Coffee, Conservation, and Rainforest Alliance Certification: Opportunities for Indian coffee

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Introduction
As the Indian coffee industry strides into the 21st century, two global trends are worth noting. First, the increasing awareness globally that coffee, especially where traditionally grown under the shade of native tree species, offers an opportunity for conservation of wildlife, forest and tree cover within agricultural landscapes. Scientific evidence that coffee can benefit conservation and, conversely, that conservation of natural forests, biodiversity and native shade trees in farms can directly benefit coffee production is accumulating from studies across the tropics from Costa Rica to Sulawesi and Mexico to India. Second, as the most-traded commodity after oil, coffee too is coming under the increased scrutiny of the informed buyer and sustainability-conscious consumer. The desire to know where coffee comes from, how it is grown, and purchase only sustainably-produced coffee that enhances the lives of farming communities and conserves the natural environment has spurred a burgeoning market powered by consumer demand. Roasters, retailers, coffee chains, and consumers are increasingly looking to source coffee from farms that are certified as sustainable through credible third-party certification programmes, particularly Rainforest Alliance certification.

In this article, we highlight how the changing scenario creates a unique opportunity for Indian coffee. We present a non-technical summary of some key scientific studies that present the links between coffee and conservation. We then provide an introduction to the systems underlying Rainforest Alliance certification and the standards (good practices) that farms would need to adopt to become certified. We believe that the Indian coffee industry and farmers, workers and local communities, as well as forests and biodiversity stand to benefit from the adoption of good practices related to social and environmental sustainability, with concordant market benefits through certification.

Agriculture and land-use conversion
Agricultural expansion has historically been one of the greatest causes of forest loss and fragmentation worldwide. It remains one of the largest threats to the world’s remaining tropical forests (Achard et al. 2002). Additionally, during the next two decades, the human population is expected to grow

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from 6.5 billion to nearly 8 billion. In their struggle to feed, clothe, and house their families, and in their consumption of material goods, people everywhere will continue to exert pressure on the Earth's limited natural resources with agriculture being an important component (Tilman et al. 2002). This is particularly acute in and around our planet's most sensitive and unique tropical ecosystems in developing countries like India. Simply designating areas as parks and preserves is not enough. Although 10 percent of the world’s area (less than 5% in the case of India) has already been set aside as protected areas such as national parks and wildlife sanctuaries, local people continue to rely on the resources within protected areas to earn their livelihoods. Given the pace of agricultural expansion and intensification worldwide, conservation of biodiversity and remnant ecosystems requires looking beyond fragmented wildlife reserves into adjoining, larger agricultural landscapes such as coffee and tea plantations (Mudappa and Raman 2007).

The Western Ghats mountain range in India is a case in point. This region, from which most of India’s coffee originates, is recognized as a global biodiversity hotspot, holding about 30% of India’s plant and wildlife. Maintaining shade of diverse native tree species can help conservation and coffee production (photo: Authors)

Certified farms protect threatened wildlife such as Asian elephants and their movement routes (Photo: Nisarg Prakash)
vertebrate species diversity in less than 6% of the area (Kumar et al. 2004, CEPF 2007). While much of the large-scale conversion of forests and grasslands to plantations such as tea, coffee and timber had already occurred in many areas prior to 1920 (Congreve 1942, Prabhakar and Gadgil 1995), forest loss, conversion, and degradation have continued into recent times. For instance, Jha et al. (2000) estimated that in a 40,000 km² area of the southern Western Ghats, one-fourth (25.6%) of the forest cover had been lost between 1973 and 1995, giving an annual deforestation rate of 1.16%. Another study showed that between 1920 and 1990, 40% of the original natural vegetation of the Western Ghats was lost or converted to open/cultivated lands, coffee plantations, tea plantations, and hydroelectric reservoirs (Menon and Bawa 1997). Open or cultivated lands accounted for 76% and coffee plantations for 16% of the conversion, which was also accompanied by fragmentation of the remaining forests into smaller remnants (Menon and Bawa 1997). The loss or gradual conversion of private forests, some in degraded stages, into plantations accounts for some of the recent increase in coffee area as well.

There is now considerable interest in extending conservation to landscapes outside designated protected areas, especially biodiversity conservation in productive agriculture, agroforestry, and plantations (Daily et al. 2001, 2003; Bhagwat et al. 2008). In the Western Ghats, while some 13,500 km² is protected as wildlife reserves from Maharashtra to Kerala, a larger area is under plantations in the landscape adjoining or within many of these reserves. There is a substantial (and increasing) area under plantations, especially of crops such as tea, coffee, cardamom, and rubber. Tea plantations, for instance, occupy a total area of over 1,100 km² in southern India and increased in coverage by nearly 6,200 hectares (5.5%) in the period between 2000 and 2006, despite a downturn in the industry for much of that period (Tea Board statistics, http://teaboard.gov.in). Coffee plantations have increased from around 2,700 km² in 1990 – 91 to span over 3400 km² in 2007 – 08 largely in the Western Ghats of Tamil Nadu, Kerala, and Karnataka (Coffee Board database, http://www.indiacoffee.org). Small cardamom spans over 730 km² (2006 Spices Board data, http://www.indianspices.com/), while rubber plantations span some 5000 km²(http://www.rubberboard.org.in/) mainly on the western slopes and plains. There are also large areas of plantations of timber (e.g., teak, eucalyptus) and other crops (e.g., arecanut, oil palm, coconut, vanilla). Despite the considerable extent, there has been little direct effort at incorporating these landscapes in conservation policy and management. The importance of these plantations and the remnant forests within them for conservation was highlighted in a recent review (Anand et al. 2010).

How coffee can benefit conservation

Among the various plantations in the Western Ghats, crops such as coffee and cardamom, being traditionally grown under the shade of trees occupy a special place. In some parts of the Western Ghats, such as the Anamalai hills, where there is no hunting of wildlife, one can walk into coffee plantations and see even endangered or endemic species such as Great Hornbills (Buceros bicornis), lion-tailed macaques (Macaca silenus), and Nilgiri langur (Trachypithecus johnii). A large body of research from around the world has established that shade-coffee plantations can support many forest species, including birds, arboreal mammals, invertebrates such as
ants and bees, and native trees and epiphytic plants (e.g., Greenberg et al. 1997a,b; Perfecto and Vandermeer 2002; Perfecto et al. 2003, 2005; Tejeda-Cruz and Sutherland 2004, Komar 2006, Jha and Vandermeer 2010). Similar results have been obtained from many studies from the Anamalais, Palnis, Chikmagalur, and Nilgiris – Kodagu in the Western Ghats (Shahabuddin 1997; Raman 2006, Bali et al. 2007, Mudappa and Raman 2007; Anand et al. 2008; Dolia et al. 2008).

Two aspects are important to remember when one considers the value of shade-coffee for biodiversity. First, although coffee plantations can support much biodiversity (Bhagwat et al. 2008), many species are restricted to forests and will survive only if existing remnant forests in the landscape such as Reserved Forests, rainforest fragments, and sacred groves are also protected (e.g., Bhagwat et al. 2005; Sridhar et al. 2008; Anand et al. 2010). Second, like the various brews of coffee, there are various brews of coffee estate when it comes to shade and farms that excessively rely on few or just single species of tree for shade, particularly alien (exotic) species such as the silver oak *Grevillea robusta*, provide poorer habitat than farms that include a diversity of native species as shade (Komar 2006; Raman 2006; Anand et al. 2008). Both these aspects, the protection of remnant forests and the diversification of native shade, are therefore emphasised by conservation-oriented certification programs like Rainforest Alliance.

Again, here Indian coffee plantations have a window of opportunity. Unlike recently-expanding coffee areas like Vietnam and Sumatra that are being established through deforestation, much of Indian coffee represents decades-old, well-established plantations, grown traditionally under shade of native tree species, with Reserved Forests and sacred groves integrated within the landscape. There has been a worrying trend in recent times of the loss of these traditional practices, leading to degradation of forest cover, and over-reliance on alien (exotic) tree species, particularly silver oak *Grevillea robusta* (native to Australia) and *Maesopsis eminii* (native to Africa). Some of these negative trends were partly induced by pressures on farmers in years of low prices (forcing felling of trees for timber) or a short-term view of cultivation (rapidly establish shade using convenient alien species). The judicious revival of traditional practices related to native shade trees, sacred groves, and forest protection, along with adoption of a no-hunting policy can convincingly project the conservation significance of Indian coffee to the world.

**How conservation can benefit coffee**

There is also increasing interest and evidence globally on the economic value of biodiversity and forests to plantations. These values may accrue directly through ecosystem services such as pollination, carbon sequestration, and watershed benefits for farms. A pioneering study in Costa Rica demonstrated that coffee estates that were near forests benefited from better pollination (Ricketts 2004). In the same 1065 ha farm, experiments showed that pollination by bees from nearby forests increased yield of Arabica coffee by 20% and improved coffee quality (Ricketts et al. 2004). The study estimated that the two patches of forest (46 ha and 111 ha) near the Costa Rican farm directly contributed to an economic benefit of USD 60,000 per year (or roughly USD 60 / ha per year) through pollination services, bringing to light an aspect that had remained invisible and unmeasured.

Similarly, a study on pollination in Robusta coffee in Sulawesi, Indonesia, concluded that retaining forest patches near
coffee estates and adoption of other good practices related to diversifying shade and reducing herbicide use, could support better bee populations (Klein et al. 2003). In this study, a bee community of 20 species or more led to a higher fruit set (95%) than a species-poor bee community of six species (70% fruit set).

Likewise, other benefits of biodiversity for coffee are being described. Studies have shown that while better and more diverse shade can support greater diversity of birds, the birds in turn may play a significant role in reducing insect pest attack on coffee (Greenberg et al. 2000, Johnson et al. 2010). Shade management is often considered only in relation to yield of coffee; however, many other benefits may accrue from shade including higher coffee quality, lower berry fall and transpiration stress (Vaa et al. 2006), better organic matter accumulation and reduction in nematode and berry disease (Beer et al. 1998; Bedimo et al. 2008). Shade can also help reduce coffee berry borer infestation, especially given the prospect of climate change (Jaramillo et al. 2009), while sustaining or enhancing quality and profitability (Muschler 2001; Gordon et al. 2007).

Besides such direct benefits, many schemes are being implemented as incentives for conservation in production landscapes, including conservation easements, direct payments or credits for biodiversity or ecosystem services, carbon sequestration and trading, purchase of lands, conservation certification of produce, corporate social responsibility initiatives, and voluntary efforts. The Rainforest Alliance certification for sustainable agriculture in coffee plantations is on these lines.

**Rainforest Alliance and the Growing Market for Sustainable Produce**

The Rainforest Alliance is helping people to change their land-use practices, setting standards for the long-term sustainable use of resources so that we can conserve the planet's great wealth of biodiversity and help people use the resources they need without compromising them for future generations. Once used only among conservation groups and development agencies, the term “sustainable” has entered the public consciousness as shorthand for wide-ranging efforts to fight poverty and pollution and protect the Earth’s resources. As this “people, planet, and profits” message spreads throughout the marketplace, demand for goods from sustainable farms continues to grow. There is also a growing consensus that certification is the most effective way to promote sustainability, by ensuring the establishment and enforcement of management practices, that protect the environment, the rights of workers, and the interests of local communities. In tropical regions rich in biodiversity, ensuring that farms are properly protecting forests, soil, waterways, and people's health is critical.

The Rainforest Alliance and the other members of the Sustainable Agriculture Network (SAN)—an international coalition of independent, non-profit conservation groups—have created a comprehensive farm certification program. The Nature Conservation Foundation, Mysore, as the SAN’s newest member and the first in South Asia, is assisting farms in the region with certification and in developing local interpretation guidelines and resources. To become certified, farms must meet strict standards developed by the SAN through consultations with social and environmental groups, farmers, industry, government and other stakeholders.

Coffee, cocoa, tea, tropical fruit (banana, orange, pineapple, passion fruit, mango, guava), flower and fern farms are certified according to the environmental and social standards of the SAN. Farms producing a
number of smaller crops—including açai, avocado, chestnuts, macadamia nuts, plantains, vanilla, cardamom and pepper—often grown in association with these commodities, may also be certified. As of the last quarter of 2010, more than 90,000 farms on nearly 1.7 million acres (690,000 hectares) in Argentina, Brazil, Chile, Colombia, Costa Rica, Côte d’Ivoire, Dominican Republic, Ecuador, El Salvador, Ethiopia, Guatemala, Honduras, India, Indonesia, Jamaica, Kenya, Mexico, Nicaragua, Panama, Peru, the Philippines and Tanzania were Rainforest Alliance Certified. In India, a number of tea and coffee plantations, including large companies as well as groups that include smallholders, have been certified by Rainforest Alliance.

From Farm to Supermarket: Linking the Supply Chain

The Rainforest Alliance is involved at every stage of the supply chain, working with producers, importers, wholesalers and vendors to promote responsibly produced agricultural goods. The online Marketplace (www.rainforest-alliance.org/farmproducts) helps companies selling Rainforest Alliance Certified products promote their brands and link farmers and buyers. Rainforest Alliance works with an increasing number of businesses, from small local stores to large international corporations, that understand that sustainability is good for the bottom line—and that certification is the best way to guarantee that their products are sustainably sourced.

Farms that meet the SAN standards are awarded the Rainforest Alliance Certified™ seal of approval, which can be used to market farm products. The Rainforest Alliance Certified seal, carrying a green frog, stands for sustainability. The green frog is now seen in thousands of markets, cafés, restaurants and offices around the world. Eco-conscious shoppers everywhere know that products carrying the seal come from responsibly-managed farms. Trendsetting food companies and supermarkets interested in knowing more about how, where and by whom their products are grown—and about the social and environmental benefits of the sustainable farming process—have come to trust and respect the integrity of the Rainforest Alliance Certified seal. By displaying the seal on their goods, farmers can tap into the growing market of enlightened consumers who are choosing to support sustainable agricultural practices through their purchases.

The Process—and Benefits—of Certification

The certification journey begins with a voluntary application to the Rainforest Alliance Certified program from a farmer or group of farmers, followed by a farm visit by specialists to determine the changes necessary to achieve certification. Once farmers are satisfied that their farms meet the certification standards, they can request a full audit (inspection). An experienced and independent auditor or team of auditors visits the farm to review every aspect of its compliance with the standards. Based on the auditors’ report, an independent certification body, Sustainable Farm Certification Intl., determines whether or not the farm merits certification. All farms or groups are inspected every year and must demonstrate continual progress. Farmers pay for the initial certification of their farms and the annual follow-up inspections. In many cases, certification services are underwritten by foundations, brokers, and buyers. By meeting the SAN standards and earning certification, farms make a positive impact in three key areas:
Environmental Conservation

The standards provide guidelines for the conservation of wildlife, forests and other valuable habitats in and around farms. Certified farms often serve as buffer zones around parks and as “wildlife corridors” between protected areas. Natural ecosystems on the farm should be identified and protected and areas not suitable for agriculture must be replanted with a variety of native tree and plant species. Waterways and soil on the farms must be protected. Waste is reduced as farm by-products are composted and used as natural fertilizer, while other wastes, such as plastics, glass and metals are collected, and recycled where possible. Farm managers must use biological or mechanical alternatives to pesticides whenever possible—and if they determine that agrochemicals are necessary to protect the crop, they have to choose the least toxic alternatives at hand (avoid chemicals on an annually-updated banned chemicals list) and use every available safeguard to protect human health and the environment. Agroforestry crops, including coffee, need to use a diversity of native shade tree species. Opportunities for conservation in crops such as tea can come from setting aside a portion of the land as natural ecosystems such as forests and grasslands or ensuring that a percentage (say 10%) of the shade and avenue trees are native species.

Social Conditions

By focusing on how farms are managed, the standards cover the full range of worker protection issues including: the rights to organize, to a safe, clean working environment, to be paid at least the national minimum wage or the regional average wage, whichever is higher, to dignified housing (including access to potable water), to medical care for workers and their families, and to education for children. The Rainforest Alliance and the SAN engage with all types of farms—from small cooperatives and family farms to large plantations owned by multinational corporations—to promote change and ensure that all agricultural workers are well-treated. Workers also benefit from better safety norms, including in the use of protective equipment during agrochemical handling and application, and no-discrimination policies.

Economic Benefits

The certification process often increases efficiency on farms. Workers are healthier and more satisfied, and trained seasonal workers are more likely to return each year—which helps improve productivity and reduce costs. Through better management and more consistent techniques and training, the quality of a farm’s products also generally improves. Certified farm owners have better access to specialty buyers, contract stability, favourable credit options, publicity, technical assistance, and premium markets. Although the Rainforest Alliance and other SAN members are not directly involved in negotiations between farmers and their product buyers, most farmers are able to leverage their certification to receive a price premium.

The SAN Sustainable Agriculture Standard

The Sustainable Agriculture Network (SAN) standards that apply for farms are the SAN Sustainable Agriculture Standard (July 2010) and the SAN List of Prohibited Pesticides (September 2009). The full version of the standards are available at:

http://www.rainforest-alliance.org/agriculture/standards (and)
http://www.sanstandards.org

The SAN Standards are organised into 10 Principles (analogous to Chapters) with
multiple criteria within each Principle. There are a total of 99 criteria, of which 15 are Critical Criteria. While farms are required to mandatorily comply with all 15 Critical Criteria, there is scope for continuous improvement overall, as it is not required that all other criteria must be met at the very initiation of certification. However, to become certified, farms need to meet a minimum of 80% of the criteria, with the added stipulation that at least 50% score is attained within each of the 10 Principles. This ensures that farms pay adequate attention to all aspects of sustainable agriculture and provides a benchmark for continuous improvement that can be assessed in annual audits. Although organic cultivation is encouraged it is not mandatory for Rainforest Alliance certification; however, strictures are included regarding the use of agrochemicals as this is a global concern (PAN UK 2008). Hence, farms must abide by the List of Prohibited Pesticides and regulations on application and safety. A brief introduction to the 10 Principles is provided below.

1. Social & Environmental Management System: The adoption of sustainable agriculture requires a social and environmental management system (SEMS) that allows farmers and auditors alike to confirm that farms are being run in compliance with the SAN standard and the laws of their country (e.g., Plantation Labour Act, Pollution Control Board norms, Wildlife Protection Act, land tenure regulations). The SEMS implements procedures for management and programmes for training and continuous improvement. Most farmers find that implementing such a management system not only improves conditions for workers and the environment, it also results in a better organized and more efficient farm. This system also needs to ensure that certified products are completely traceable and kept separate from any non-certified produce (chain-of-custody requirement).

2. Ecosystem Conservation: The standard requires farmers to identify and conserve existing ecosystems (such as deciduous and evergreen forests, grasslands, wetlands, and water bodies in and around the farm) and facilitate ecological restoration of critical areas, often through reforestation with native species. This includes protecting waterways and wetlands from erosion and contamination, prohibiting illegal logging and other deforestation, as well as measures to prevent negative impacts on natural areas outside the farm. Maintaining vegetation barriers, such as hedges around housing and public roads, as well as native vegetation along streams and rivers is required to reduce agrochemical drift, prevent soil erosion, and provide habitat for wildlife. For coffee growers, a shade cover of 40% is required, with two strata of shade, and a diversity of on average 12 native species per hectare. For tea growers, opportunities for native tree planting should be found in buffer zones along streams and roads.

3. Wildlife Protection: Certified farms serve as refuges for wildlife, so farmers need to make an inventory of wildlife species and habitats that exist on their land and take specific steps to protect them, especially endangered species. This includes educating workers, prohibiting hunting and the removal of plants and animals from the land, protecting nests and critical habitats, and avoiding the keeping of wildlife species in captivity. Farms are also required to take a larger landscape view and protect the movement routes (corridors) of animals,
such as Asian elephants *Elephas maximus* and gaur *Bos gaurus*. In Indian coffee farms, while protecting property and newly planted fields with fencing and barriers, care could be taken to leave open access to water bodies, forest patches, and routes for animal movement.

4. **Water Conservation:** The standard requires that farmers take measures to conserve water, which begin with monitoring water sources and consumption. The installation, or modification of technology may be necessary to reduce water consumption on the farm, reduce any wastage, and avoid contamination of springs and rivers on and near their property. Farmers should have the proper permits for water use, treat wastewater and monitor water quality. It is critical that coffee waste is treated properly and wastewater and solids are not directly emptied into any waterbodies.

5. **Working Conditions:** Farmers must ensure fair treatment and good working conditions for all employees, as established by such international bodies as the United Nations and International Labour Organization. The standards prohibit forced and child labor and all forms of discrimination and abuse. Workers, including temporary and contracted workers, should be aware of their rights and farm policies and enjoy legally established salaries, work schedules and any benefits required by the national government. If housing is provided, it must be in good condition, with potable water, sanitary facilities and waste collection. Workers and their families should have access to healthcare and education.

6. **Occupational Health and Safety:** Certified farms should take steps to provide a safe working environment in field, factory, storage, and pulping areas. Detailed prescriptions are provided for safe storage of hazardous materials such as agrochemicals including fertilizers and compost, fuel and flammable substances. Workers should use proper personal protective equipments—such as appropriate masks, gloves, and helmets—in all activities that pose risk including agrochemical mixing and application, shade lopping, and coffee pulping. Safeguards for sprayers and regular medical tests for workers are other aspects in the Standard.

7. **Community Relations:** The standard requires farmers to be good neighbors and inform surrounding communities and local interest groups about their activities and plans. They should consult with interested parties about the potential impacts of their farm and contribute to local development through employment, training and public works. Farms are encouraged to work with local NGOs in aspects such as environmental education, wildlife conservation, and waste management.

8. **Integrated Crop Management:** The Sustainable Agriculture Network encourages the elimination of chemical products that pose dangers to people and the environment. Certified farms eliminate such products by using integrated crop management to reduce pests. They must record all agrochemical use and work to reduce or eliminate dangerous products. They should not use transgenic organisms, products that are banned in their country, or products prohibited by national and international agreements and those listed in SAN List of Prohibited Pesticides.

9. **Soil Conservation:** One goal of sustainable agriculture is the long-term
improvement of soils, which is why certified farms take steps to prevent erosion, base fertilization on crop requirements and soil characteristics, and use organic matter and mulching to enrich soils. Vegetative ground cover and mechanical weeding are preferred in order to reduce agrochemical use whenever possible. The cutting or burning of forest cover, including second-growth forest, is not permitted to prepare new land for cultivation.

10. Integrated Waste Management:
Certified farms are clean and orderly with programs for managing waste through recycling, reduction and reuse. Waste—office, domestic, medical, factory, and farm waste—is treated and disposed of in ways that minimize environmental and health impacts. The use of open waste dumps and open burning of waste are discouraged as they have negative effects on human health and the environment. Workers are educated about managing waste properly on the farm and in their communities.

Conclusion
Coffee plantations and the conservation movement in India clearly have much to contribute to each other. Indian coffee estates can build on traditional practices such as growing coffee under native shade trees and integrated with natural forests by adopting additional sustainable agricultural practices to enhance their value locally and in international markets. As Rainforest Alliance certification and the market for produce certified following the underlying SAN Standard grows rapidly, Indian coffee can utilise the opportunities on offer to contribute to greater social and environmental well-being, while also growing good, profitable, and sustainable coffee.

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References


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