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# Use of the chambira palm (*Astrocaryum chambira*) in rainforest communities of the Peruvian Amazon

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**Use of the chambira palm (*Astrocaryum chambira*) in rainforest communities  
of the Peruvian Amazon**

**S<sup>3</sup> Report**

**September 22, 2009**

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**Introduction**

We proposed to research the use of chambira palm fibers and the sale of chambira crafts in four communities located about 100 miles from the city of Iquitos, Peru. In this part of the Peruvian Amazon, women are organized into groups that work to obtain the fibers and sell their products in a sustainable way, and at the same time promote the cultivation of the palm trees in their family gardens. As is the case with so many products from tropical forests, there is great geographic variation in the abundance of the resource (chambira) and variation in the amount of income that local residents (in this case women) actually receive from their products (Neumann and Hirsch 2000, Coomes 2004, Penn 2008). This research was conducted along the Tahuayo and Blanco rivers that enter a large community reserve in Peru, the 420,000 hectare Area de Conservación Comunal Regional Tamshiyacu-Tahuayo (ACRCTT). This reserve has been locally managed with an emphasis on conserving forest resources such as chambira because they are so important to the local economy and ecology (Bodmer et al. 1997). Before leaving for Peru, we conducted additional library research on chambira, non-timber forest products (NTFPs) and the socioeconomic and environmental characteristics of the western Amazon region where our study was conducted. This study was submitted to HRBNet (project 124064-1) and approved by the Grand Valley State University Human Research Review Committee (reference number 10-01-H). Once in the field, with the help of very capable Peruvian assistants we were able to visit five communities (Esperanza, Buena Vista, Chino, San Pedro, Diamante Azul) and cover a

larger area than we had originally planned to study. Travel was by foot or boat, and we stayed most nights in a field station owned by the Rainforest Conservation Fund (RCF) in the village of Chino, on the Tahuayo River. The Rainforest Conservation Fund is a Chicago-based conservation organization that hires Peruvians to work on conservation projects in the Peruvian Amazon.

## **Results, Findings and Lessons Learned**

### **1. Library and document research**

This research was conducted on the GVSU Allendale campus before we traveled to Peru, and allowed us to improve our understanding of *Astrocaryum chambira* and other palm species native to our study area, non-timber forest products (NTFPs) and the socioeconomic and environmental characteristics of the western Amazon region where our study was conducted. We were also able to obtain several documents and publications from Peru and study them before leaving the United States.

Palms are one of the most abundant and important groups of plants in Amazonia and the importance of palm species in Amazonia for subsistence and commercial uses is well documented (Peters et al. 1989, Henderson et al. 1997). An example of this is the chambira palm (*Astrocaryum chambira*), which is an important source of fiber for weaving and income in western Amazonia (Jensen and Balslev 1995, Vormisto 2002, Coomes 2004). Chambira is a large, spiny, single-stemmed palm that can reach over 25 meters in height, and its striking appearance and usefulness was no doubt noted by early explorers to the western Amazon. While Vormisto (2002) explains that the first journal description of chambira was published in German in 1934, we were able to find a description of native use of this species by Hardenburg (1910) where the author admired the light, durable hammocks woven from the strong chambira fiber by the Huitoto natives living in the upper Putumayo River along the Peru-Colombia border.

Today, in the northeastern Peruvian Amazon, chambira palm fibers are used to make everything from string, fish nets, hammocks, artwork and crafts. The sale of these products to both Peruvians and tourists provides an important source of income to women living in rural villages. This income is vital for the purchase of school supplies, medicine and children's needs.

Just as we were beginning our research, the topics of the chambira palm, chambira weaving, and rural women in the Peruvian Amazon was receiving unprecedented attention due to a New York Times article by Roxana Popescu (2009) that was also widely read by the conservation community in Peru. The story even referred to two of the villages in our study (Esperanza and Chino) and covers common themes associated with poor rainforest inhabitants making a living in an ecologically sustainable way while reducing poverty through the sale of chambira handicrafts, in this case, “baskets” that are made as wall hanging which are sent to the United States. This village enterprise is run by women with the guidance and support of the Peruvian government and non-governmental organizations (NGOs), and portrayed in the story as a way to “save the rainforest” while reducing poverty. Our field research quickly taught us that this story and its claims were faulty and inaccurate in several ways which will be addressed later in this report.

## **2. Harvests of wild chambira and other palms**

Palms are the most useful and economically important wild plants in the western Amazon (Peters et al. 1989). Their fruits are especially important in the Iquitos markets, but thousands of these palms are cut down to obtain their fruits. The most important palm in ecological and economic terms is the aguaje palm (Vásquez and Gentry 1989, Penn 2008). The tall, huge aguaje palm (*Mauritia flexuosa*) has been a symbol for conservation (and a conservation problem) in this region for many years, even as the aguaje fruit provides income for some 5000 people alone in the city of Iquitos (del Castillo et al. 2006). Because aguaje with the best quality fruit is cut down first as extractors enter the aguaje palm swamps (Penn et al. 2008), the price of quality fruit has recently reached all-time highs in Iquitos due to the constant demand for this fruit (Nube 2006). In this part of the world, wild palms are viewed for their economic importance first, over their ecological importance

In the upper Tahuayo River Basin (our study area), local residents use a wide variety of palm species for subsistence needs and to obtain income. Table 1 provides examples of some of the more common uses we found during our study. Many of the palms that are tall (e.g., aguaje, ungurahui, chambira) are cut down in order to reach their fruits, and palms used for building materials or palm heart are also cut down. With chambira, the long, dangerous spines on the

trunk promote the felling of the palm to reach the newest palm shoot (“cogollo”) without being injured in the process.

Table 1. Partial list of native palm trees commonly used by people in the upper Tahuayo.

Vernacular name	Scientific name	Part Used	Common uses	Market use*
Aguaje	<i>Mauritia flexuosa</i>	Fruit	Edible fruit, drink	C
		Trunk	Grub production	C
		Petioles	Crafts	O
		Leaf	Art, thatch	O
Aguajillo	<i>Mauritiella armata</i>	Fruit	Edible fruit	O
Cashapona	<i>Socratea exorrhiza</i>	Trunk	Construction material	
		Aerial roots	Medicinal	
Catarina	<i>Attalea microcarpa</i>	Leaf	Thatch, art	
Chambira	<i>Astrocaryum chambira</i>	Leaf	Fiber, art	C
		Fruit	Edible fruit, medicinal	O
Huacrapona	<i>Iriartea deltoidea</i>	Trunk	Flooring	O
Huasaí	<i>Euterpe precatoria</i>	Apex	Palm heart	C
		Trunk	Construction, flooring	O
Huicungo	<i>Astrocaryum murumuru</i>	Fruit	Edible fruit	O
Huiririma	<i>Astrocaryum jauari</i>	Fruit	Fish bait	
Inayuga	<i>Attalea maripa</i>	Leaf	Thatch	
		Petiole	Fruit picking device	
Irapáy	<i>Lepidocaryum tenue</i>	Leaf	Thatch	C
Nijilla	<i>Bactris</i> spp.	Fruit	Edible fruit	O
Palmiche	<i>Geonoma</i> spp.	Leaf	Thatch	
Pijuayo**	<i>Bactris gasipaes</i>	Fruit	Edible fruit, drink,	C
			animal feed, fish bait	
		Trunk	Flooring	
Shapaja	<i>Attalea</i> spp.	Leaf	Thatch	O
		Fruit	Edible fruit, grub prod.	
Sinamillo	<i>Oenocarpus</i> spp.	Fruit	Edible fruit, drink	O
		Trunk	Construction, flooring	
Ungurahui	<i>Oenocarpus batau</i>	Fruit	Edible fruit, drink	C
		Trunk	Construction, flooring	
		Endosperm	Medicinal	
Yarina	<i>Phytelephas macrocarpa</i>	Leaf	Thatch	
		Fruit	Edible fruit, medicinal, art	O
		Live palm	Soil improver	

Scientific names from Henderson et al. (1997)

\* Key: (C) commonly marketed; (O) occasionally marketed.

\*\* *Bactris gasipaes* could be considered a "domesticated" wild palm; a selected form of *Bactris macana*.

There is now local concern over the destructive harvesting of chambira palms and the loss of this resource over time in the study area. Local residents have seen what happened with the destruction of the aguaje palm, and the near disappearance of high quality fruit from some areas. Once the demand for chambira artwork jumped with a project sponsored by the tourist lodge in Chino around 2004, residents there witnessed the destruction of a large number of chambira palms near their village. The economic incentive to quickly harvest as many chambira palms as possible was great, overriding ecological concerns. Like aguaje and other palm fruits, chambira fruits attract many game animals and help sustain the local hunting economy (Bodmer et al. 1997). The women who work with chambira themselves are now more actively involved in the local decision-making processes about resource use in the area. These concerns are not new. In the late 1980s the village of Chino itself began to tax and restrict the extraction of palm fruits, game animals, fish and other natural resources because they realized that their resource base was being depleted, often by outsiders who came into take out large quantities of resources. This led to the effort to create a community reserve (Penn and Alvarez 1990), and the conservation of the chambira palm was part of the government proposal to create the reserve (see Moya et al. 1991).

Three local developments have occurred due to the demand for palm resources. First, in the five villages of our study area, aguaje has dropped in economic value to these communities over the last decade and a half (even as prices rose in Iquitos) because the aguaje palm swamps have been heavily depleted where the fruit is most accessible, and stands of productive female palms with quality fruit are difficult to reach. Far less fruit comes out of the upper Tahuayo than in the past. Second, the local value of the chambira palm has greatly increased due to the recent demand for fiber (not fruit). Chambira cogollos are commonly sold and traded in the area, and often brought from distant villages outside of our study area, even as far as the village of Magdalena on the Quebrada Tamshiyacu. The finished product (chambira artwork) is a value-added NTFP that has driven this demand. One chambira basket now brings more money to local residents than a 40 kilo sack of Tahuayo aguaje. And basket-making is not a seasonally restricted activity as aguaje fruit harvesting is, giving this activity far greater economic potential than aguaje fruit over the course of a year. Finally, the planting of palm species that have high economic and ecological value has been a priority in the area, spearheaded by tree-planting projects supported by and designed with Rainforest Conservation Fund (see Penn and Neise 2004). Aguaje and now chambira are key components of the tree-planting programs. These

projects have had varying degrees of success and community participation, are not considered finished, and will require a few more years of work.

Today, many of the villagers that we interviewed view the unsustainable use of chambira palms as a major problem in the area, and the local management committee has made the management of the species a conservation priority (Comite de Gestión 2006). Moreover, residents of the area must participate in the creation of management plans for the community reserve (ACRCTT), which they are required by law to do. This is done through a locally elected group called the ACRCTT management committee (Comite de Gestión). The provincial government biodiversity and natural resources program (PROCREL) oversees this process and is also in need of this information in order to improve the effectiveness of their conservation programs in Peru. They currently use the Tamshiyacu-Tahuayo reserve as a model for the management of other areas (PROCREL 2008), and the making of chambira crafts is viewed as an economic development activity that is sustainable and helps eliminate poverty. Of the five communities we visited, the village of Esperanza participates the least in the Comite de Gestión as they struggle to determine what areas of the forest actually belong to them.

Chambira palms occur naturally in mature forests of the area and more commonly in secondary forests or fallows near villages. The seeds are often dispersed by rodents and the young palms are protected by local residents who then weed them and help them to grow. The primary source of the fiber is the emergent leaf shoot or crown shaft (cogollo), a long (can be 3m long) leaf “spear” containing the pinnae of the new leaf. The sub-epidermis of the leaf pinnae is made into fine string and then used to make hammocks and baskets. Other parts of the spear such as the mid-vein are used to make products like brooms, while fans (“avanicos”) are made from the wider leaf pinnae. Coomes (2004) reports that the palm produces 4 to 6 leaf spears per year, although our informants told us that this figure is too high, and our own observations of the palms lead us to agree. While the villagers claimed to harvest every other leaf spear that emerges in order to sustainably harvest the palms and avoid excessive stress, damage or death of the palms, we observed that most palms were losing nearly all their cogollos to fiber harvests.

We conducted surveys of ten 50 x 50 meter plots in mature forest and fallow areas where the fiber was harvested by residents of the village of Chino. We used hand held GPS units to map the plots and harvested palms. Statistical analysis of this data will be forthcoming in our publication. What was immediately obvious was that the cogollo harvests do not in any way

appear to be sustainable, and most palms are not allowed to rest and grow even one new frond between harvests. We observed even young chambira palms (<10 years old) that had experienced seven consecutive cogollo harvests. The harvests of wild chambira were not only intense, but usually confined to rather small areas. For example, the harvest areas for most of the Chino weavers were concentrated in three areas near the confluence of the Tahuayo River and the Quebrada Blanco. The three areas ranged in size from about a square kilometer to less than one-half that size. This finding contradicts the assertion by Newing and Bodmer (2004) that residents of this area must use and necessarily require large areas of forest for economic activities because forest resources are dispersed over large areas.

### **3. Cultivation of chambira**

During the course of our fieldwork we were not able to find a random sample of 30 chambira gardens, as we had planned to do in our S<sup>3</sup> proposal, let alone just 30 gardens, because only a small number of women had planted this species. Only the women in Chino had planted chambira in their own, individual gardens, while the women in Esperanza had planted a large (over one hectare in size) garden together containing 300 chambira palms with the help of PROCREL extensionists. Two factors stood out with respect to cultivation. First, the palms in the Esperanza garden were small and less than half of the original 300 planted in 2007 had survived. Second, although the women's chambira organization "Guacamayo" in the village of Chino had 20 members, only 11 members had planted chambira in their gardens, which contradicts stated goal of the organization: All members must plant the palms so as to reduce harvest pressure on wild chambira populations and guarantee and adequate supply in gardens that can be sustainably harvested to satisfy demand for the fiber. All of the Chino gardens containing young chambira palms were less than one hectare in size, and most were quite small, and less than .25ha in size. A few older chambira palms (often called "mother" or seed trees) were also present in some of these gardens.

We surveyed all 11 gardens of the Chino women, counting the number and recording the condition of all chambira seedlings, juveniles and adults palms, and found that all but four of the gardens had less than a dozen chambira palms (statistical analysis of this data will be forthcoming in our publication). This means that at least 16 of these 20 women, who use large amounts of chambira palm fiber, do not in any way have enough of the palms growing in their

gardens to sustain their chambira weaving or prevent them from using mostly wild chambira palms. This not only raises conservation concerns about the overexploitaton of palms in the area, but again contradicts the report by Popescu that explains how villagers have planted chambira groves to supply their weaving needs, “preserve the trees” and implies that the conservation objective has been achieved. To be fair, we did not visit all 9 villages of the communal enterprise. Still, in our study area, which has a history of tree conservation and tree-planting projects with communities, the palms were heavily exploited and nearly all of the harvested palms we observed had most, if not all of the fronds cut, rather than every other frond, every six months, as reported by Pospescu.

On a brighter note, planting chambira is a cheap, low-cost way to create populations of the palms. The villagers explained to us that with large palm species like *A. chambira*, instead of planting the seeds in the ground it is better to just throw out the seeds and let nature take its course. When actually planting the seeds, it is not easy to get the palm that you want, and it is best to use pre-germinated seeds if one is to plant them.

#### **4. Economics and earnings from chambira**

We learned that the making of chambira baskets for export to U.S. customers was not the “brainchild” of Noam Shany as reported by Popescu (2009). Villagers in Chino explained to us how the idea was in fact first initiated by the wife of the owner of a tourist lodge there, who sent some 400 baskets and pieces of artwork to the United States. To learn about the economics of the chambira weaving enterprise, and more about the sale of chambira to tourists and within the region, we developed a questionnaire that included questions about other economic activities and household characteristics of the five villages (Appendix 1). This questionnaire was developed in Peru after we arrived, and submitted to HRBNet and approved by the Grand Valley State University Human Research Review Committee (see Appendix 2).

A total of 122 women were interviewed in the five villages, which was over 90% of existing households. Statistical analysis of this extensive database will be forthcoming in our publication. However, initial review of our data highlights several obvious situations with respect to the chambira enterprise, and the socioeconomic situation of families in the five villages. First, women participating in the village enterprise from Chino and Esperanza were usually making from 50 to 100 dollars every three to four months from their baskets during the last year

of sales, and this was a new and very significant source of income for these women, usually their main source of income. Some of this income was sent to Iquitos to support family members there, usually children. The women earned about \$10 for each basket, and some could make as many as 15 to 20 baskets a month with the help of other family members. The women in Chino had the added benefit of a tourist lodge to sell a diverse variety of crafts to (not just chambira baskets), with sales being greatest during the tourist season of May-August. Second, despite these earnings, only about 15 to 40% of families living in the two enterprise villages (Chino, Esperanza) were participants in the village chambira enterprise. With a chance to sell crafts to tourists, only about one-third of the families in the three non-enterprise villages (Buena Vista, San Pedro, Diamante Azul) were making chambira crafts for sale to tourists who frequent the area.

Clearly, chambira weaving for foreign buyers is certainly not a “new way of life” as reported by Popescu (2009) for the vast majority of rural families our study area, let alone the thousands of rural villages in the Peruvian Amazon. Even within enterprise villages, most families are not weaving chambira baskets or other artwork for commercial purposes. Only a relatively small number of families were participating in the export enterprise. One lesson that we did learn was that whether the women were involved in the enterprise or not, many of them were struggling to support children, other family members family or a second household in the city of Iquitos, relying on local natural resources and their rural efforts to do this. This means that the rural economies and earnings are often being invested in urban households and endeavors, questioning whether rural standards of living can significantly improve if earnings are not reinvested in rural areas and households.

At the same time, most of the women and many men in these villages know how to weave chambira into a variety of useful and salable products. Entering the enterprise is not easy for non-members of the weaver groups, and there was a type of exclusivity that existed on the part of the enterprise members. We are concerned that families in need of additional income may be excluded from the enterprise, and the government of Loreto needs to assess this situation to help ensure opportunity for impoverished rural families. At the same time, our study convinced us that there is not enough chambira (either wild or cultivated) near the enterprise villages to supply increased production of chambira baskets in a sustainable way. Clearly, improved efforts

with chambira cultivation are urgently needed in the enterprise villages and elsewhere if this fledgling industry is to expand.

During the interview process, we found that although the majority of the 122 women interviewed knew how to weave chambira, most were not interested in joining the enterprise for a number of reasons. Many felt that they or their household would turn into a “factory”, sitting at home all day weaving, and that the enterprise was too demanding, stifled creativity, and forced them to abandon their gardens and other traditional subsistence and economic activities. This makes it clear that while economic poverty is a problem in the area, chambira weaving for the enterprise is not an attractive economic activity for most women.

### **5. Village characteristics, change and continuity**

The use of the questionnaire allowed us to learn a great deal more about the villages and their inhabitants than the questions themselves required. Statistical analysis using CHI-square and ANOVA tests is forthcoming in our publication. The villages and family life shared many similarities and common socioeconomic and environmental characteristics. Demographic change in the midst of continuity was one example. Most households had sent at least one if not several children to study, work, marry or live in the city of Iquitos. This rural to urban migration was a strong pull factor, especially for children and young people. Whole families had left, and village populations had usually declined in the last decade, as the village became older, and often “sadder” with the loss of children as we were told. In the village of San Pedro, aging and with just 11 families, the people remarked that there were not even enough residents to have a decent minga (a form of reciprocal group labor, common in agriculture), and only eight or nine students attended the school there. Village populations were usually over reported to help obtain more aid, infrastructure, and services. As was mentioned earlier, earnings from chambira and other activities often leave the villages and are in fact invested in Iquitos, to support family members and even a second household there. The drain of money to the city may indeed hinder development in rural areas, and forces us to look at rural poverty alleviation in a different way.

Newing (2009) has emphasized the mobility and migratory nature of people in this area. However, most of the women interviewed were born in their current village of residence or had lived there more than 20 years, contradicting this claim. One reason our results may differ from those of Newing (*ibid.*) is that we interviewed women in five villages over a large area, while the former study was concentrated on a small area in Quebrada Blanco in the villages of San Pedro

and Diamante Azul, interviewing hunters who have since left the area. Some residents reported to us that they came to this area because they were told about the richness of game to hunt, abundant forest resources and land, and the richness of resources in the community reserve

Both socioeconomic and environmental conditions differed or varied within all villages in the study and between the five villages we studied. The use, availability and economics of chambira and chambira craft production also differed significantly between the villages, and there was great variation in the use and earnings from chambira within each village. The village of Chino has greatly benefitted from the existence of a large tourist lodge that opened in 1996, as well as the presence of foreign researchers who pay wages for guides and need other services. Esperanza had benefitted greatly from the health post that opened there in 1992 and the government healthcare specialists who are employed there. The population of Esperanza has in fact experienced a recent rise due to recent arrivals from a nearby village that was swept away by the Amazon River. A new secondary school in Chino gives residents hope that their village will grow in population because only two other distant villages along the Tahuayo River have secondary schools.

## **6. Conclusion and Recommendations**

Our findings from this S<sup>3</sup> study lead us to recommend that more communities become involve in the conservation, sustainable use and cultivation of *A. chambira*, not just in the upper Tahuayo River valley, but in all areas where the species is exploited commercially. While much emphasis had been placed on the conservation of aguaje palms (*Mauritia flexuosa*) in this area, more attention needs to be given to the chambira palm and as part of the forthcoming government management plan for the reserve. In reality, the chambira weaving enterprise has changed lives for only a small number of families in a few communities. We feel our findings are especially important because we show this even in an area where direct sale of the crafts is possible (to tourists), an option unavailable to most other communities in the chambira export enterprise. Dependence on eco-friendly export markets makes these women completely vulnerable to export market changes and economics.

Most of the women and many men in these villages know how to weave chambira into a variety of useful and salable products. Entering the enterprise is not easy for non-members of the weaver groups, and there was a type of exclusivity that existed on the part of the enterprise

members. We are concerned that families in need of additional income may be excluded from the enterprise, and the government of Loreto needs to assess this situation to help ensure opportunity for impoverished rural families. At the same time, our study convinced us that there is not enough chambira (either wild or cultivated) near the enterprise villages to supply increased production of chambira baskets in a sustainable way. Additional and improved efforts with chambira cultivation are urgently needed in the enterprise villages and elsewhere if this fledgling industry is to expand.

Despite the economic poverty in these villages, the earnings of the enterprise members, and the fact that the vast majority of the 122 women knew how to weave chambira, most non-participants were not interested in joining the chambira enterprise for a number of reasons. This makes it clear that while economic poverty is a problem in the area, chambira weaving for the enterprise is not an attractive economic activity for most women. Finally, efforts to combat rural poverty such as the chambira enterprise face many obstacles. If rural residents continue to migrate to Iquitos and use their rural earnings to support family in the city, poverty alleviation and development in rural areas will remain elusive.

Our plan is to publish this study in a leading journal such as *The Journal of Applied Geography* when time permits.

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Appendix 1: Questionnaire.

**ENTREVISTA SOCIOECONÓMICA**

Nº

**I Datos generales:**

1. Comunidad: \_\_\_\_\_ Fecha: \_\_\_\_\_

**II Características del hogar:**

2. ¿Cuál es su actividad principal? \_\_\_\_\_

3. ¿Cuántas chacras tiene usted en la actualidad? \_\_\_\_\_ Bajial \_\_\_\_\_ Altura \_\_\_\_\_

4. ¿Tiene chambira en sus chacras? Si ( ) No ( ) ¿Qué cantidad? \_\_\_\_\_ ¿Lo usa? \_\_\_\_\_

5. ¿En su chacra la chambira fue sembrado o es natural? \_\_\_\_\_

6. Si fue sembrado ¿Porqué sembró chambira? \_\_\_\_\_

7. ¿Sabe usted tejer con fibra de chambira? Si ( ) No ( ) ¿Porqué aprendió? \_\_\_\_\_  
¿De quién lo aprendió? \_\_\_\_\_ ¿Cuándo lo aprendió? \_\_\_\_\_

8. ¿Usted se dedica a la artesanía con chambira? Si ( ) No ( ) ¿Porqué? \_\_\_\_\_

9. ¿Pertenece usted a algún grupo artesano? Si ( ) No ( ) ¿Porqué? \_\_\_\_\_

10. ¿Apoyan sus hijos en el trabajo con la chambira? Si ( ) No ( ) ¿Como? \_\_\_\_\_

11. ¿Qué otras partes de la palmera chambira son utilizados? \_\_\_\_\_

12. ¿Con qué otros sembríos cuenta en su chacra? \_\_\_\_\_

13. ¿Qué animales cría usted? chanchos ( ) gallinas ( ) patos ( ) otros \_\_\_\_\_

**III Características del uso y venta de la chambira:**

14. ¿De dónde consigues la chambira/cogollos? monte ( ) purma ( ) chacra ( ) otra gente ( )

15. ¿Cuántos cogollos cosechas? \_\_\_\_\_ Por mes: \_\_\_\_\_ En el verano: \_\_\_\_\_  
Cuando hay turistas: \_\_\_\_\_ Otros: \_\_\_\_\_

16. ¿Cuántos cogollos vienen del monte: \_\_\_\_\_, chacra: \_\_\_\_\_, purma: \_\_\_\_\_, otra gente: \_\_\_\_\_? Otras observaciones: \_\_\_\_\_

17. ¿Qué tipo de artesanías elabora? Hamacas ( ) abanicos ( ) trampas de pescar ( ) cestas ( )  
jicra/bolsa ( ) pulsera ( ) collares ( ) aretes ( ) paneros ( ) otros \_\_\_\_\_

18. ¿Cuántos cogollos utiliza? Para: Hamacas \_\_\_\_\_ abanicos \_\_\_\_\_ trampas de pescar \_\_\_\_\_ cestas  
\_\_\_\_\_ jicra/bolsa \_\_\_\_\_ pulsera \_\_\_\_\_ collares \_\_\_\_\_ aretes \_\_\_\_\_ paneros \_\_\_\_\_ otros \_\_\_\_\_

19. ¿Cuál es el precio de sus artesanías? Hamacas: \_\_\_\_\_ abanicos \_\_\_\_\_ trampas de pescar \_\_\_\_\_  
cestas \_\_\_\_\_ jicra/bolsa \_\_\_\_\_ pulsera \_\_\_\_\_ collares \_\_\_\_\_ aretes \_\_\_\_\_ paneros \_\_\_\_\_ otros \_\_\_\_\_
20. ¿Cuánto es el ingreso con la venta de las artesanías? En un mes: \_\_\_\_\_ En un año: \_\_\_\_\_  
La época más baja: \_\_\_\_\_ La época más alta: \_\_\_\_\_

Appendix 2: Human Subject Research Protocol Description and Application.

**GRAND VALLEY STATE UNIVERSITY  
HUMAN SUBJECTS REVIEW**

**Expedited or Full-Board Review  
ONLY**

**1. Describe significance, purpose and goals of this project in lay terms, including its contribution to the scientific research dialogues.**

Palms are one of the most abundant and important groups of plants in Amazonia and the importance of palm species in Amazonia for subsistence and commercial uses is well documented (Peters et al.1989, Henderson et al. 1997). An example of this is the chambira palm (*Astrocaryum chambira*), which is an important source of fiber for weaving and income in western Amazonia (Jensen and Balslev 1995, Vormisto 2002, Coomes 2004) In the northeastern Peruvian Amazon, chambira palm fibers are used to make everything from string, fish nets, hammocks, artwork and crafts. The sale of these products to both Peruvians and tourists provides an important source of income to people living in rural villages, especially women. This income is vital for the purchase of school supplies, medicine and children's needs. I propose to research the use of chambira palm fibers and the sale of chambira crafts in 4 communities located about 100 miles from the city of Iquitos, Peru, together with Grand Valley State University (GVSU) S<sup>3</sup> Scholarship student Ms. Anel Guel. There, villagers work to obtain the fibers and sell their products in a sustainable way, and at the same time promote the cultivation of the palm trees in their family gardens. As is the case with so many products from tropical forests, there is great geographic variation in the abundance of the resource (chambira) and variation in the amount of

income that local residents actually receive from their products (Neumann and Hirsch 2000, Coomes 2004, Penn 2008).

This research will be conducted during July 2009 along the Tahuayo and Blanco rivers that enter a community reserve in Peru, the Area de Conservación Comunal Regional Tamshiyacu-Tahuayo (ACRCTT). This reserve has been locally managed with an emphasis on conserving forest resources such as chambira because they are so important to the local economy and ecology (Bodmer et al. 1997). With our work, the amount of chambira that is harvested and used in the 4 villages will be established, as well as the number of chambira palms that are harvested in the surrounding forests and nearby gardens. This is important because of concern over the destructive harvesting of these palms and the loss of this resource over time in the area. Local residents are actively involved in the local decision-making processes about resource use in the area. These concerns are not new, and will be addressed now by our research in order to better manage the resource and guarantee a sustainable source of income for the future. The results of this study will also provide a significant contribution to scientific research because this species and its use by humans have never been studied in a community conservation context, or to provide specific management recommendations for the species to rainforest communities.

**2. Describe research design, methods and procedures in detail. Include foreseeable or anticipated risks of harm or discomfort to participants. Describe protections against risks.**

To answer questions on chambira harvest, use and economy, we will first conduct interviews with the villagers. These methods are participatory, and involve more than just asking questions. We will spend many days walking with villagers in their gardens, in the forest, and in make visits to their homes. We will study populations of chambira palms by conducting censuses of seedlings, juveniles and adults, and recording the number of leaf spears (“cogollos”) that have been harvested on each tree to obtain fiber. A random sample of 30 gardens will provide data on cultivated chambira. In the forest this will be done by walking transects (minimum 100m in length) and in quadrants (50 x 50 meters). A representative sample of at least 30 quadrants and 30 transects near each of the 4 villages is our goal. Quadrants and transect coordinates will be recorded using hand held GPS units. This study design will provide a representative sample of chambira populations that is robust and will provide needed quantitative analysis of their abundance and distribution.

There are no foreseeable risks with this research methodology. J. Penn has already informed the villagers about the study during a visit to the area in April 2009. He will acclimate the student (Anel Guel) to the physical and social environment in the research area before beginning the research. We will lead the research participants through the interview process and together make visits to gardens and forests which will result in them verbally explaining and also showing us what is most important about chambira utilization, extraction and cultivation. These are neither risky procedures nor are they likely to bring up uncomfortable situations.

**3. Describe target study population, methods of recruitment and sample selection (if any). Justify any restriction to or against a protected subgroup. Describe potential benefits to participants or others from study results.**

The target populations are rural residents living in 4 small villages along the Tahuayo and Blanco rivers of northeastern Peru. These are small rivers located about 100 miles from the city of Iquitos. Because the communities are small and are already aware of this research project, we will not need any form of recruitment material except word of mouth. As previously stated, the information from this study will help residents of the area to create management plans for the use of chambira palms. They view the unsustainable use of chambira palms as a major problem in the area, and have made the management of the species a conservation priority. We will provide the 4 villages with a final report in Spanish from our study that will be useful for this management process.

**4. If the research study is potentially therapeutic for participants, describe alternative therapies and their risk to benefit ratio.**

N/A

**5. Describe security for study data acquisition and management, including final disposition.**

It is important to note that during the past 25 years he has worked in the area, J. Penn has found that most villagers are proud of their work and achievements, including their contributions to the academic world. Nevertheless, the names of participants will not be recorded, except on the consent forms or if a participant specifically requests that their name be used in a presentation or publication. Thus, information will never be connected to a name unless desired by a specific participant.

If information is used in a publication, pseudonyms will be used in place of actual village names, so that villages cannot be identified. Any maps published will only be portions of original maps, or degraded copies.

All data will be kept on personal computers of J. Penn and Anel Guel with password protection. They will not share delicate information (e.g., illegal extraction, sacred sites, community secrets) with others through presentations, publications or other means.

**6. Describe participant compensation or incentive plan, if any.**

There is no compensation for participants.

**7. Describe consent dialogue process. Include qualifications of investigator and copies of all consent, assent, permission or other information documents.**

It is important to note that Principal Investigator J. Penn has worked for 25 years in the study area and knows these villagers well. S<sup>3</sup> Student Anel Guel visited the area in 2008 for a period of 25 days. Both are fluent in Spanish. We will verbally explain the objectives of his project in Spanish to village authorities and all participants, how the information will be used, and their rights while participating. Each potential participant will be provided with a consent form (Appendix I) that is written in Spanish containing a description of the research, research procedures, risks, benefits, confidentiality, voluntary nature of their participation, and contact information for HRRC (see Appendix II). After reading the consent form, we will answer any questions they may have. Before participating in anything related to this project the individual must sign the consent form, and each will have a copy for their records. Participation will remain voluntary through the project and individuals can end their participation at any time with no repercussions.

**8. Include copies or descriptions of all study measurement instruments.**

A questionnaire will be used (Appendix III) when conducting interviews with participants who have volunteered to be interviewed. Two battery powered hand held GPS units (model GPSMAPC60x) will be used to record geographic coordinates in the field. Distance measurements can then be obtained from these coordinates when we return to the GVSU campus.

**9. Include signed copies of all approvals, agreements, sections of grant applications, etc.**

See Appendices I and II.

**Signature of Researcher:** James Penn      **Date:** June 25, 2009

**Literature cited:**

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Vormisto, J. 2002. Making and marketing chambira hammocks and bags in the village of Brillo Nuevo, northeastern Peru. *Economic Botany* 56(1): 27-40.

**Appendix I.** Proposed informed consent form in English.

**USE OF THE CHAMBIRA PALM IN RAINFOREST COMMUNITIES OF THE  
PERUVIAN AMAZON**

**INFORMED CONSENT FORM**

**RESEARCH PROCEDURES**

- a. This study proposes to research the use of the chambira palm and sale of its products in communities located alongside the Tamshiyacu-Tahuayo Regional Communal Conservation Area (TTRCCA).
- b. The study will be done with participation of local residents and carried out in benefit of the conservation of natural resources, especially the communal management of chambira, and the well being of these communities.
- c. The study will use a socioeconomic survey that contains questions about the use, extraction, cultivation and sale of chambira, including information such as the techniques used to make crafts with chambira, gathering techniques, and how local people see the use and economy of chambira to date and in the future. During the month of the research (July 2009) we also propose to walk through the forest and survey gardens with the study participants. This study will be carried out specifically within and in the surroundings of the communities of San Pedro, Buena Vista, Chino, and Esperanza.
- d. All adult members of the communities will be eligible to participate in the study.
- e. After the study, all participants will have the right to see and/or receive the results of the study. Therefore, we will prepare a summary document of the study results for participants and for community authorities.

## **RISKS**

There are no foreseeable risks associated with the proposed research procedures. We (the researchers) will not reveal or publish names of participants in the study, nor the actual names of the communities involved. Nevertheless, we reserve the right to publish non-original maps from the study, such as degraded maps or drawings.

## **BENEFITS**

The information and results produced from the study will have various potential benefits and uses for the communities, especially those that wish to manage their natural resources in a sustainable manner for the future. In particular, the results of the study will benefit the families that make chambira crafts, and those that harvest or cultivate the palms because the information derived from the study could really help the proper management of this species. Likewise, the information obtained and the maps made will greatly help in the management and protection of community lands and forests of the participants.

## **PARTICIPANT PRIVACY**

Participation is voluntary and participants may withdraw from the study at any time and for any reason. There is no risk or harm involved, and no loss of any rights. The researcher will not publish any participant names or connect participant names to the study. The same applies for village names. All data will be private and protected by the researchers. After the study, all participants will have the right to see and/or receive the results (a copy of the report we prepare) and copies of any publications.

## **CONTACT INFORMATION**

This research is directed by Dr. James Penn of Grand Valley State University (GVSU). Dr. Penn can be contacted at GVSU by telephone at 616-331-8522. In Iquitos, his phone numbers are: 24-

1918, when staying at Calle Dos de Mayo 668, or 26-4233, when at Calle Atahualpa 1520. Dr. Penn can respond to any question, worry or problem participants may have, or they may call the office of Human Subject Research Review at GVSU (616-331-3197). This research has been reviewed according to the Grand Valley State University procedures governing your participation in this study.

## **CONSENT**

I have read this form and agree to participate in this study.

---

Name

---

Date

**Appendix II.** Proposed informed consent form in Spanish.

## **FORMA DE CONSENTAMIENTO**

### **EL USO DE LA PALMERA CHAMBIRA IN LAS COMUNIDADES RURALES DE LA AMAZONIA PERUANA.**

#### **PROCEDAMIENTOS DE LA INVESTIGACION**

- a. Este estudio propone investigar el uso de la palmera chambira y la venta de sus productos en las comunidades aledañas del Área de Conservación Comunal Regional Tamshiyacu-Tahuayo (ACRCTT).
- b. La elaboración del estudio con la participación de los moradores locales será realizada en beneficio de la conservación de los recursos naturales, especialmente el manejo comunal de chambira, y el bienestar económico de las comunidades.
- c. El estudio realizara una encuesta socioeconómica que contiene preguntas sobre el uso, extracción, cultivación y venta de chambira, incluyendo información tal como las técnicas de elaboración de artefactos de chambira, técnicas de recolección, y como los moradores locales vean el uso e economía de chambira actualmente y para el futuro. Durante el mes de la investigación (Julio 2009), también proponemos andar en el monte y las chacras con los participantes del estudio. Dicho estudio será realizado específicamente dentro y en los alrededores de las comunidades de San Pedro, Chino, Buena Vista y Esperanza.

- d. Todo los miembros adultos de la comunidad son elegibles participar en el estudio.
- e. Después del estudio, todos los participantes tendrán derecho de ver o/y recibir los resultados del estudio. Por lo tanto, preparemos un documento sumario de los resultados del estudio y entregar el documento a las autoridades comunales.

### **RIESGOS**

No se advierte ningún riesgo que esta asociado con los procedimientos propuestas en esta investigación. Nosotros (los investigadores) nos comprometemos a no publicar los nombres de los participantes en el estudio, ni los nombres de las comunidades en publicaciones. Sin embargo, nosotros reservamos el derecho de publicar mapas no originales (como un mapa degradada, un croquis) del estudio.

### **BENEFICIOS**

La información producido por este estudio y los resultados de la investigación tendrían varios beneficios y uso potenciales para las comunidades, especialmente ellos que desean manejar sus recursos naturales en una forma sostenible para el futuro. En particular, los resultados del estudio beneficiara las familias que se dedican a la artesanía de chambira, y ellos que cosechen y cultivan las palmeras porque la información derivada del estudio ayudaría realmente al buen manejo de esta especie. Asimismo, la información obtenida y los mapas elaborados ayudaran bastante en el manejo y protección de las tierras y bosques comunales de las comunidades.

### **CONFIDENCIALIDAD DEL ESTUDIO (PRIVACIDAD DE PARTICIPANTES) Y REPORTAJE DE INFORMACION**

Su participación es voluntaria y usted puede retirarse del estudio en cualquier momento y por cualquier razón. No hay ningún perjuicio o pérdida de derechos. Nosotros (los investigadores) nos comprometemos a no publicar los nombres de los participantes en el estudio, y los datos serán protegidos por los investigadores. Después del estudio, todos los participantes tendrán derecho de ver o/y recibir los resultados del estudio como copias del reporte que preparemos y cualquier publicación.

### **CONTACTOS**

Esta investigación es dirigida por Dr. Jim Penn de Grand Valley State University (GVSU). Dr. Jim Penn puede ser contactado en GVSU por teléfono No. 01-616-331-8522. En Iquitos, su números de teléfono son: 24-1918, con domicilio en Calle Dos de Mayo 668, o 26-4233, con domicilio en Calle Atahualpa 1520. Dr. Penn puede responder a cualquier pregunta, inquietud, o problema relacionada con la investigación. Usted puede contactar la oficina de Human Subject Research Review de GVSU en el teléfono 01-616-331-3197. Esta investigación este de acuerdo con los páramelos fijados por Grand Valley State University que dictan su participación en esta investigación.

### **CONSENTAMIENTO**

He leído este documento y estoy de acuerdo en participar en este estudio.

---

Nombre \_\_\_\_\_

Fecha \_\_\_\_\_

**Appendix III.** Proposed questionnaire for study.

**ENTREVISTA SOCIOECONÓMICA**

N°

**IV Datos generales:**

21. Comunidad: \_\_\_\_\_ Fecha: \_\_\_\_\_

**V Características del hogar:**

22. ¿Cuál es su actividad principal? \_\_\_\_\_

23. ¿Cuántas chacras tiene usted en la actualidad? \_\_\_\_\_ Bajial \_\_\_\_\_ Altura \_\_\_\_\_

24. ¿Tiene chambira en sus chacras? Si ( ) No ( ) ¿Qué cantidad? \_\_\_\_\_ ¿Lo usa? \_\_\_\_\_

25. ¿En su chacra la chambira fue sembrado o es natural? \_\_\_\_\_

26. Si fue sembrado ¿Porqué sembró chambira? \_\_\_\_\_

27. ¿Sabe usted tejer con fibra de chambira? Si ( ) No ( ) ¿Porqué aprendió? \_\_\_\_\_

¿De quién lo aprendió? \_\_\_\_\_

¿Cuándo lo aprendió? \_\_\_\_\_

28. ¿Usted se dedica a la artesanía con chambira? Si ( ) No ( ) ¿Porqué?

\_\_\_\_\_

29. ¿Pertenece usted a algún grupo artesano? Si ( ) No ( ) ¿Porqué? \_\_\_\_\_

\_\_\_\_\_

30. ¿Apoyan sus hijos en el trabajo con la chambira? Si ( ) No ( ) ¿Como? \_\_\_\_\_

\_\_\_\_\_

31. ¿Qué otras partes de la palmera chambira son utilizados? \_\_\_\_\_

32. ¿Con qué otros sembríos cuenta en su chacra? \_\_\_\_\_

\_\_\_\_\_

33. ¿Qué animales cría usted? chanchos ( ) gallinas ( ) patos ( ) otros \_\_\_\_\_

**VI Características del uso y venta de la chambira:**

34. ¿De dónde consigues la chambira/cogollos? monte ( ) purma ( ) chacra ( ) otra gente ( )

35. ¿Cuántos cogollos cosechas? \_\_\_\_\_ Por mes: \_\_\_\_\_ En el verano: \_\_\_\_\_

Cuando hay turistas: \_\_\_\_\_ Otros: \_\_\_\_\_

36. ¿Cuántos cogollos vienen del monte: \_\_\_\_\_, chacra: \_\_\_\_\_, purma: \_\_\_\_\_, otra gente: \_\_\_\_\_?

Otras observaciones: \_\_\_\_\_

37. ¿Qué tipo de artesanías elabora? Hamacas ( ) abanicos ( ) trampas de pescar ( ) cestas ( ) jicra/bolsa ( ) pulsera ( ) collares ( ) aretes ( ) paneros ( ) otros \_\_\_\_\_

38. ¿Cuántos cogollos utiliza? Para: Hamacas \_\_\_\_ abanicos \_\_\_\_ trampas de pescar \_\_\_\_ cestas \_\_\_\_ jicra/bolsa \_\_\_\_ pulsera \_\_\_\_ collares \_\_\_\_ aretes \_\_\_\_ paneros \_\_\_\_ otros \_\_\_\_\_

39. ¿Cuál es el precio de sus artesanías? Hamacas: \_\_\_\_ abanicos \_\_\_\_ trampas de pescar \_\_\_\_ cestas \_\_\_\_ jicra/bolsa \_\_\_\_ pulsera \_\_\_\_ collares \_\_\_\_ aretes \_\_\_\_ paneros \_\_\_\_ otros \_\_\_\_

40. ¿Cuánto es el ingreso con la venta de las artesanías? En un mes: \_\_\_\_\_ En un año: \_\_\_\_\_  
La época más baja: \_\_\_\_\_ La época más alta: \_\_\_\_\_