UEBT SOURCING WITH RESPECT®

BIODIVERSITY ACTIONS

CARDAMOM IN THE WESTERN GHATS, INDIA

A Case Study

from DPP Spices Project, GIZ India For more details, see page 5

A Biodiversity Action Plan (BAP) provides guidance in designing and implementing concrete practices on sustainable use and conservation of biodiversity when growing and sourcing natural raw materials.

CARDAMOM *Elettaria cardamomum*

The Facts

- Native to the Western Ghats
- Evergreen perennial plant
- The fruits and seeds can be used as a culinary spice and seasoning
- Widely cultivated in tropical countries including India, Guatemala and Indonesia
- In Western Ghats has been cultivated in small to large privately owned farms since the 19th century
- Some farms follow organic practices
- Monoculture is common and contributes to soil stress and high incidence of pests
- Non-organic farms often use highly toxic agrochemicals, including banned pesticides, in uncontrolled ways (e.g. preventive or routine use)
- Soil and water bodies are often contaminated with agrochemical residue
- Disposal of agrochemical containers is haphazard and not managed
- Farmers mostly rely on underground water for irrigation in the dry season but recently the volume available is not sufficient
- Landscapes where cardamom grows are composed of a mix of forest and agroecosystems and grasslands with some animal reserves and sanctuaries
- Land conversion is a threat to biodiversity, reducing beneficial species diversity and increasing human-wildlife conflict.
- Invasive species are spreading in farms and surrounding areas due to human introduction and spontaneous growth
- Most farmers use firewood from shade trees for drying cardamom pods

CARDAMOM HILLS IN THE WESTERN GHATS

The Western Ghats is a mountain range spreading over 140,000 km² in South-western India. This ecoregion is special for its high level of biological diversity and unique biophysical and ecological processes. It also contains a high level of endemism, sheltering most of India's endemic species and some threatened species such as tigers, Asian elephants and leopards.

Within the Western Ghats is a mountainous area called Cardamom Hills. Its name is attributed to the cardamom spice that has been cultivated in the area since the 19th century at high elevation and alongside coffee and pepper.

The Western Ghats as well as the Cardamom Hills are composed of contiguous protected areas including the Periyar Wildlife Sanctuary that includes a tiger reserve. These areas attempt to restrict human access and protect the natural high biodiversity in the area. Within the Cardamom Hills is the Cardamom Hill Reserve (CHR), confirmed as a Key Biodiversity Area (KBA) of international significance.

The rainforests of the CHR serve as a natural corridor for wildlife in the region, however illegal clearing of the forest for agriculture and land encroachments are an issue, as well as the indiscriminate use of toxic agrochemicals in the plantations of the Cardamom Hills.

Indiscriminate use of toxic agrochemicals

Despite its high biodiversity importance, the Western Ghats and more specifically the Cardamom Hills are threatened by indiscriminate pesticide application. Toxic levels of these chemicals, mostly attributed to coffee farms, have been found in water bodies.

Due to climate change, monocultures, pesticide overuse and soil degradation, pests are increasingly a problem, and so the cultivation of cardamom has become highly dependent on pesticides. The pesticides persist in the environment and are potentially causing negative impacts on plants, invertebrates and small birds.

Pesticide dependence is also having an adverse impact on the exportation of cardamom from India, when high levels of residue are found, thereby causing the crop to be rejected for trade.

Eupatorium, Mikania (*Mikania micrantha*), Lantana (*Lantana camara*), Nila grass (below) (*Mimosa diplotricha*), and Siam weed (*Chromolaena odorata*), Parthenium, Silver Oak, and other invasive species are spreading.

They are coming to the farms from forest areas and other unused land. Rapid and uncontrollable expansion of invasive species can disturb an ecosystem's natural dynamics and composition, impacting its capacity to sustain the native wildlife. Conflicts between wildlife and human are also a consequence of this degradation of natural habitats. Wild animals get closers to areas where humans live to look for food and shelter.

Moreover, in farming fields the invasive species compete for nutrient with cardamom and other crops. Some farmers use high toxicity herbicides to control them with negative impact on soil and water, which are now polluted.

Given the extent of dynamics described above, conservation and restoration of natural ecosystem is best achieved through collective actions. In most cases it is advisable to work in collaboration with local or regional authorities and/or nature conservation organisations and contribute to landscape actions.

CONSERVATION

GOAL 1 CONTRIBUTE TO THE CONSERVATION OF NATURAL ECOSYSTEMS INCLUDING PROTECTED AREAS

- **Address human-wildlife conflict**
  Partner with relevant institutions to help address the root cause of the conflict between wildlife and humans. Collaborate to improve the conditions of natural habitat where these species find shelter and food. Implement solutions to protect humans and their sources of livelihood (e.g. crops and livestock) that avoid killing wildlife (e.g. use of natural fences and alert systems instead of electric fences).

- **Help reduce the spread of invasive species**
  Partner with local institutions to research the control of invasive species and pests through biological and natural methods. Contribute to initiatives to raise awareness on this topic and to promote the adoption of alternatives.

GOAL 2 REDUCE APPLICATION AND CONTAMINATION OF AGROCHEMICALS

- **Gradually reduce the use of synthetic agrochemicals by favoring organic alternatives and natural management**

  – Ensure systemic monitoring of pests and weeds.

  – Identify and use organic alternatives to synthetic pesticides and herbicides.

  – Adopt seeds selection and propagation methods that ensure healthy seeds and regulate sowing density.

  – Manage non-farmed areas (e.g. buffer zones) to introduce native and beneficial species that compete with invasive species and contribute to pest control (e.g. trap plants or attraction of beneficial insects, birds, etc.) as well as reduce cross-contamination.

  – Ensure ground cover with native vegetation, mulch and similar materials that will contain invasive species and weeds, and also control weeds manually.

  – Implement natural structures to regulate humidity. Ditches can be used to channel water away during the rainy season and avoid over saturation of water. Vegetation and mulch can be used during the dry season to increase infiltration and humidity. Shade can be regulated through pruning and removing breakage throughout the year.

  – Promote crop resilience to pests and changing climate

- **Promote crop resilience to pests and changing climate**
  Identify the most adapted varieties and crop patterns by setting up experiments where local traditional varieties are planted and intercropped with pepper, coffee, trees (including fruit trees) and beneficial weeds. Monitor for quality, resilience to extreme weather events, resistance to pests and diseases, and response to different IPM practices including organic substances application

GOAL 3 CONTRIBUTE TO SOIL REGENERATION

- **Perform soil analysis** Analyse soil properties such as structure, stability, fertility, biological components, moisture and drainage conditions and decide on soil management accordingly. Understanding soil needs is the first step to stop indiscriminate use of fertilisers. Laboratory analysis is one option. However, if farmers are in remote areas and with limited economic resources, visual soil analysis can be sufficiently informative. Farmers can be provided with basic tools for analysis or access to laboratories.
- **Gradually reduce the use of synthetic fertilisers** Ensure farmers are aware of alternatives to synthetic fertilisers and how to produce them. Alternatives may include indigenous farm animal manure, compost, or intercropping with green manure crops as cover crops.

GOAL 4 CONTRIBUTE TO CONSERVATION OF WATER RESOURCES

- **Use of efficient irrigation methods to reduce the consumption of water**

– Where crop density allows, use drip irrigation to increase irrigation efficiency. If density is an obstacle, favor water sprinklers. Flood irrigation is to be avoided in all cases and water received by the crops should be monitored.

– Consider climatic factors and plants' needs before irrigating. Collect and consider meteorological information before irrigating. Train farmers on visual ways to identify crop water needs (e.g. leaf color).

– Reduce reliance on groundwater and above ground sources by using natural structures to ensure humidity (e.g. vegetation cover, mulch) and to collect rain water (e.g. natural ponds).

- **Assure water quality**

– Perform a water analysis before irrigation and clear water from pollutants throughout the use of plants, microorganisms, or technology before irrigating.

– Stabilise steep areas with vegetation and other natural structures that reduce the risk of run offs. Plant vegetation along canals, rivers and other surface water bodies to contribute to purifying accidental wastewater.

GOAL 5 REDUCE CONTAMINATION FROM WASTE AND PROMOTE REUSE

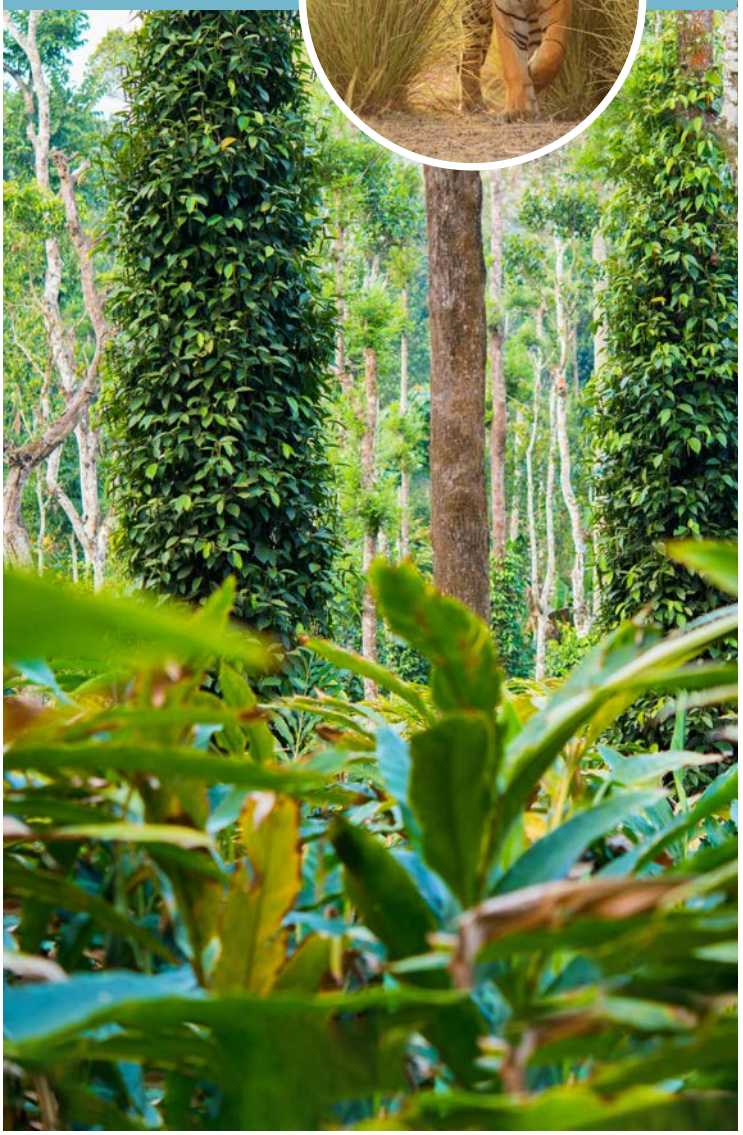
- **Train farmers on safe disposal of agrochemical containers.** e.g. triple rinsing and puncturing of empty containers.
- **Set up a collection system for non-organic waste and organise disposal with authorized bodies for possible recycling.** Provide training to farmers on how to use organic waste for composting and as biofertilisers.

A healthy soil is the foundation of healthy crops. Good biotic and abiotic soil conditions contribute to food supply and habitat for crucial organisms that support crop growth.

Soil is degraded as a consequence of practices such as monocultures, excessive and indiscriminate use of fertilisers, and similar. When soil is degraded the resilience of crops to pests, diseases, and climatic stress is reduced, which negatively impacts yields.

Soil degradation can be reversed through practices aiming to balance soil conditions. Those include diversification of crops, cover crops, crop rotation and natural inputs. When soil conditions are restored, crops health is also ensured.

REGENERATION



Water is a crucial resource and indispensable for the biodiversity in the Western Ghats and Cardamom Hills. However due to indiscriminate use of agrochemicals, both above and below ground water sources are contaminated. This is having detrimental effects on fauna including death and defects. It is also a threat to human health.

There is little awareness on how agricultural practices are affecting its availability. Inefficient irrigation systems are leading to water resources depletion.

Given its importance, this natural resource should be used sustainably. This can be done by reducing pollution through agrochemical reduction and natural control measures. Efficiencies can be promoted by choosing more adapted crop varieties to local conditions and promoting the diversity in the fields, installing more efficient irrigation systems and natural structures to catch rainwater.

SUSTAINABLE USE

IMPACT

A 2017 comprehensive literature synthesis[1] that reviewed multiple scientific studies on biodiversity conservation techniques shows that:

- **Buffer zones** reduce the negative impact of agrochemicals on flora and fauna.
- **Reducing pesticide use** decrease the negative impacts of farming on biodiversity.
- **Avoiding the intensive application of pesticides** benefits invertebrate, plants and bird species. A higher diversity of soil fauna can be found in low agrochemical-input systems.
- **Using pest-resistant varieties** are a low-cost control method with minimal impact on ecosystems.
- **The use of compost** leads to higher microbial biomass, reduced soil erosion and water runoff, high carbon levels and organic matter and to higher crop yields.

Other expected impacts

- **Reducing the use of synthetic agrochemicals** is a way to cut costs. It is expected that over time and with yields stabilising, investments made to change practices will be paid back through higher income.
- **Returning to traditional varieties** that are highly adapted to local conditions, is expected to ensure crop resilience over time more so than hybrid varieties. Any reduction of yields compared to the use of hybrid varieties in the short term may be compensated by more stable yields over time.

Roles and responsibilities

- International organisation and local companies invested in a public-private partnership that provided the financial resources needed to start up the process of defining a Biodiversity Action Plan (BAP).
- Farmers contributed by sharing experiences and knowledge.
- A team consisting of alocal agronomist, with the support of an ecologist and a UEBT biodiversity expert, gathered all relevant knowledge and defined the BAP.

About the DPP Spices Project, GIZ India

This project is part of the develoPPP.de Programme implemented by GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). The lead partner agencies for this project are AVT McCormick and McCormick Switzerland. develoPPP was set up by BMZ to involve the private sector in areas where business opportunities and development policy initiatives overlap.

The objective of program is Enhancement of Smallholder Spice Farmer's Capacities in Sustainable Farming' aims to strengthen the production of Cardamom, Cumin, Turmeric, Dill Seed and Celery in six states of India – Kerala, Tamil Nadu, Karnataka, Rajasthan, Punjab and Haryana – to increase the capacities of spice farmers to make production practices more economically, socially, and environmentally sustainable.

The UEBT Standard

UEBT's Ethical BioTrade Standard – through its requirements in Principles 1 and 2 (Conservation of Biodiversity / Sustainable Use of Biodiversity) – guides its members and their suppliers to define and implement systemic approaches to biodiversity conservation and sustainable use. To facilitate this process, UEBT recommends companies adopt Biodiversity Action Plans as a strategic road map for businesses to contribute to reversing the loss of biodiversity on Earth.

Learnings to share

- A partnership between an international organisation and a local processing company facilitated the start of the activities and provided the financial resources needed.
- The presence of an experienced team of agronomists and their long-term collaboration with farmers represented a significant source of information to understand the key issues to tackle at the farming level.
- The expertise of an ecologist complemented existing knowledge with a broader understanding of local biodiversity and how this can be instrumental to tackle issues at the farm level. Moreover, this expertise was crucial to understand the negative impact of farming on local biodiversity and how to counteract it.
- The BAP approach helped to organise all knowledge into a set of clear targets and activities to implement.
- Considering the starting point of the farmers, a two-step approach was needed to facilitate:
  - the transition from synthetic agrochemicals to organic alternatives
  - the transition to regenerative practices.

How to begin?

Acting for biodiversity means acting in a systemic and context specific way. You can:

- **Assess opportunities** and threats to biodiversity in the context of your sourcing.
- **Implement actions** that focus on conservation, restoration, and sustainable use.
- **Plan different measures** and coordinate with different actors along the supply chain.

About UEBT and this work

This case study is one of many examples of plans and types of actions that can be taken to reduce negative impacts on biodiversity or promote positive impacts. UEBT has drawn this material from its work with various companies and provides these cases to inspire companies to take concrete actions in their own supply chains.

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