# Promoting Biodiversity Conservation and Ecosystem Services Enhancement in Agrarian Landscapes

Insights from India, Kenya and Tajikistan

# Biodiversity loss can be stopped

through sustainable agricultural practices

and mainstreamed policies as solutions are demonstrating !

### Biodiversity loss - a silent process at global level

Nature plays a critical role in providing food and fodder, energy, medicines and genetic resources and a variety of materials fundamental for people's physical wellbeing. The current predominant way in which humans manage agroecosystems leads to biodiversity loss, neglecting negative environmental impacts, nutrition and health aspects and food losses at global scale. Not only biodiversity in general, but also local crop varieties and breeds of domestic livestock are disappearing at a steady rate. Since the 1900s, some 75% of crop genetic diversity has been lost and 30% of livestock breeds are under threat of extinction. 75% of the world's food is generated from only twelve crops and five animal species. Three species alone – rice, maize and wheat - contribute to 60% of our vegetal food consumption.

These dramatic trends of biodiversity loss together with an associated reduction in ecosystem services are projected to continue or worsen in response to indirect drivers such as rapid population growth, unsustainable agricultural production systems and associated technology development - globally and in the three countries of project implementation. According to the Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), these rapid declines in biodiversity and ecosystem services mean that most international societal and environmental goals, such as the Aichi Biodiversity Targets and the 2030 Agenda for Sustainable Development, will not be achieved (IPBES 2019).

Changes in land and sea use (1), direct exploitation (2), climate change (3); pollution (4), and invasion of alien species (5) are the main direct drivers of biodiversity and agrobiodiversity loss. Conversion of land for agricultural purposes with monocultures is expected to become the largest single driver of biodiversity loss (Convention of Biological Diversity, CBD). On the other hand, agrobiodiversity is key to food and nutrition security, resilience to climate change and the global challenges of our food systems. The Draft Post-2020 Global Biodiversity framework (CBD, February 2020) suggests to "ensure the sustainable use of biodiversity providing for socioeconomic development and sustainable livelihoods of people, while guaranteeing appropriate valuation of and payment for ecosystem services by 2030".

### Agrobiodiversity

Agrobiodiversity "The variety and variability of animals, plants and microorganisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries.

It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals.

It also includes the diversity of nonharvested species that support production (soil microorganisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agroecosystems." (FAO 1999).

Agrobiodiversity is an integral part of the entire biodiversity, with manifold interrelations between both categories. The Millennium Ecosystem Assessment framed ecosystem services as supporting, regulation, provisioning and cultural services fulfilling human needs. Agroecosystems are established and maintained by humans to enhance provisioning services and reduce dis-services, with agrobiodiversity playing an important role.

# Agrobiodiversity is the foundation of agriculture.

It provides food, feed, fibre and fuel: crops, animals, insects, trees, microorganisms.



**It maintains ecosystem services:** soil health and fertility, pollination, and natural pest predators.



## It improves health and nutrition:

growing and eating diverse crops and animals provides people with the variety of nutrients and energy they need for good health.





# What are the challenges for biodiversity mainstreaming in agrarian landscapes?

# Biodiversity is not sufficiently reflected in policies and within government institutions

As in many other countries, in India, Kenya and Tajikistan environment-friendly and sustainable agricultural policies and strategies at large-scale are not yet widely promoted. Efforts to address the alarming loss of agrobiodiversity and deterioration of ecosystem services are at an initial stage. **Insufficient awareness** goes along with a **lack of political will for biodiversity conservation**. This leads to **food systems that focus on production and productivity, and policies, laws and regulations** that **subsidize intensive agricultural production** without addressing negative **trade-offs**.

**Often, government policies** to promote biodiversity conservation and ecosystem services enhancements **lack coherence**, both horizontally between sectors, and vertically, between national and sub-national policies, laws and regulations. **Budgets for agrobiodiversity conservation** tend to be minimal.

# Fragmented responsibilities and insufficient coordination weaken food systems

Biodiversity and agriculture are two fields often dealt with separately. **Responsibilities** for agriculture and fishery are mostly anchored within ministries of agriculture, whilst conservation of biodiversity and multi-lateral agreements, such as the CBD, fall under the responsibility of ministries of environment. **Coordination mechanisms** are minimal. **Centralized government structures**, like those in **Tajikistan**, hamper the implementation of biodiversity friendly land use practices.

In **India and Kenya**, the promotion of conventional agriculture is complemented by encouraging organic farming or local foods as separate market segments – without changing the overall sectoral paradigm. On this basis, the potential of agrobiodiversity for the sustainable economic development of agricultural and food sectors, human and environmental health remains largely untapped.

### Knowledge gaps impede sustainable agroecosystem management

Only **informed people** can make informed decisions. Despite a huge body of knowledge related to biodiversity conservation and management among research institutions, international organizations, NGOs and farmers, there are still **significant knowledge gaps** among policy makers, government officials, agricultural technicians, private sectors, and community members.

The benefits of agrobiodiversity and the trade-offs of different land-use approaches, e.g. intensive cropping at the expense of soil fertility and water quality, are not sufficiently known. In Tajikistan, there are **not enough resources and specialized personnel** to conserve and use the crop genetic diversity nor to develop the required seed production base. Frequent staff rotation leads to a loss of capacity and knowledge. A proper **knowledge management system** is not in place, capacities for agricultural planning, including agrobiodiversity and ecosystem services, as well as climate patterns, are limited.

In all three countries, civil society and especially **NGOs are the driving force supporting the implementation of biodiversity-friendly practices** with farmers, but their dependency on external funding may disrupt the continuity of activities. Consequently, farmers cannot rely on their constant support; donors frequently change topics and focus. This weakens the possibility for building institutional and organizational knowledge on agrobiodiversity conservation and limits the possibility for civil society actors to scale up existing initiatives.

**Knowledge gaps** contribute to a tendency towards maintaining conventional agricultural strategies, even if shortcomings and negative trade-offs are known. This results in little progress towards a strong promotion of conserving biodiversity in agrarian landscapes and enhancing ecosystem services.

#### Unbalanced gender roles weaken women's influence

In the rural societies of our pilot countries, women are the custodians of agrobiodiversity. They provide the main work force in the field. However, it is mostly men, who take farm management decisions regarding cultivation and marketing, especially cash crops. Women's longer-term outlook with regard to nutrition and health, tends to be neglected.

#### Agroecosystems are threatened by Climate Change effects

Climate change is posing extreme challenges to farmers. Climate models forecast changing precipitation patterns and a steady increase in temperatures in most areas of the world, including in our pilot countries. Climate change can lead to longer and more severe dry spells, increase in heavy rainfalls, or invasion of pests and diseases due to increased temperatures. This threatens local seed systems and availability and contributes to the disappearance of species, varieties and animal races (genetic erosion).

#### Need for quick financial returns favours biodiversity loss

Striving for economic development and quick returns of investments leads to loss in crop and livestock diversity due to replacing traditional, nutrition-rich crops by high-yielding varieties. Incentives and subsidies offered by governmental agencies encourage farmers to opt for monocultures, as there is market demand for highly productive cash crops. Investment in monocultures can result in an unsustainable venture for farmers, largely because of remoteness of communities from the market and due to climate change effects. Farmers shoulder the risk and often pay heavy prices with monoculture farming, both economically and environmentally.

# What does the global project "Biodiversity and Ecosystem Services in Agrarian Landscapes" do?

The **project strengthens the capacities** of land users and their organisations, technical experts and decision-makers in civil society and governmental institutions. These operate at local, regional and national level in the agricultural, environmental, forestry and water sectors. Their improved knowledge and its application to strategies, planning and practice contributes to promoting biodiversity and ecosystem services in agrarian landscapes.

# Agrobiodiversity gives farmers options to manage climate risks:

growing diverse crops allows farmers to reduce their risk of losses from extreme floods, droughts and irregular weather events.



It helps to manage pests and diseases without chemical inputs.



It sustains rural peoples' livelihood and traditions.



### PANORAMA PLATFORM

As the world population grows and climate change continues to threaten livelihoods, we have to find agricultural production methods that support farmers and the environment. Many SOLUTIONS already exist. For sustainable Agriculture and Biodiversity Solutions, GIZ, Rare, and IFOAM - Organics Internationalhave joined forces. To date, PANORAMA presents 174 solutions from around the globe with the brightest ideas bringing together agriculture and nature conservation. New solutions can be uploaded for revision and publishing by practitioners, researches, development workers and individuals for mutual learning and exchange.

#### Please visit the platform

#### https://panorama.solutions/en



**Global engagement** is ensured through participation in high level policy dialogue for instance at the COP14 (Egypt, 2018) or at the FAO Launch of the Biodiversity Mainstreaming Platform in Rome (Italy, 2019). At the Global Landscape Forum (2019, 2020, Bonn) there have been side events organised with partners. The project evaluates **biodiversity-enhancing land-use practices in agriculture and implements those in pilot activities.** 

Technical, organisational and socio-cultural experience gained during implementation is collected, analysed and disseminated **at regional and national level.** The measures **are improving the sectoral plans** and the **capacities of the institutions** operating in the area of land use. **Experiences are shared**, findings documented with examples, and disseminated at international conferences and on an internet-based platforms.

Key activities focus on:

- 1. **piloting biodiversity-friendly land use approaches** with farming communities;
- 2. capacity development of farmers, civil society, academia and private sector;
- 3. **promotion of mainstreaming agrobiodiversity in policies** and strategies at national and sub-national levels;
- 4. **awareness creation** on the urgency of agrobiodiversity and ecosystem services conservation through **discussion and dialogue fora**, international conferences and the **online platform PANORAMA**.

### What are the Lessons learnt?

# What matters to mainstream agrobiodiversity in policies and within institutions

Influencing policies in a way to move towards a paradigm change promoting the sustainable management of agrobiodiversity and ecosystem services is a long-term undertaking. It can only be achieved, if all society stakeholders are aware and work jointly on all identified challenges and gaps. Continuous small steps matter to change the overall picture on the medium to long term.

**Policies developed in a participatory way** with all sectors and **framed with a bottom-up approach** enable consideration of agrobiodiversity and ecosystems services in a more comprehensive way. However, policies and strategies remain solely on paper, if not complemented by **adequate budgets and action** plans.

**Regular cooperation** between government sectors and civil society, e.g. through **intersectoral fora and thematic working groups** helped to create a common understanding, awareness and joint efforts for more sustainable agricultural approaches and food systems.

**Bilateral and multi-lateral projects can build the bridge to link civil society to Government** and create awareness on NGOs' and CBOs' contribution to farmers well-being and consumers' demand.

Recognizing the role of traditional institutions like village councils and NGOs who have the knowledge of traditional biodiversity-friendly agricultural practices and dovetailing this knowledge with an updated technical expertise can support the mainstreaming of agrobiodiversity.

The identification and publication of best practices as *Solutions* on the **PANORAMA** platform and the presentation at expert dialogue for a helped to bring together different actors, promote peer to peer learning and contributed to create awareness at policy makers' level.

#### Strengthened capacities improve agroecosystem management

Training sessions on "**Integrating Ecosystem Services into Development Planning**1", have been offered to representatives from ministries, state agencies, universities, research institutions, NGOs, the private sector and farmers. In Tajikistan and Kenya, these **training programs or modules are being integrated into the curricula** of universities, selected agricultural technical and vocational training centres, and into county or district development plans.

At field level, the combination of awareness programmes and farmer field schools (FFSs) based on diverse crops and techniques for biodiversity conservation, was a new learning process for all parties involved. Putting farmers in a participatory way at the heart of learning and teaching in the field and not in the classroom, resulted in changing perceptions and change of land use techniques.

#### Improved land use approaches increased biodiversity

**On farmers' pilot sites, shifting from monocultures to diverse cropping systems** and applying biodiversity-friendly agricultural practices led to rich insect populations and improved soil conditions. Species diversity and ecosystem services increased. The traditional Jhum system in India, for example, supports at least 40 different crop species per 0,5 acre. **However, there will only be an increase in biodiversity in the long run if farming families are fully convinced.** 

#### Balanced gender roles strengthen food systems

Women and men, young and old people and their knowledge and competencies are equally important for agrobiodiversity management. In **patriarchal societies**, **such as those of Tajikistan and Kenya**, it has been important to include more women in the cultivation and marketing processes, because they often consider nutritional aspects over sales figures. Specific capacity development measures and **placing women as traditional knowledge carriers on agrobiodiversity in the forefront of joint learning events** augmented their empowerment. Now, in the pilot areas in Tajikistan, women are more involved in decision-making. In the communities of **Meghalaya**, in India, women play a major role in agriculture by **tradition**. They are often respected for their knowledge and for managing the ecosystem diversity, since they are responsible for sustaining the livelihood of the family.

# Farmer to farmer exchange and scenario planning for climate change adaptation

**Farming families are aware of climate change**, but they lack the capacities and tools to adapt to the negative impacts. The crucial role that **a rich crop diversity plays for the resilience to climate change effects has been key to all awareness and training programmes.** Farmer to farmer exchanges and exposure visits to other areas with a higher crop diversity (e.g. more resilient rice varieties) proved to be useful tools for farming families in India. In Tajikistan, **climate scenarios** with corresponding biodiversity-friendly practices were developed. Only practices that proved robust within all forecasted scenarios were proposed to farmers.

# Safeguarding Livelihoods of Communities in India



Jhum, (shifting cultivation) as a farming practice is mostly found in North East India and it is the way of life deeply embedded in the tradition and culture of the local communities of the region. However, in the recent past, due to changes in the socioeconomic conditions and land use patterns, shortcomings like shorter jhum cycles, reduced fallow period, loss in soil fertility and poor crop yields are observed, thereby threatening degeneration of the state's rich natural resource and wellbeing of the communities that directly depend on this resource.

The project generated awareness and strengthened the capacity of jhum optimization and intensification measures, which contributes to promoting biodiversity and ecosystem services while ensuring food and livelihood security of the farmers.



**<sup>1</sup>** ValuES: Methods for integrating ecosystem services into policy, planning and practice" (www.aboutvalues.net).

# Conservation of local varieties in Tajikistan



The practice of seed conservation and exchange among farmers that contribute to the conservation of genetic resources and agrobiodiversity has been found in Ayni and Rasht districts.

However, over the past years, some local varieties started to disappear due to climate change and a lack of local seed production systems based on local knowledge. Evidence of this can be many local plants that were used centuries in remote districts by farmers are less commonly used today due to improper management of harvesting and conserving seeds, which contributes to the extinction of local species. The global project has helped to enhance local knowledge and built skills of female farmers to establish seed banks that offer a way to preserve this historical and cultural value. One significant contribution was to strengthen agricultural biodiversity and support ecosystem services in agricultural landscapes by facilitating the conservation of local species and pass these skills to future generations.



### Translating policies into action and giving agrobiodiversity a value

Conserving agrobiodiversity has to go hand-in-hand with **income generation**. In Kenya, the development of a county policy on biodiversity led to **public procurement of nutrient-rich African Leafy Vegetables (ALVs)**. This new market segment encouraged farmers to produce ALVs for schools and hospitals. In Tajikistan **farmers started to save money** for food purchase from diverse farming systems. In India, the promotion of crop diversity **encouraged organic farming**.

### What are the Conclusions?

#### Paradigm shift towards sustainable food production is needed

Contemporary agricultural approaches with their focus on production and productivity neglect environmental impacts, health aspects and food losses. A **fundamental global shift towards sustainable production of diverse, healthy, nutritious food, treated with care all along the value chain, thus reducing food losses and waste**, is necessary and will create new opportunities for income generation, employment and health.

### Biodiversity conservation and development of agriculture can no longer be treated as separate issues

**Biodiversity and agrobiodiversity relate to each other** and belong together; the boundaries between both are fluid. Responsibilities cannot be fragmented anymore. **Intersectoral coordination between all stakeholders** along with awareness creation and capacity building need to influence policy making.

#### New cost models need to consider costs for biodiversity loss

**Long-term or alternative investments** in sustainable land use management (e.g. tree planting, erosion control measures) are economically often not attractive as environmental and ecosystem-related costs are not compensated for. Payments for biodiversity-friendly food production and financial incentives for sustainably produced biodiversity products are missing in the pilot countries.

#### Global strategies can underpin national engagements

The **Draft Post-2020 Global Biodiversity Framework** of the CBD demands urgent global, regional and national policy actions to transform economic, social and financial models so that biodiversity loss will stabilize in the next 10 years. **Global and multilateral agreements can underpin national strategic decisions**.

#### Enabling factors call for strategic actions

The high number of **best practices** (although often isolated), **growing consumer demand** for organically produced food and **societal movements**, **e.g.** "Fridays for Future" or the **Green Generation Initiative**<sup>2</sup> are enabling factors. A pandemic like **Covid-19** is demonstrating the importance to learn from mistakes regarding unsustainable resource management and fragile food chains.

In India and Tajikistan, local food production is the response to reduced food imports. In order to create synergies for sustainable food systems, **challenges need to be addressed strategically, while at the same time making best use of the enabling factors.** 

1#FridaysForFuture is a movement that began in August 2018, after 15-year-old Greta Thunberg and other young activists sat in front of the Swedish parliament to protest against the lack of action on the climate crisis (https://fridaysforfuture.org/). Elisabeth Wathuti founded the Green Generation Initiative in Kenya (https://greengenerationinitiative.org). Licypriya Kangujam is a child activist from India (https://globalvoices.org/2020/10/04/youth-activist-licypriya-kangujam-leads-indias-movement-against-climate-change/).

### **Our Recommendations**

**Raise awareness: Lobby for a fundamental global shift towards sustainable food production systems** that take trade-offs between production, biodiversity and ecosystem services into account.

**Create incentives:** Enhance **the design of new agrobiodiversity-friendly policies,** developed in a participatory manner, **with incentives for the production of nutritious food, and removal of dis-incentives** for biodiversity-friendly agricultural practices. Support **budget planning** to ensure **financial resources for biodiversity-friendly production**.

**Build the bridge:** Boost national **cooperation platforms** between different ministries and all societal stakeholders. Consider **civil society organizations as key partners**. Strengthen national NGOs dedicated to agrobiodiversity conservation and use.

**Enhance knowledge:** Expand **capacity development** on agrobiodiversity and ecosystem services in **governments**, **universities and agricultural colleges**, **among civil society actors**, **private sector and farmer organizations**. Support learning modules on **the integration of ecosystem services into development planning** to induce change.

**Support mutual learning**: Promote **Farmer-to-Farmer extension and Farmer Field Schools,** to offer sustainable farm management options to farmers, decreasing their economic dependency on monoculture farming.

**Increase economic interest:** Establish linkages between **agrobiodiversity and economic opportunities** through payments for environmental services, biodiversity farm products, link to the health food sector, agro-ecotourism and rural gastronomy in agrarian landscapes.

**Support new cost calculation models:** Create public awareness on the costs of ecosystem services and biodiversity loss.

Facilitate the **establishment and sustainable management of community seed banks** to conserve traditional native seeds, to strengthen the availability and access to local varieties. Create links between the community-based seedbanks and national seed systems to trigger positive policy change.

Build the capacities of the future: Encourage universities and agricultural training institutes to integrate training courses on sustainable food systems into their curricula.

**Move from piloting to upscaling.** Support the introduction of sustainable agricultural approaches into entire regions, federal States (India) and adjust projects accordingly.

**Support national engagements in multilateral environmental agreements (MEAs):** Strengthen joint efforts of ministries of agriculture and ministries of environment to engage in the upcoming Post-2020 Global Biodiversity Framework of the CBD through strengthening sustainable agriculture and forestry approaches.

Use windows of opportunity: Create awareness in conferences, radio, TV, internet and social media on the importance of agrobiodiversity to manage climate change effects. Raise public understanding of the importance of local / regional food chains.

## Intersectoral Forum for Agrobiodiversity and Agroecology (ISFAA) in Kenya

Stakeholders from the Ministries of Agriculture (MoALFC) and Environment (MoEF), civil society organisations, e.g. the Alliance of Networks in Agroecology (ANAK) and Kenya's National Farmers' Federation (KENAFF), private sector, academia and research, county administrations, and development organisations / foundations are part of the intersectoral forum for agrobiodiversity and agroecology.

Approximately 80 participants network in six Thematic Working Groups (TWGs) of ISFAA, namely

- 1. policy and law,
- 2. national and international engagement,
- 3. biosafety, GMOs and seed sovereignty,
- 4. principles, practices and climate change,
- 5. access and benefit sharing
- 6. County engagement.

The Forum is a Kenyan initiative hosted by MoALFC. It meets regularly to present the work of the TWGs and develops policy recommendations on sustainable food systems that take agrobiodiversity and ecosystem services into account. ISFAA builds the bridge between stakeholders and government.



#### IMPRINT

#### Published by:

Deutsche Gesellschaft für

Internationale Zusammenarbeit (GIZ) GmbH

Sitz der Gesellschaft Bonn und Eschborn

Friedrich-Ebert-Allee 36 + 40 53113 Bonn, Deutschland T +49 228 44 60-0 F +49 228 44 60-17 66 T +49 61 96 79-0 E info@giz.de I www.giz.de

Bonn, 2020

Author/Responsible/Editor, etc.: Akhmedov, Gaparova Koholova, Lohmann, Pala, Peter, Pfefferle, Quilitzsch-Schuchmann

Design/layout, etc.: GIZ, Dushanbe

Photo credits/sources: GIZ / WHH GIZ in cooperation with WHH

On behalf of

Federal Ministry for the Environment, Nature Conservation,

and Nuclear Safety (BMU)

#### URL links:

https://www.giz.de/en/worldwide/52789.html

GIZ is responsible for the content of this publication.