

FOREST MANAGEMENT PUBLIC SUMMARY

PanAmerican Woods Plantations S.A., Costa Rica

September 2013

Plantations Palo Arco, Moravia and Carrillo Guanacaste, Costa Rica.



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Certifier: SmartWood Program of the Rainforest Alliance

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FSCTM Statement

Panamerican Woods Plantations (PAWP) is voluntarily and fully committed to the principles and criteria promoted by the Forest Stewardship Council® for environmentally appropriate, socially beneficial and economically viable management of it forest management units located in Guanacaste, Costa Rica.

PAWP as a company promotes and sponsors the independent monitoring of its operations, including its social and environmental impacts, in order to ensure compliance with the FSC standards and principles as well as to continuously strive to improve the nature and scope of its activities.

PAWP proudly received its first FSCTM certificate in 1999, successfully maintained its status for over a decade as and FSCTM certified company and currently holds license code FSCTM C018348

Folkert Kottman

CEO Panamerican Woods Plantations S.A.



Introduction

PanAmerican Woods S.A. (PAW), formerly known as Bosque Puerto Carrillo S.A. is a Costa Rican based company committed to the management of a sustainable teak plantation, based on fundamental criteria of efficiency, cost effectiveness, quality, safety, environmental and social responsibilities always complying with all national laws and regulations and the FSCTM principles and criteria.

Between 1983 and 1994 PanAmerican Woods S.A. (from here one to be referred to as PAW) purchased 3822 hectares of land. 74,8 % of the properties are now planted with teak (*Tectona grandis*) and a small amount of pochote (*Bombacopsis quinatum*) and other native species. The non-cultivated area remains as protection zone (22,9 %), or is used for infrastructure (1,2 %). The property is divided into three plantations, Palo Arco (2124 ha), Carrillo (1363 ha) and Moravia (335 ha), all located in the peninsula of Nicoya, province of Guanacaste (Costa Rica). In the year 2005 PAW started the second rotation, replacing stands that reached their financially optimum moment of harvesting. The first cycle will be replaced completely in the year 2015.

PanAmerican Woods S.A. is a capital stock corporation with approximately 1500 shareholders. Controlling interest is, since 1998, in the hands of the Dutch 'Nederlandse Internationale Bosbouw Ondernemening' (NIBO) N.V.



Policy statement PanAmerican Woods S.A.

- PanAmerican Woods S.A. aims at the sustainable production of high-quality teak (Tectona grandis L.f.) hardwood. The property of PanAmerican Woods S.A. will produce a constant quantity of teak timber that mainly will be exported in the form of logs or Rough squares
- PAW will protect the long term social and economic well being of its workers and local communities, through the provision of safe working conditions, acknowledging the right of workers to negotiate terms and conditions of living and of work in accordance with Costa Rican policies and regulations, complying with all other applicable laws and regulations related to workers rights and privileges, providing appropriate training, and encouraging worker's commitment and productivity.
- PAW will respect all applicable laws and regulations and keep close contact with government bodies in Costa Rica.
- PAW will only operate on land to which it has clearly defined and documented legal rights, where its activities are compatible with established land use policies, and where the appropriate authorizations have been obtained, in accordance with regulations.
- PAW aims at operating a commercially viable tree plantation to produce high quality teak timber, in such a way as to complement the remaining natural forests and surrounding eco-systems, and to provide benefits to local communities.
- PAW will also aim at adding shareholder value i.e. creating a healthy financial return. By making this third and last step after acting ecologically and socially sound, PAW aims at being a truly sustainable company, able to be self financing and thus serving the needs of all, including financial, stakeholders.
- PAW will incorporate in its management operations the protection of watersheds, natural forest remnants, wildlife and other forms of biological diversity, within the boundaries of its properties.
- The areas where ecological values are preserved or restored and maximized will be spatially arranged by PAW in such a way as to form a lasting, interlinked ecological network within the plantation and also serve to restore and to preserve ecological corridors for the environment of the plantations. These ecological areas will be legally secured for future generations.



- PAW will conduct appropriate and reliable monitoring of its operations, including its social and environmental impacts, in order to continuously improve the nature and scope of its activities.
- PAW will sponsor the independent monitoring of its operations, in order to ensure compliance with internationally accepted criteria for the establishment and management of plantations in the tropics, such as the principles and criteria proposed by the Forest Stewardship Council [FSCTM] for plantations anywhere in the world.
- PAW will sponsor independent research to define optimum harvest levels and characteristics, the harvesting and management techniques most appropriate to our conditions, ways to optimize the financial viability of our operations, and ways to establish the most appropriate environmental balance between our plantations and the surrounding natural environment.
- PAW will implement, and periodically review and update, its Management Plan, in order to meet the objectives of the company, to maintain full compliance with national regulations, and to continuously improve its financial, social and environmental performance.



Physical conditions

The property presents fertile, well drained, volcanic and alluvial soils (luvisols, cambisols). In some parts sloping, but in the majority flat sedimentary areas, which are extremely fertile agricultural soils. In flat areas, some drainage channels were added to the natural drainage pattern. Water coming from the wells in the plantations is used as drinking water for people on or near the PAW properties. The terrain surrounding the plantations is mainly used for cattle ranging, which is also the former land use of the plantations.

The tropical monsoon climate, with a well defined dry season, provides a 7 months wet season with an annual precipitation average of 2000 mm.

All plantations of PanAmerican Woods S.A. are located in the Central American country Costa Rica on the peninsula of Nicoya, in the province of Guanacaste (Costa Rica). Divided in the three plantation areas of Palo Arco, Carrillo and Moravia.

The present land use in the plantations is the following according to a detailed an complete land survey making use of an accurate GPS system and software that has been performed continuously since 2001:

Type of Land use in Carrillo	Amount per land use in hectares	Percentage per land use
Plantation of Pochote (native species)	32,9	2,4%
Plantation of Tectona grandis	960,2	75,1%
Infrastructure	19,8	1,5%
Natural forest	325,1	21,0%
Total	1338,0	100%

Type of land use in Palo Arco	Amount per land use in hectares	Percentage per land use
Plantation of <i>Tectona grandis</i>	1475,0	69,5%
Infrastructure	22,5	1,1%
Natural forest	627,0	29,4%
Total	2124,5	100%

Type of land use in Moravia	Amount per land use in hectares	Percentage per land use
Plantation of <i>Tectona grandis</i>	216,1	64,4%
Infrastructure	2,7	0,8%
Natural forest	116,6	34,8%
Total	335,4	100%



Tree crop specie planted

Pochote (*Bombacopsis quinatum*) is a native specie that grows well in the area and produces a good quality wood in the long term. 39 has of pochote have been planted in Carrillo plantation.

In 1986 the main industrial specie planted in the plantations of PanAmerican woods S.A. changed into *Tectona grandis* (teak) since that year 2861 has been planted successfully. The selection for teak as the major specie to plant is directly related to the overall objective of the enterprise: the production of high quality wood. Teak has long been recognised for its excellent wood properties, making it one of the most valuable many purpose timbers of the world.

Teak is native from India, Burma, Thailand and Laos and grows best in a warm tropical climate with a dry season of 3-5 months, rainfall of about 1500 to 2000 or more millimetres per year, and a mean annual temperature of 22-27°C. (Keogh, 1987). Teak develops faster, as compared to native species which provide a similar quality of wood (ex. mahogany). It is a fast growing species, and develops well, as has been proven during the first cycle, in a healthy manner in the province of Guanacaste, Costa Rica, because of the dry season in this region



Natural forest areas, Protection zones and ecological upgrading

In total, 28,4% of the PAW property area is either natural forest which remains completely untouched and has developed in a healthy manner during the last decade and a half or consists of natural vegetation types such as swamps and natural regeneration zones along rivers and streams. The natural forest is mainly located alongside streams, valley bottoms, around wells and on the more inclined areas. The larger part of the natural forest can be classified as *Bosque Húmedo Tropical con asociación atmosférica seca*. These forests consist entirely of original natural vegetation that has not been touched or replanted during the establishment phase of the plantations. It is prohibited to cut trees, hunting, burn or graze inside these protected areas, all according to Costa Rican forestry law.

Since 1999 a tropical biologist conducted on a regular basis extensive inventories of the local flora and fauna. Based on the findings of these inventories and her recommendations 7 connecting ecological corridors have been installed and certain forest management practices, such as thinning intensities, have been altered in order to improve and protect the local ecosystem. Furthermore, an annual average of 1000 seedlings of native tree specie, most of them in danger of extinction and all native to the local area, has been planted in protection areas, along roadsides and drainage channels.

During all successive biological inventories the tree species Cristobal (*Platymiscium parviflorum*) and Cocobolo (*Dalbergia retusa*) have been encountered in the Palo Arco plantation area inside the natural forest transects where these species have been planted by the company. As mentioned before, these species have been extensively harvested in Costa Rica and has been rated as in danger of extinction on a national level.



Environmental impact assessment

An environmental impact assessment has been carried out. The compensatory recommendations of this study have been incorporated in the operational forest management plans of the company. These compensatory and corrective measures are thought to diminish or compensate negative impact, as well as to improve the general environmental quality of the properties.

- The garages are going to be controlled regularly. The polluting residues should be handled with care and carried to an appropriate place in order to avoid, or at least to minimize, the concentrated site pollution around the place. Sawdust and special oil baths are used to avoid oils from leaking in the soil.
- Old oil and oil filters coming from cars, tractors, saw-machines, etc. are recycled thanks to the collaboration with Súper Filtros and Rally de Centroamerica.
- For the same reason education on *environmental awareness* is continued to be given to the people working in the field and garages. Discussion about this issue is encouraged in group meetings.
- The environmental education includes the identification of threatened or endangered species in order to be able to protect them better.
- Agrochemicals will always with extreme precautions, respecting national regulations and with the outmost care for the safety of our workers and the environment.
- The use of heavy machinery will be restricted to the roads in order to minimize the damage on the soils in the field and diminish the risk of erosion. Skyline systems and winches will continue to be sued to extract wood from inclined sites and harvesting operations are only carried out during the dry season when the soil is firm.
- It is important to consider the important biological balancing role of the ecological corridors in the plantations that are going to be preserved and protected.
- Plantation of native trees in the protection zones of the plantation and along public roads in order to improve the status of the local ecosystem.
- Use of protective clothing and equipment by the employees in order to minimise the damage of the noise and the risk of accidents.
- Trying to increase the presence of the low vegetation layer in the tree plantation by means of a better management of the light. This implies stronger thinning's when possible, in order to allow more vegetation to develop under the tree canopy layer. This will be taken into account during the thinnings schedule planning.
- Continuing of the erosion inventory under different covers and on different slopes. The aim is to find out under which circumstances erosion occurs less. The conclusions of this study will be used to adjust management, aiming at less erosion.
- Developing and following a fire-fight strategy in all the plantations.
- Analyzing the soil before the time of replanting in order to develop a better strategy for this task
- Improving the environmental awareness between the field workers.



Erosion limitation strategy

Based on the initial results of the continuous erosion inventory under different covers and on different slopes and the recommendations made by Dr. Alfredo Alvarado, PanAmerican Woods has developed a special strategy for limiting erosion rates in sloping areas:

- Favouring ground vegetation in order to protect the soil against erosion. This can be achieved by means of a better management of the light. This implies stronger thinning when possible, in order to allow more vegetation to develop under the tree canopy layer. This has been taken into account during the thinning schedule planning. This strategy includes also the respect for all type of vegetation that naturally grow on the plantation floor
- It is absolutely forbidden to cut any kind of native tree inside all protection zones, this in order to minimize erosion appearance.
- Preserve and protect the existing drainage channels, natural as well as man made.
- Protect the stream and river sides with the maintenance and in some cases increase of plant species (ex. planting trees or creeping plants).
- Allowing the passage of heavy machinery only through the roads.
- Doing the extraction by means of winching in combination with skyline systems. In doing so, we expect to diminish the physical damage to the soils as a direct or indirect result of extraction.
- Evaluate damage caused by extraction of wood shortly after the harvesting operations have been completed, based on the evaluation report corrective actions will be planned and implied in order to prevent/limit erosion
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Health and Safety Programs

PanAmerican Woods S.A. aims to offer its workers with the safest and healthiest working conditions available. Therefore PAW has developed a complete Health and Safety Policy. The company is executing this Policy through the development of "Health and Safety Programs" are according to the Costa Rican laws and procedures. The process includes the development and Implementation of:

- "Health and Safety Regulations" (Reglamento de Seguridad e Hygiene Ocupacional)
- "Health at Work Program" (Programa de Salud Ocupacional)
- "Emergency Plan" (Plan de atención de Emergencias).
- "Health and Safety Supervision: Department" (Departamento de Seguridad y Salud Ocupacional)

All these programs and documents have been revised and approved by the ministry of Law and the National Insurance Company of Costa Rica, and its implementation is being carried out with the help of a full time office of health and safety which has been installed in 2008. The documents have been explained and are available to all employees. The compliance of all requisites is periodically checked by inspectors of the government as well as by an on-going supervision system carried out by the officers of PAW's health and safety department.

The Health and Safety Regulations present all rights and duties of the company and for employees to be accomplished in relation with safety matters. It includes rights and duties compulsory by Law, but also other commitments from the company itself. An example is the obligation for the company providing to employees with all the required safety equipment, and the obligation for the employees of wearing the safety equipment, etc.

The Health at Work Program is where the safety policy of the enterprise is transformed into an operational plan. It includes schedules, and organisation of Training activities.

The health and safety office carries out an on-going continuous system of control of the implementation of all former explained activities, and of the Health and Safety situation of the company. It is carried out by a specialist in "Ciencias de Salud Ocupacional" who has been hired in 2008 on full time basis in order to supervise all operations related with the programs and control. This supervision is also in charge of all training activities related with Safety, Health, Labour Laws, Fire fighting, Emergencies, Management of Safety Equipments, etc. This office will last for as long as the company itself.



Social Impact

PAW provides a year-round stable source of income in a region with little economic activities. PAW applies preference in contracting people from the local region and trains them for their specific job and supplies the necessary safety equipment. PAW complies with all Costa Rican legislations and laws regarding social security and financial incomes.

PAW maintains good, open relations with the local communities. Neighbours of these communities are given the opportunity to participate in training and educational programs by the company. The company provides for its neighbours free access to the recreational and sporting facilities, loans machinery, provides free fuel and construction wood, assists in the case natural disasters. Free medical care is being provided to all the company's workers.

Furthermore, PAW collaborates in the maintenance of public roads and infrastructure. PAW has good and stable relationships with local and regional government, research institutes and universities and will maintain these relationships, sharing information and providing free access and hostage to visitors.

A social impact study was fulfilled in 2006 by an independent group of Costa Rican consultant. The following text contains the conclusions of this report:

- A significant advance has been made during the last 6 years with regards to communal development. The same can be determined when taking into account the financial investments made in public spending in infrastructures, housing, education as well as the development of job openings
- The participation of communal organizations is fundamental for the development of the region and the work done has improved the overall quality of life for the inhabitants of the region what indicates the importance of assisting these type of organizations
- Education in the region requires important impulses, significant steps have been taken. However, poverty prevails as the largest obstacle for the possible gain to be made. Education is not be enjoyed by all habitants of the region y is not entirely promoting conditions for young people to prepare themselves for the job opportunities in the region.
- The unemployment problem is clearly visible in the region, reflected in the migratory search for employment which the communities cannot offer with the exceptions of the companies PanAmerican Woods, FRUVEPEN and some local tourist destinations such as the hotel Punta Islita.



- There seems to be a lack of information with regards to the cultivation of teak. This results in a negative profile in the communities in despite of the mayor impulse the company has had on the overall development of the region being one of the mayor employers in the zone with benefits not only reaching its employees but the local communities as a whole.
- The different peaks in productivity of the plantations have caused considerable amounts of jobs resulting in the positive and fast moving positive trends in local development. However, from time to time the amounts of jobs have fluctuated affecting the household economy of families.
- The management of water, especially in the case of Carrillo, is very important. The overall objective is always to prevent unnecessary water usage, maintain a maximum number of water caption tanks and pretreatment of water.
- Pan American Woods S.A, has provided materials for local development projects which are directly benefit the inhabitants of the region. However, the social policy should always aim at diversification and anticipate material requests with proactive action plan proposals. The social approval of the communities of the region is always positive for future projects that aim to impulse a better coexistence and improved relations.
- Continue with the assistance to national policies regarding sustainable development and the protection of biogenetic resources.
- Inform the local communities about steps and actions taken for the protection of natural resources and water management especially in the farm of Carrillo.
- Promote the development of public infrastructure through negotiations with municipalities and searching for alternative resources for the realization of better transport and communication in the region
- Continue to stimulate the quality of job opportunities starting with education. The scholarship program presented in this study could be an interesting solution in order to overcome the limited resources available which the school in Coyote could administer.
- The company has assisted universities and their students who are conducting forestry related research, facilitating transport and lodging as well as providing information and internal research results

In the same social impact study report a social plan was presented which can summarized with the following table and which have been incorporated in the long term and operational Forest Management Plans of the company



Área	PAW activities
Local community development	Periodic social consultations: participate in meetings which permit communication with the local community leaders and development groups Continue with the cooperation with local, organized, community groups The company's social policies will continue to be respected Occupational health and safety programs will continue as well as the emergency plan provided by the company being in this way a model example for the region Assistance and donations will continue to be provided to local community development groups which request the same (schools, colleges, churches, nature conservation groups, etc)
Natural resources	The company will continue to participate in community activities related to environmental education organized in the region The water catchment areas within the company's estates will continue to be protected The natural resources and ecosystems present in the estates will continue to be monitored and the scientific results will continue to available to research institutes, schools and colleges. The company will maintain contact with MINAE and COVIRENA for the protection of natural resources The company will maintain contact with MINAE and emergency commissions in order to prevent and combat natural wild fires whenever necessary
Social economic	Local people will have preference when hiring workers The company's installations will continue to be available for training by for example public an private organization in order to contribute to the local social and economic development
Education	The natural resources and ecosystems present in the estates will continue to be monitored and the scientific results will continue to available to research institutes, schools and colleges. Students and universities will be assisted in their research by providing access and lodging The company will continue to be active in the local activities related to the environmental education in the region
Training	Training programs will continue to be provided to the company's workers and neighbors who might be interested The public version of the FMP will be available for the public as well as ecological inventory reports Refreshment courses will be given to the company's workers and neighbors
Recreation, sport and culture	Local initiatives for the stimulation of culture, recreation and sport for will be promoted

Monitoring and field research

In order to be able to estimate standing timber volumes, annual increment and harvesting volumes to be expected an annual silvicultural inventory has been carried out during the last decade. The following tables provide a summary on mean diameter at breast height and mean commercial volume per hectare as well as total commercial volume per plantation area as for the first and second cycle concerned. All results have been calculated on the basis of the inventory conducted in 2013.



PALO ARCO 1st cycle

Aro	Stand	DBH	Basal	Commercial	Commercial
Area (ha)	density		Area	volume	Volume Palo Arco
(IIa)	(trees/ha)	(cm)	(m^2/ha)	(m ³ /ha)	(m^3)
489,	1 198	31,6	14,49	111,9	54730

PALO ARCO 2nd cycle

Area (ha)	Stand density (trees/ha)	DBH (cm)
986,5	507	12,8

CARRILLO 1st cycle

Area (ha)	Stand density (trees/ha)	DBH (cm)	Basal Area (m²/ha)	Commercial volume (m³/ha)	Commercial Volume Carrillo (m³)
	(uees/na)		(III /IIa)	(III /IIa)	(111)
123,1	194	30,7	14,36	101,8	12536

CARRILLO Pochote

Area (ha)	Stand density	DBH (cm)	Basal Area	Commercial volume	Commercial Volume Carrillo
(IIII)	(trees/ha)	(CIII)	(m ² /ha)	(m^3/ha)	(m^3)
32,9	240	27,3	14,05	60,2	2342

CARRILLO 2nd cycle

Area (ha)	Stand density (trees/ha)	DBH (cm)
826,3	769	8,3

MORAVIA 1st cycle

Area (ha)	Stand density (trees/ha)	DBH (cm)	Basal Area (m²/ha)	Commercial volume (m³/ha)	Commercial Volume Moravia (m³)
75,0	160	32,0	12,87	92,6	6945

MORAVIA 2nd cycle

Area (ha)	Stand density (trees/ha)	DBH (cm)
141,1	602	12,3

Until this date no major damage caused by pests and/or has occurred in the PAW plantation estate. A Costa Rican specialist, of the Technical Forestry Institute in Cartago, visits the PAW plantations on a regular basis in order to evaluate the health conditions of the different plantation areas of Palo Arco, Moravia and Carrillo. Data and results of the monitoring system are available for scientific research purposes.



Planned thinnings and final harvests

The plantations are thinned on an individual management unit basis. These units vary in size from 3 to 99 hectares. For each unit the standing wood stock and growth rates are known as a result from the annual inventories. Based on a long term growth and financial valuation model for each unit the exact moments and volumes involved of thinning and final harvest are being projected and calculated.

The following tables summarize the commercial volume that will be harvested in each of the three plantation units during the period 2014-2018.

	MORAVIA 2014-2018						
Year	Industrial Harvest Volume (m³)	Area (Ha)					
2014	1665	64,3					
2015	3127	69,7					
2016	977	70,4					
2017	4270	67,7					
2018	1908	91,1					
2014/18	11946	363,2					

PALO ARCO 2014-2018			
Year	Industrial Harvest Volume (m³)	Area (Ha)	
2014	3815	66,4	
2015	18807	386,6	
2016	22168	649,9	
2017	18094	541,8	
2018	20399	432,3	
2014/18	83283	2076,9	

CARRILLO 2014-2018			
Year	Industrial Harvest Volume (m³)	Area (Ha)	
2014	12944	147,9	
2015	510	74,3	
2016	2952	225,9	
2017	5962	296,9	
2018	5526	280,6	
2014/18	27894	1025,6	



Post harvest assessment.

Directly after harvesting operations have been completed, a special field survey and assessment are carried out in order to control and rehabilitate the possible damages caused by the harvest operations to water courses, standing trees, main and extraction roads, drainage systems, natural vegetation and the landscape.

Products and markets

Since 2001 PAW plantations has become a steady supplier of segmented round wood of PanAmerican Woods Industry S.A. where this wood is being used to produce important quantities of high quality flooring that is mainly exported to the United States and Europe. The remaining part of the round wood that is being harvested by PAW plantations is being sold with great success in the form of rough squares and long round wood to several long term clients in South-East Asia.

Apart from the financial income generated due sales of wood additional income is being obtained by the sale of certified teak seeds. The process of seed certification in Costa Rica is performed by "Oficina Nacional de Semillas" (the national seed bank). A total of 265,2 hectares is managed as seed orchard and have received the official title "rodal semillero inscrito en el programa de certificacion de semillas: categoria certificado autorizado B". Approximately 5000 kilos on an annual basis have been collected and sold to the forest specie seed banks.

Second rotation

In the next decade all the existing teak plantations will be replanted at an approximate annual of 150 has. After a low impact mechanical site preparation the individual units will be replanted in the wet season following the final harvest that has been executed during the dry season. All applicable laws and regulations will be respected. As an innovative company the rooted cuttings of cloned plus trees identified in 2004 in the PAW plantation area are being used as planting material for the second rotation.



Closing Words

PanAmerican Woods is an enterprise on the move. During the last years strong changes have been implemented. The board of directors has changed, new managers were put in place, a complete new management style has been introduced, policies have been altered, and results have become more and more visible. The company has become important supplier of large diameter plantation teakwood on the international market and in 2003 for the first time in the company's history financial dividends have been paid to its shareholders. The company is confident that these positive trends will continue in the years to come.

Anybody that would like to propose improvements for the company or wants to familiarize with the PAW way of working is invited to do so.

We thank you for your attention,

The management staff of PanAmerican Woods Plantations S.A.



PanAmerican Woods (Plantations) S.A.

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