

**Key Findings: Community Knowledge and Use of Algarrobo, *Prosopis spp.*,
and Dry Forests Surrounding San Pedro de Lloc, La Libertad, Peru**

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1) Study Overview

The study consisted of:

- a) Twenty-two structured interviews conducted in Spanish with members of communities in and around San Pedro de Lloc, La Libertad, Peru, concerning the ways in which they know, value, and use Algarrobo trees. Communities interviewed include La Venturosa, Amauta, and El Rázuri (the latter two are adjacent to the San Pedro de Lloc forest), and the village of Santonte.
- b) Interviews with representatives of prominent community stakeholders such as the district government and the peasant-farmers' association.
- c) Visits to significant local stands of *bosque seco* forest to survey forest biodiversity, health, and different types of forest use.

2) Uses and Values Key Findings

- Top reasons listed by respondents for Algarrobo's value is for their role in **oxygen production (mentioned in 40.9% of interviews)** and as a source of **fuelwood (27.3%)**.
- 73.1% reported cooking over both gas and firewood, while an additional 7.7% of respondents cooked solely using firewood, meaning **80.8% of respondents cooked with Algarrobo firewood at least occasionally**.
- **Fuelwood harvest for firewood and charcoal vary significantly** in their demand, rate of use, nature of extraction, and final destination, with firewood largely used locally in some bakeries and many homes as "consumo doméstico" and charcoal trafficked and these distinctions should be taken into account when designing a conservation project.
- Algarrobo commonly **chosen as a cooking fuel for both cultural and economic factors**. Algarrobo firewood's flavor makes it the fuel of choice for cooking special dishes, and its heat makes it ideal for cooking hard foods such as legumes. Respondents mentioned also mentioned choosing Algarrobo wood because of the price of canisters for gas stoves.

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- Algarrobo products (such as Algarrobina) rarely produced within communities in and around San Pedro de Lloc.

3) San Pedro de Lloc forest

- The San Pedro de Lloc forest is **notable for its large trees**. While two active charcoal-production pits were encountered in the San Pedro de Lloc forest, signs of fuelwood harvesting (felled trees or cut branches) were present but few.
- Species observed in the San Pedro de Lloc forest:

Birds:

- Chilala (Pale-legged Hornero *Furnarius spp.*)
- Chisco (Long-tailed Mockingbird *Mimus longicaudatus*)
- Carpintero (Scarlet-backed woodpecker *Veniliornis callonotus*)
- Tordo (Scrub Blackbird *Dives warszewiczi*)
- Parraquito (Pacific Parrotlet *Forpus colestis*)
- Bananaquit bird *Coereba flaveola*
- Perlita tropical (Tropical Gnatcatcher *Polioptila plumbea*)
- Streak-headed Woodcreeper *Lepidocolaptes souleyetii*
- Tortipili/putilla (Vermilion Flycatcher *Pyrocephalus rubinus*)
- Tortolita palomita (*Columbina spp.*)
- Cuculí (West Peruvian Dove *Zenaida meloda*)
- Gallinazo cabeza roja (Turkey vulture *Cathartes aura*)
- Gallinazo cabeza negra (Black Vulture *Coragyps atratus*)
- Chucraco (Grove-billed Ani *Crotophaga sulcirostris*)
- Picaflor costeña (Amazilia Hummingbird *Amazilia amazilia*)
- Further reported sightings of Guarowao (Northern Crested Caracara *Caracara cheriway*), Tuco (Striped Owl *Pseudoscops clamator*), and Bubo (Great Horned Owl *Bubo virginianus*) in Cañoncillo.

Mammals (reported sightings):

- Zorro costeño (*Pseudalopex sechurae*)
- Zorillo (Molina's or Striped hog-nosed Skunk *Conepatus chinga* o *C. semistriatus*)

Reptiles:

- cañán (Peruvian desert tegu *Dicrodon guttulatum*) known locally as the. Supposedly endangered.

Plants:

- Cuncuno/tetillo (*Vallesia glabra*)
 - Sapote (*Capparis angulate*)
 - Asote de Cristo (*Scutia spicata*)
 - Vichayo (*Capparis ovalifolia*)
- Based on our research, **key threats to local forests** appear to be: harvesting for charcoal, harvesting for firewood, poorly defined environmental law and problems enforcing it, poorly defined land ownership, and concerns about government reluctance to uphold landowners' property rights if their land should be "invaded" by settlers, which may lead landowners to consider selling forested lands.



Fig. 1 One of the largest trees in the San Pedro de Lloc forest.

4) Recommendations for A Rocha Peru

A. Serve as a facilitator of, rather than an expert in, forest management

Negotiations of control over the use and management of forests around San Pedro de Lloc between actors such as the district government of Pacasmayo, the comunidad campesina de San Pedro de Lloc, la Asosación Muchik, the CAU-Tecapa, and interested individuals have a long and complex history that A Rocha Peru should strive to be familiar with. These competing and often conflicting claims on the forests mean that it is important for A Rocha Peru to invest time and resources in developing a more detailed and comprehensive understanding of the motives and methods of this organizations before entering into binding commitments with them. For this reason, further immersion in the community and hiring of local staff would be invaluable to better understand the various factors preliminarily outlined in this paper in order to implement an effective and long-lasting conservation program.

Many of these organizations have been involved in forest management for decades, meaning that A Rocha Peru cannot afford to propose anything less than rigorous suggestions for forest management in areas where they have historically operated. That being said, A Rocha Peru, though new to forest management as an organization, has much to offer through connections with scientists, experts, and technicians such as Drs. Maria de los Angeles la Torre-Cuadros and Sarah-Lan Mathez-Stiefel and students and professors at the Universidad Nacional de Trujillo. High priority should be given to utilizing these resources and to building lasting relationships between local universities, professors, students, and existing organizations working in dry forest conservation to aid local organizations such as CAU-Tecapa and La Asosación Muchik by facilitating scientific and social research and technical assistance.

B. Prioritize the San Pedro de Lloc forest

After multiple visits, and considering the importance of re-valuing forests in dry forest conservation around San Pedro de Lloc, I would strongly encourage A Rocha Peru to pursue the conservation of the “San Pedro de Lloc” forest, even while continuing research into who owns the land. The forest is within easy walking distance of the town center, making it an ideal location for promoting recreation and leading educational tours for schoolchildren, youth, and adults. Though small, the forest contains many huge Algarrobo tree specimens, significantly larger than those seen in Cañoncillo, and while the northern part of the forest lacks underbrush and seems commonly

used for grazing livestock, the southern part of the forest is rich with a diversity of plants and animal species, especially birds. While I would recommend that A Rocha Peru serve as a facilitator for organizations such as CAU-Tecapa and La Asociación Muchik than step directly into forest management of Cañoncillo or Tronco Prieto, I do think that A Rocha Peru could play an important role in promoting and advancing the conservation of smaller forests in the area, such as the San Pedro de Lloc forest. As I am unaware of any other group currently in charge of managing use and access to the San Pedro de Lloc forest (although this does not mean one does not exist), I think the forest's relatively small size could be ideal for management by A Rocha Peru². A valuable next step would be to accompany CCSPLL leadership on a tour of the other small (<10 ha) forests of the area and do rapid assessments of biodiversity and presumed threat, with follow up as needed.

C. Promote community-wide environmental education: *Focusing on ecological and aesthetic value of forests and negative health effects of wood smoke.*

An important part of A Rocha Peru's environmental education should be focused on encouraging communities to reconsider and re-value forests. Because legitimate utilitarian use of the forest has decreased with laws restricting fuelwood harvesting, it is important to emphasize and demonstrate that forests have ecological, cultural, and historical value alongside their economic uses. A Rocha Peru can help do these by leading forest walks with adults and children, showing them again the riches of flora and fauna found there, and reminding individuals how rare and valuable dry forests are in the La Libertad region. Though probably to a lesser degree than focusing on re-valuing forests, addressing ignorance and scientific misconceptions will also prove essential for the success of future conservation efforts. Special attention should also be given to raising awareness of the value of Algarrobo trees in preventing desertification, as this was seemingly little recognized by interview respondents.

An important aspect of environmental education that could be used to address fuelwood use would be to use the value placed on fresh air and human health to promote efficient stoves or different fuel sources. Two of the interview respondents mentioned the negative effects of wood smoke. Educating villagers about these health effects and providing instruction and incentives for

² Respondents in La Venturosa alerted me to the planned construction of a new highway, La Autopista del Sol, through San Pedro de Lloc. Before A Rocha Peru invests significantly in the preservation of the San Pedro de Lloc forest it would be worth checking to ensure that the forest is not in the path of the planned highway.

alternative cooking techniques could positively affect rural health of women, in particular, and decrease fuelwood dependence.

D. Advocate for change on a national level in management of the charcoal trade

Reducing the presumably unsustainable rate of fuelwood harvesting from dry forests around San Pedro de Lloc is both one of the most crucial—and likely one of the most difficult—elements of ensuring their conservation. While it is unclear what percentage of the deforestation of Cañoncillo and other forests near San Pedro de Lloc is driven by local firewood consumption and what percentage of it is driven by the larger commercial charcoal trade, wider literature review makes it clear that on a regional and national level the charcoal trade is by far the larger concern. Current attempts to control the charcoal trade by confiscating trafficked charcoal in transit seems to be ineffective in stopping deforestation, implying that any attempt to control dry forest deforestation must focus on the largest sector of primary consumers of Algarrobo charcoal: urban *pollerías*.

To that end, any local forest conservation and environmental education by A Rocha Peru should also be accompanied by involvement in an awareness and advocacy campaign at a regional and national level. Specifically, I recommend that A Rocha Peru consider the possible benefits of lobbying for a change to market-based legislation for algarrobo charcoal, enabling it to be sold legally but with a mandatory “sustainability tax” for *pollerías* that could be used to incentivize alternative fuel sources and reforestation projects. As an alternative, existing law could be enforced and *pollerías* could be fined per their consumption of charcoal, with the fine revenues going towards a specific fund. Necessarily accompanying changes in legislation would be a media campaign directed towards the wider public to raise awareness and enable their sympathetic response to proposed changes and a second campaign directed towards the owners of *pollerías*. While *pollería* owners might originally be hostile to efforts to reduce Algarrobo charcoal consumption rates, it is important to remember that they will be directly and negatively affected if Algarrobo populations decline to the extent that the charcoal supply is threatened, which may be of use in gaining their support. The campaign would consist of peer-to-peer educational conferences, preferably led by owners of successful gas-stove *pollerías*, to *pollería* owners about the source and impacts of their charcoal use and exploring options for reducing or mitigating their consumption of Algarrobo charcoal.