



The three fruits of Ayurveda's *triphala* formula. Clockwise from top: *Terminalia bellirica* fruit, *Phyllanthus emblica* fruit, and *T. chebula* fruit. Photo ©2019 Sebastian Pole

FairWild Project in India Is a Win-Win-Win for *Terminalia* Trees, People, and Hornbills

By Connor Yearsley

In the Western Ghats mountains of India, a FairWild Standard implementation project is benefitting plants, people, and animals. For local people, sustainably harvesting FairWild-certified fruits of belleric myrobalan (*bibhitaki*; *Terminalia bellirica*, Combretaceae) and chebulic myrobalan (*haritaki*; *T. chebula*), two medicinally and economically important tree species, has provided a better alternative to destructive and dangerous logging. And, unlike logging, harvesting the fruits provides a recurring benefit.¹⁻³

This FairWild effort also has protected nesting/roosting sites of two rare hornbill species: the great hornbill (*Buceros bicornis*), also called the great pied hornbill, and the Malabar pied hornbill (*Anthracoceros coronatus*), both of which may eat the *Terminalia* fruits and disperse the seeds.* The certification project demonstrates the potential social, ecological, and health-bringing benefits of the FairWild Standard.¹⁻³

According to Josef Brinckmann, research fellow at Traditional Medicinals and member of the American Botanical Council (ABC) Advisory Board, it is important to understand that a standard is a set of rules in the form of principles, criteria, and performance indicators, with control points that can be audited by a third party to measure compliance.

“The FairWild Standard, in my experience, is the most rigorous voluntary sustainability standard (VSS), specifically designed for the sustainable wild collection of medicinal and aromatic plants, uniquely applying a whole-ecosystem approach that includes relevant criteria for environmental, economic, and social sustainability,” wrote Brinckmann, who has helped implement the standard around the world (email, April 11, 2019).⁵

“Its implementation supports sustainable production and trade, quality assurance, biodiversity conservation, and resilient rural economies, while rewarding the wild-collection communities for functioning as stewards of sensitive ecosystems,” he added (see “In-Depth: The FairWild Standard” sidebar).⁵

* Photographic evidence indicates that the great hornbill eats the *Terminalia* fruits and disperses the seeds, and it is assumed that the Malabar pied hornbill also does this, according to Jayant Sarnaik, founding member and joint director of the Applied Environmental Research Foundation. Hornbills, in general, have been called “farmers of the forest” because they are highly effective at dispersing seeds of rainforest trees. They cover large areas to find enough fruit to eat and reportedly do not destroy the seeds, like many animals do. Smaller seeds pass through the hornbills undigested, while larger seeds are regurgitated and spit out.⁴

Both *T. bellirica* and *T. chebula*, the target species of this project, are medium-sized to large deciduous trees with small fruits (drupes). The fruits of these species are two of the three ingredients of the *triphala* (“three fruits”) formula, along with the fruit of amla (*Phyllanthus emblica*, Phyllanthaceae). Triphala is one of the most important and commonly used formulas in India’s traditional medicine system of Ayurveda and has been used for more than 1,000 years for many purposes, including as a digestive aid. Human clinical trials have shown that the formula has antidiabetic and anti-obesity effects and can reduce abdominal pain, constipation, flatulence, hyperacidity, and mucus.^{6,7}

In January 2019, the American Herbal Pharmacopoeia (AHP) released a monograph and therapeutic compendium for the fruit of *T. bellirica*, and it is working on monographs and therapeutic compendia for the two other triphala ingredients and triphala itself, which AHP claims will be the first in a Western pharmacopeia.^{8,9}

Based on a 2018 assessment, the great hornbill is considered vulnerable according to the Red List criteria of the International Union for Conservation of Nature (IUCN), meaning it is “considered to be facing a high risk of extinction in the wild.”¹⁰ The species mates for life. When the female is ready to lay eggs, she finds a large tree cavity, often in riverine habitats, and is sealed into the cavity with a wall made of feces and other materials. As she incubates the eggs, the female depends completely on the male to feed her and the offspring through a small opening left in the wall. If anything happens to the male during this time, the family is doomed, but this nesting strategy provides nearly complete protection from predators of eggs and hatchlings. One of the few trees big enough for the nest is *T. bellirica*, and the great hornbill reportedly obtains water entirely from the fruits it eats, including *Terminalia* fruits.^{3,4,11}

Based on a 2016 assessment, the Malabar pied hornbill is considered near threatened according to the Red List criteria of the IUCN, meaning it “is close to qualifying for or



The FairWild-certified harvesting areas for *Terminalia bellirica* (in Ratnagiri district) and *T. chebula* (in Pune district)



Great hornbill *Buceros bicornis*
Photo ©2019 Thipwan

Botanical illustration of *Terminalia chebula* from W. Roxburgh, *Plants of the coast of Coromandel*, Vol. 2. (1798)

is likely to qualify for a threatened category in the near future.”¹² This distinctive black-and-white bird has a large yellow and black beak that is topped with its oversized casque (a hollow structure that allows its calls to resonate through the dense forest habitat). Although its name may imply that its range is limited to the Western Ghats, it also is found in parts of central and eastern India and Sri Lanka.^{12,13}

The Project

In 2010, the Applied Environmental Research Foundation (AERF), a conservation non-governmental organization (NGO) based in Pune, Maharashtra, India, began to consider the FairWild Standard as a way to address important biodiversity conservation issues. Since 1996, AERF has conducted conservation projects in the northern Western Ghats, a global biodiversity hotspot.^{1,14} The Western Ghats is a mountain range that stretches about 1,000 miles along the western coast of India and contains a large proportion of the country’s biodiversity, much of which is not found anywhere else in the world. In fact, about a third of the plant species known in India are found in the northern part of this range.¹⁵

AERF previously determined that about 95% of the forest area (about 9,000 square kilometers, or 3,475 square miles) in the northern Western Ghats was owned and managed by local communities. Because of remoteness, a lack of economic opportunities, and a lack of knowledge about the importance of biodiversity conservation, these communities often identified logging as their preferred livelihood option, which has resulted in extensive forest degradation and biodiversity loss.¹⁴

In 2007, according to AERF, it launched India’s first incentive-based forest conservation initiative. With help from donors, AERF’s “MyForest” initiative offered farmers a financial incentive to stop logging. At first, many community members were confused that they could receive benefits for not logging, but the initiative eventually caught on.¹⁴ Now, through conservation agreements, AERF has secured protection for about 2,400 hectares (9.3 square miles) of



Great hornbill *Buceros bicornis*
Photo ©2019 Köln Zoo

Opposite page:
Belleric myrobalan *Terminalia bellirica*
Photo ©2019 Max Major



forest in the northern Western Ghats until 2027, according to Jayant Sarnaik, founding member and joint director of AERF (email, May 9, 2019). But AERF needed to create financial self-sufficiency to sustain its conservation efforts for the long term and turned to the FairWild Standard as a potential solution.¹

Further motivation came when United Kingdom-based Pukka Herbs, which specializes in organic herbal teas and supplements, expressed interest in purchasing FairWild-certified fruits of *T. bellirica* and *T. chebula*. AERF was encouraged by this partnership and inspired Pukka Herbs to also participate in the MyForest initiative by conserving 50 acres of private forests in the village of Wadi Adhishti in Ratnagiri, Maharashtra.^{1,14}

AERF identified two areas for possible implementation of the FairWild Standard. First, the Bhimashankar Wildlife Sanctuary in Pune district is known for the collection and sale of *T. chebula* fruits by the Mahadev Koli, the local

tribal community. Second, the forests of Sangameshwar in Ratnagiri district are rich in populations of *T. bellirica* trees, many of which are located in sacred groves that are valued for their religious significance. These groves are important for biodiversity colonization and act as “stepping stones” for species that pass through the landscape.¹

In 2013, the Darwin Initiative, a UK government grants mechanism that helps protect biodiversity and the natural environment through locally-based projects worldwide, awarded three years of support for the FairWild project, which enabled the University of Kent’s Durrell Institute of Conservation and Ecology (DICE) to study the ecology of the area. A smaller grant from Keidanren Nature Conservation Fund also was awarded to TRAFFIC, an NGO that works globally on wildlife trade issues, to support this project. These funds allowed AERF to purchase and install equipment for processing (drying and pulverizing) the fruits. They also allowed AERF to conduct situation analyses, training sessions with the local communities, and trial collection exercises.¹

At the same time, AERF established a for-profit entity, Nature Connect India Pvt. Ltd., for conducting transactions related to the manufacturing and sale of the FairWild-certified processed material. AERF and Nature Connect recognized that the FairWild premium, a percentage of the value of the product that is returned to the community for its development needs, could be used to build biogas plants (thereby reducing the need for the collection of firewood) and/or improve sanitation, for example. This would encourage conservation of the natural resources.¹

Pukka Herbs’ Sustainable Herbs Manager Ben Heron worked extensively with Nature Connect for years to help coordinate with stakeholders and implement the necessary good agricultural and collection practices (GACPs) to assure that the *Terminalia* fruits meet the standards of the British Pharmacopoeia and now the AHP, along with organic and FairWild training and certification (email from Sebastian Pole, co-founder and Master Herbsmith of Pukka Herbs, May 2, 2019).

Because of AERF’s previous work in the northern Western Ghats, it had established valuable relationships with the local people and understood many of the biodiversity and socio-economic factors. Through surveys, AERF confirmed that villagers in the



Malabar pied hornbills
Anthracoceros coronatus
 Photo ©2019 Petr Simon

In-Depth: The FairWild Standard — A Q&A with Josef Brinckmann

What are the main stipulations of the FairWild Standard? Which of those are most important?

JB: All of the main stipulations are important and support each other. First, a risk assessment must be carried out on the target species for collection in order to determine whether the species will be managed as a high-, medium-, or low-risk plant. Then, a resource assessment is carried out for the entire mapped area where the collection will occur. The resource assessment considers not only the target species but all species that occur in the managed area. If it is determined that a threatened species occurs in the managed collection area, whether flora or fauna, the eventual management plan must prescribe collection practices that will not be detrimental to the long-term survival of the threatened species in the habitat. If a threatened or endangered animal shares habitat with the wild plant collection area, then additional wildlife-friendly criteria may need to be developed to augment the plan.

Both the risk and resource assessments inform the development and implementation of an adaptive management plan. At this point, it is known what the maximum optimal yield per year can be, the regeneration rates, and other special considerations for capacity building and training of the harvesters. Part of the management plan involves periodic monitoring and evaluation. This may lead to adapting the management plan to any observed changing conditions, such as impacts of increasingly extreme weather events. Finally, successful use of the standard depends on annual audits carried out by trained inspectors from accredited independent third-party control bodies, as well as trading and labeling rules for the finished product brands.

Can the standard be applied universally to any wild plant? Why or why not?

JB: In the years preceding the publication of version 1.0 of the FairWild Standard in 2006, drafts of the standard, as well as a precursor standard (the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants [ISSC-MAP]), were test implemented internationally with a diverse range of plant species, situated in all different ecosystems, from the Amazon and the Andes, arid zones in Africa, forests and meadows of southern and eastern Europe, and steppes in floodplains of Asia. It was indeed important to determine and prove a global applicability of the standard. The precursor ISSC-MAP was merged into the FairWild Standard version 2.0 in 2010.

What can be said about the accountability that the FairWild Standard creates, since retaining the certification seems to depend on all community members?

JB: I don't actually think that the FairWild Standard is designed to hold wild-collection companies and/or their employees or members accountable. Holding collectors accountable sounds like policing, which is not what it is all about. Of course the individual collectors undergo capacity building and training (on the requirements of the standard), but the ones really being held accountable are the product brands that use the ingredients. Most wild collectors I've met take great pride in their work, and everyone in the village knows each other personally. If one person is jeopardizing the income of 99 others, the situation will be resolved. In any case, there are much bigger problems for wild collectors and small farmers. One of the biggest problems today is how widespread nonpoint-source pesticide contamination has become, globally. Wild-collection operations in the most remote locations on the planet have to contend with occasional market rejections due to detection of pesticide residues of unknown origin, due to long-range

atmospheric transport. The other big problems include alarmingly rapid loss of biodiversity across the planet (from wild land conversion to farming or grazing, for example), urbanization, and mass migration of youth from rural to urban areas. The rural wild-collection communities are aging, and very few young people are staying to continue the tradition of wild collection of medicinal plants for local medicine and trade.

Why has the standard not been implemented more widely? What are the main barriers to its implementation?

JB: Being a member of the FairWild Foundation board of trustees since 2008, I must admit that I have been disappointed in the relatively low interest and uptake of the standard by industry. But I get it. It is not easy, and the public is not demanding it. In the meantime, many other "easier" voluntary sustainability standards (VSSs) have been developed and have become applied more widely. There is a bigger market for "sustainability lite."

In my view, however, even if a brand is not interested in sustainability marketing and use of the logo on labeling, which certifies that the ingredients are produced in compliance with the standard, it makes good business sense to use the available tools and guidance (e.g., the resource assessment and management plan guidance). Implementing the standard and using the tools give all stakeholders in the value chain (the wild harvesters, processors/suppliers, and finished product brands) data that are really useful for long-term planning, quality assurance/control, and supply chain risk mitigation. I view implementation of the FairWild Standard as relatively inexpensive insurance. The data inform planning and reduce uncertainty, especially for fast-growing companies.

How financially viable is the FairWild Standard?

JB: Financial viability of implementing the FairWild Standard has to do with the size of the operation and annual quantity of plants harvested. It would not be economically viable for a micro-enterprise that harvests only five to 10 tons annually, but it can be economically viable for a small to medium-sized enterprise that is harvesting 50 to 100 tons annually, also depending on the market value of the botanical itself. Almost all FairWild-certified operations in the trading system were already inspected and certified for compliance with an organic wild-crop harvesting practice standard. If an operation is already familiar with the requirements of complying with organic regulations, adding on the FairWild Standard is not as complicated. However, the operation will still need a dedicated person for compliance with standards. This person manages the audits and post-audit corrective action measures, as well as the ongoing monitoring and evaluation of the collection area, periodic revision of the management plan as more is learned, and annual training of the qualified collectors.

There are fixed costs (the fees charged for the annual inspection and certification), which can be considerable, especially for remote operations, if the inspector needs to travel from another country and spend several work days in the field for the audit. It should also be noted that the FairWild Standard requires that collectors are paid higher-than-normal farmgate prices and are also recipients of premium fund monies, which the collectors can use for the purpose of improving the quality of life in their communities and households. Decisions on use of the funds are to occur through a democratic process. The FairWild operators I visit around the world are genuinely appreciative of the additional funds that help them lead more dignified lives in the very hard work of wild harvesting plants day in and day out.

“Lastly and more importantly, with scaling up of the FairWild-certified value chains, at least for the target species of our projects, positive impacts for biodiversity conservation grow multifold. This is on the grounds that the entire resource area gets certified, resulting in conservation of many other plants and animals. All this makes the project unique.”

Bhimashankar Wildlife Sanctuary depended mostly on rice (*Oryza sativa*, Poaceae) cultivation for their livelihoods, but also depended on income from other sources, of which *T. chebula* fruits accounted for about 50%. Similar information was gathered at the other site in Sangameshwar.¹

In 2015, the first year of FairWild certification, 2.6 metric tons (MTs) of *T. bellirica* fruit and 3.6 MTs of *T. chebula* fruit were collected under the standard. In 2016, 4.6 MTs of *T. bellirica* fruit and 4.9 MTs of *T. chebula* fruit were collected.¹ And, in 2018, 5 MTs of *T. bellirica* fruit and 4.5 MTs of *T. chebula* fruit were collected, according to Sarnaik. Significant quantities of semi-processed fruits were delivered to Pukka Herbs (3.2 MTs in 2015 and 4.4 MTs in 2016), and the company uses the FairWild- and organic-certified fruits in its triphala capsules, turmeric (*Curcuma longa*, Zingiberaceae) active tea, and lean matcha green tea (*Camellia sinensis*, Theaceae).¹

Albuquerque, New Mexico-based Banyan Botanicals, which specializes in Ayurvedic products, purchases some of the FairWild-certified fruit powder from Pukka Herbs and uses it in its triphala tablets. “We would also like to use FairWild-certified *Terminalia* fruit powder in other products, but the supply is still increasing, as the scope of this project continues to expand to other communities in the area,” wrote Devang Shah, chief operating officer of Banyan Botanicals (email, April 10, 2019).

According to Sarnaik, the demand for the FairWild-certified value chains that AERF established is growing by about 300% each year. This requires bringing more areas under certification. For example, in the first year (2015), there were six certified resource areas in Sangameshwar for *T. bellirica*. There are now 12 resource areas for *T. bellirica*, and at least two more will be added in 2019. The project is taking place on about 200 hectares across all the sites. In the case of *T. chebula*, the land is owned by the local communities, and in the case of *T. bellirica*, the land belongs to the government. “For both value chains, the land is not legally protected, and there are multiple threats to these lands and the resources within,” Sarnaik wrote (email, April 1, 2019).

The collectors are told to harvest a maximum of 70% of the fruits from each tree and leave at least 30% for regeneration, according to Sarnaik. “In any case, it is practically impossible to harvest all the fruits, as the trees of *T. bellirica* are quite tall and old,” he wrote. In the case of *T. bellirica*, old trees fruit in alternating years. For *T. chebula*, all the trees fruit every year, but the changing climate has an impact on harvest levels. “Sustainable harvesting practices are well documented for both species, and collectors are trained every year so they remember the dos and don’ts of harvesting,” Sarnaik added.

The FairWild project is safeguarding about 2,000 *T. chebula* trees and 500 *T. bellirica* trees. Because the trees are wild, they do not require heavy maintenance by the local communities, but the “sustainable management of the resource area is key to high-quality fruit production,” Sarnaik wrote. Currently, the project is also saving three nesting sites of the great hornbill and six nesting/roosting habitats of the Malabar pied hornbill. One hornbill nesting site typically supports one offspring each year, according to Sarnaik.

Sarnaik thinks this project is significant and unique because it has attracted attention and ensured participation of many stakeholder groups, including

Terminalia chebula collector in the Bhimashankar Wildlife Sanctuary
Photo ©2019 Sebastian Pole



local communities, businesses, academic institutions and individual researchers, nonprofits, and government institutions. In addition, it may be one of the only projects “from the forest-based value chain sectors in which the communities at the grassroots level gained access to the global market for adopting good practices and sustainable biodiversity use,” he wrote.

“Lastly and more importantly, with scaling up of the FairWild-certified value chains, at least for the target species of our projects, positive impacts for biodiversity conservation grow multifold,” Sarnaik continued. “This is on the grounds that the entire resource area gets certified, resulting in conservation of many other plants and animals. All this makes the project unique.”

Shah noted that “the project is a great example of how one company’s commercial need can provide opportunity where one may not have existed before. In this case, we have a need for high-quality *T. bellirica* and *T. chebula* fruits. This project supports local communities to collect these fruits, which are not as valued in the local market, in hopes that the increased income is a better and more sustainable alternative to cutting the trees for wood.”

Locally, low-quality fruits may sell for less than a dollar per kilogram, according to Shah. “Whereas we can pay a premium in this case, due to the higher quality of these fruits,” he wrote. “For this project, the forest areas have been certified organic along with the FairWild wild-collection practices.”

Pole noted that “with approximately 25% by volume of all herbs used in the herbal industry coming from the wild [according to some estimates], it is vital that we have more sustainable certification for wild harvesting projects. FairWild is the best standard for this in the world” (email, March 26, 2019).[†]

According to Pole, the FairWild Standard also provides a framework to ensure the fair and equitable sharing of benefits that arise from the use of genetic resources, as required by the Nagoya Protocol on Access and Benefit Sharing (ABS) of the Convention on Biological Diversity (CBD) (email, April 16, 2019).

The Western Ghats project is creating interest among indigenous communities from other areas, according to Sarnaik. “It is likely that we will implement [similar projects] at other locations,” he wrote. “For example, we intend to develop a FairWild value chain for *Madhuca longifolia* [Sapotaceae] fruit.”

Sarnaik said it was challenging to deal with the learning curves and priorities of the different stakeholders who were involved in this project. “It takes lots of patience, perseverance, and negotiation skills to address these challenges,” he wrote.

For more information about this FairWild project, videos that give an on-the-ground perspective from the wild collectors in India are available on the Sustainable Herbs Program website.¹⁶ HG

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[†] According to the June 2018 TRAFFIC Report, 60-90% of medicinal and aromatic plant species in trade are wild collected,² but Pole thinks that volume is more indicative of the pressure being placed on natural resources.