

PROJECT PROPOSAL

1. CATEGORY OF FUNDING APPLIED FOR

Conservation of Natural Resources

2. PROJECT TITLE:

"Agro-forestry: towards a balance between the production and extraction of chambira palm leaves for indigenous handicrafts in the Colombian Amazon"

3. PRINCIPAL COORDINATOR

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4. ORGANIZATION OF AFFILIATION DURING PROJECT

Cabildo Indígena San Martín de Amacayacu

San Martín de Amacayacu

Leticia

Amazonas

Colombia

5. AMOUNT OF FUNDING REQUESTED

US \$10.481

6. DURATION OF PROJECT

12 months

7. ENDORSERS

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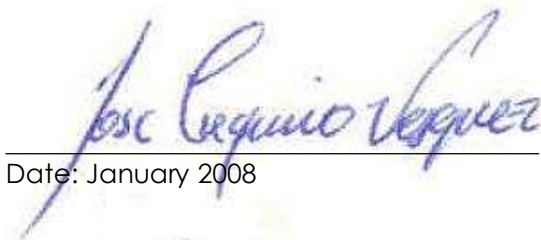
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Date: January 2008

9. INTRODUCTION

Chambira is a non-timber forest product made from the fibers of the youngest leaves of the chambira palm, and is used for the elaboration of handicrafts such as hammocks, bags, necklaces etc. A balance between chambira palm leaf production and extraction is essential to obtain an ecological and social harmony concerning this resource in the Tikuna indigenous community of San Martin de Amacayacu, Colombian Amazon. Natural palm densities are low here and the cultivation of this palm is not yet a common habit of the indigenous people. However, the palm leaves are highly wanted in the village as the sale of chambira handicrafts to visiting tourists currently represents the mayor source of income for many families in the village. As a result, the extraction of the palm leaves to obtain the fibers currently surpasses leaf production and many palms are irreparably damaged.

This project is the result of a participatory planning process with the community of San Martin and aims to show that a chambira palm agro-forestry system is a feasible innovative technology, as it will allow local artisans to have a sufficient and stable supply of palms and vegetal resources in a few years' time. This will permit the production of highly elaborated and economically profitable handicrafts. The proposed chambira palm agro-forestry system provides an adequate answer to the ecological, economic and social problems associated with the scarcity of the palm. Additionally, it provides an alternative to timber extraction and the cultivation of illicit crops. It also addresses sustainable development themes such as gender, recuperation of local knowledge and organic waste management. Ultimately, the project is a crucial part of the general territorial organization of the community which aims to improve the people's quality of life by protecting and caring for the natural resources towards the future.

10. PROJECT SUMMARY

(A) GLOSSARY

Chambira: This tropical palm (*Astrocaryum chambira* Burret) is a solitary grower and can reach up to about 20 meters in height. Its stem is covered with spines and fibers can be extracted from its leaves for the manufacturing of handicrafts. It also produces edible fruits.

Climbing tree: a suitable tree planted next to the chambira palm; it serves for climbing which allows for a safe harvesting of chambira leaves, avoiding the spines. This tree should not attain a very wide crown as it would then obstruct the palm.

Agro-forestry system: in this type of agricultural system, the planting of trees is combined with vegetal crops. Usually, the vegetal crops benefit from the shade provided by the trees and tropical soil fertility can be managed more easily in comparison with, for example, open cassava fields.

Integrative approach: this term means that many different aspects are included in, and affected by, the project. In this case, for example, each of the following aspects will be addressed: conservation of natural resources, production, organic waste recycling, community sociology and economics, gender and recuperation of local knowledge.

Gender: this term in development sociology implies and stimulates the inclusion of women's participation in processes commonly managed by men. It also recognizes the important, but often invisible, role of women in society.

(B) PURPOSE

This project seeks to resolve the current and precarious imbalance between chambira palm leaf production and extraction for handicrafts made of the fibers in the Tikuna indigenous community of San Martin de Amacayacu in the Colombian Amazon. This imbalance is not only causing ecological damage by killing the palms, but also economic and social problems as a result of the scarcity of suitable palm leaves and leaf stealing respectively. The urgent desire to extract chambira leaves reflects the importance of the chambira products as the mayor or even only source of income for the majority of the families in the community since the sale of agricultural products is not profitable. Other economic alternatives could be the illegal timber extraction or the cultivation of illicit crops, but people do not prefer this kind of occupations. Additionally and intentionally other integrative aspects will be addressed: gender, organic waste management and recuperation of local traditional knowledge and identity related to agro-forestry and the cultural value of chambira in Tikuna society.

The suggested solution is the planting of chambira palms and additional crops or other vegetal resources in an agro-forestry system. By planting palms in this manner, each artisan will have access to sufficient leaves to obtain the fibers that are essential for the manufacture of handicrafts. In between the palms, other crops (peppers, tomatoes, lemongrass etc.) or useful plant resources (medicinal plants, fruit trees etc.) can be cultivated, profiting from the shady space permanently available in between the palms. Even though soil fertility will not be lowered through this agro-forestry system, the elaboration of compost from currently unused organic waste will definitely favor plant growth as the clay soil is naturally poor in nutrients.

(C) PLAN

By means of a careful inventory and mapping of the existing chambira palms on the lands of each participating handicrafts producer of the community, and in relation to the yearly production of this person, it is possible to plan how many seedlings should at least be sown in the appointed fields so that each person will have access to sufficient leaves for harvesting. The palm seedlings will be extracted from the forest, where they usually grow under the shade of their mother and die. Simultaneously, the climbing tree seedlings will also be selected on the basis of older people's knowledge of which tree species are suitable for this task and have a similar growth speed as the chambira palm. Each seedling will carefully be excavated without disturbing the soil around the roots, and will be placed temporarily in a seedling bag. The seedlings will be transported as soon as possible to their new destination. Here, generous holes enriched

with compost elaborated from the community's organic waste will have been prepared beforehand so that the palm and climbing tree seedlings spend as little time as possible in the bags. The rest of the agro-forestry field will be sown with other crops or vegetal resources, all according to the interest and wishes of the field owners. Here, the compost will also be used. Importantly, the planted seedlings will be monitored for at least a year in order to determine survival rates and growth characteristics. A comparison between the different planting fields will be carried out afterwards. The growth characteristics of the different additional crops or vegetal resources will also be monitored and compared. This comparison will serve to determine which crops are most suitable for this innovative agro-forestry system. In order to focus on the artesian side of the chambira products, two four-day workshops about chambira handicraft production and quality improvement will be organized.

The project will involve a local person who speaks the Tikuna language as technical support to help organize the logistics of the planned activities; food and cassava drink preparation, administration of equipment etc. This will ensure an adequate coordination and thus time efficiency. This person is also in charge of the coordination of the monitoring of the chambira and other crops.

(D) BENEFITS

Ecologically speaking, by creating a balance between chambira palm fiber production and extraction through the proposed agro-forestry system, the total chambira palm population will increase and each palm will be in a better state. Consequently leaf production will be higher. Wildlife will be positively affected as healthy palms produce fruits they will eat. Many of these animals attracted to these fruits are abundant in the region and could serve as food since hunting is still one of the major sources of protein for the Tikuna indigenous people of the Amazon rainforest. Economically, it is estimated that the current average yearly income of San Martin households involved in chambira handicraft production is about 100 US dollars. By increasing palm availability and decreasing time spend finding and harvesting palms in the forest, more time will become available for the actual production of handicrafts. Through the handicraft workshops, we also aim to improve product quality. Since demand for chambira handicrafts is high, incomes of local households could thus be more than doubled. This will emphasize the role of women as participating in income generation. In addition, social tensions in the community due to the stealing of chambira leaves will be reduced, organic waste will be used to fertilize the normally poor soil and there will be plenty of opportunities for the exchange and recuperation of local traditional knowledge concerning the chambira palm.

The literature on chambira agro-forestry systems points at the ecological and economic potential these systems can have for indigenous communities living in the Amazon rainforest (¹, ² and ³, amongst others). So far, however, there is no record on the adequate implementation of such systems. This project can become a first successful pilot study, and may be replicated throughout the region.

¹ Kahn F. (1988). Ecology of economically important palms in Peruvian Amazon. *Advances in Economic Botany* 6: 42-49

² Holm Jensen O. (1996). Use and economic potential of the palm *Astrocaryum chambira* (Araceae): a quantitative approach. MSc thesis, University of Arhus, Denmark.

³ <http://www.fao.org/docrep/X0451E/X0451e05.htm>

11. METHODOLOGY

1) Inventory and mapping of number and state of existing palms per participating artisan

The project will begin with a one-day participative workshop in which an estimated ten interested artisans will elaborate maps of the areas where they currently extract chambira palm leaves. It has been found in previous cases that the people of San Martín are able to draw their territory with great detail, so that the information presented on the maps can be checked easily afterwards in the field. Each palm will be numbered and its state will be analyzed for its height, number of leaves and general condition. This information is also important for the territorial organization of the community⁴.

2) Calculation of number of palm seedlings based on handicraft production

In two subsequent participative workshops of one day each, each artisan will document how many of which chambira handicraft products he or she has sold over the last 12 months. This will allow a calculation of how many chambira leaves were extracted. It is known for example that to make a big hammock, up to 15 leaves are needed. For a small bag about 2 or 3 and for a big or tightly elaborated bag up to eight. Based on this inventory of palms present on the lands of each artisan, it can be determined if the available palms were sufficient to account for the number of leaves extracted and thus: how many palms the artisan should in theory have in order to account for production in the last year. Additionally, the participating artisans will estimate how many handicrafts they could be making or would like to make in their free time if there were sufficient palms. Based on these data and the availability of each person concerning the proposed palm field, we can calculate how many seedlings each person will plant, keeping in mind that palms need to be sown at least six meters apart.

3) Localization and preparation of planting fields

As soon as possible, the clearing of the proposed planting fields of approximately half a hectare each will be started. This will be done through a traditional minga: several community members are invited to participate, sufficient cassava drink is prepared and after the work is done, people will eat together. This way, and by the presence of other community members, the work of cleaning a planting field is carried out much faster and pleurably. The mingas greatly enhance community social bonding and confirm community identity, it being a very traditional way of working. Several mingas can be organized per day. Per planting field, four mingas will be organized: one to cut the undergrowth, one to cut the big trees, another one at least a week later to gather the dead trunks and branches, and a final one to burn these. A week or so later, the planting field can be sown by the owner.

4) Elaboration of compost

The planting field will not be abandoned for recovery after a few years like the usual cassava staple crop planting fields which need to be left fallow because of the low natural fertility of the Amazon upland clay soil. Instead it is proposed that they will be used continuously for the cultivation of various kinds of edible crops, medicinal plants, small fruit trees or other plants and small trees used to make handicrafts. This is possible as this agro-forestry system mimics natural processes in certain ways, such as for

⁴ 'Ordenamiento territorial': indigenous communities have the obligation by the Colombian Constitution of 1991 to organize their territory to be able to obtain recognition as Indigenous Territorial Entities allowed to exercise their own politics concerning traditional customs and language, education, health, environmental management etc. and also administer their own governmental economic support.

example the successional cycles in forest clearings⁵. However, to aid soil fertility for these crops, compost will be elaborated from organic kitchen waste (for example: banana peels, cassava skins, fish waste, sugar cane). The compost will also be used for the preparation of the palm planting holes, so that the seedlings will grow healthily. Each participant will be instructed personally at the very beginning of the project on how to construct a compost container from locally available materials and how to elaborate the compost, so that it will be ready when the time of planting comes. Organic kitchen waste will be mixed with rotten tree matter to ensure the presence and prolific growth of beneficial micro-organisms.

5) Search and transplanted of palm and climbing tree seedlings

Chambira palm seed germination is difficult as many seeds are infested with beetle larvae while they are still immature and connected to the palm⁶. Therefore, it is proposed that plant seedlings from the wild will be used for transplanted to the proposed planting field. Usually, in the wild chambira palm seedlings start growing under the shade of their mother and eventually the vast majority dies because of the lack of sun. More chance have seeds that are carried away and buried by rodents such as the guarra⁷. As such the extraction of the seedlings does not pose a threat to the wild palm stock. The chambira palm trunk is covered in spines, which can be avoided by planting a 'climbing tree' next to the palm in order to safely harvest the leaves, as local knowledge has it⁸. The climbing tree could be productive as well by being a timber, palm or fruit species. The palm and climbing tree seedlings will be sought and extracted from the forest in form of ten *mingas* as a the area where the palms and their seedlings are encountered covers about 50 hectares of mostly dense lowland jungle. Some of parts of this area have to be reached by boat. The estimated time needed to find the chambira and climbing tree seedlings for one planting field is one day. The older people in the village know where to find them, and will come along as guides and instructors. This will stimulate the exchange of local knowledge related to the theme. The climbing tree seedlings will also be selected based on the older people's knowledge of the tree species that are suitable and have a similar growth speed with the chambira palm. Since chambira palm seedlings are very sensitive, each seedling will be excavated carefully without disturbing the soil around the roots too much^{9,10} after which they will be temporarily placed temporarily in seedling bags. The climbing tree seedlings will be treated identically. The seedlings will be transported as soon as possible to their new destination in the plantation field, where the seedlings will be spaced at least six meters apart, as they need full sun to thrive.

6) Sowing of secondary crops according to wishes of field owner

Independently, each plantation field will be sown with additional crops or other vegetal resources. Possible other crops are peppers, tomatoes, lemongrass, cucumber, tobacco etc. Other vegetable resources include medicinal plants, other plants used for handicrafts, fruit trees etc. The mix between secondary crops and chambira palms will be based on the interest and wishes of the field owner.

⁵ Southgate (1998) in: Fadiman M.C. (2003). *Fibers from the Forest: Mestizo, Afro-Ecuadorian and Chachi Ethnobotany of Piquigua (*Heteropsis ecuadorensis*, Araceae) and Mocora (*Astrocaryum standleyanum*, Arecaceae) in Northwestern Ecuador*. PhD Thesis, University of Texas at Austin, US.

⁶ Local knowledge.

⁷ Gallego L.M. (2005). El tejido en chambira, una actividad que une más que sogas. *Boletín de Antropología*, Universidad de Antioquia, Medellín, 19(36): 164-185.

⁸ see also

http://www.rainforestconservation.org/data_sheets/agroforestry/Astrocaryum_chambira.html

⁹ Moreno F. (2006). Manejo de la palma chambira. En el clan achote de la etnia nonuya, comunidad de Peña Roja, medio río Caquetá, Amazonas. *Revista Semillas* 26: www.semillas.org.co

¹⁰ Borgtoft Pedersen, H. (1994). Mocora palm-fibers: use and management of *Astrocaryum standleyanum* (Arecaceae) in Ecuador. *Economic Botany* 48(3): 310-325.

7) Monitoring plant growth

For at least one year after sowing the agro-forestry fields, the chambira palms, climbing trees and secondary crops will be monitored for survival and growth rates. These measurements will serve for evaluation and comparison.

8) Handicrafts workshop

To enhance the quality and profitability of the chambira handicrafts, a renowned artisan from Leticia, Mr. Pizango, will be invited to share his knowledge of the art of weaving and working chambira by means of two four-day workshops. This artisan is known throughout the region for his high quality work with local natural materials¹¹. By enhancing the quality of the handicrafts, they these can be sold to visiting tourists at a better price¹², using the same amount of chambira fibers.

9) Time frame

Activity	1	2	3	4	5	6	7	8	9	10	11	12
1) Inventory and mapping palm trees	X	X										
2) Calculation No. palm seedlings	X	X										
3) Localization and preparation palm planting fields			X	X								
4) Elaboration compost	X	X	X	X	X	X	X	X	X	X	X	X →
5) Search and transplantation palm seedlings					X	X						
6) Sowing secondary crop					X	X						
7) Monitoring palm growth							X	X	X	X	X	X →
8) Handicraft workshops								X	X			

¹¹ On several occasions, handicrafts workshop were organized with Mr. Pizango in San Martin with huge success: the women in San Martin all have been selling more necklaces and bracelets since, and also at a higher price (about 6.000 pesos, a little over US\$3) than their original necklaces (max 4.000 pesos, a little over US\$2). The workshops prove to stimulate artisans from San Martin to recuperate lost weaving techniques, and help regain the feeling of pride and identity that used to come along the production of goods based on chambira palm fibers. Many stories related to the cultural importance of chambira are told in such occasions and thus transmitted to other generations so this knowledge will not be lost.

¹² Gallego L.M. (2005). El tejido en chambira, una actividad que une más que sogas. Boletín de Antropología, Universidad de Antioquia, Medellín, 19(36): 164-185.

12. RESULTS/APPLICATION

- ✓ The primary result will be to achieve a balance between the production and extraction of chambira leaves. The current estimated number of palms per artisan is 30, while the availability of leaves per palm per year is between one and two. This will at least double through this project. Chambira palms will be better conserved as extraction pressure will be less due to the proximity of agro-forestry fields to the village. This way, leaf searching time and palm maintenance will also be more efficient.
- ✓ The chambira agro-forestry system will be a good example of sustainable, permanent use of poor Amazonian soils, permitting the conservation of a natural resource. Many communities in the region have such small territories that they cannot fulfill the required years of soil recovery after the cassava fields have been abandoned, thus losing overall soil fertility and risking crop failure. The proposed project is expected to generate replicable, positive spin-offs for the region as a whole.
- ✓ The agro-forestry system will allow for the permanent cultivation of other, useful plants such as fruit trees, timber or palm species alongside the chambira palms, permitting a full time access. Usually, the 1 hectare cassava planting fields are abandoned after a few years and left for the jungle to take over. Many sown useful species are thus encountered in the middle of the lush regrowth after several months and difficult to find. Fruit trees and several useful plants for handicrafts also need space and sun to grow well and often perish after abandonment of the planting field which will not happen under the proposed agro-forestry conditions.
- ✓ In addition to plant resources, the agro-forestry system also attracts various kinds of animals which could be hunted to contribute to the protein supply of the Tikuna indigenous families.
- ✓ It is important to underline that the project does not aim to replace the traditional production-for-food patterns, which would seriously endanger food security. On the contrary, it aims to cater for those who spend their free time elaborating handicrafts on a small scale. Based on conversations with the artisans, production-for-food patterns will not be disturbed as relatively very little time is dedicated so far to the elaboration of handicrafts. Even if this time would be doubled food production would still not be threatened.
- ✓ By elaborating compost to fertilize the agro-forestry soil, organic waste will benefit many useful plants instead of being thrown away.
- ✓ It is expected that the stealing of chambira leaves will be substantially reduced through the increase in leaf availability. This will greatly help diminish the social tensions that presently complicate the production of handicrafts from chambira palm fibers.
- ✓ There will be considerable economic benefits from the project: through the integrated workshop of handicraft making/quality improvement, the unitary value of each chambira product can also increase. Consequently, the yearly average family income of 100 USD from the sale of these products can more than double. So far, there has always been more tourist demand for handicrafts than the village has been able to offer. Tourist numbers have always been on the increase.
- ✓ As the elaboration of handicrafts generally is the activity of women, their participation in the community and role as income generators will be favored greatly as a result of this project.
- ✓ It is expected that additional information on the sowing and cultivation requirements of the additional crop will lead to a recuperation of much local knowledge which is dwindling fast, as well as to a revalorization of the cultural identity associated with the chambira palm.

13. BUDGET

Item	Description	Total Amount (COP)	Total Amount USD (1 USD = 1.921 COP)
Principal coordinator			
Field work salary	350.000 pesos monthly (12)	4.200.000	2.197
Local technical support			
Field work salary	300.000 pesos monthly (12)	3.600.000	1.883
Materials			
1000 black seedling bags (100 per plantation field)	1000 x 1.000 pesos per bag	1.000.000	523
10 watering buckets	10 x 35.000	350.000	183
10 spades	10 x 35.000	500.000	262
15 large machetes	15 x 10.000	150.000	78
15 small machetes	15 x 15.000	225.000	118
30 sharpening stones	30 x 3.500	105.000	55
15 pair of rubber boots	15 x 20.000	300.000	157
Food for three workshops for project planning	per workshop 5 chickens (a 15.000) 5 kg rice (a 2.000) 1 oil (3.000) 3 sugar (2.000)	282.000	147
Food for 40 mingas: preparation of 10 planting fields	per minga 5 chickens (a 15.000) 5 kg rice (a 2.000) 1 oil (3.000) 3 sugar (2.000)	3.760.000	1.967
Food for 10 mingas: search and extraction seedlings	per minga 5 chickens (a 15.000) 5 kg rice (a 2.000) 1 oil (3.000) 3 sugar (2.000)	940.000	492
Gasoline to reach the areas of wild chambira by river, 10 mingas	30 galons (a 8.000)	240.000	126
Gasoline to transport the materials and gasoline from Leticia*	2 trips of 15 galons (a 8.000)	240.000	126
Food for two workshops handicraft making	per day of workshop 2 chickens (a 15.000) 2 kg rice (a 2.000) 1/2 oil (1.500) 1 sugar (2.000)	408.000	213
Payment two workshops by handicraft specialist	8 x 25.000	200.000	105
Transport handicraft specialist	4 x 30.000	120.000	63
Manual seed drill	for making holes in seeds	45.000	24
Stationary	Report color printing, paper, white newspaper sheets, pens, pencils, copies etc.	1.000.000	523
Leaflet production of project experience for external organizations	100 x 15.000	1.500.000	785
Unexpected expenses (5%)		874.737	457
Total Amount Applied		19.994.737	10.481
Contribution by indigenous community San Martín de Amacayacu			
Boat and outboard engine	wooden 9 meter long boat with a 15HP YAMAHA motor		
Food and stay PI and handicraft teacher (Mr. Pizango)			
Basic ingredients food workshops and mingas	fruits, plátano, cassava, cassava drink etc		
Measuring tape	for monitoring plants		
Photocamara	for taking the pictures for the report and leaflet		
Manual seed drill	for making holes in seeds		

*food can be bought locally

14. REVIEW OF LITERATURE

San Martin de Amacayacu is a Tikuna indigenous village of about 500 inhabitants in the Amacayacu National Natural Park in the southernmost 'tail' of Colombia. The people here primarily live of small scale swidden agriculture, fishing and hunting. However, due to the geographical isolation of the community none of these activities allow a monetary income as there is no market where products can be sold. The market where these products could be sold is at one day traveling by boat in Leticia; the extremely low prices offered and the high gasoline costs make the trip not worthwhile. About 80% of the community earns their *only* income from the sale of chambira fiber handicrafts to visiting tourists who are on the increase now that the tourist sector in Colombia is developing.

The income from these handicrafts varies highly between families as it depends on the amount made and their quality. Usually, each artisan family owns about 30 chambira palms. Due to the low availability of palms (compare with Vormisto, 2002) and the adequate management these palms should be given to maintain healthy palms (only one of every three new leaves can be harvested, see Vormisto, 2002), a maximum of 3 hammocks can be produced from such a palm stock per year. For one Tikuna-style hammock (see photograph 1 in annexed materials), about 12 to 15 leaves are needed, which is more than is mentioned by Vormisto (2002) for Bora hammocks. For a small bag (photograph 2), three leaves are needed and for bigger or more elaborated bags, up to 5 leaves. Based on conversations with Tikuna artisans, the maximum income from these chambira products is estimated at about 100 US dollars a year, and comes from the sale of elaborated traditional hammocks (at about 30 dollars each), bags (ranging from 5 to 10 dollars each, photograph 4), bracelets (up to 1 dollar, photograph 3) and necklaces (up to 2 dollars, photograph 5). If palm availability could be increased by this project, the income from these handicrafts will be higher as the demand for chambira products has always been higher than supply (see also: Moreno, 2006, for a regional example).

According to Bennett (2002), 80% of the population of the so called developing world use non-timber forest products for their daily needs, while the value of global trade in these products has been estimated to exceed 1 billion US dollars yearly. The indigenous people of the Amazon have forever relied on non-timber forest products for their daily lives as well: for roofing, baskets, bags, rope, medicine, paints and sieves, to name just a few examples (Posey, 1985). Currently, handicrafts made from these products represent the mayor or only source of income of many indigenous families in this region (Vormisto, 2002; Moreno, 2006). If managed adequately, non-timber forest products have been promoted as an alternative to timber extraction or the cultivation of illicit crops and as a complement to agricultural production, in the case this agricultural production cannot be sold profitably (Pinedo et al, 1989; Bennett, 2002). Many non-timber forest products are originate from palm species: bark, fruits, fibers etc¹³.

Palms are characteristic features in the Amazon jungle, and especially in the western part of Colombia, Peru and Ecuador where up to 121 species have been documented (Montafur and Pintaud, 2006). One of these palm species is *Astrocaryum chambira* Burret, commonly called chambira (Vormisto, 2002; Moreno, 2006, Lopez et al, 2006; Montafur and Pintaud, 2006). This palm grows solitary and can reach up to 20 meters in height. Its stem is covered in spines. The fruits are edible and attractive to many rodents, monkeys and birds. Its primary habitat is on sandy soils where they can be found to occur naturally in high densities. However, they can also be planted on higher clay soils where they occur naturally in low densities. It has erect, pinnate leaves. From the yet to unfold young leaved, fibers can be extracted to elaborate handicrafts such as hammocks, bags, bracelets, necklaces etc. These products also have a very important cultural value: the chambira palm itself and the many weaving styles figure

¹³ <http://www.fao.org/docrep/X0451E/X0451e05.htm>

prominently in Tikuna mythology, and so do related resources used in the elaboration of chambira handicrafts, such as the paints, seeds or even bones or fish scales (see also Gallego, 2005, for a similar description of the importance of chambira in Yagua society).

Although agro-forestry systems generally employ timber species, palms can also be employed (Fadiman, 2003 and Rosero, 2004). The most important factor is the creation of shade and prevention of soil erosion by the (non-)timber tree species for the additional crops which can range from medicinal or edible crops to ornamental flowers, paint or seed producing plants for handicrafts (Fadiman, 2003). Because of its growth characteristics and income generating importance in neo-tropical communities, the chambira palm has been mentioned specifically to have potential for small-scale agro-forestry systems (Kahn, 1988, Vormisto, 2002 and Fadiman, 2003). However, only one case is known where 800 chambira palm seedlings were actively transplanted. Unfortunately, the seedlings were not treated very carefully and only 40% of the seedlings grew successfully (Moreno, 2006). A similar result is reported by Borgtoft Pedersen (1994) for the closely related *Astrocaryum standleyanum* where a very careful handling of the seedlings was also recommended as a result.

It is important to emphasize that this chambira agro-forestry project does not pretend to replace basic daily production-for-food patterns of swidden agriculture of a large variety of crops, hunting, fishing and gathering by the elaboration of income generating chambira products, nor will the increase of chambira palms be a panacea for the many economic necessities of the local indigenous people. It should be clear that in San Martin de Amacayacu basic food necessities are met by those ancient production-for-food patterns. The sale of chambira products elaborated in free time is locally considered as an addition to cover for basic necessities which the forest does not provide such as soap, salt, sugar, cloths, schooling etc¹⁴. Even the doubling of the income from the chambira products still leaves families with a low yearly income. Still, for the people in San Martin any increase in family income is more than welcome, as there is basically no other source of income. The expected reduction in stealing leaves will much alleviate existing social tension (see also: Fadiman, 2003).

Furthermore, the proposed chambira agro-forestry system is innovative as the indigenous people are not used to this kind of agro-forestry system (traditionally, they merely extract fibers from wild palms without cultivating them; see also: Gallego, 2005). In practice, however, the proposed agro-forestry system is not so different from the traditional swidden agriculture; mixed crops are cultivated on a small planting field, which in the case of the proposed system is *not* abandoned after a few years as is customary, which is the key to its sustainability. The application of organic compost ensures the availability of sufficient nutrients on the planting field. Rosero (2004, p. 101) quotes an indigenous woman from a community in Ecuador where agro-forestry was implemented as an economic alternative to the destructive extraction of forest resources: "*The agro-forestry model has allowed us to work more as we can keep cultivating the same field, we don't have to leave the field anymore as my ancestors used to do, we have to clean and clean and can't let everything regrow again*".

Agro-forestry can also permit the recuperation of local knowledge about the requirements of plant species when they are assigned to their space in the planting field according to their needs of sun and shade - water and soil, for example (Rosero, 2004). In fact, what agro-forestry really pretends to be is a holistic reflection of the jungle but with useful plants only (Posey, 1985). And the only people who know this jungle so well are its native inhabitants such as the Tikuna people of San Martin de Amacayacu, who are expressing by means of this proposal their desire to change to an innovative agro-forestry system for cultivating the chambira palm. The role of women as income generators is emphasized as this will enhance their participation in community life.

The main reason for proposing this project to the Lindbergh Foundation is the initial support needed to establish the several small chambira agro-forestry systems. This

¹⁴ <http://www.fao.org/docrep/003/W8801E/w8801e03.htm>; see also and Gallego, 2005.

is very time- and effort consuming and at first needs to be supported externally because the local indigenous people generally need the whole day to gather enough food for their families through fishing, hunting and (swidden) agriculture. In the little time left, they generally elaborate handicrafts. Through this one-time support to compensate for time normally invested in reproductive activities, a sustainable, easy-to-maintain chambira agro-forestry system can be set-up in a relatively short time. This will improve the quality of life of several Tikuna families from San Martín de Amacayacu for many years to come.

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17. SUPPORTING MATERIALS

These photos are taken by Ms. van Gils in San Martin de Amacayacu.



Photo 1: Tikuna woman showing her chambira hammock.



Photo 2: Tikuna woman elaborating chambira string from the fibers.



Photo 3: Tikuna woman elaborating chambira bracelets.



Photo 4: Tikuna father and daughter showing chambira bags.



Photo 5: Tikuna women showing the necklaces they made during the workshop in may 2007 with Mr. Pizango (top left) in San Martin de Amacayacu.



Photo 6: Tikuna boy using the manual seed drill for making holes in tough seeds.



Photo 7 (left): a chambira palm with all the leaves extracted and dying, and 8 (right): a healthy chambira palm which has reached such tallness that the leaves can not be extracted anymore.