Inter-specific diversity of homegardens in central Amazon settlements

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Key words: native fruits, exotic fruits, small farmer, diagnosis.

Introduction

The tropical forest ecosystem is characterized by the high species diversity of its biological system. Some species are of high social and economic value due to fruit production. The indigenous agroforestry practices had introduced the use of these species by planting them in mixed fruit tree crops with other useful plants, a common practice among Amazonian peasants from government settlement areas. This planting diversification which is based on farmers' ethnic-cultural origin, is an intrinsic characteristic of traditional farming system, and became strategy to provide for food security and income, through the sale surplus.

Though, the fruit tree species are economically and socially important in the region, many lack agronomic knowledge. Some species, such as *cupuaçu* (*Theobroma grandiflorum*) have a known potential. Other species, such as *abiu* (*Pouteria caimito*), *biribá* (*Rollinia mucosa*), and *ingá* (*Inga edulis*) are popular in the region. Palm trees are, in general, important food source and are also used in landscape (Souza et al. 1996).

Home gardens composition is determined both by farmers' preferences for trees that provide some kind of service, as well as farmers' origin, contributing independently, for different actions. These actions allow the conservation of genetic resources, the domestication of native species, and the adaptation of exotic species to the region's soil and climatic conditions.

Home gardens are an underutilized source of promising new plants for commercial production because farmers often test exotic plants before risking a larger investment by planting them fields (Dubois, 1996). Home gardens are often impressive reservoirs of agrobiodiversity – that portion of biodiversity used in agricultural production – but their potential is still largely untapped. Some home gardens contain dozens of trees or shrub species, and an equal number of cultivated herbs and grasses (Smith et. al. 1998)

This study analyzes the inter-specific diversity of home gardens from family production units from two municipalities studied during the Western Amazon Embrapa's Agro-Socio-Economic Diagnosis Project.

Material and Methods

The composition of 41 small farmers' homegardens of two communities were studied in order to evaluate agricultural diversity in government settlement projects. Fourteen farmers were located in Sao Francisco dust road, in Manaus Municipality (AI) and 27, on Balbina road, in Presidente Figueiredo Municipality (AII), both in the State of Amazonas.

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During field work, farmers were interviewed for primary data on production costs and cultivation processes, using structured questionnaires in order to identify (1) detailed knowledge of land use, (2) existing and predominant land use and agricultural systems, and (3) problems and difficulties of farming systems, bringing about the characterization of these farmers.

Results and Discussion

A total of 38 species in the homegardens were identified in 41 households visited. From these total, 20 species were exotic and 18, native (Tables 1 and 2). The most common species was *Theobroma grandiflorum*, with a frequency of 71% in the community AI, and 81%, in the community AII. Among the exotic species, avocado was the most frequent species (64%) in community AI, while mango and jack fruit had the highest frequency (44%) in AII.

The composition of homegardens from AII community shows a preference for exotic species which are cultivated for cash in other regions as well as for species with potential in the region (*Theobroma grandiflorum* and *Bactris gasipaes*). The migrating origin of population from these settlement projects had probably influenced the choice for species of economic value.

In the community AI, with both traditional and migrating households, shows the predominance of native species, with no concern for economic importance (*Alibertia edulis*, *Pourouma cecropiifolia* and *Oenocarpus mapora*), promoting a higher diversity among both exotic and native groups of species. Coomes and Burt (1997) also found high diversity of native species in indigenous agroforestry systems.

Table 1. Native species found in homegardens from two settlement areas in Central Amazonia.

Family	**Species**		**Frequency (%)**	
	Scientific name	**Local name**	**AI**	**AII**
Sterculiaceae	*Theobroma grandiflorum*(Spreng.)Schum.	Cupuaçu	71	81
Sterculiaceae	*Theobroma cacao* L.	Cacau	07	-
Annonaceae	*Rollinia mucosa (Jacq.)* Baill	Biribá	29	-
Arecaceaea	*Bactris gasipaes* H. B. K.	Pupunha	50	44
Arecaceaea	*Euterpe precatoria* e *Euterpe oleraceae*	Açaí	36	-
Arecaceaea	*Oenocarpus mapora* Karsten	Bacabinha	07	-
Arecaceaea	*Scheelea martiana* Burret	Urucuri	07	-
Sapindaceae	*Paullinia cupana* var. sorbilis(Mart.) Ducke	Guaraná	14	-
Sapotaceae	*Pouteria caimito* (Ruiz & Pav.) Radlk.	Abiu	14	-
Icacinaceae	*Poraqueiba sericea* Tulasne	Umari	07	-
Cecropiaceae	*Pourouma cecropiifolia* Mart.	Mapati	07	-
Rubiaceae	*Alibertia edulis* (Richard) Rich. ex DC.	Puruí	-	4
Mimosaceae	*Inga edulis* Mart.	Ingá-cipó	29	48
Caryocaraceae	*Caryocar villosum* (Aubl.)	Piquiá	07	-
Myrtaceae	*Eugenia stipitata* McVaugh	Araçá-boi	21	-
Euforbiaceae	*Hevea* spp	Seringueira	07	-

Table 2. Exotic species found in homegardens from two settlement areas in Central Amazonia.

Family	Species		Frequency (%)	
	Scientific name	Local name		
Lauraceae	*Persea americana* Mill.	Abacate	64	41
Moraceae	*Artocarpus heterophyllus* Lam.	Jaca	21	44
Anacardiaceaea	*Mangifera indica L.*	Manga	43	44
Annonaceae	*Annona muricata L.*	Graviola	14	11
Annonaceae	*Annona squamosa L.*	Ata	-	04
Arecaceae	*Cocos nucifera* L.	Coco	50	33
Rutaceae	*Citrus* spp	Citrus	50	37
Passifloraceae	*Passiflora edulis* Sims	Maracuja	-	19
Bromeliaceae	*Ananas comosus* (L.) Merrill.	Abacaxi	14	33
Musaceaea	*Musa* spp	Banana	29	30
Caricaceae	*Carica papaya* L.	Mamão	07	33
Myrtaceaea	*Psidium guajava* L.	Goiaba	-	19
Anacardiaceae	*Anacardium occidentale* L.	Caju	07	41
Rubiaceae	*Coffea arabica* L.	Cafe	36	41
Piperaceae	*Piper nigum* L.	Pimenta-do-reino	-	11
Solanaceae	*Diospyros kaki L.*	Caqui	-	01
Myrtaceae	*Syzygium malaccensis*	Jambo	36	07
Bixaceae	*Bixa orellana* L.	Urucum	-	07
Myrtaceae	*Syzygium cumini* (L.) Skeels	Jamelão	07	-

Conclusions

The results showed an increased diversity value in homegardens from settlement areas, indicating the possibility for successful adoption of agroforestry technologies that would improve farming systems in use.

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