Supplementary material

Table S1: 21 tree-based foods from Madre de Dios, Peruvian Amazon, identified based on a literature review.

Common name	Scientific name	Edible (E) or medicinal (M) function
Copoazú	*Theobroma grandiflorum*	E
Peach Palm or Pijuayo	*Bactris gasipaes*	E
Guanabana	*Annona muricata*	E
Guaba	*Inga edulis*	E
Aguaje	*Mauritia flexuosa*	E
Camu Camu	*Myrciaria dubia*	E
Ungurahui	*Oenocarpus bataua*	E, M
Huasai	*Euterpe precatoria*	E, M
Huicungo	*Astrocaryum murumuru*	E, M
Caimito	*Pouteria caimito*	E, M
Charichuelo	*Garcinia macrophylla*	E
Shihuahuaco	*Dipteryx micranta*	E
Shapaja	*Attalea phalerata*	E, M
Shebon	*Attalea butyracea*	E, M
Lucuma	*Lucuma macrophylla*	E
Ubos	*Spondias mombin*	E, M
Uvilla	*Pourouma cecropiifolia*	E, M
Arazá fruit	*Eugenia stipitata*	E
Cocona	*Solanum sessiliflorum*	E
Copaiba	*Copaifera officinalis*	M
Sangre de Grado	*Croton dracanoides*	M

Table S2: Sector of the interviewees for both sets of interviews, with local agroforestry and commercial specialists of Madre de Dios, Peruvian Amazon.

Sector	Institutions related to the local agroforestry specialists	Institutions related to the local commercial specialists
NGO	PROFONANPE (Fondo Nacional para Áreas Naturales Protegidas por el Estado) https://profonanpe.org.pe	Camino Verde http://caminoverde.org
	ArBio https://www.arbioperu.com	
	CINCIA (2) (Centro de Innovación Científica Amazónica) https://cincia.wfu.edu	
	Camino Verde http://caminoverde.org	
	Caritas Perú https://www.caritas.org.pe/zona-sur/	

Association	AAE (2) (Asociación Agricultura Ecologica) www.ecodely.com	PALSAMAD (Asociación de Palmicultores San Juan)
Academia / public research	IIAP (Instituto de Investigaciones de la Amazonía Peruana) http://www.iiap.org.pe/web/iiap_region_madre_de_dios.aspx	UNAMAD (3) (Universidad Nacional Amazónica de Madre de Dios) https://unamad.edu.pe
		CITE productivo https://www.itp.gob.pe/cite-productivo/madrededios/
Private sector		INALA https://inalagroindustria.com
Other	None (2)	

Table S3: Questionnaire for the interview with local agroforestry specialists in Madre de Dios, Peruvian Amazon, in order to identify 10 high-potential NUS.

Benefits	Criteria	Question
Environmental	Growing conditions	Does the species have tolerance for the following environmental conditions: • Droughts? • Degraded soils?
	Ecosystem services	Does the species positively affect the soil quality or texture?
Nutritional	Perceived nutritional benefits	Is the species known to be: • Nutritive? • Medicinal?
	Diet diversification	Does the species have the potential to diversify the local diet?
Commercial	Market value	Does the species have an established market?
	Market potential	Does the species have market potential, locally or internationally?

Table S4a: Questionnaire for the interview with market specialists in Madre de Dios, Peruvian Amazon. Each question is asked for each of the 10 high-potential species that the specialist has experience with.

What do you know about the species productivity in terms of yields over time?
During which season does the species produce yields?
How long can the fresh product be preserved?
Can the product be transformed (e.g. dried)?
What is the current state/recognition of this species on the market (local and international)? What is its current price on the market? How much do the farmers receive from it (raw product)?
Do you know where the species is marketed in or outside of Peru?
Is there any type of incentive or support for the growth of this species?
How do you see the future of the commercialisation of this species? Is it worth telling farmers to plant more of it?

What do you think of the high-potential species list, are they representative of the most promising species for AFS?

Table S4b: Questionnaire for the interview with farmers in Madre de Dios, Peruvian Amazon.

Background
Name?
Could you talk about your farm's history, when and why you started working on it?
What are your main products?
Quantification
How many hectares do you have? How many hectares do you have under AFS?
How far is your plot located? How do you get there?
Did you take up a loan to start the system? After how much time did it become profitable?
What are the maintenance costs throughout time?
How many family members/people work on your plot throughout the year? For how many hours a week?
What is the main source of income for your family? How much does the plot contribute to that in pourcentage?
How much does the plot contribute to your familiar food consumption?
Agrobiodiversity
How many species do you cultivate in your AFS?
Which of the high-potential (HP) species do you have on your farm? Which are your favourites from the list? (show list)
What is the main reason you chose to integrate them into your system? Which benefits do you get from them?
What do you know about the species productivity in terms of yields over time? (for each HP species)
During which season does the species produce yields? (for each HP species)
Do you sell your HP products? If so, where and how do you sell you HP products? For what price? How much of it do you sell per year/season (yield)?
How did you provide yourself with them (seeds, seedlings)? Where from?
Would you recommend the use of HP species to other farmers? If not, which other species would you recommend for AFS and why?
What do you think of the rest of the HP list? Would you cultivate these species? Why (not)?
Challenges
What are the main challenges of practicing AF? (climate change? Market access? Initial investment?)
Do you apply strategies to overcome the challenges? (Fireproof species, watering, cooperatives?)
What would be a driver for you to plant more species? (market, neighbours, time, less workload?)
How do you see the future of your farm?

Table S5: Source of the collected data to estimate the profitability of NUS production in smallholder-managed agroforestry systems in Madre de Dios, Peruvian Amazon.

Description of data	Source
Farm characteristics used to design the mixed NUS agroforestry system	
Size of farm	Farmer interviews
Number of species managed	Farmer interviews
Density of plantation	Field observation (during which farmers confirmed observations by providing the chosen cropping density)
Design structure	Field observation confirmed by the extensive commercial specialist interview (Camino Verde)
Income-related data	
First year of harvest	Farmer and commercial specialists' interviews
Months of production per year	Farmer and commercial specialists' interviews for the species *Theobroma grandiflorum* and commercial specialists interviews only for the other species
Productivity per tree (yields)	Farmer and commercial specialists' interviews
Price per unit on the local market	Farmer and commercial specialists' interviews
Gradual increase in production	Commercial specialist extensive interview (Camino Verde)
Cost-related data	
Seedling costs	Commercial specialist extensive interview (Camino Verde)
Replacement rates throughout time	Commercial specialist extensive interview (Camino Verde)
Local salary of hired labor	Commercial specialist extensive interview (Camino Verde)
Transportation to the market	Farmer interview (later round)
Losses due to unsold product	Farmer interview (later round, at the weekly food fair)
Months of production per year	Farmer and commercial specialists' interviews for the species *Theobroma grandiflorum* and commercial specialists interviews only for the other species

Table S6: Estimated years until first harvest, production and prices of high-potential NUS in Madre de Dios, Peruvian Amazon. Values are based on interviews of farmers (n=23) and market specialists (n=7).

		Years until first harvest			Production (unit/yr/tree)			Price (PEN/unit)		
	Fruit	mean	sd	n	mean	sd	n	mean	sd	n
1	Acai	3.5	0.63	6	17.9	12.77	4	2	1.41	2

2	Aguaje	6.9	2.01	7	161.3	127.13	12	1.4	0.36	12
3	Araza	2.6	1.92	4	20.8	17.15	6	3.3	2.32	10
4	Camu-camu	4	1	3	66.2	70.87	4	5.8	2.34	7
5	Cocona	1	0	3	10.9	9.84	5	2.5	0.61	6
6	Copoazu	3.2	0.98	6	14.6	19.45	6	6.7	2.53	16
7	Guaba	1.9	0.89	5	139.4	80.02	8	0.9	0.30	10
8	Guanabana	4.5	3.53	2	4.8	0.29	3	2.7	1.71	4
9	Pijuayo	4	1.15	4	27.3	11.98	7	3	1.22	8
10	Ungurahui	18	8.57	5	49.2	32.16	6	2.4	0.81	6

Table S7. Scores for each of the 21 species identified in the literature review regarding their ecological, economic and nutritional benefits, based on interviews with local agroforestry specialists in Madre de Dios, Peru. The species are ranked in increasing order for total scores.

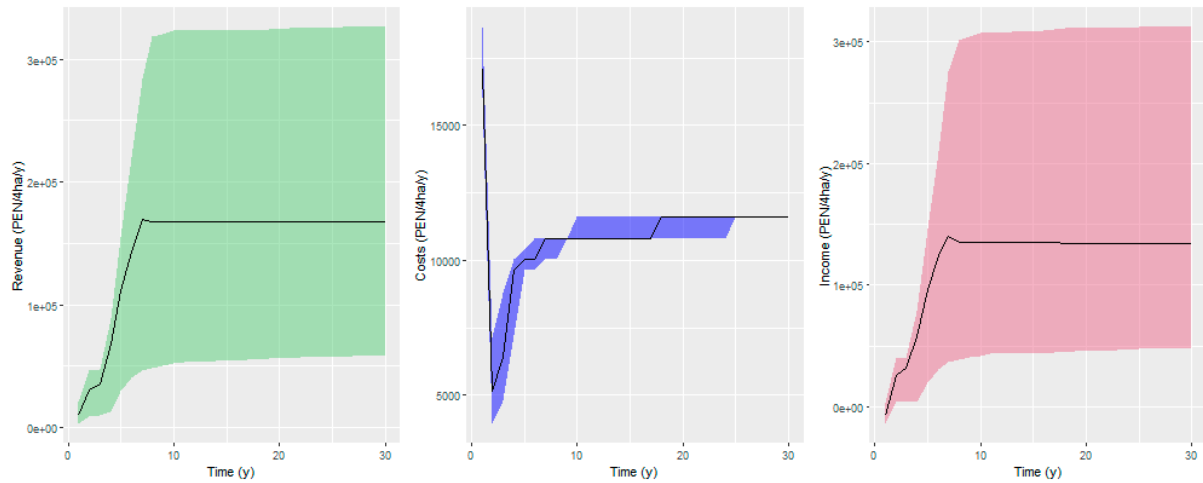| Species (common name)	Score on the questionnaire (in percent of 'yes')		
	Ecological benefit (%)	Economic benefit (%)	Nutritional benefit (%)
Huicungo	39	27	55
Charichuelo	30	50	58
Uvilla	61	41	45
Shihuahuaco	67	36	48
Shapaja	67	27	58
Shebon	64	32	61
Ubos	45	64	70
Copaiba	48	95	36
Lucuma	42	82	64
Sangre de Drago	58	95	36
Caimito	45	82	67
Ungurahui	33	86	82
Araza	33	95	76
Camu-Camu	21	100	88
Pijuayo	52	86	73
Guaba	94	64	58
Guanabana	52	82	82
Cocona	48	91	82
Huasai	61	91	79
Aguaje	48	100	82
Copoazu	67	100	73

Figure S1. Projected revenue (a), costs (b) and profit (c) for a diverse agroforestry system based on 10 NUS with high economic, ecological and nutritional potential as indicated by farmers and specialists in Madre de Dios, Peruvian Amazon. The species that were included in the modelled system were copoazu, guaba, huasai, aguaje, cocona, pijuayo, guanabana, arazá, ungurahui and camu-camu and their number per category was randomized. The colored areas indicate 95% bootstrap confidence intervals.