pointed out, there are a weak private sector engagement, weak implementation and empowerment of policy and legal frameworks, lack of value addition to forest products, poor link between production and industries, lack of technical knowledge on sustainable forest management and lack of financial institutions. In the other hand Ethiopians mentioned their expectations from the SSKE, which includes to learn about the best afforestation and re-afforestation practices, the integration of actors in developing strategies, key government interventions in the forest sector, how to develop market chain- large scale and small scale planters, resolving competing land use interests (trade offs), and how to promote forest industry development.

### **10 - 12:00 h Rodrigo Martins Vieira Coelho Ferreira, Grupo Plantar**

Established on February 1967 in Belo Horizonte, The **Plantar Group** was originally established with a focus on the forestry business, including the process going from the management of seedling nursery, planting and tree maintenance, to the complete formation of eucalyptus forests. Through actions focused in planning, research and technology, Plantar is able to perform all forestry activities, and its customers include pulp and paper wood panels, iron and steel mills and pencil industries. Managing their own forests as well as others, the company now operates in seven Brazilian states. Plantar was established during the time of the Brazilian forest fiscal incentives, in which from 1967 to 1984 nearly 5,6 million hectares of land were reforested with investments from private individuals and companies, with capital from tax due to the federal government. These investments as fiscal incentives, were part of the federal government plans to expand sustainable wood supply for the growth of pulp and paper industries, to produce charcoal for the growth of the siderurgic industries, and for energy substitution to minimize dependency on petroleum.

Among the group, there is the company **Centro Norte Mudás e Sementes**, founded in 1971, which is specialized in the production of eucalyptus seedlings. It currently has three production nurseries located in Curvelo (MG), Itumbiara (GO) and Teixeira de Freitas (BA), with the capacity to produce 90 million seedlings

annually. The seedlings are produced through a system of mini-cuttings, using the most modern production techniques available on the market.

With a vision for the future based on the sustainable development philosophy and using its large scale forests to produce charcoal, in 1985 **Plantar Siderúrgica** was established, a company which is vertically integrated in the pig iron production. Today, the company is a reference in terms of sustainability due to its self-sufficiency in renewable charcoal from planted forests. The industrial carbonization process, performed in high capacity furnaces, uses computerized methods of process control, including monitoring in real time.

**Plantar Empreendimentos**, is another company of the group, operates in the segment of high quality preserved wood. With participation in various markets, the company has earned recognition for its product excellence, AMARU, and for its sustainably managed businesses. AMARU can be applied in areas as diverse as construction, agribusiness, landscaping, furniture and interior decorating and design.



Figure 3. Presentation by Rodrigo Ferreira from Plantar

**Plantar Carbon Ltda.** is the Plantar Group's consultancy company for climate change and sustainability, built upon the Group's innovative experience in the global carbon market. The activities started 15 years ago with the development of the first Brazilian carbon credits project under the Clean Development Mechanism of the Kyoto Protocol.

In association with the World Bank's Prototype Carbon Fund (PCF) and Bio Carbon Fund (BioCF), **Plantar Carbon** has developed and successfully implemented three project activities that generate carbon credits, known as "*Projeto Plantar*" (Plantar Project). The overall goal is to reduce the concentration of greenhouse

gases in the atmosphere by (i) establishing new stocks of sustainable planted forests, (ii) improving the production process of renewable charcoal in order to reduce methane (CH<sub>4</sub>) emissions, and (iii) the production of Green Pig Iron<sup>®</sup>, based on the use of renewable charcoal, instead of coal coke.

#### **Main take home messages for Africans:**

- Plantar is a company created to take advantage of the forest fiscal incentives provided by the Brazilian government in the 1960's;
- Plantar has developed from a reforestation company, and diversified into seeds and seedling production, metallurgic industry, preserved wood producer, and carbon market consulting;
- Plantar Carbon Project, started in 2001, and is one of the first carbon finance projects developed. It created carbon stock by (i) reforesting 11,600 ha of deforested and abandoned pasture lands with sustainably managed and independently-certified plantations and (ii) avoided emissions by using renewable charcoal - a solid biofuel from new and additional planted forests - instead of coal coke in pig iron production.

**For more information, visit [www.plantar.com.br](http://www.plantar.com.br)**

## 14- 16:00h Fernando Castanheira Neto, Secretary of Strategic Affairs, Presidency of Republic of Brazil

Brazil has one of the largest forest areas in the planet, 463 million ha, and only 7,6 million ha dedicated to planted forests (less than 1% of the country total area). Within this small area Brazil produces enough planted wood to supply about 90% of all industrial round wood, over 80% of charcoal demand, and about 62% of all firewood consumed. Planted forests has a great importance for Brazil, as it is first producer of charcoal, the fourth largest producer of pulp, and ninety producer of paper.

The climate and soils advantages of Brazil, associated to the technological and scientific development of the planted forest sector, were crucial to push Brazil to have the highest forest productivity in the world, which opens up opportunity for greater participation in the international market of planted forest products.

Regardless of its importance, the planted forests sector in Brazil yet does not have a structured development strategy within the federal government, but less articulated and diluted initiatives within other public policies. To fix this situation, the Secretary of Strategic Affairs (SAE in Portuguese) commissioned a working group in 2010 to recommend strategic actions toward a National Policy for Planted Forests (PNFP).

*Why SAE works with policy for planted forests:*

- Long-term planning sector
- Forest policy linked to other environmental agendas (different governmental agents)
- Linked to many important production chains (e.g. paper, construction, energy, metallurgy and furniture)
- Very important for the Brazilian rural development
- Important as an alternative source for illegal logging and to reduce pressure over native forests
- Over a hundred years of development on the planted forests sector
- The Brazilian silviculture (*Eucalyptus* and *Pinus*) is recognized worldwide
- It is a strong intermediate sector
- Poorly organized as a whole (many segments with disparate interests)
- Primarily oriented to the domestic market:
- Sectorial Gross Domestic Product – USD 56 billions
- Exports: USD 9.4 billions

*The National Policy for Planted Forests objectives:*

- Integrated policy: rural and industrial
- More diverse forest economy and with greater added value products
- Increase the involvement of forest products in the international market (Currently less than 3%)
- Promote new markets & products (energy, housing, bioproducts, genetically modified trees, and services)

*Desired Conditions*

- Good policy coordination at the national and local level
- Long-term financing (public and private)
- Support for scientific and technological development
- Structuring of production chains (not only in one product/commodity)
- Favorable business environment (environmental permits and land ownership)
- Infrastructure and logistics
- Investment in information, analysis and strategic intelligence (market research, production costs)

- Integration with rural development (forest development, integrated crop/ livestock/forestry)
- Development of national capacity and investment in increased productivity
- Commercial and technological exchange with other countries

### *Challenges*

- How to include small producers in forestry development:
  - Directed credit
  - Technical assistance
  - Production integration with other chain links (forest promotion)
  - Promoting diversification of the rural production (Integration Crop-Livestock-Forest)
  - Stimulating cooperativism

### *Instruments*

- Financial instruments:
  - Direct credit for plantations (ABC Program / Pronaf florestal / Constitutional funds)
  - Credit notes (agriculture notes)
  - Credit for productive chains (habitation programs, furniture, renewable energy...)
- Research & Development integrate to technical assistance (Embrapa + ANATER)
- Sanitary plant defense (nursery for seedlings, control of pest and diseases)
- Forest/rural insurance
- Good governance directed to forestry development
- Good formulation and implementation of Command & Control policy (Forest Code)
- Others: Payment for ecosystem services (REDD+), Forest Reserve Quota, Water producers, etc.

### **Main take home messages for Africans:**

- A well-developed planted forests sector is no pure luck. A conducive policy and legal framework goes a long way in supporting forest plantations;
- To incentivize reforestation, the free and illegal usage of native forests must be strongly prevented and compensated with reforestation, especially in the case of forests for energy;
- The government actively created subsidies to foster forest plantations as a way to sustainably produce charcoal to supply the metallurgic industries, and to support the pulp and paper industry;
- Private sector need good signals from governments, and an enable environment for the long-term forestry investments;
- Sectorial forest development strategies linked to industrial sectors, like pulp & paper and charcoal for metallurgic industries were important vectors for forest plantations development in Brazil;
- Forest plantations sector demand constant investment in research to increase productivity, to be competitive, and is key to promote the forest sector in the long term; and
- Good institutional governance contributes to this process. Planted forests in Brazil are now under the jurisdiction of the Ministry of Agriculture.

**For more information, visit [www.sae.gov.br/site/?page\\_id=11513](http://www.sae.gov.br/site/?page_id=11513)**

## 16 – 18:00h Roberto Silva Waack, AMATA Brasil

AMATA is a company that serves as a bridge between the forest and the consumer market, offering certified wood that is produced with social responsibility and guaranteed origin.

AMATA wood comes from planted forests of native species, eucalyptus and pine—that are also low-impact managed -- because the company believes that working with various types of forest is an asset. In this way, the company offers solid wood, sawn timber and wood suitable for processing.

In each operation, AMATA goes beyond compliance with environmental standards. Our operations are based on sustainability, focused on obtaining certification from independent institutions and social license to operate. After all, it is necessary to generate value and share it with all parties involved: clients, shareholders, employees, suppliers and residents of the communities in the areas surrounding the managed areas.

### *Low impact forest management*

One of the ways of producing timber in native forests is through low impact forestry. AMATA harvests forest products in a manner that generates as little impact as possible, removing only what nature can replenish.

Throughout the production process, there is a special care with regards to the social impacts of the forestry activities. For example, local communities are included in the supply chain, workers are eligible to join the team and the traditions of the region are encouraged.

### *Plantations with native species*

In the forests of *Pará*, AMATA predominantly plants *paricá*, a local specie from the region, which can be used for various purposes, including solid and processed wood. AMATA planted these native species in 2008. By 2017, the wood, which is certified by the Forest Stewardship Council (FSC®), will be available on the market.

Just 7% of commercial plantings in Brazil involve native species, according to the ABRAF 2013 report. Accordingly, more effective techniques for obtaining and producing seedlings and seeds, ground handling, planting, pest control, fertilization, harvesting and transport of native species is still needed.

### *Plantations with exotic species*

With the goal to offer the ideal solution for each client, AMATA works with an ample forest portfolio, including eucalyptus and pine plantations. These forests produce more homogenous products, ideal for large scale transformation. AMATA produce and sells mostly solid wood, which can be used in the civil construction and/or furniture, but also for other products such wood panels, energy and pulp.

### **Main take home messages for Africans:**

- Amata is a private company that works with different shareholders. The Brazilian investment funds come mostly from pensions;
- Amata only works with certified wood, to guarantee customers the environmental and social quality of its products, and to its shareholders added economic value for its investment;
- Amata works with multiple forest schemes, from natural forest management, planted forests natives as well exotics, and mixed system as agroforestry and silvipastoral systems;
- Amata produces multiple products according to market needs and trends, from solid round wood, saw wood, and energy; and
- Amata focused on international markets of developed countries, where certified wood gets premium prices, and sell sub products in the domestic market.

**For more information, visit [www.amatabrasil.com.br](http://www.amatabrasil.com.br)**

## **Tuesday, Feb 24th, 2015 visiting FARESP (Federation of Forest Replacement Associations of São Paulo State)**

At this day, the participants visited two Forest Replacement Associations. First at the city of Pilar do Sul, the group visited the Institute REFLORESTA, and later in the city of Itú the ACERVIR Forestry.

### *Forest Replacement*

Forest replacement is a law requirement in the state of São Paulo, which mandates that any small or medium commercial or industrial consumers of wood products should guarantee its sustainable supply of wood, or contribute to a forest replacement program, which will replant the same amount of wood consumed somewhere within the state. The forest replacement program is implemented by the Forest Replacement Associations (FRA), which are generally composed as NGOs and business associations to develop the work of seedling production, technical assistance, reforestation promotion, and monitoring. Each FRA usually establishes a modern tree nursery, and hires forest technicians to run it and as well to provide Technical Assistance to farmers.

Farmers in the other hand, provide the land and labor for the reforestation, and have full ownership of the wood produced. The ultimate goal is to have enough planted trees that can sustainably sustain the small and medium size business, and prevent the harvest of natural forests.

The wood consumers pay a fee to each FRA to reforest the same amount of wood consumed, which is estimated on base its annual consumption and on a factor of about 6 trees per cubic meter consumed. Nowadays, the costs to replace each tree for the consumers is about US\$ 0,35/tree, which sums up to about US\$ 2,1 per cubic meter of wood consumed.

Each business that pays FRAs the fees for its forest replacement obligations, receive a seal typed “this business reforest” which they can use for marketing purposes.

### **The Institute REFLORESTA**



Figure 4: Visit to Institute Refloresta.

The Refloresta Institute was named in 2010, originated from the NGO Ecoar Florestal which was created in 1996 with the aim to focus on forest conservation and restauration, and forest production and replacement. The Ecoar Florestal was a spin off from the Ecoar Institute, a NGO created in 1992, just after the Earth Summit in Rio de Janeiro.

Nowadays the Refloresta Institute has a staff of 26 people, including forest engineers and technicians, promoters, seed collector, tree nursery personnel, and administration on its five offices in the cities of São Paulo (headquarters), Pilar do Sul, Capão Bonito, Porto Feliz and Ibiúna. Currently Refloresta operates 2 trees nurseries in the cities of

Pilar do Sul and Capão Bonito, which were established in partnerships with local entities, and are structured to produce high quality seedlings. Refloresta also uses its infrastructure to develop environmental education programs with neighboring communities.

The Institute Refloresta receive its funds for forest replacement from 500 small business in the city of São Paulo, such as bakeries, pizzas and other wood oven operated restaurants, and charcoal consumers such as barbecues restaurants (churrascarias). Since 1996 more than 13 million trees have been planted through this program, engaging more than 800 family small farmers throughout 34 municipalities.

### **ACERVIR Forestry**

ACERVIR is the association of ceramic producers of the city of Itú and region, established in 1985 with 13 associates, with the goal to associate the ceramist in order to seek solutions for the ceramic industry. By 1994 the ceramic industry was purchasing fuel-wood from Mato Grosso state, about 1000 km away, making the energy cost very expensive.

To support its associates to reduce energy cost and comply with legislation, ACERVIR created the unit ACERVIR Forestry in 1995, after authorization from the Secretary of Environment of São Paulo, in order to receive forest replacement fees from its associates.

Nowadays more than 100 industries pays the forest replacement fees to ACERVIR, and up today about 7,5 million trees have been planted with over 322 small farmers. Annually about 400,000 eucalyptus trees are planted in about 240 hectares, while 60,000 native trees are planted to expand the areas under permanent protection. Today, 20 years after the forestry program was created, the ceramic industry of the Itú region is surrounded by a green belt of eucalyptus plantations, which allows them to purchase fuel-wood within 100 to 150 km radio.

The advantages of ACERVIR Forestry for its associates, is that it goes beyond just obeying the state legislation, but securing a sustainable supply of low cost and quality energy for its associates. To make the ceramic business continuously feasible in the future, a sustainable and renewable supply of firewood is very important.

### **Main take home messages for Africans:**

- Forest replacement is a forest policy in operation for nearly 30 years in São Paulo state, created to prevent further deforestation from the industrial and commercial demand of wood and woodfuels from small and medium size business;
- Forest Replacement policy is a smart funding mechanism to get local private business to finance reforestation, and it is fair to small business, given that its cost represent only about 1% of the business revenues;
- Wood consuming business associations can organize themselves as Forest Replacement Associations, and as such, develop a strategic reforestation plan designed to address their needs for a secured supply of legal and sustainable wood. It also contributes to create regional stocks of quality wood with low transportation cost, which also can be an incentive for the creation of other wood processing business; and
- Up today the forest replacement policy have resulted in the planting of about 150 million seedlings throughout São Paulo state, reforesting 85,000 hectares among 5,700 small farmers, and generating about US\$ 410 million in the rural economy, with social inclusion of small farmers and local communities.

**For more information, visit [www.acervir.com.br](http://www.acervir.com.br) and [www.ecoarflorestal.org.br](http://www.ecoarflorestal.org.br)**

## Wednesday, Feb 25th, 2015 visiting IPEF (Forestry Science and Research Institute) and São Manoel charcoal factory

At this day, the participants visited first the IPEF in the city of Piracicaba, and later the São Manoel charcoal factory in the city of Atibaia.

### IPEF

The Forest Science and Research Institute (IPEF – Instituto de Pesquisas e Estudos Florestais), created in 1968, is a non-profit association which mission is to contribute towards technical-scientific, social and economic development of the forest sector, as well as coordinate the creation of cooperative researches among forest companies through integration with Universities, Research Centers and Society.

For four decades now, it has been offering conditions for research and technological development, aiming at improving the productivity, quality and use of planted forests, and contributing towards the development of the forest sector in an economically feasible, environmentally suitable and in a socially fair way.

Under the Cooperative Programs, IPEF involves the 25 partner companies' professionals in all stages of research, including the design stage, planning, and implementation up to obtainment of the results and conclusions. IPEF currently carry out several cooperative research programs in partnership with forest companies to enhance the knowledge and state of the art of forest science.

IPEF has also a very well know seed bank, which develop harvesting, processing, storage and distribution of seeds, pollen and seedlings. IPEF works with a range of 150 species and provenances, and so far has distributed over 200 tons of seeds throughout the world.

Furthermore IPEF ha a strong focus on publication and events for training of associated companies.



Figure 5: Visit to IPEF.

Regarding the charcoal sector, Brazil is the largest charcoal producer in the World, with about 8-10 million tons annually, and 90% of it dedicated for industrial usage for the production of pig-iron, steel, and alloys. About 60% of the production is the hands of small producers, while 40% is in the hands of larger charcoal companies.

Nowadays about 50% of all charcoal in Brazil is produced with planted forests, and efforts are under way by public and private sector to reach full sustainability by 2025.

The production of charcoal represents 3,8% of all greenhouse gases emission by Brazil, mostly methane, and the government is working with private sector and universities to cut off emissions by flaring the methane.

Many Brazilian and other international companies are now developing power co-generation capabilities from charcoaling, taking advantage of methane and other flammable gases, since 50% of the wood energy is lost through the pyrolysis smoke. In France one company already sells 3,3 MWh of power to the grid from charcoaling co-generation.

**For more information, visit [www.ipef.br](http://www.ipef.br)**

### **São Manoel charcoal factory**

The charcoal factory *São Manoel*, is a family business founded in 1995, and controls all production chain, from the reforestation of eucalyptus, to the carbonization process, packing, storage, sales and deliver of its final products. The company presents itself as a social and environmental responsible company, given that they offer its employees good working conditions and opportunities to improve its quality of life, besides using only planted eucalyptus on its production process, collect tar from the pyrolysis smoke, and do recycling of materials.

The company currently sells charcoal for the domestic market in bags of 2, 3, 4, 5 and 10 kg each of charcoal, with the seal from FSC (Forest Stewart Council). They also sell firewood for pizza ovens, wood stoves and fireplaces in packages of 10 and 20 kg, besides fire starters embedded in alcohol as a clean and safe option. The company owns a fleet of trucks to deliver its products to both large and small clients.



Figure 6: Visit at São Manoel charcoal factory.

The eucalyptus plantations are established on the company lands, respecting the surrounding protected environmental reserves and water springs, and as well they purchase eucalyptus wood from other woodland owners. The tar collected from the condensation of the smoke from charcoaling (pyrolysis), is sold to produce insecticides for agriculture.

Through partnership with the ESALQ University, the company receives students for visits, and develops new technologies, such tar production. Also its charcoal is tested on the lab of the university, to check, control and maintain its quality, which fixed carbon is about 80%.

**For more information, visit [www.carvaosaomanoel.com.br](http://www.carvaosaomanoel.com.br)**

### **Main take home messages for Africans:**

- Forestry research for planted forests pays off with significant improvements in productivity, making forest plantations very lucrative;
- Private companies can finance forestry research through cooperative efforts, if counting with a high quality pool of scientists through universities;
- Brazil has today the highest productivity in eucalyptus in the world, mostly due its intensive forestry research and innovation efforts in the past 40 years, done by three forestry research cooperatives, including IPEF;
- Charcoal production can be easily modernized, even using traditional pyrolysis techniques;

- Charcoal production can be profitable under sustainable forestry and social responsible approaches; and
- During charcoaling, about 700 KWh of power can be cogenerated by each ton of charcoal produced, by burning flammable gases generated in the pyrolysis, with appropriate technologies.

### **Thursday, Feb 26th, 2015 visiting FIBRIA**

At this day, the participants visited FIBRIA pulp company, in the city of Aracruz in the state of Espírito Santo.

FIBRIA is the global largest producer of eucalyptus pulp. The company has an annual production capacity of 5.3 million tons, with mills located in Três Lagoas (Mato Grosso do Sul), Aracruz (Espírito Santo), Jacareí (São Paulo), besides Veracel, a mill in Eunápolis (Bahia), in joint venture with Stora Enso. In partnership with Cenibra, it operates Portocel, in Aracruz, the only Brazilian port specialized in pulp shipments.



Figure 7: Visit to Fibria's tree nursery.

With its operations based entirely on renewable forest plantations, in the states of São Paulo, Minas Gerais, Rio de Janeiro, Espírito Santo, Mato Grosso do Sul and Bahia, Fibria has a total forest base covering 969 thousand hectares, of which 343 thousand hectares are native forests that have been set aside for environmental conservation.

Technological development is one of the factors that have contributed to Fibria's leadership in the eucalyptus pulp market, by ensuring the high level of productivity of the plantations and the superior quality of the pulp produced. Fibria operates a high tech tree nursery with annual production of 90 million high quality clonal seedlings.

In October 2012, the company entered into a strategic alliance with the Canadian company Ensyn to invest in renewable fuels derived from wood and biomass. Ensyn's core technology, Rapid Thermal Processing, or RTP™, converts residual non-food biomass from the forest and agricultural sectors to high yields of light liquids. Ensyn's technology produces a renewable fuel oil, or RFO™, a petroleum-replacement that is used for heating, power generation and also serves as a feedstock for refineries in an application known as Refinery Co-processing.

#### *Forest savings program*

The Forest savings program provides incentives for the planting of eucalyptus by farmers who own rural properties in the vicinity of Fibria planted areas. For over 24 years the program has been introduced in the states of Bahia, Espírito Santo, Rio Grande do Sul and São Paulo, with over 72,000 hectares of plantations established, benefits over 2,900 small farmers.

This production model opens up the prospect of sustained business for farmers, who receive planting incentives from the first year they enter the program, through the supplying of eucalyptus seedlings for reforestation, technical assistance, support for the selling of the produced wood, and environmental

education. The program encourages the generating of income, preservation of the environment and sustainability in the countryside, by harmonizing forest use with food production and animal husbandry. The produced wood serves as savings for farmers, who can sell it whenever it needs revenues.

For FIBRIA, such program is very strategic, because it supply the factory with about 40% of all its wood demand, has lower cost for the company since it does not require purchase of land and plantation maintenance cost, and improves relationship with neighboring farmers. In 2014 FIBRIA purchased 1,8 million m3 of wood from small farmers.

*FIBRIA also develops several other strategic programs for the company, including:*

- Environmental Education Centers (EECs) are bases established for the holding of formal and informal educational activities related to environmental themes, the promotion of integration between local communities and relationship-building between the company and society.
- The Conservation and Management of Natural Resources program aims to identify, monitor and manage the environment in the areas where the company operates, studying the risks its activities present and the adoption of preventive measures, always considering the particularities of each region. Nearly 40% of the company land is under native forests as forest reserves, soil and water protection areas, and biological corridors.
- Fibria monitors its watershed to evaluate impact of eucalyptus on water flows. Research has indicated that the impact of a mature eucalyptus plantation is similar of that of native forest, however younger eucalyptus forests demands higher volumes of water, and to mitigate that FIBRIA now manage watersheds with eucalyptus plantations of different ages.
- Fibria maintains the Apiculture Project, which fosters honey production in the company's plantations, offering technical training and forest areas for production. This project involves neighboring communities in formal apiculture, generating income, improving the quality of life and opening up new markets.
- In the past 5 years Fibria has changed its policy on relationship with surrounding communities from confrontation to dialogue. The Enabling Dialogue program gets to know the communities and establishes a permanent space to build relationships and enter into dialogue. The process, preferably, begins with the arrival of a team ahead of the forestry operations, with a detailed presentation about the operational processes. Next, the community has an opportunity to express its doubts, to make criticisms and suggestions.
- Fibria now understand more the social and environmental impacts of its operation on neighboring communities, and seek to mitigate it, and include as much as possible neighboring communities and farmers into their business operations, for wider social benefits from the pulp business.
- The need for certification of its production process, was key to move Fibria towards dialogue with surrounding communities. For instance, Fibria has returned 11,000 hectares of land to neighboring indigenous communities, and is negotiating with landless peasants movements land acquisition from Fibria, and their inclusion on the business as small forestry holders.
- Fibria has an active and aggressive program on innovation, to seek incremental gains in productivity, to adapt to climate change, and to develop new business opportunities.

**For more information visit [www.fibria.com.br](http://www.fibria.com.br)**

#### **Main take home messages for Africans:**

- Industrial forest development need a favorable and stable policy environment to flourish, especially clarity on the land tenure issues;

- A large forest company such as Fibria, can lead forest development innovation on productivity and process, and as well in local social development;
- Large forest companies can strategically include small farmers and other neighboring business on its production process, to also be part of their business and have economic and social gains as well; and
- Large forest companies can benefit from good social and environmental practices when its customers demand certification of the production process.

### **Friday, Feb 27th, 2015 visiting REFLORESTAR**

At this day, the participants visited Project REFLORESTAR, in the city of Viana in the state of Espírito Santo.

The REFLORESTAR is a government program, which began in 2011, from a partnership between the Espírito Santo state secretary of environment and water resources, with the state secretary of agriculture and fishing. The program aims to increase the forest cover in the Espírito Santo state in about 230 thousand hectares by 2025, in accordance with the state government development plan for 2025.

The strategy pursued by the program is to keep, restore and increase forest cover in rural properties, creating opportunities for new income for the woodland owner, through adoption of soil friendly practices.

In order to achieve its goal, the program is implementing six different approaches:

- Conservation of standing forests: for properties which already have some native forest, by paying woodland owners an stipendium to incentivize them to preserve the native forest;
- Natural regeneration: to isolate and eliminate ongoing degradation factors from certain areas (agriculture land, pasture, etc), so that its natural vegetation can regenerate;
- Recover with planting: reforestation with native species from the Atlantic Forest ecosystem in degraded areas, in order to recover the ecosystem main natural functions;
- Agroforestry systems: to mix trees with agriculture (coffee, cacao, fruits, etc.), so to increase soil protection;
- Silvipastoral systems: combine trees with pasture lands, so trees cover can help to protect soils and watersheds, while allow possible diversification of the production with income from trees; and
- Managed forest: cultivation of trees species aimed at sustainable management, and preserve the environmental services of the forest regarding soil conservation, water and biodiversity protection, while generate income to woodland owner.

To reach the project target with the six approaches listed, the government need to help farmers with technical assistance and financial resources, besides supervise project implementation, and monitor and evaluate program deliverables and indicators.

*The line actions of the program include:*

- Payment for Environmental Services (PES): i) long term as direct payment to land owners to preserve, regenerate and recover of natural forest vegetation, and ii) short term as supplying resources for the implementation of the program, such as free tree seedling deliver at farm gate, fertilizers, pesticide, herbicide and hydrogel.

- **Forest Extension:** provide the necessary technical assistance to support and make viable the increase in forest coverage. This includes training and maintaining forest agents in the field, in order to keep a continuous and quality rural technical assistance.
- **Implementation and monitoring:** Develop implementation and monitoring tools, soil mapping simulation, technical and financial management, supported clusters and operations guidelines.
- **Research and knowledge:** support research entities to increase the knowledge on techniques of forest cultivation, aiming at the increment in productivity.
- **Legal framework:** supporting new regulations and adjustment in the forest legislation, to enable the policies to be more viable and effective.



Figure 8: Visit to Reflorestar Program agroforestry plots.

The REFLORESTAR program is financed by the Fundagua, a fund which obtains financial resources from several sources, including grants, state operational budget, credit and also from petroleum royalties. The state of Espírito Santo has off shore oil reserves which are explored by large oil companies. By the previous governor decision, 3% of the royalties received by the state government is invested in Fundagua, and 2,5% goes exclusively for PES, which sums up to about US\$ 6,5 million yearly.

One positive impact of this program is on the improvement of water quality for the capital city Vitória, given that water source for the city comes from two rivers, and its

watersheds is served by the REFLORESTAR program. The water company that supply the city CESAN, have observed that water turbidity is significantly improved when upstream soil is protected by vegetation, and just 1% reduction in water turbidity have a significant cost reduction on water treatment downstream, which savings could be enough to finance the PES to reach such result.

**For more information, visit [www.meioambiente.es.gov.br/default.asp](http://www.meioambiente.es.gov.br/default.asp)**

**Main take home messages for Africans:**

- Payment for environmental services to small farmers, is an important incentive for forest cover conservation and recover;
- There are many forest and agroforestry alternatives to maintain land use with forest cover, but the incentives provided to farmers to do so must be competitive with traditional land use practices; and
- Right political decisions can allocate funds for PES, from royalties and other government revenues and sources, and even from water users.

## 6 Immediate reaction from the Brazil visit:

On the last day of the trip, The World Bank staff gathered the participants in the hotel conference room in Vitória, and performed a wrap-up evaluation of this SSKE. The first exercise (A) was to have the participants writing down in an evaluation survey, about their reaction according to their expectation, and comments about the visit to Brazil. The second exercise (B) was a go around oral individual comments about their perception, and a third exercise (C) was to develop an immediate action plan for each country, e.g., Mozambique and Ethiopia. In resume, the main written comments obtained were:

### A. Participants reactions<sup>1</sup>

#### What were the most valuable aspects learned from this SSKA ?

#### **Policy and strategies**

**Research cooperation between companies and universities**

**Interaction between Fibria and smallholders**

**Simple technology for charcoal production**

**Forest replacement**

**Watershed management**

Different Incentives for reforestation

Partnerships between different forestry players

Cloned forests

Pulp and paper industry

Eucalyptus plantations and its management

Integration between several actors within the forest sector

Payment for environmental services

Increased knowledge about the commercial value of different forest products and the value chain

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<sup>1</sup> The responses with more than one respondent are highlighted by bold text, and larger letter size implies in more responses on the same issue. The responses were confidential and therefore it was not possible to identify who and from which country the comments were.



Figure 9: Wrap-up evaluation session.

Which organization/person contacted that you would like to continue have exchanges?

**Fibria**

Government representatives

IPEF

Program REFLORESTAR

IPEF and PROLENHA<sup>2</sup> ( for charcoal issues)

*INCAPER (Espírito Santo agriculture research, extension, and technical assistance Institute)*

What knowledge you would like to apply on your work?

**Motivate policy and decision makers in my country about revising our legal framework to better address forest incentives and replacement**

**Smallholders program**

Tree nursery technology

Change the view about eucalyptus in my country

Community engagement with forest companies

Incentives for reforestation

Coordination gov/private sector/communities

Forest replacement policy and strategy

Clonal forest

Link research with forest production

What are the most critical issues for implementation ?

**Convince policy makers about the need for more knowledge on reforestation and policy for forest replacement**

<sup>2</sup> PROLENHA, is a NGO dedicated to woodenergy modernization. [www.prolenha.org.br](http://www.prolenha.org.br)

## Scale up Financial resources

### Introducing new technologies

Keep the group together through email interaction

World Bank follow-up and inputs to country programs and activities

Having the government as active partner

Further technical assistance

Introducing new varieties

Creation of special incentives

Community engagement on private reforestation

Interrelation between local communities and forest companies

#### **B. Oral comments<sup>3</sup> :**

##### **From Mozambique**

**It was very interesting to see the partnership between forest companies and research institution to improve productivity.**

**The integration between forest companies and surrounding communities was very good, and a good example for Portucel in Mozambique.**

**It was impressive to see the high quality and modern technologies in the tree nurseries in Brazil.**

**It was good to see how charcoal production in Brazil, although using traditional technologies, is very well organized, efficient and fully sustainable.**

**It was very good to see how the forest replacement associations do a decentralized work on promoting reforestation in São Paulo.**

**The Brazilian experience of out growers scheme is well consolidated, by large industries and as well by the forest replacement associations.**

**There was in Brazil a forest plantations strategic planning for long term, which pay off.**

**I learned that the environmental impact of eucalyptus (mainly related to water issues) was not always bad, as we think it is in Mozambique.**

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<sup>3</sup> Since it was an oral presentation, it was possible to identify the country which the comments is related to, but we decided not to identify the person who made the comment.

The payment for environmental services has shown to me that the government must recognize and value the importance of preserving the environment for benefit of the country.

The forest sector in Mozambique generates much revenue for the government, but it is not reinvested into the sector. Here we learned that we have to reinvest more, with incentives for preservation and reforestation.

On this trip I learned of methods and tools that will help improve my professional performance in Mozambique.

The out growers scheme seems to be a very strategic action by large forest companies, to guarantee a low cost supply of wood and with quality.

It was good to see the production of charcoal totally based on plantations, which states the need to plant before consumption.

It was good to see how the forest companies preserve great portion of the native forest for soil, water and biological protection.

It was good to see that reforestation in Brazil generates clear economic benefits, but as well positive social and environmental impacts.

It was interesting to see how reforestation for industrial use can be socially inclusive of neighboring farmers and communities.

It was important to see that there are clear incentives for small growers to reforest

It was good to see that residues wood from pulp production was being used for charcoal production.

### **From Ethiopia**

**We learned that we have to modernize our charcoal production process, and do forest replacement.**

**It is important to integrate private companies into forest industry.**

**It was very interesting to see that each clone of eucalyptus is designed for specific quality of product.**

**We have to develop a forest replacement policy in Ethiopia. It would be easier since we already have exotic species that could be planted.**

This trip was very inspiring, as it shown that there are new ways of thinking and doing things. The modern forestry seeing inspire us to do better with what we have in Ethiopia.

We have to improve our technologies and methods, to improve our plantations.

We have to include more producers into reforestation.

We learned clearly that forest plantations can help to save the native forests.

It has inspired me to include some of lessons here into the Growth and Transformation Plan II in Ethiopia.

The lessons here show me how the government forest company, which I managed in Ethiopia, can be improved to help transform our country from agrarian to an industrial country.

It was good to see how eucalyptus is an import raw material for the industries of Brazil.

Eucalyptus helps the sustainable development of Brazil.

It was interesting to see how the forest industry in Brazil integrates knowledge and efforts among different actors.

It became clear to me that we have to develop a forestry learning center in Ethiopia.

It was interesting to see how the combination of good government policies with private sector capital, developed the iron and steel industry based on sustainable charcoal.

We need to develop clones in Ethiopia.

We need to improve the survival rates of our seedling.

#### From others participants <sup>4</sup>

**This trip did show the importance of the value chain, from producers to industry, and engaging local communities.**

The trip also shows the importance of good interaction between government and private sector.

This trip shown that charcoal production can be simple, but under modern standards, efficient, sustainable and organized.

Forest plantations can be integrated with natural forests, and they need each other side by side.

This trip was money well spent.

This trip did show the importance of a good policy framework for forestry development.

It was good to see that in many circumstances forests are more valuable than agriculture for smallholders.

It was good to see that charcoal can be an important energy source for the long term, can be produced in a simple but modern, sustainable, serve the metallurgic industry and open up new development opportunities.

#### Critics

**The agenda was very tight, rushed. We would like to have had a slower pace trip.**

This trip should have included some cultural experience. We would like to have learned more how Brazilians live and entertain themselves.

The agenda should have discussed into more details the policy aspects that led Brazil to be a leader on planted forests.

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<sup>4</sup> PROFOR and Norwegian government.

## 7 Overall lessons learned from the visit for a broader audience:

For many countries who want to develop forest plantations, some key lessons learned from this visit to Brazil demonstrate the main issues that need to be worked out:

- An enabling and stable policy environmental that attract private sector investment. Forest plantations are long term risky investments, and as such private investors must have the confidence that their investment will be profitable and secured during the years of investment maturation. Therefore, a well though policy framework to support medium to long term forest planning and investments is very important to create an enabling environment.
- Cooperative research for improved productivity. In order to continuously attract investors, forest plantations must be productive and profitable. In most geographic areas, tree improvement and best practices in silviculture needs to be tailored to local geographic conditions, e.g., adapted to local climate, soil, and terrain geography. The example of IPEF clearly demonstrated the importance of industry oriented forestry research, while Fibria and the Forest Replacement Associations did show the field application of technological advancements on forestry, which also benefits smallholders.
- Forests and mainly native forests are a natural resource which produces important externalities for local communities and the planet. Therefore forest policies must value its preservation and externalities, such as soil and biodiversity conservation, water and carbon storage, and scenic landscapes. In Brazil five examples of such forest policies were demonstrated to participants<sup>5</sup>:
  - i. Sustainable Supply Plan: In order to not use the native forests as its wood source, larger industrial consumers of wood, such as the case of Fibria, are mandated to secure a sustainable supply. For that purpose, Fibria owns a mosaic of hundreds of thousands of hectares of land under eucalyptus cultivation, to sustain its enormous demand for wood fiber;
  - ii. Forest Replacement: To also avoid cutting native forests for its own consumption, even small and medium size industrial and commercial consumers of wood, such as ceramic industries and even neighborhood pizzerias and barbecue restaurants are obligated in São Paulo state to replace its wood consumption. By contributing to regional Forest Replacement Associations programs, such as the cases of Institute Refloresta and Acervir Forestry, small and medium consumers cooperatively finance the cultivation of eucalyptus trees, in order to sustain its significant demand for woodfuel;
  - iii. Forest Reserves and Permanent Protected Areas: To maintain the minimum forest externalities, the Brazilian Forest Code requires all landowners to keep permanent protected forest coverage surrounding water springs, along waterways, in steep terrains, and as well set aside minimum forest reserves which can be from 20% of the total farm area in the Atlantic Forest biome to 80% in the Amazon Forest biome;
  - iv. Payment for Ecosystem Services. To maintain more lands within their territories under forest cover, governments compensate farmers with payment for environmental services, such as the case of Espírito Santo state government (Reflorestar Program), in order to keep farmlands with some type of forest cultivation, and preserve forest externalities; and
  - v. Climate Change: To avoid greenhouse gases emissions and keep a carbon stock, forest companies receive incentives as carbon credits. The example of Plantar, demonstrated that charcoal producers have now the opportunity to be further compensated with payment for environmental services, by maintaining larges wood stocks in plantations, and by substituting

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<sup>5</sup> The Sustainable Supply Plan (Plano de Auto-Suprimento), the Forest Replacement (Reposição Florestal) and Forest Reserves and Permanent Protected Areas (Reservas Legais e Areas de Preservação Permanente) are regulated policies, while the Payment for Ecosystem Services and Climate Change are incentive policies..

a fossil fuel (coal) for a renewable fuel (sustainable charcoal) within the metallurgic industries. Furthermore, avoiding methane emissions during charcoaling process, charcoal producers can be further compensated.

- Start-up incentives for reforestation. The largest investments in planted forests in Brazil were done for about 17 years (from 1967 to 1984) with fiscal incentives. Although with imperfections, these fiscal incentives were very important to create a large forest stock of pine and eucalyptus wood, which sustained the growth of a robust forest industry. Nowadays forest companies and forest replacement associations do provide incentives for smallholders, to attract them to the forestry industry. Also, as mentioned above, the governments can provide incentives to farmers maintain forest coverage, as payment for environmental services.
- Charcoal production can be a modern industry. The example of São Manoel charcoal factory demonstrated that charcoal can be produced totally sustainable based on planted forests, with a clean and organized production process, and yet with simple, low cost and efficient technology such as the brick kilns. Furthermore, as discussed during the visits, charcoal producers have new opportunities to sell its sub-products such as the fines generated for fuel or briquettes, the condensable portion of exhaust gases (tar and pyrolytic liquids), and even the non-condensable gases. The flaring of non-condensable gases such as methane to reduce GHG emission can generate carbon credits, and furthermore the energy output of the burning of methane and CO can be used to cogenerate heat and/or power<sup>6</sup>.
- Forest industries must integrate with surrounding communities. The example of smallholders programs of Fibria and the Forest Replacement Associations were the most visible positive interaction of the forest industry with neighboring farmers. Furthermore, Fibria demonstrated that engaging and negotiating with local communities such as indigenous tribes, farmers, and landless peasants resulted in a more peaceful coexistence, diminished robbery of wood and intentional forest fires on their plantations, and improved the social development of these communities.
- Forest certification is an effective tool for economic development, environmental sustainability, and social responsibility. The example of Fibria, which adopted international forest certification methods in order to continue to be competitive in the international markets, improved its environmental and social practices. Also the case of Amata, indicated that international forest certification methods allows them to sell wood at premium prices in the international markets.

## **8 Application of the knowledge disseminated to the reality of the two guest countries (Ethiopia and Mozambique):**

The knowledge acquired in Brazil can be useful in both Mozambique and Ethiopia, if properly adapted to each country needs, restrictions and opportunities. As stated by most participants, the success of the knowledge transfer to foster the development of planted forests will be in function of three crucial issues such as: i) political support from policy and decision makers, ii) availability of financial resources, and iii) technical assistance.

Nevertheless, based on the discussions and comments obtained from the participants during the visit, some specific lessons which could be immediately applied to each country are:

### **To Mozambique:**

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<sup>6</sup> The technology of power cogeneration from carbonization is maturing, and a French company (Carbonex) already cogenerate and sell to the French power grid about 700 kWh per ton of charcoal produced.

- Motivate policy and decision makers to support the initiatives to promote the growth of planted forests;
- Reinvest some of the government revenues from forest concessions, as incentives for small holders forest plantations;
- Establish a similar policy to forest replacement to local small and medium industries and commerce, as to begin creating the mentality among business that all wood consumer should be responsible for its sustainability, and to engage private sector to contribute financially to the reforestation effort;
- Considering that charcoal production and trade is the largest forest business in the country, develop a charcoal modernization strategy for the country, which should lead the charcoal producers of Mozambique towards: i) organization of the producers through cooperatives and associations for forest replacement and small business management training, ii) cleaner production of charcoal with improved efficiency and no pollution, and iii) explore additional revenues for producers such a carbon financing, and sale of sub-products;
- Form a partnership between the government, local universities, Portucel and other forest companies, with technical assistance from IPEF<sup>7</sup>, to develop a cooperative forestry research program, aimed at first to improve the genetic material available for reforestation; and
- Create a working group between the government, local communities, individual farmers, Portucel and other forest companies to engage in dialogue, and build a positive agenda for forestry development and social inclusion.

### **To Ethiopia:**

- Motivate policy and decision makers to support the initiatives to promote the growth of planted forests, and mostly to engage private sector;
- Establish a similar policy to forest replacement to local small and medium industries and commerce, as to begin creating the mentality among business that all wood consumer should be responsible for its sustainability, and to engage private sector to contribute financially to the reforestation effort;
- Considering that charcoal production and trade is the largest forest business in the country, develop a charcoal modernization strategy for the country, which should lead the charcoal producers of Ethiopia towards: i) organization of the producers through cooperatives and associations for forest replacement and small business management training, ii) cleaner production of charcoal with improved efficiency and no pollution, and iii) explore additional revenues for producers such a carbon financing, and sale of sub-products; and
- Form a partnership between the government, local universities, and local forest companies, with technical assistance from IPEF<sup>8</sup>, to develop a cooperative forestry research program, aimed at first to improve the genetic material available for reforestation.

The Ethiopian participants also expressed their immediately expectation after this visit, drafting an action plan to be discussed once back home, which in their own words are<sup>9</sup>:

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<sup>7</sup> Or other leading cooperative research programs, such a SIF-Sociedade de Investigações Florestais at the Universidade Federal de Viçosa, FUPF – Fundação de Pesquisas Florestais at Universidade Federal do Paraná, and CAMCORE at the North Carolina State University.

<sup>8</sup> Or other leading cooperative research programs, such a SIF-Sociedade de Investigações Florestais at the Universidade Federal de Viçosa, FUPF – Fundação de Pesquisas Florestais at Universidade Federal do Paraná, and CAMCORE at the North Carolina State University.

- “The team believes that the lessons obtained from the tour should be contextualized with the existing conditions in Ethiopia. Despite the expected social, economic and political differences between the two countries there are tremendous practices that can be customized to Ethiopia’s condition. The team believes that the following could be given attention as lessons to capitalize in /Ethiopia’s forest sector.
- National Forest Development Fund is established by the Brazil Forest Service. Ethiopia can establish forest funds at two levels. Forest fund at Federal and Regional level could be promoted. Funds can be mobilized from payment for ecosystem services. Payments can be requested for services such as water developers, energy generating companies, irrigation companies should pay for services forests provide interns of hydrological cycle, upstream silt management, big irrigation projects and etc. Financial sources can also be obtained from donors that support forestry initiatives. Legal frame work for the fund management should be provided by the Federal Institute. Cement factories could also raise funds for afforestation and re-afforestation projects. The funds should finance Sustainable Forest Management.
- National Forest Information System is part of the Brazilian Forest Service. Ethiopia lacks national and regional information database which has to be strengthened.
- PPP (Public Private Partnership) is an experience that Brazil exercised to manage tropical forest resources. PPF can be established between regional forest development enterprises and small scale tree planting associations and private individuals
- Forest replacement philosophy is a key to ensuring sustainable forest products. Ethiopia could plan replacing utilized forest plantations by engaging relevant public, NGO and civic partners. For instance, in Brazil associations are engaged in forest replacement. New Associations can be formed by interested professionals or existing associations can be engaged in this activity.
- Private forest farms are encouraged in Brazil. They are paying negligible land rent. In Ethiopia private developers can be encouraged by tax exemption, technical and technology support, import facilitation through duty free, by encouraging loan for forest investment, market linkage and value chain etc.
- The research institute IPEF is lined with 25 companies as a partner. These companies give financial supports to the research activities. The associations are engaged in extension of research findings. Therefore, the research is demand driven and the findings likelihood of practical implementation is high. The research institute is engaged in various disciplines of forestry including genetics, tree breeding, propagation, ecophysiology, tree improvement, forest certification etc. All these research activities are planned and executed as per the request of the stakeholders. In Ethiopia, the National Research System shall engage all relevant partners and strengthen the link for efficient and effective research intervention.
- A sustainable charcoal production is one of the field tour that has been visited. Charcoal making has one been recognized as forest destructive activity. Now, there are companies engaged in sustainable charcoal production. The company the team visited a charcoal firm which produces an oil that can be used for improving crop productivity. Such charcoal producing firms can be promoted and established in Ethiopia by supporting different associations. To ensure its sustainability it should have its own plantation and it can also operate through out-growers scheme. It can be used as income generation source and employment opportunities.
- FIBRIA is the leading pulp and paper producing industry in the world. The industry has its own plantations to feed the industry. The industry manages the natural forests in the area together with the forest plantation. The company mainly operates clonal forestry in order to increase the productivity of the plantations. The company has very efficient forest nursery that can produce healthy and vigorous seedlings. The nursery system is also efficient in terms of cost. FIBRIA planned and implemented social strategy and community engagement plan solve the conflict of raised from

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<sup>9</sup> This section was extracted from Ethiopian participants SSKE follow up action plan. Mozambicans have not provided their action plan.

the surrounding community. They have formulated clear and strong relationship policy with community. They have also established social and environmental investment policy. The nursery system in Ethiopia needs improvement. The potting media and the pot should be modernized. The research system should attempt to promote clonal forestry particularly to industrial forestry. Forest related enterprises should establish harmonious relationships with the local community. The experience of the firm in the conflict management by promoting social infrastructures should be adopted to Ethiopia's context.

- There is a company that implements PES in Brazil. The company is state owned which is also engaged in natural vegetation forest conservation and river bank rehabilitation program activities. In Ethiopia, PES systems should be established by the federal ministry and the regional states. The financial resources mobilized by the PES could be utilized in a manner stated before as costs of rehabilitating upper catchment for dams, irrigation facilities and etc.”

## 9 Final remarks.

Participants left the week energized and eager to apply some of the knowledge back home, which despite the great potential, the planted forests sector in both countries is still very limited. Both countries are currently contemplating how different types of forest plantations – from smallholder-led plantations to private plantations – can contribute to their national development plans.

In Ethiopia, for instance, woodfuel is the most important forest product consumed with a total volume exceeding 144 million m<sup>3</sup> in 2013. However, estimates suggest that 46% of total actual woodfuel demand is covered by non-sustainable woodfuel extraction from natural forest, wood- and shrub land, which results in deforestation. Furthermore the construction sector consumed another 6.5 M m<sup>3</sup> in 2013, from which around 30% of the construction timber market volume is served with informally harvested wood from natural forests.

Formalization and modernization of woodfuel and construction sectors in Ethiopia should be a priority moving forward as this has the potential to generate significant employment opportunities and can be a driver of economic growth in the forestry sector, including through export diversification and import substitution.

In Mozambique, all charcoal is still produced from native forests, which results in an immense pressure on natural resources, way beyond its regeneration capacity. Nevertheless Mozambique has been experiencing a new wave of investments in planted forests, and there are concerns in how smallholders can be integrated into these new supply chains.

Both Ethiopia and Mozambique are currently engaged in REDD+, and could create instruments to foster different types of plantation through climate financing. In Ethiopia, the Ministry of Environment and Forestry is seeking ways to mainstream forestry into the Growth and Transformation Plan II, the country's most important medium-term strategic document; whereas Mozambique is currently looking at policy options to improve the business environment to attract private investment into planted forests.

Nevertheless, some of the major barriers identified to further expand the sector in Africa are:

- Uncertainty regarding the availability of land, including land-tenure issues;
- Lack of access to affordable long-term finance;
- Weak prioritization of forestry sector compared to other land use sectors to date;
- Lack of engagement of private forestry business to attract new technology and best practices;
- Ineffective local extension schemes to engage smallholders in high productivity planting and harvesting schemes; and
- Lack of applied research.

To overcome these barriers, the governments of both countries should take strategic actions, develop a forest plantations friendly policy framework, and count with the support from The World Bank and donors. The World Bank should continue supporting these countries through different instruments, such as technical assistance and knowledge sharing (include a link to the FCPF in both countries and to the ESW in Mozambique on Business Environment) and financing such as the REDD+ readiness process, and RBF programs such as the Oromia Forested Landscape Program in Ethiopia.