

Practical instruments for biodiversity management on farm and in the company

A case study from the spice sector in India

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Biodiversity-friendly pepper production in Kerala, India.



THE MISSION

DEVELOPING EFFECTIVE INSTRUMENTS FOR THE SUSTAINABLE PROTECTION OF BIODIVERSITY

More and more farmers, collectors and companies around the world are implementing actions to conserve and restore biodiversity. Biodiversity provides the basis for functioning ecosystem services, which in turn deliver services such as fertile soils, clean water, pollination or climate regulation. As we are facing a dramatic loss of biodiversity and ecosystem services the integration of biodiversity-friendly practices into value chains is crucial. In order to support farmers, collectors and companies in planning, implementing and monitoring biodiversity-friendly practices, hands-on instruments are needed. The „Private Business Action for Biodiversity“ (PBAB) project commissioned by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) as part of its International Climate Initiative (IKI) and implemented by GIZ together with its partners Global Nature Fund (GNF) and Union for Ethical Biotrade (UEBT) has tested pilot approaches in three partner countries – Brazil, India and Mexico. This publication shares some of the findings from a project implemented to promote biodiversity-friendly spice production in India, while also illustrating the benefits of using instruments such as the Biodiversity Action Plan.

Threats to spice production in the Western Ghats of India

India is the world's largest exporter of spices. 80 percent of these are grown on small and fragmented land and represent an important livelihood for millions of small farmers (over 2.5 million small farmers in India grow one or more spices). One of the most important regions for spice production are the Western Ghats in India, which are also among the world's most important biodiversity hotspots.

The main spices grown in the Western Ghats are black pepper, cardamom (green), nutmeg and cinnamon. The increasing demand for these spices has led to an intensification of production, which is associated with deforestation. At the same time, poor agricultural practices and, above all, the excessive use of (sometimes prohibited) pesticides are a problem for the entire region, as they not only impair soil fertility, soil fauna and pollinators locally, but also cause massive water pollution in watersheds. Changing climatic conditions have put farmers under additional pressure.

Furthermore, these unsustainable practices have resulted in a loss of income for farmers as the produce is of insufficient quality and is sometimes even rejected by the market due to high pesticide residues. Fields made unprofitable by poor agricultural practices are often abandoned, with the farming community moving elsewhere. From a business perspective, a constant, long term supply of many high-quality spices can currently not be guaranteed due to poor agricultural practices and subsequent migration in the region. At the same time, pesticide residues in the final product represent a high reputational risk for companies.



Biodiversity-friendly pepper production



Chilli

|| THE APPROACH

INSTRUMENTS FOR BIODIVERSITY-FRIENDLY PRODUCTION

A promising approach towards more sustainability in the spice sector is to promote biodiversity-friendly production and commercialization. The approach utilized within the "Private Business Action for Biodiversity" (PBAB) project is validated by the fact that there already are various examples in the Western Ghats, which show that biodiversity-friendly spice production is possible: The spices can be cultivated in mixed cropping systems; and it is possible to reduce the use of chemical pesticides or to completely replace them with sustainable alternatives.

However, both the producers' and the companies' knowledge about biodiversity and ecosystem services in the spice sector in India was limited when the project started. Furthermore, there was no prior experience with instruments for integrating biodiversity aspects into business processes and little technical knowledge about biodiversity-friendly production practices. By improving awareness and knowledge on biodiversity and biodiversity management instruments, the PBAB project aimed to bring promising examples for biodiversity-friendly spice production to scale. As a result, leading multinational companies in the spice sector have set goals to make spice production more sustainable by introducing biodiversity-friendly practices.

Cardamom



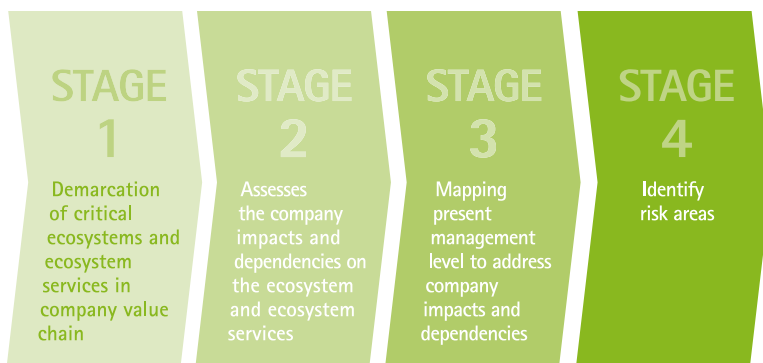
VERSATILE INSTRUMENTS AS A KEY TO SUCCESS

BIODIVERSITY ACTION PLAN, BAP MONITOR AND BIODIVERSITY ASSESSMENT TOOL

During the pilot implementation in India, the PBAB initiative has focussed on testing and improving management instruments that may serve as a road map for conserving and restoring biodiversity as part of the agricultural production and procurement. The following instruments proved promising to support the implementation of biodiversity-friendly systems among Indian spice producers and small and medium-sized enterprises in Western Ghats of India. The **Biodiversity Assessment Tool** as an instrument for

- helps to prioritize measures according to relevance as well as feasibility given the available resources and expertise
- supports farmers and companies in setting up a monitoring and evaluation system to assess the efficiency of a Biodiversity Action Plan, as well as its effects on biodiversity.

As a first step of the project, therefore, the instrument was adapted to national conditions with input from a group of Indian and international experts. Pilot studies have been implemented on selected small-scale production areas. Another important activity was to raise awareness of small producers for biodiversity on and around their farmland. Global Nature Fund and the Union for Ethical BiTrade supported the methodological development and pilot studies as implementation partners of the project.



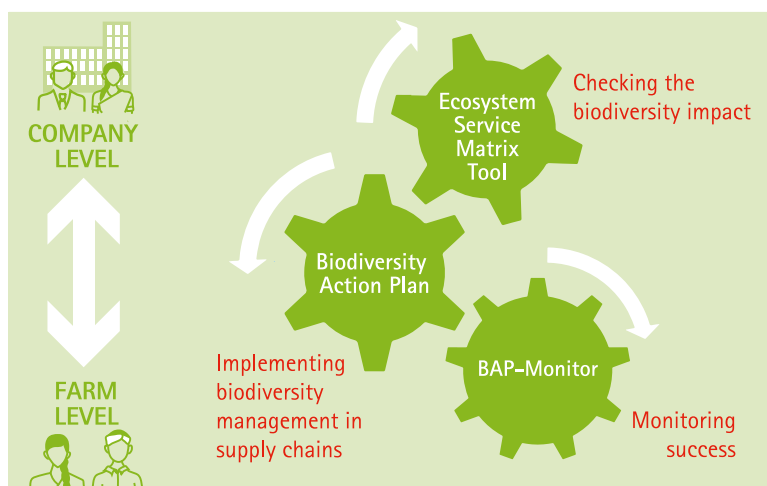
The functionality of the Ecosystem Service Matrix (ESM) as part of the Biodiversity Assessment Tool.

assessing biodiversity and ecosystem services helps stakeholders in selected value chains to identify impacts and dependencies on biodiversity. It includes the development of an Ecosystem Service Matrix (ESM), which is used to map the risk areas related to various ecosystems and ecosystem services on which any given business is dependent on or has a direct impact on. In the spice sector value chain, this tool was used to identify risks resulting from biodiversity loss in the Western Ghats. The results were incorporated into the development of adaptive measures to address biodiversity issues and make the spice sector sustainable.

Biodiversity Action Plans (see next page in detail) for companies and farms as developed by the Global Nature Fund were not yet known in India at the start of the project. They provide guidance for biodiversity management at the company and/or farm level. A Biodiversity Action Plan is a helpful instrument for scheduling, implementing and monitoring biodiversity measures on and around farms, as it:

- helps to assess the current status of their supply chain and define gaps to act on biodiversity integration as well as baseline information
- provides support and examples for defining aims, targets and measures as well as an actual work plan

The BAP-Monitor (Biodiversity Action Plan Monitoring Tool), developed with the support of Global Nature Fund and Union for Ethical BiTrade, provides additional guidance for hands-on monitoring of measures as outlined in a Biodiversity Action Plan. The instrument enables monitoring on two levels; performance and impact. This tool also helps quantify the status of implementation of measures defined in the Biodiversity Action Plan and at the same time provides guidance for measuring impact by defining impact indicators and appropriate measuring methods.



Versatile tools as a key to success: Biodiversity Action Plan, BAP-Monitor and Ecosystem Service Matrix Tool

IV. BIODIVERSITY ACTION PLANS

ADVANTAGES AND CHALLENGES OF THE INSTRUMENT

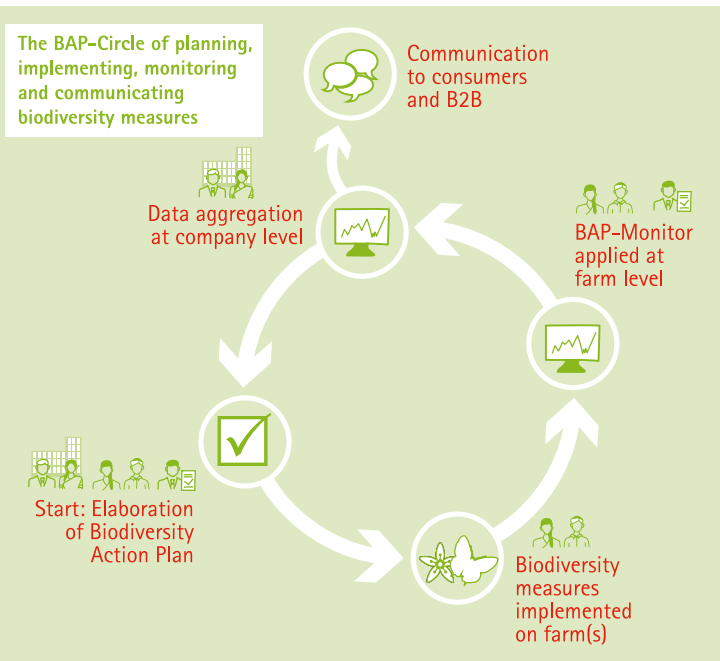
Biodiversity Action Plans help producers and local companies **understand the advantages** of sustainability in the context of biodiversity. They can identify actions that allow for the continuation of current activities while ensuring the protection of biodiversity and ecosystem services to benefit future activities.

Applying the Biodiversity Action Plan has proven to be useful for the spice farmers, as well as the spice companies, as it has **strengthened and valorised farmers skills** on

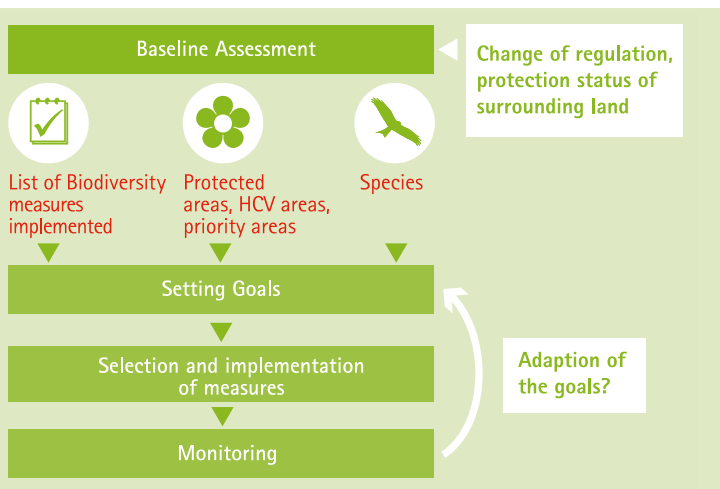
biodiversity-friendly, sustainable spice farming practices and has built industry-wide capacities around biodiversity. Through Biodiversity Action Plans, companies implement a systematic approach for biodiversity management, which allows them to replicate the approach in different production areas.

Also, Biodiversity Action Plans provide an **easy tool** for farmers and companies to **communicate their biodiversity efforts**. The definition of targets and monitoring indicators enables clear communication about the measures that are to be implemented, the expected as well as the actual results. This clarity is important when it comes to internal decisions around promoting and fulfilling buyers' and clients' requests for information.

Challenges in the Biodiversity Action Plan implementation may arise when internal or external expertise on the status of biodiversity in farming areas and the surroundings is not available or when existing expertise is not framed into specific measures and targets. Also, the uptake of measures might be limited if short-time costs for the implementation remain with farmers or if collaboration is needed amongst many stakeholders without proper organizational structures in place. For further upscaling, capacity development activities, such as awareness-raising workshops for companies and farmers and trainings in the use of the instrument, are crucial. Also, adequate financing opportunities for more costly measures need to be explored.



- Company or standard organisation
- Farmer/group of farmers/wild collectors
- Advisor, such as biodiversity expert/local NGO



Training of trainers for the implementation of Biodiversity Action Plans.



WHAT WE ACHIEVED V.

IMPACTS OF THE PILOT IMPLEMENTATION IN INDIA

Within the pilot studies in the Western Ghats of India, there were some encouraging achievements:

- **Over 900 people improved their knowledge on the importance of biodiversity in spice production.** Field visits and detailed group discussions provided better learning opportunities to farmers and company staff, thus improving knowledge on biodiversity. The training programme also enabled farmers from different regions to share their knowledge. The training of trainers helped disseminate the approach within partner organizations. Over 89 percent of the participants stated that they can use what they learned in their everyday work.
- **A total area of 3000 ha was targeted by the implementation of measures from Biodiversity Action Plans.** Around 2500 farmers have implemented biodiversity measures in their fields. The measures have a positive impact on the ecosystem services and thereby are beneficial to the **local population/community**.
- **Indirectly, 34 000 ha of land was positively influenced by the project, as this area is cultivated by producers linked to the participating companies.** Seven spice companies now have increased awareness of the importance of Biodiversity and Ecosystem Services, conducted assessments and adopted action plans with as part of this project, with the goal to integrate biodiversity into their existing processes or frameworks and enable easy adaptation to biodiversity-friendly production and commercialization.
- **Three spice companies have already started to implement Biodiversity Action Plans.** One of them developed a Biodiversity Action Plan at company level, which will guide future decisions in the pepper sector. Another company successfully managed to secure funds for the implementation of biodiversity-friendly

measures at farm level through a private-public-partnership project.

- **Instruments and training materials developed and promoted by the project have been adopted by important stakeholders in India,** thereby guaranteeing a multiplier effect beyond the initial scale of the pilot project.
- **Key recommendations have been included in India's National Sustainable Spice Programme,** thereby ensuring an outreach at national scale in India. The programme was jointly developed by the Spices Board of India, World Spices Organization (which is the technical arm of All India Spices Exporters Forum with over 200 member companies) and the Sustainable Trade Initiative IDH.
- **On the international level, the instruments are being used and promoted** by actors such as the Union for Ethical Bioproducts (also in cooperation with Rainforest Alliance) and Global Nature Fund. Thus, the lessons learned of the project will be helpful on a global level, as partner organizations of the project will continue to promote and implement Biodiversity Action Plans in other sectors and regions.





A map designed to plan biodiversity measures at farm level as part of a BAP.

VI. LESSONS LEARNT

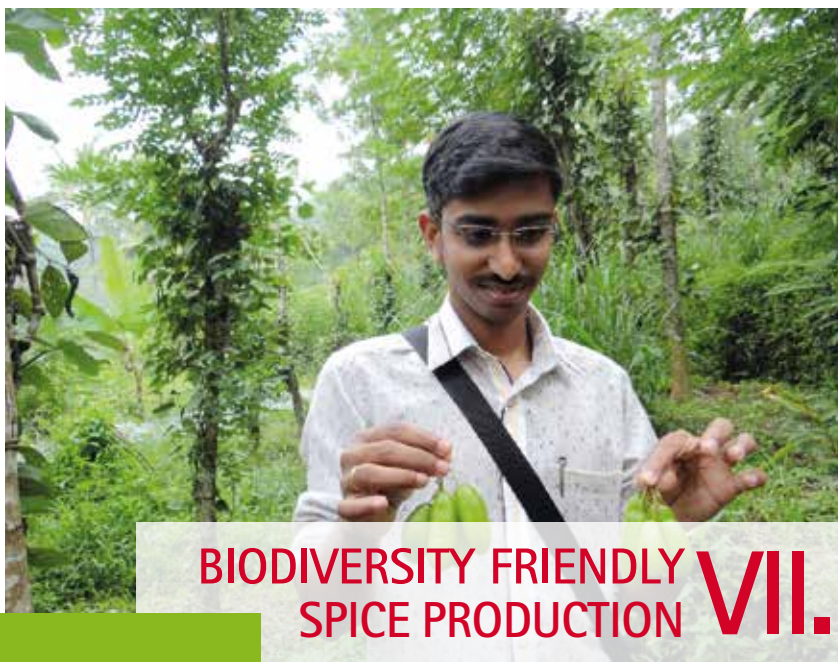
FROM THE PILOT PROJECT

- In the project preparation phase, it is important to carefully analyse the pressure points within the value chains. By addressing these, it is easier to motivate stakeholders to change and start working on biodiversity-friendly production and commercialization Biodiversity includes people, so the analysis should be based on a holistic approach of sustainable development, which includes social, economic and ecological dimensions.
- It is recommended to target the whole value chain, as all companies along the chain can bring in motivation for change and provide important conditions for driving it.
- Linking biodiversity to ecosystem services, as well as analysing the company's impacts and dependencies on both, helps illustrate the high relevance of the topic. Climate change and biodiversity can be addressed simultaneously, as many measures are beneficial for both issues.
- It is crucial to look at the costs of biodiversity measures and identify mechanisms to compensate farmers for the costs and efforts of implementation. For some measures this means that the availability of seeds and seedling materials needs to be assured.



A cardamom farmer inspecting his plants.

A young spice farmer diversifying his production with fruits and vegetables.



BENEFITS FOR THE PRODUCTION SYSTEM

The implementation of Biodiversity Action Plans promotes measures that **contribute to conservation and sustainability in the context of biodiversity** through the management of existing ecosystems, habitats, natural resources and other areas important for biodiversity in the farming fields, and at a landscape level in the surrounding areas. The recommended measures are based on a baseline assessment of the respective farm and its surroundings, thus meeting not only farming needs but also identifying room for activities outside the farm boundaries.

During the pilot implementation period, farmers adopted different practices to enhance biodiversity in and around their farms, with **benefits for the production system** as well as for biodiversity, such as:

- **Bio fencing with flowering plants.** It encourages bees and other pollinators to thrive on the farm. This has a direct positive impact on crop production. Bio fencing can also reduce certain pests; e.g. Hibiscus can reduce stem borer population in cardamom and Chrysanthemum can reduce soil nematode population. At the same time, the flowering plants have an economic value and can increase the farmers' income.
- **Soil and water conservation by vetiver grass.** The hilly terrain of Western Ghats is subject to heavy soil erosion and runoff during monsoon. Contour planting of vetiver grass can prevent soil erosion.
- **Intercropping with medicinal herbs.** Plumbago is a high-value medicinal plant in the Ayurveda industry

and farmers can gain additional income by introducing such medicinal herbs as intercrop or additional crops on the farm. Apart from direct economic benefits, plants such as plumbago are efficient in controlling rats and rodents within the farm. Plants like neem can be used for making various organic products such as organic pesticides, organic growth promoters, etc.

Measures for biodiversity conservation and sustainability also provide **benefits for climate change adaptation**: For example, introducing local varieties within the farm ensures better resilience to local climate change impacts. A diversification of crops also increases insurance against crop failures as well as ensuring resilience. For the past few years, Western Ghats has seen torrential rains followed by long dry spells, shifting of the monsoon, and increased occurrence of pests and diseases. These challenges can be met with biodiversity measures that foster permanent soil coverage, promote ecological structures and contribute to soil health and fertility as well as the presence of beneficial insects.

Measures implemented during the pilot phase point at a **significant improvement of important ecosystem services** such as pollination, soil fertility and carbon sequestration. Pollinators and other beneficial insects in the ecosystem increase through a diversification of crops, while a build-up of soil microbes results in increased soil health and organic matter content. Agroforestry systems meanwhile increase carbon sequestration. However, it takes more than three years of pilot implementation to document reliable impacts on ecosystem services at farm level.



Hands-on training on Biodiversity Action Plan implementation for cardamom.

VIII. BIODIVERSITY FRIENDLY SPICE PRODUCTION

BENEFITS FOR EVERYONE

Farmers benefit from improved provision of ecosystem services because they are crucial for the spice production and consequently sustain the economic viability of farm operations. The diversification of crops provides new opportunities for increasing and diversifying farm incomes. Opportunities for commercialization of farm products improve through compliance with buyer and client requirements. Long-term relations between companies and farmers lead to fair payments and engagement in shared actions for learning and improvement. Costs for farmers depend highly on the type of measure selected. Some might even be cost-saving, while others require additional financing or support during a transition phase.

Companies may ensure sustainable production and a continuous supply of spices. They benefit from the reduction of risks, such as operational risks related to the availability of production factors and to climate change, reputational risks, and risks related to market access, regulations and laws. They also benefit from improved business opportunities. Costs for companies may include human resources (farm advisors), certification costs, support for the implementation of measures on farms and higher raw material prices. Biodiversity Action Plans allow companies to replicate their biodiversity-friendly approach in different geographical areas and with different products.



Cardamom and pepper growing in biodiversity-friendly agroforestry systems.



Pepper growing in biodiversity-friendly agroforestry systems

People living in production areas benefit from an enhanced provision of ecosystem services, such as food supply, access to clean and safe water and better quality of soil, which may contribute to poverty reduction in rural areas. Health risks for farm workers and their families are reduced by minimizing exposure to toxic and persistent chemicals.

Consumers benefit from reduced health risks by minimizing exposure to toxic and persistent chemicals in food and get the option of choosing biodiversity-friendly produced spices.

Good news for biodiversity: the instruments are there, we just need to use them.

Biodiversity-friendly production and commercialization has proven to be a highly relevant topic for stakeholders in the Indian spice sector. There is a growing awareness among businesses for implementing sustainable practices and standards. Instruments to support the implementation of such practices are needed. The Biodiversity Action Plans, which were promoted by the PBAB project as a core instrument for planning, implementing and monitoring adequate biodiversity measures on farming fields, have been positively received, as they are hands-on, flexible and can easily be adapted to the specific contexts on a farm. The pilot implementation of Biodiversity Action Plans in the spice sector showed that the instrument works well and brings positive impulses for biodiversity.

FINANCIAL RESOURCES

The following is an estimation of approximate costs for replication of selected activities concerning the Biodiversity Action Plan implementation (based on implementation costs in rural areas in Southern India in 2019):

- Cost for a Train the Trainers workshop on Biodiversity Action Plans (two days with 25 participants, including food but no accommodation/transport): 4000 Euros (if international experts are required, these costs have to be added)
- Cost for Biodiversity Action Plan trainings with farmers (two days with 30 participants, including food but no accommodation/transport): 2000 Euros (if international experts are required, these costs have to be added)
- Cost for implementing one Biodiversity Action Plan in India with one farmer in the field (including nursery and plant material, baseline soil analysis, awareness workshop, travel costs and expert advice): approx. 270 Euros for one crop cycle



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