





Best Practices

Conservation and Sustainable Management of Biodiversity in Khyber Pakhtunkhwa (BKP Project), Pakistan

Edited by Dr Christine Martins

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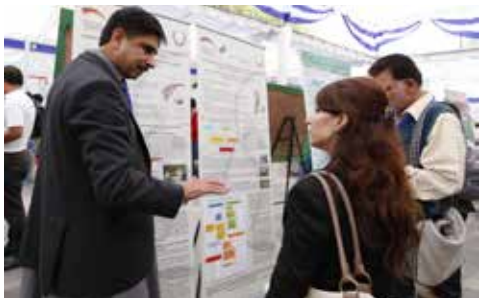


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Abbreviations

ADP	Annual development plan
ARI	Agricultural Research Institute
BKP	Conservation and Sustainable Management of Biodiversity in Khyber Pakhtunkhwa, Pakistan
BMZ	Federal Ministry for Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung)
BWG	Biodiversity Working Group
CABI	Centre for Agriculture and Biosciences International
CBAM	Community-based adaptation measures
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
FFS	Farmer Field School
FGD	Focus group discussion
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IDB	International Day for Biological Diversity
JFMC	Joint forest management committee
KP	Khyber Pakhtunkhwa
KP-BSAP	Khyber Pakhtunkhwa Biodiversity Strategy and Action Plan
LFFS	Livestock Farmer Field School
LSC	Local subsidy contract
MAP	Medicinal and aromatic plant
MEA	Multilateral environmental agreements
MoU	Memorandum of understanding
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-governmental organisation
NRM	Natural resource management
NTFP	Non-timber forest product
P&DD	Planning and Development Department
PPP	Public private partnership
PRA	Participatory Rural Appraisal
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RMA	Rapid market appraisal
SMS	Subject matter specialist
USD	US Dollar
VA	Vulnerability assessment
VCD	Value chain development
WWF	World Wide Fund For Nature

Preface

Pakistan holds a special status with regard to ecological diversity, ranging from the Arabian Sea to the second highest mountain peak of the world. Its diverse ecosystems are home to unique flora and fauna, which sustain the livelihoods of the majority of the population of the country. The province of Khyber Pakhtunkhwa (KP), with about 40% of the country's forest reserves, hosts a vital biodiversity of genes, species, populations and ecosystems. Natural disasters and anthropogenic factors combined with climate changes pose serious threats to KP's biodiversity and increase the vulnerabilities of the forest, natural resources and agriculture-dependent communities.

By ratifying the Convention on Biological Diversity (CBD), each party commits to conserve biological diversity within its own country as well as to support other countries, in particular developing countries, to achieve the convention's objectives. Germany has assumed this task and assists its partners with the implementation of the CBD through development cooperation. In the ninth meeting of the CBD Conference of Parties (COP9) in Bonn in 2008, Germany took the lead in providing financial support for the conservation of biodiversity. On this occasion, the German Chancellor Angela Merkel pledged an additional EUR 500 million for the period 2009-2012 for the protection of forests and other ecosystems, and an additional EUR 500 million each year thereafter. The present project is financed from these biodiversity funds.

Since October 2012, GIZ on behalf of BMZ has supported the provincial authorities in KP in improving the conservation and sustainable management of its biodiversity. The objective of the project "Conservation and Sustainable Management of Biodiversity in Khyber Pakhtunkhwa" (BKP Project) is that "public and private actors (public administration, NGOs, entrepreneurs, development organizations) at provincial and district level increasingly apply the experiences gained in the pilot measures for the sustainable management and conservation of biodiversity and for adaptation to climate change in Khyber Pakhtunkhwa".

The project's leading partner is the Planning and Development Department of KP; implementing partners are the Forest, Environment and Wildlife Department and the Agriculture, Livestock and Cooperation Department, with their respective attached departments. The project focuses on policy advice, capacity-building and awareness raising; pilot measures implemented are meant to enhance the adaptive capacities of the local people and generate best practices for up-scaling by the relevant government departments.

One of the first activities of the BKP Project was to analyse the experiences of similar projects in the area. This report identified a range of valuable lessons and best practices, but revealed that, with a very few exceptions, such lessons and practices are hardly incorporated in the government formal development agenda for future replication. The BKP Project wanted to avoid such an outcome. In order to generate ownership and facilitate the possible adoption of project results at higher levels, the documentation of its Best Practices was developed in a process actively involving province and district partners, covering a longer time period and a sequence of different workshops. Jointly with government staff, GIZ analysed the experiences made during project implementation and reflected on lessons learnt and examples which could be considered as best practices. The present brochure comprises their knowledge and feedback and makes it available to others.

The target group for the document are staff from governmental and non-governmental organisations in Pakistan as well as people and projects outside of Pakistan working in the field of biodiversity. The Best Practices documented should not be detailed technical guidelines, but more broad, wide-ranging and general descriptions, insights and recommendations.

Wolfgang Hesse Peshawar, May 2016
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Area characteristics

The BKP Project is implemented in Khyber Pakhtunkhwa (KP) Province, in Pakistan's Northwest. Bordering with Afghanistan, the region was until 2010 known as the North-West Frontier Province. KP is the smallest province in Pakistan but holds most of the national forest and, accordingly, is very rich in biodiversity; thus, KP's biodiversity is of national importance. KP mostly lies in the mountain region. These mountains are a major source of fresh water, upon which the irrigated plains largely depend; these plains serve as food basket for the country. Protected areas such as game reserves, wildlife sanctuaries, and national parks cover 14% of the province.

Khyber Pakhtunkhwa is gifted with diverse ecological zones as it gradually increases in altitude from the south (250 meters in Dera Ismail Khan) to the extreme north (7700 metres in Chitral District). Owing to the gradual increase in altitude, the ecological diversity has manifested itself in obvious variations in flora and fauna. The livelihood of the population has historically depended on natural resources.

Today, however, the fragmentation of habitats, overuse of natural resources, conversion of land for (largely unsustainable) agriculture, introduction of invasive species, as well as high population pressures and climate change, are all posing serious threats to biodiversity and those natural resources. The situation is largely attributable to a lack of integrated policy framework; weak or missing institutional coordination; and low awareness at various levels, ranging from village communities to political decision makers.

KP is the second most-densely populated province of Pakistan, at around 382 persons per km^2. (Note: All population data are extrapolations for 2015 from the 1998 census). The BKP pilot area is located in the northern part of KP, in Malakand Division, in Swat and Chitral Districts. Three project villages lie in Shamozai Valley in Lower Swat (600-900 m altitude), three in Lalkoo Valley in Upper Swat (1200-1400 m) and three in Golain Valley of Chitral District at an elevation of around 2,200 metres.

Swat District has a size of 5,337 km^2 with ca. 2.2 million inhabitants (population density of ca. 412 persons per km^2), while Chitral District is larger (14,850 km^2) and much less densely populated (ca. 0.49 million inhabitants, ca. 33 persons per km^2). The terrain of Chitral is very mountainous; around 76 per cent of the land is mountains and glaciers. Vegetation period in Chitral is shorter than in Swat as winter starts earlier due to the high altitude. Snow prohibits access to Chitral for some months in winter. Chitral District has a typically continental steppe climate, with average annual precipitation ranging from 100 mm per year in the far north to 580 mm in the south. In Swat District, the annual rainfall averages 830 mm.

In KP, with its 83% rural population (Swat 86%, Chitral 90%), most of the population directly depends on the use of forest and natural resources for their livelihood. Agriculture and forestry are important sources of income, both relying on intact ecosystems and undisturbed natural resources. The conservation and sustainable management of biodiversity is an important pre-requisite for increasing the resilience and food security of the rural communities.


Swat


Livelihood in Chitral


Chitral

1. Community-based adaptation measures

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The assessment of communities' vulnerabilities to climate change helps to provide orientation to stakeholders for the identification and prioritization of adaptation measures. Integrated bottom-up planning and joint implementation of the selected measures contribute to the conservation and sustainable management of biodiversity; to minimizing the adverse effects of climate change on the area; and also to community development.

Background

Climate change has become a critical challenge to development, economics and investment, due to its impacts on life, ecosystems and national and global economies. Developing countries – poor people especially – are affected by the negative impacts of climate change because of their lack of institutional, financial and technological capacities to deal with the threat. The magnitude of the impact of climate change depends on the vulnerability and the adaptive capacity of the affected people and the economic sectors. Improved biodiversity management enhances resilience to climate change and contributes to adaptation strategies. Enhanced protection and management of biological resources can mitigate the impacts of climate change and contribute to solutions as communities strive to adapt to climate change (see UNEP, 2010; GIZ, 2014).

In the BKP project area, climate change also adversely affects the livelihoods of the local communities which mainly depend on the services and benefits that the ecosystems provide. Biodiversity – the basis of their sustainable production – is slowly eroding. In agriculture, local species and varieties which are well adapted to the specific environment, and better resist the negative effects of climate change, are disappearing at an alarming pace. Reasons are manifold: lack of awareness, one-sided propagation of high-yielding varieties, uncontrolled and excessive use and exploitation of natural resources, poor management practices (such as inappropriate use of chemical fertilizers and pesticides), overuse of forests and non-timber forest products (NTFPs), as well as overgrazing of rangelands and uplands pastures.

Planting of soybeans is promoted for improving soils and family nutrition.

In the past, the relevant government services have worked in an un-coordinated way, with insufficient communication within and among the departments, and planned their field activities in a top-down manner. Farmers were insufficiently supported in their efforts to adapt to climate change, and to conserve and sustainably manage biodiversity as a basis for

their livelihoods. Thus, there is a high demand for community-based adaptation measures (CBAM) tailored to the local situation, which enable vulnerable people to identify and implement appropriate responses to climate change themselves.

Best practices of similar projects

At the start of the BKP Project, 13 biodiversity conservation and natural resource management projects implemented in the mountain valleys of Northern Pakistan were analysed for their lessons and best practices (GIZ BKP, 2013a). Successful practices included: raising private forest and fruit nurseries, joint forest management, sport hunting, district coordination mechanisms, resource conservation plans, extension cadres for livestock and agriculture, students' engagement, village conservation funds, community exchanges, land development infrastructure (irrigation channels, protective walls), and collection and post-harvest processing of medicinal and aromatic plant species.

However, "unfortunately, with the exception of very few, such lessons and practices are hardly incorporated in the government formal development agenda for future replication." Integration into government policies and funding-decisions are urgently required. In addition, the report emphasises the capacity-building of local communities: "The traditional top-bottom approach of delivering service through the government and NGOs has proven less effective in addressing the problems at the grass root level". A radical shift from resource-focused interventions towards a community-centred approach for local capacity-building, to address the problems at the local level, is needed to improve local ownership to address development challenges themselves. Knowing in advance the pitfalls experienced by other projects helped BKP dealing with such problems.

Concept and implementation – what has been done and how?

Vulnerability assessments for integrated bottom-up planning

Vulnerability is defined as the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. It depends on the character, magnitude, and rate of climate change and variation to which a system is exposed; its sensitivity; and its adaptive capacity. A vulnerability assessment is the practice of identifying, measuring and ranking vulnerabilities of a system. It is usually applied to inform decision makers and to support processes of adaptation in rural communities. Measures aim to enhance the ability to resist or avoid harmful consequences of climate change (see GIZ, 2014).

The project developed and applied a tool for the assessment of vulnerabilities of communities and ecosystems towards the impacts of climate change. Such vulnerability assessments (VA) ensure that the measures implemented reflect the priorities of the community and, at the same time, consider the local climatic realities. Measures for adaptation can aim either at increasing the adaptive capacity of the community (e.g. increase farmers' knowledge of proper land management, restrict uncontrolled grazing, provide policy advice) or at decreasing its sensitivity to the effects of climate change.

After orientations on climate change vulnerabilities in Pakistan, climate change exposure, sensitivities, coping capacities and impacts (see GIZ BKP, 2013b and c; Adelphi and EURAC, 2014), the VAs were implemented by teams of agricultural and forestry experts. The teams' members were drawn from nine different departments of the Forestry, Environment and Wildlife Department, and the Agriculture, Livestock and Cooperation Department, along with project staff.

The teams applied different Participatory Rural Appraisal (PRA) techniques to understand and assess the climate change-related vulnerabilities of communities at the village-level. These techniques included key informant discussions, focus group discussions (FGDs), village resource mapping,

transect walks, and field observations. The FGDs were conducted separately with men and women.

Information was collected on general village issues as well as on main natural hazards and their impacts. Afterwards, in smaller sub-groups, staff of the different departments collected information related to the nature and mandate of their offices (forest, NTFPs, wildlife, agriculture extension, livestock and dairy development, fisheries, on-farm water management, soil conservation and agriculture research). One whole day was spent in each village, to understand the issues of the area.

Forest officer conducting a focus group discussion with men on vulnerability issues in a Swat village.

The results of the vulnerability assessment show a number of factors that contribute to the vulnerability of communities in the area. Among the most pressing factors are population pressure combined with inaccessibility and, subsequently, a high dependence on local resources leading to a degradation of ecosystems in the area. Based on the vulnerability assessment and consultations with the pilot communities, a set of adaptation measures were identified. The communities have been fully involved in all steps. They participated in the VA, including identification of the adaptation measures; and in planning and implementation of measures, including procurement of materials, supervision and quality assurance (hence "community-based adaptation measures", CBAMs).

Implementation of community-based adaptation measures (CBAMs)

The CBAMs were implemented via a multi-stakeholder process involving communities, government institutions and the project. This innovative mechanism for demand-driven and integrated planning and implementation of field measures was termed 'Triangle of Cooperation' (see graphic). The project funded adaptation measures through local subsidy contracts (LSC) with the community, which had to form a village organisation registered with the Social Welfare Department, and open a bank account. To receive support, the community had to enter into an agreement (memorandum of understanding, MoU) with the concerned department to specify their roles and responsibilities. While the community was responsible for the implementation of the adaptation measures, the involved government department provided training and oversight. Both the communities as well as the extension staff of the line departments experienced a 'partnership for development'.

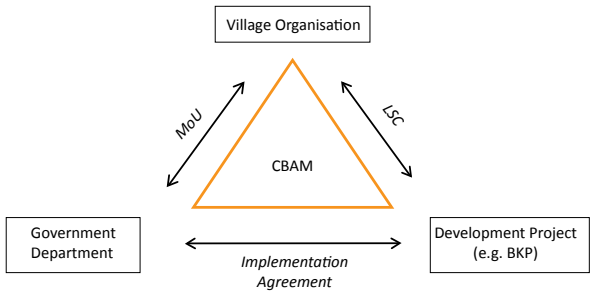

Figure 1: Triangle of Cooperation

Different CBAMs were implemented according to the triangle of cooperation. Measures comprised, among others, *in situ* conservation of indigenous plant species such as *Caralluma* and of a local cattle breed; and the natural regeneration of dry temperate Himalayan forests by *Cedrus deodara* (see Best Practice 2), as well as value addition in walnut production (see Best Practice 3). In the following, three further examples of CBAM are explained in detail.

Introduction of mulberry fruit based feed-blocks as livestock feed

Chitral district lies amidst the dry temperate Himalayan forests, receiving winter snow and no monsoon rains, due to which vegetation cover is less. In rural areas where landholdings are small, farmers practice subsistence agriculture and keep a limited number of livestock to meet their household needs. During the vulnerability assessment, it was realized that there was an acute shortage of fodder for livestock, especially during winter season. The feed situation was worsened by a prolonged winter season/dry season.

Mulberry *(Morus ssp.)* grows abundantly in the area. The fruits have high protein and sugar content. Most of the mulberry fruit drops to the soil, rots, and is thus lost. The project introduced mulberry fruit based feed-blocks in Golain Valley, through training and practical demonstrations given to female and male farmers. These feed-blocks are an example of adaptation to overcome fodder deficiency and keep the livestock healthy for improved meat and milk production. The local community has learned how to prepare the feed-block and knows its nutritional and economic value.

Promotion of biodiversity-friendly farming practices

As a measure to tackle the impact of droughts caused by climate change – something identified during the vulnerability assessments – biodiversity-friendly farming practices were promoted, which improve the moisture retention and buffer capacity of soils. The project supported its partner departments in the demonstration of a wide range of biodiversity-friendly farming practices to participating communities. During farmer field-days and comprehensive Farmer Field Schools (FFS, see Best Practice 4) in the pilot districts, farmers learnt about the production and application of organic fertilizers, physical and biological pest control and the promotion of legumes for the enrichment of soil fertility and the ecological environment, amongst other topics.

In the project area, imbalanced and inappropriate application of chemical fertilizers is commonly practiced, which has adverse effects on human health and the environment, including on soil biodiversity. In order to improve soil biodiversity and at the same time improve crop yields in a cost-efficient manner, the Agriculture Extension Department promoted fermenters for the production of organic fertilizer in the target villages. In these concrete tanks, organic manure is fermented; a part of the irrigation water passes through the tank, which enriches the irrigation water with nutrients. This not only benefits the farmers directly, by reducing the human labour needed for transportation and spreading the manure in the fields, but is also an environment-friendly measure. The liquid organic fertilizer improves the physical, biological and chemical properties of the soil and, as such, contributes to the enrichment of the soil biodiversity. Water-holding capacity of the soil increases so that the soil can maintain moisture for a longer period.

FFS members discussing vegetable production in Chitral.

Introduction of climate change adapted plants

With advancing climate change, drought periods will be longer and more frequent; a trend which was clearly indicated during the vulnerability assessments. The promotion of drought-resistant and climate change-adapted plants, such as olive trees, contributes to increasing the resilience of the local communities. The area in Swat is suitable for olive growing: wild olives grow here in cemeteries, which are biodiversity hotspots thanks to their protection over centuries. Olive trees can be planted on marginal land; they bear fruit after 4-5 years of plantation and generate income by providing the source product for olive oil. Pakistan is highly dependent on the import of edible oils. The establishment of small processing plants for the production of olive oil can contribute considerably to the supply of edible oils.

The project provided 3000 high-quality olive tree seedlings to farmers in Swat, organized training on grafting and budding, and arranged an exposure visit for olive farmers to an olive-producing community for direct exchange with successful olive farmers. In the store of the local olive growers association, farmers could see different possibilities of value addition to olives besides olive oil: dried leaves and olive seed powder are used for medical treatments. After the exposure visit, the Agricultural Research Institute (ARI) improved the olive value chain in Swat through varied training of the farmers (for value addition, see also Best Practice 3).

Results – what has been achieved?

Empowerment: It was impressive to see how eager and committed communities were to participate in the training and to jointly plan and implement the CBAMs together with the extension staff. The implementation of biodiversity-friendly farming practices in the context of a changing climate exposed governmental staff to an integrated and demand-driven extension approach, which went beyond the mere implementation of activities but supported the empowerment of communities. The registered village organisations possess the preconditions to receive support from other sources.

Awareness creation: The feedback received from the government partners – both through formal and informal ways – indicated that there is substantial increase in awareness regarding biodiversity conservation. The participation in the vulnerability assessments and the subsequent joint implementation of a wide range of adaptation measures increased the awareness of different stakeholders around biodiversity in general and, more specifically, around the interrelatedness of biodiversity, ecosystem services and climate change.

Capacity-building: The project introduced government staff of different levels (national, provincial and district) to the concepts, tools and approaches for biodiversity conservation and adaptation to climate change, and provided opportunity for exposure to international efforts on biodiversity conservation, which reflected back on the local situation. Officials from different departments increased their comprehension of the need for, and benefits of, interdisciplinary and inclusive planning approaches to render demand-oriented and climate-proof services to the 'customers' – the rural communities.

Demand-driven bottom-up planning: During the local-level vulnerability assessments conducted with the nine partner departments, community-based biodiversity-friendly adaptation measures were planned jointly with the target communities. The departments involved now better understand the climate-related vulnerabilities of the area; they are able to plan, prepare and submit proposals for CBAMs to the government in their Annual Development Plans (ADP). The NTFP Directorate, for example, has submitted a proposal for the conservation of wild vegetables in the province, and the Agriculture Extension and Agriculture Research Departments have sent agrobiodiversity-focused proposals to the government for approval.

Inter-departmental cooperation and linkages development: The VA process and the subsequent implementation of community-based adaptation measures provided opportunities for the government extension staff and the local communities to plan and work together. The activities have helped government departments to shift from a sectoral approach to more integrated interventions for the conservation and sustainable management of biodiversity under climate change. This process also developed linkages of the target communities with the government agencies.

Replication: After training and practical demonstrations on different biodiversity topics, the farming communities have now started to replicate the CBAMs on their own. For instance, the production of mulberry fruit based feed-blocks is being replicated by some farmers, and some of them have started marketing the feed-blocks in the area. Also, the fermenter technology is being replicated by other farmers.

Gender considerations: For the very first time, women were given the opportunity to take part in planning processes and were involved in implementation of the measures. One of the best examples is the successful implementation of a Livestock Farmer Field School (see Best Practice 2) in one of the conservative communities of Shamozai Valley. Furthermore, male government staff provided training to the women folk in the target communities, for the first time.

Concept development: The VAs conducted in the BKP Project contributed to the development of the concept and the guidelines for standardised vulnerability assessments of GIZ which are documented in "The Vulnerability Sourcebook" (see GIZ, 2014; Adelphi and EURAC, 2014).

Recommendations for implementation and up-scaling

- Local-level VAs are an important tool for integrated bottom-up planning. They help to identify socially-acceptable and biodiversity-friendly measures that support adaption to climate

change. The government should consider making VAs mandatory so that values and services of biodiversity can be safeguarded.

- The project's approach of planning and implementing CBAMs is sustainable and successful when all the stakeholders are involved in the consultation process and jointly accept and administer their responsibilities. This should be the normal feature of all the proposals of both agriculture and forestry sectors. For this, strong and effective coordination and communication mechanisms need to be in place. Instead of a sectoral approach, a landscape approach has to be applied.
- For further promotion of biodiversity conservation to support local communities in climate change adaptation, the different tools introduced by the project, such as training, workshops, exposure visits to promising communities and institutions, use of print and electronic media etc., have to be used continuously, taking into account local culture and norms.
- In general, the government allocates only a meagre amount of funds for the green sector. In cases, the budget allocated is more for the staff salaries than for the field level activities. Sufficient budgetary allocations to the green sector for biodiversity-friendly adaptation measures should therefore be guaranteed by the government, to replicate the best adaptation measures on a needs-basis.
- The majority of women in rural areas are engaged in agricultural and other natural resource management (NRM) related activities – such as processing of products – but the departments lack female staff to support women-related activities. The recruitment of female field workers is important to bridging the gap and ensuring better service delivery. It is encouraging that the Agriculture Extension Department has recently appointed female staff and deployed them to the districts.

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Community-based adaptation measures

Recommended implementation steps

- Conduct capacity-building and awareness-raising of all the key stakeholders on biodiversity conservation for climate change adaptation
- Assess vulnerability of communities to the impacts of climate change
- Identify and prioritize suitable adaptation measures
- Strengthen village-based organisations in planning and implementation of adaptation measures (e.g. registration, opening bank accounts, record keeping), ensure appropriate involvement of women considering local norms and traditions
- Formalize cooperation agreements between the community and the supporting institution, be it government, NGO, or development project
- Support the planning and implementation of CBAMs in regular coordination with the community members and respective government departments, focusing on practical demonstrations
- Organize monitoring and evaluation of CBAMs involving the local communities as much as possible
- Initiate sufficient budget allocation for biodiversity-friendly adaptation measures in government departments

2. *In situ* conservation

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The conservation of biodiversity is an important pre-requisite for enhancing sustainable development of rural communities. The *in situ* conservation of (agro-) biodiversity is especially useful since it promotes the sustainable management of biodiversity by maintaining its potential for continued adaptation. It also helps communities to understand and harness the economic and social benefits of their local natural treasures.

Background

The conservation of biodiversity is a central pre-requisite for increasing the resilience and food security of rural communities. In this context, the *in situ* conservation of (agro-) biodiversity is especially important. According to the Convention on Biological Diversity (CBD), *in situ* conservation is defined as "the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties". In contrast to *ex situ* conservation (outside the original habitat, e.g. in gene banks), *in situ* conservation helps ensure the ongoing processes of evolution and adaptation within their environments, which is especially important in times of climate change (see FAO, 2015; Kotschi, 2011; Zhou, 2011).

When the BKP Project started field implementation in 2014, the level of understanding of conservation and sustainable management of biodiversity among all actors involved was low. The relevance of biodiversity with regard to the resilience and adaptability of ecosystems to a changing climate was not recognized. The perception prevailed that biodiversity conservation and food security were competing development goals (see GIZ BKP, 2013). However, in the context of rural livelihood development, *in situ* conservation supports the empowerment of communities to understand and harness the economic and social benefits of biodiversity resources.

Caralluma tuberculata growing in its natural habitat.

Concept and implementation – what has been done and how?

The measures identified during the vulnerability assessments (as described in Best Practice 1) also included *in situ* conservation activities: the conservation of plants and animals in their original habitat. In order to create awareness of *in situ* conservation at the responsible government departments, as well as in local communities, and to demonstrate practical ways for implementation at local level, the project – together with its partner departments – planned and implemented a broad range of *in situ* conservation measures with selected pilot communities in Swat and Chitral, which are outlined below. The measures described also include examples of successful government-sponsored *in situ* activities with which the project had no involvement.

Re-introduction of *Caralluma*

Caralluma tuberculata is a high-value medicinal plant with anti-inflammatory and anti-tumour characteristics, also used traditionally as a nutritious vegetable. In former times, the species was found abundantly in the Shamozai Valley of Swat District. High market prices induced unsustainable harvesting methods. Due to the indiscriminate uprooting and overgrazing of hills mainly by small ruminants, *Caralluma* has almost disappeared from the area. During the vulnerability assessments in the Swat District it was decided to reintroduce the drought-resistant medicinal plant in its natural habitat, and to support ecological restoration.

To prepare the re-introduction of *Caralluma*, the staff of the NTFP Directorate arranged meetings with the community for further awareness creation, site selection, and to agree on management activities to be carried out by the community, such as fencing, planting, watering and controlling the site. Three plots – one in each target community of the valley, ranging from a quarter of an acre to one acre – were established on the farmers' land and fenced to avoid being grazed by the animals. Fresh *Caralluma* plants were planted by community members under the supervision and guidance of the NTFP Directorate. The project supported the reintroduction of *Caralluma* with the purchase of 120 kg of planting materials, fencing material and transportation costs.

Women Livestock Farmer Field School for local cattle breed conservation

The local *Achai* cattle breed is an important component of the livelihoods of the farming communities in the Shamozai Valley of Swat. Since theirs is a male-dominated and conservative society where women are confined to household activities, women handle the cattle at home and are not aware of appropriate husbandry practices for maintaining the productivity of their animals. Due to the low awareness of disease-control methods and the lack of access to the government veterinary facility, cattle mortality was high, adversely affecting the precious breed.

The BKP Project supported a Livestock Farmer Field School (LFFS) of 25 women. A female expert of the Swat Livestock and Dairy Development Department facilitated the different sessions over a period of ten months. Theory-cum-practice, they had a focus on practical works to develop the understanding of the illiterate women. For the first time, the women of the target community attended training and experienced educational opportunity. The LFFS comprised of different experiments which covered a wide range of problems related to the *Achai* breed and cattle husbandry in general. The women conducted trials on health issues, feeding and housing, analysed the results together, and jointly drew lessons how to improve the productivity of their animals, and identified better practices for conservation and improvement of the local breed.

In situ conservation of *Apis cerana*

Another example of *in situ* conservation of a local species is the promotion of the production of honey by *Apis cerana*. Four species of honey bee are found in Pakistan. While *Apis dorsata, Apis florea*, and *Apis cerana* are indigenous species, *Apis mellifera* was introduced to Pakistan in the 1970s. The introduction of the exotic bee species, the unsustainable harvesting of honey from the local bees, ongoing degradation of bee flora and the excessive use of pesticides all continue to threaten the local honey bees of Pakistan. The indigenous species *Apis cerana* plays a vital role as pollinator. Their honey is seen as a delicacy, fetching very high prices, and is therefore considered a good source of income for communities living in remote areas.

Apis cerana comb for honey production.

With the support of the project, the NTFP Directorate conducted awareness-raising and knowledge development activities for selected communities of Lalkoo Valley in Swat, to promote the conservation and sustainable management of the *Apis cerana* honey bee. Compared to the standard efforts to promote the exotic species *Apis mellifera*, it was a new approach to offer a training in the management of an indigenous bee species. Over a two-day training course, the NTFP Directorate demonstrated the application of modern bee-keeping equipment to 30 male and female apiculturists, in separate sessions. Capacity-building for women is also a new approach of extension for the NTFP Directorate. It was the first time that the female beekeepers had received training, and it was given by a male trainer.

Area closure for natural regeneration – *in situ* conservation of *Cedrus deodara* in Chitral

Afforestation in remote, mountainous areas is usually very costly and less effective than natural regeneration induced by the disbursement of seeds that are generated by mother trees. However, in order to ensure successful natural regeneration, the area at stake needs to be temporarily protected from grazing animals and human interference. These tasks are usually best implemented by an adjacent community which needs to have a genuine interest and to be equipped with certain knowledge and skills.

The Forest Department in Chitral has successfully promoted restocking of a degraded forest area near the village of Madaklasht. The forests and the surrounding pastures have been used for livestock grazing and collection of firewood. With the consent of the community, an area with a low vegetation density was selected for the *in situ* conservation of *Cedrus deodara*, which is one of the most important indigenous species of the Dry Temperate Himalayan Forests. After several consultations with the communities, the Forest Department initiated the establishment of a Joint Forest Management Committee (JFMC) for the conservation of natural forests.

This official body is responsible for the protection of the enclosed area by implementing patrols and prosecution of trespassers found guilty of illicit grazing, poaching or tree felling. The revenues from collected fines are used to fund a *Nagahban*, or watchman. The JFMC is also responsible for monitoring the implementation of the recently re-introduced concept of active herding, i.e. that animals are henceforth prevented from roaming freely but are, instead, herded to specific grazing areas. However, as sufficient money is needed at the outset to pay the *Nagahban* and compensate the services of the JFMC, the Forestry Department made funds available to bridge the time until the system was self-sustaining and generated income by itself.

Uncontrolled grazing is a threat to natural regeneration.

Co-management: Trophy hunting

Since the late 1990s, Pakistan has been known for its effective incentive-based scheme of markhor *(Capra falconeri)* conservation by the people (see Bellon, 2008; Bhatt et al., 2012; Edwards, 2006). The markhor, Pakistan's threatened mountain goat and its national animal, is listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Since 2002, CITES allows an annual export quota of twelve markhor trophies from Pakistan: four trophies each from KP, Balochistan and Gilgit-Baltistan. 80% of the revenues from the permit sales are paid into the accounts of the local communities, which protect the animals from illegal hunting and poaching. This income benefits the local population and motivates them in wildlife conservation.

A markhor, KP's flagship wildlife species.

The Wildlife Department of KP is successfully implementing co-management approaches for trophy hunting. Each year, the KP Wildlife Department issues up to four permits for hunting; the price per permit is determined by auction. Hunting is then allowed in special areas under the supervision of the department and the local community. Hunters all over the world are ready to pay premium fees for the unique hunting experience in KP. According to information from KP Wildlife Department, the trophy hunting scheme for markhor has earned revenues of USD 3.3 million over the last 17 years (1998-2015). In the 2015 hunting season, the price per markhor trophy was between USD 70,000 and 100,000.

Results – what has been achieved?

The numerous activities implemented by the BKP Project have created awareness and ideas for sustainable in situ conservation, both at village- and at policy-level. The activities provided tangible hands-on field demonstrations in the project's pilot districts. In addition, the measures brought together staff of the various partner departments for multi-disciplinary and inter-departmental planning and cooperation. Both the BKP pilot community and the extension staff of the government departments experienced a "partnership for development". The existing gap between community and governmental extension staff was closed. All in all, the demonstration and joint implementation of a wide range of measures for in situ conservation cultivated greater awareness of ecosystem service, climate change and biodiversity issues, amongst government staff and community members.

Internal monitoring of awareness-raising in Swat and Chitral revealed that, through cooperation with the project, the participating communities enhanced their knowledge and understanding of the relevance for their livelihoods of biodiversity conservation and management. Moreover, participating officials from different departments were sensitized to the need for, and benefit of, interdisciplinary and inclusive planning approaches to the rendering of demand-oriented and climate-proof services to the 'client' – the rural communities.

The Khyber Pakhtunkhwa Biodiversity Strategy and Action Plan (KP-BSAP), which has been developed through an iterative process taking up lessons learnt during project implementation, also considers comprehensive in situ conservation of biodiversity and agrobiodiversity (which is a part of biodiversity), as indicated in the following targets (GIZ BKP, 2016: 60):

- Target 12: By 2025, the extinction of known threatened species in Khyber Pakhtunkhwa has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
- Target 13: By 2025, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species in Khyber Pakhtunkhwa is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

For the first time, the local community gained knowledge about propagating and conserving local species such as Caralluma. However, experience has shown that site selection was very important: Only one of the three plots planted with Caralluma showed good results. On those sites with very marginal land, Caralluma plantation was less successful. Still, some progressive farmers started transplantation of Caralluma on their own land without project support.

After the series of LFFS sessions, the participating women improved the health status of their cows and milk production increased. The women also used the LFFS sessions to discuss other issues; they gained self-confidence and improved their problem-solving and decision-making ability.

Physical measurement of cow weight after disease control during LFFS.

The promotion of *Apis cerana* made farmers aware about the importance of this species for pollination and crop yields. The demonstration of sustainable honey harvesting methods will help secure steady incomes from honey sales without destroying hives and colonies, as it has been the traditional practice. After the training, the participants agreed to discourage the cutting of bee flora and to minimise the use of pesticides on orchards and elsewhere.

The natural regeneration close to Madaklasht is advancing well. Since executive powers were handed over to the democratically established JFMC, the community has fully taken over responsibilities for forest management and the JFMC is actively fulfilling its duties. Fines are collected and used for covering the costs of a watchman and the JFMC, in a transparent way.

According to data collected by the KP Wildlife Department, the population of markhor has recovered from 275 animals in KP in 1993 to over 3,500 in 2015. Controlled and community-based trophy hunting has proven to be a feasible approach for *in situ* conservation as well as for effective community development.

Caralluma tuberculata plantation in progress.

The results of BKP's *in situ* conservation measures at a glance:

- Increased awareness for the value of biodiversity and the need for *in situ* conservation
- Increased knowledge of the propagation and conservation of local species
- Sensitization regarding the need for involvement of communities as custodian for the conservation of natural resources
- Empowerment and self-confidence among communities, ownership on project-initiated *in situ* conservation sites, increased motivation of the community to take care of their natural resources
- Better communication between communities and government departments
- Mainstreaming of *in situ* conservation measures in work plans of the relevant departments

Recommendations for implementation and up-scaling

- As the experiences of the *in situ* conservation measures in KP have shown, community participation in biodiversity conservation, as well as income generation from conservation efforts, are crucial for success. They lead to local ownership and taking over of full responsibility for management activities, and independent addressing of development challenges. These two principles should be considered in any conservation attempt.
- The possibility to earn income with a threatened species increases the likelihood that a community protects valuable animal or plant species from illegal exploitation, and applies principles of sustainable management. In this regard, the potential of medicinal and aromatic plants such as *Caralluma* or honey production with *Apis cerana* should be further explored and promoted.

- Markhor trophy hunting is an impressive example of the successful conservation of a threatened species by local communities leading to a steady increase of the threatened animal, on one side, with the generation of substantial revenues for the local communities (through the controlled selling of trophy permits to rich hunters all over the world), on the other. Considering the present recovery of the markhor, a slight increase of the number of permits could be considered by CITES.
- The natural regeneration of degraded forest areas depends on the degree to which responsibilities and user rights are transferred to the local community. Local communities have a genuine interest in protecting and sustainably managing the natural resources they depend on, as long as they directly benefit from their conservation activities. This simple but effective model of biodiversity conservation should be further replicated.
- Concerned departments should ensure that *in situ* conservation activities become a regular part of their work plans. With the *in situ* conservation targets of the KP-BSAP, the different departments have sufficient guidance to further breakdown and budget for the implementation of *in situ* conservation measures in KP.

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In situ conservation

Recommended implementation steps

- Identify threatened plants and animals to be conserved through *in situ* conservation with defined objectives
- Sensitize, motivate, raise awareness and build capacity of local communities as well as concerned government institutions on *in situ* conservation
- Organise local communities and ensure active involvement of the local population, including women, in the *in situ* conservation activities
- Consider incentive/reward systems for the conservation efforts of the communities, e.g. community shares from income generated from trophy hunting
- Empower local communities by applying a participatory approach as well as handing over rights and responsibilities to them
- Develop a proper mechanism for *in situ* conservation (e.g. management plan including the role and responsibility of concerned actors)

3. Local value chain development

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Adding value to local agrobiodiversity products is a powerful tool for rural communities to improve their livelihoods, increase their competitive advantage and strengthen their resilience to the impacts of climate change. Supporting the sustainable marketing of non-timber forest products and local varieties of fruit and food crops increases income from natural products and, at the same time, conserves agrobiodiversity.

Background

The project's pilot districts of Swat and Chitral are located in the remote mountainous areas of Khyber Pakhtunkhwa (KP). These areas are rich in indigenous varieties of non-timber forest products (NTFP) and local fruit and food crops. Among these are walnuts, fruits (peaches, apricots, apples, oranges, etc.), morels, honey and many more. Dependence on subsistence agriculture and the use of traditional agricultural techniques is high. The quantity and quality of locally grown products is low and fluctuating, leading to food insecurity and dependence on imported products.

The local communities mostly focus on the production of crops and fruits, lacking facilities for post-harvest storage or processing of products. With no possibility to add value through processing or packaging, products have to be sold immediately to middlemen who pay low prices. The fact that there are very few producer group formations makes local communities vulnerable, as individuals have little market power. Without access to market information, their knowledge of markets is limited.

Economically important also are around 60 varieties of medicinal and aromatic plants (MAPs). Pakistan's exports of high-value medicinal plants generated over USD 10.5 million in 2012, with a substantial percentage of the supply coming from Swat and Chitral. Gathering is mostly done by women and children of nomadic hill-tribes who earn supplementary income through this activity, with the plants then brought into the market by collectors who are usually local farmers (see Sher, 2013).

Collection of local medicinal plant *(Matricaria chamomilla)*.

Analysis has shown that there is an increasing demand for locally produced products on the major domestic markets, thus providing an opportunity for pro-poor growth and, at the same time, promoting the sustainable management and agrobiodiversity-conservation of key commercially-used varieties. Overall, there is a huge need to improve all steps within the value chain, with a focus on adding value to local varieties produced in the project area (GIZ BKP, 2014c).

Concept and implementation – what has been done and how?

Value chain development (VCD) is key to adding value to the products grown and collected by local

communities in Swat and Chitral, helping to generate higher income while conserving biodiversity. The value chain concept consists of the major steps of primary production or collection, processing, marketing and consumption of agricultural products (see Figure 2). The project conducted a number of capacity-building activities to familiarize farmers with the value chain development approach, and supported them in a range of related areas.

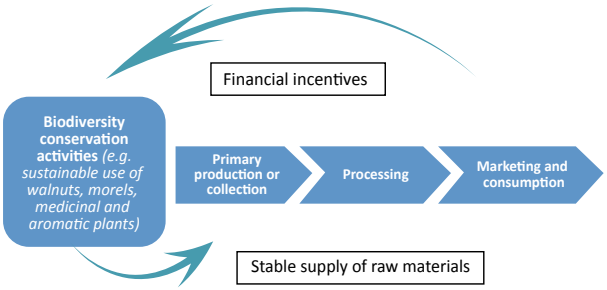

Figure 2: Connecting biodiversity conservation with the value chain concept (adapted from ValueLinks Manual; GIZ, 2007)

Identifying marketable "agrobiodiversity products"

Farmers participated in training aimed at identifying and prioritizing selected products for promotion. The focus of the training was on the identification and conservation of economically important local NTFP and agrobiodiversity products such as walnuts, medicinal plants or honey. (Note: agrobiodiversity is that part of biodiversity which is relevant for food and agriculture). Additional criteria for the selection were the potential for value addition, and the conservation of climate change adapted plants (e.g. *Caralluma* and olive trees; see Best Practice 1 and 2), as well as the potential to add value by utilizing the competitive advantages of the location (e.g. seed potato production in Chitral; see below). One major criterion was also the involvement of women in the value chains and their participation in the local economy, thus empowering them. The factors used for prioritization of selected products were clustered into economic, social and environmental issues and then grouped according to priorities. For Chitral, the top priorities included walnuts, medicinal and aromatic plants (in particular liquorice) and fruit trees (apricots and mulberries). For Swat, the top priorities emerged as walnuts, medicinal and aromatic plants, and local trout fish.

Identifying potential markets (rapid market appraisal)

To learn more about market demand, a local consultant conducted rapid market appraisals (RMA) in two major domestic markets, Rawalpindi and Lahore, to assist in prioritizing local agrobiodiversity products for value chain development. The RMA included collecting information about all steps of the value chain and provided recommendations for follow-up, such as improved techniques/processing to yield better prices at wholesale markets.

Group work during value chain workshop.

Training in value chain development and development of a road map

The project conducted comprehensive training on the value chain approach for selected pilot communities. Topics covered in the training included the value chain concept, identification of different steps in the value chain, market analysis and marketing strategies. Participants analysed the value chains of selected local products and developed a roadmap for adding value to the respective local products. GIZ's ValueLinks Manual (GIZ, 2007) was adapted to the local context and made available to communities and partners.

For those value chains in which women participated at least 30% of the time, 'road maps' were developed, where specific activities to add value and improve production and marketing were identified. Road maps were developed for walnuts in Chitral and Swat, liquorice in Chitral, and trout fish in Swat.

Exposure visits to support linkages with the private sector

The VCD activities continued with exchange visits of walnut farmers from both districts to the markets in Lahore and Rawalpindi, where they learnt from traders, commission agents, exporters and processors about the various quality criteria of proper walnut picking, drying, sorting, cracking, grading, processing, packing and marketing. Afterwards, walnut traders and processors from Lahore and Rawalpindi markets visited the producers, rural aggregators, commission agents/wholesalers, and markets in the main walnut producing valleys of Swat and Chitral to see the production situation at the locations, to exchange ideas and to encourage producer-trader linkages for further cooperation.

Certification for adding value to biodiversity

Certification can add value to biodiversity products, especially when targeting export markets. Certification achieves a 'recognizable' product, distinct from others, which can point to its additional value (healthier, tastier, produced/processed in a particular way, by particular people, in a particular region). Common examples are certification of origin and/or organic standard, Fairtrade, or Fair Wild (www.fairwild.org/standard). Certification, special labels and brand names can make use of the 'distinctiveness' of biodiversity products and help conserve biodiversity (see GIZ, 2015).

The UNDP-supported Mountains and Markets Project is about introducing the FairWild standard to Pakistan in its project areas of KP and Gilgit-Baltistan. The FairWild standard certifies sustainable collection, social responsibility and fair trade principles for wild plant collection operations. A FairWild mission to Pakistan in November 2015 identified the following products as promising export products for the international market: Chilgoza pine nuts *(Pinus gerardiana),* morels *(Morchella),* sea buckthorn *(Hippophae rhamnoides)*, liquorice *(Glycyrrhiza glabra/uralensis)* and black cumin *(Nigella sativa).* In 2016, pilot projects will explore the certification of morels and Chilgoza pine nuts.

Follow-up activities

In order to further strengthen linkages among value chain actors, stakeholders recommended that the project should focus its follow-up activities on supporting capacity-building of walnut farmers and formation of farmer business groups. Further follow-up activities include strengthening the agricultural extension services to support the walnut farmers in tree management, provision of improved/certified plants, disease management and appropriate associated technologies, product development and value addition (e.g. processing), standardization of packaging, enhancement of farmers' participation in marketing, capacity-building for compliance to quality standards, and development of a traders' directory.

Seed potato production in Chitral

In various valleys of Chitral, the main cash crop of farmers is potatoes. However, quality seed potato is rare in Pakistan, and expensive if at all available; most seed potatoes are imported. Thus seed potato production – which is very much suited to the unique high-altitude location, with its favourable soils and climatic conditions, and free of diseases – is the subject of a new public-private partnership (PPP). Partners are a Pakistani seed potato production company in Lahore, the international non-governmental organization Helvetas/Swiss Intercooperation, the BKP Project, and the potato seed production association in Garam Chashma, Chitral. With the contribution of the project, the most appropriate seed potato variety, "Paramount", will be distributed so as to deliver quality seed potatoes to Chitral and down-country markets.

Farmers along with FFS expert examining soil for seed potato production.

Beekeepers checking the honey in the beehive during the value chain development activities of the FFS in Chitral.

Results – what has been achieved?

The BKP Project has achieved the following results:

Awareness about the economic benefits of improved quality products has been increased through capacity-building and awareness-raising activities supported by the project. Staff from different government departments, at provincial and district level, farmers and traders were trained and sensitized to the value chain development approach; and thus know how to analyse and apply a systematic approach to identifying what is required at each step of the value chain, and how to achieve it. The understanding of market mechanisms and market information has increased; stakeholders know that market information is crucial to achieve better prices, and that it is important to consider the required quality and quantity.

Knowledge and skills in the area of value chain development has improved. This includes identification of marketing strategies, product development and improved organization among producers and sellers. This is particularly important for farmers with no or little access to and knowledge of sustainable production and harvesting techniques, as well as a lack of market information. Capacity-building of the governmental departments (Agriculture Extension, Agriculture Research, NTFP) has improved relationships between the government staff and the communities who often feel neglected by the government services.

Cooperation and up-scaling: Inter-departmental cooperation, and the application of an integrated approach between the District and Province Agriculture Department and NTFP Directorate and NGOs, have contributed to sustainable approaches. An example for up-scaling is that the VCD approach was taken up by the NTFP Directorate in the walnut value chain.

Income and agrobiodiversity conservation: The project supported conservation efforts and created some examples for the sustainable development of pilot areas. The nutritional, ecological and economical value of nearly-extinct medicinal and food plants, like morels, have been acknowledged and recognized. The plantation of walnut trees in Swat and Chitral, the planned establishment of walnut farmer cooperatives, and other value addition activities will also contribute to increased income for farmers. This will further increase awareness of the importance of conservation and the sustainable utilization of agrobiodiversity.

Women's participation: Women involvement in VCD is mainly in the collection and processing and not in marketing. Though the project tried to involve women in marketing activities, the participation of women remained restricted due to cultural constraints. For instance, the two Female Farmer Field Schools, which were successfully introduced by the Project for walnut and food processing activities in Chitral, contributed to the empowerment of women in their participation in the local economy.

Recommendations for implementation and up-scaling

Best practices for local value chain development identified in this chapter relate to capacity-building and enabling activities among local communities in partnership with government institutions and the private sector. They have the potential to be scaled up to include other products and value chains.

- VCD is a complex process and takes time to be understood and to be implemented. With only short vegetation periods in the mountainous regions, the progress of the interventions within a year is limited. When planning value chain activities, the geographical location, accessibility and seasonal calendar of the district has to be considered. With regards to any outside assistance, a long-term commitment is needed in order to achieve tangible and sustainable results. The VCD activities within the BKP Project were only a small component of its activities, and focussed on the conservation of agrobiodiversity. Realistically, stand-alone VCD projects are required, focusing on main crops to really boost the local economy.
- The involvement of government departments is crucial to ensure sustainability and integration of value addition activities in the relevant policy frameworks. Agriculture Research Institutes and Agriculture Extension Services, as well as the NTFP Directorate, play a pivotal role for VCD in the districts. Universities like University of Swat can play a much more important role in the future. The political will to cooperate and to bring themes forward where the local population can benefit cannot be stressed enough. This applies to the provincial and district levels, but also between all involved VCD stakeholders.
- Similarly, the role of the private sector should be strengthened by investments in the value chain development of the communities, including sensitization for local varieties and sustainable production and consumption patterns. Strong linkages between producer and buyer build the basis for further improvement in the chains. The farmers as well as the traders are entrepreneurs and have to invest in their business to make it successful. Overall, producer groups or cooperatives are promising vehicles to enable local farmers to collectively produce and sell products and, in turn, negotiate better prices for their products.
- Continuous efforts to develop capacities in product development, value addition and marketing, among different actors (producers, traders, government extension service, agriculture research, wholesalers, and farmers) along the value chain, are necessary to conserve biodiversity and simultaneously improve livelihoods of the rural communities. In the case of the walnut value chain, pre- and post-harvest management can be addressed through training on tree management, diseases, selection of improved plant varieties, appropriate picking methods, as well as training on proper drying, grading, shelling and standardized packaging material. Capacity-building to improve the quality of the produce and, consequently, to achieve high market prices, increase the competitive advantage of the location, and ensure the access to markets, is particularly important for farmers with no or little access to, or knowledge of, sustainable production and harvesting techniques and/or market information.
- Gender aspects have to be fully incorporated in any value chain approach, as women play an important role in the production process and consequently in the generation of income, but remain severely challenged on account of cultural and social obstacles. The involvement of women in the different steps of the value chain should be analysed, and support should be provided accordingly. For example, the females of the walnut-producing households are responsible for certain steps in the production process like drying, de-shelling (cracking) and processing. Consequently, the capacity-development measures must address women in a culturally sensitive way, e.g. by formation of women groups and through training and exposure visits to markets. Improved

networks and establishment of women groups can play an important role in strengthening their participation in the local economy.

- Huge investments are not always necessary to the improvement of value chains: the provision of small tools/equipment/measures is sometimes sufficient to achieve considerable results. Through simple measures such as ensuring the harvesting of mature walnuts, provision of tool kits for harvesting and cracking, and the use of appropriate and labelled packaging material, the loss of walnuts can be reduced by 10-20%, according to the statements of the traders. The sale of de-shelled walnut kernels receives higher prices, reduces transport costs at the same time by 2-3 times compared to walnuts in-shell, and creates jobs at local level, especially for women, who undertake the shelling.

Quality checking of walnut kernels.

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Local value chain development

Recommended implementation steps

- Conduct surveys to identify marketable "agrobiodiversity products"; identify key crops suitable for value addition
- Conduct awareness-raising and training in value chain development for farmers and other stakeholders (e.g. government staff, collectors, local traders)
- Analyse the value chain, searching for possible improvements including by-products; develop a 'road map' for value addition to selected crops
- Organize exposure visits for key farmers and local government staff, helping them to understand market requirements and link them to the market; establish producer groups for greater market power
- Organize exposure visits for traders and processors to link them to the rural areas
- Maximise the ecological and economical potential of the variety of areas and products (e.g. climatic conditions, certification).
- Provide training, equipment (e.g. processing facilities) and capacity development to local communities for sustainable management and production of agrobiodiversity products (e.g. grading and packing)
- Remove taxes and duties on naturally grown products that put a burden on local communities

4. Awareness-raising for biodiversity conservation

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Biodiversity conservation is only possible when people at all levels are motivated and well aware of the needs and benefits of sustainable management of biodiversity. Effective and diverse approaches and tools used to reach different target groups will create more awareness and better understanding of biodiversity issues.

Background

In Pakistan, as well as in other parts of the world, many people do not recognise the relationship between biodiversity and their own well-being; biodiversity remains unclear and intangible to them. They need to become aware of the critical role biodiversity plays in providing the essentials for survival and well-being. Only then are they likely to take the steps needed to consider biodiversity in their daily lives and practices – and also at policy levels. Awareness is a first step in developing understanding and concern and, ultimately, action in biodiversity conservation. Carefully targeted awareness and education programs can enable communities to protect and conserve the natural heritage in their immediate vicinity, on which their cultures and livelihoods depend (see Hesselink et al., 2007).

In 2014, the BKP Project conducted a baseline survey in its pilot areas in Swat and Chitral Districts to assess the level of knowledge and understanding of biodiversity (see GIZ, 2014). Survey results revealed that the knowledge-level of the communities regarding biodiversity was unsatisfactory. Not a single respondent knew the meaning of the term "biodiversity". Practices such as the excessive use of pesticides, imbalanced application of fertilizers, and use of hybrid varieties of seeds were applied to increase crop productions; however, farmers were unaware that these practices not only damaged their environment but also that the imbalanced use of pesticides has significant consequences for human health. The survey results indicated that villagers were not making any efforts to protect biodiversity because they did not know what actions needed to be taken.

Students participating in environmental game.

Without awareness creation and knowledge transfer, biodiversity conservation cannot be ensured, nor can its benefits be fully appreciated. Awareness-raising is the first tool for biodiversity conservation and has proven to be highly effective in educating the populace, as well as government and other relevant stakeholders, on the biodiversity issues that are crucial for the livelihoods of the rural communities.

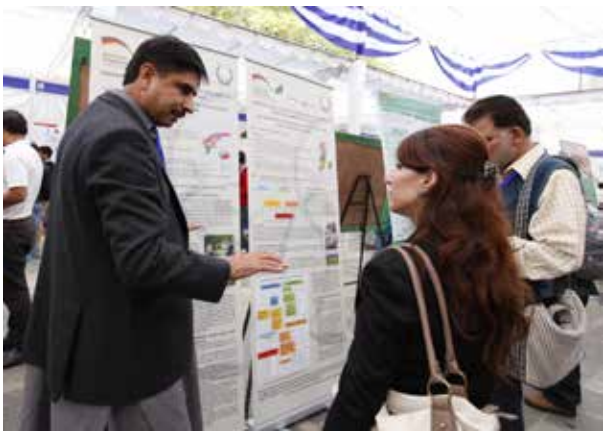
Concept and implementation – what has been done and how?

The BKP Project considered awareness creation as a fundamental tool for the achievement of the project objectives. Thus it developed a comprehensive

awareness and communication strategy focusing on government staff, general public, farmers, religious leaders, teachers and students, all of whom would be encouraged to take action and play their part in the conservation and sustainable management of biodiversity. The BKP Project organized various awareness-raising activities right from the start, using different approaches to reach a different target audience and achieve its goals.

Awareness-raising at government level

The project supported the participation of government staff (from district and provincial level) in national and international workshops for capacity-building and enhancing knowledge of biodiversity and related issues. Around 300 officials, including women, were trained and oriented on the concept of biodiversity. The project also supported the government partner departments in developing information and awareness-raising materials for farmers, teachers and students – on biodiversity, agrobiodiversity, agricultural best practices, and the flora and fauna of the province and its importance to their livelihoods. These informational materials were widely distributed at the village, district and provincial levels. To disseminate information materials on biodiversity, the project created an e-mail distribution list of government partners, academia, students, NGOs, biodiversity experts, parliamentarians, journalists, and key opinion-leaders. This list was frequently used for sharing project communication materials and biodiversity information.



Government officer from Chitral explaining BKP's vulnerability assessment at a conference in Nepal.

Awareness-raising among the general public

To reach the general public, the project produced the quarterly newsletter THE BKP NEWS, as well as biodiversity calendars, posters (e.g. on biodiversity in general, on technical issues such as compost-making, and on the Aichi Biodiversity Targets), informational booklets, flyers and other publications. The project engaged the popular FM radio stations to cover project activities, biodiversity and agrobiodiversity issues through their live transmissions and programmes in the local languages. Local and national newspapers and websites reported on the project's different awareness activities. The project also produced informational video documentaries on value chain products and their marketing. Furthermore, other communication and awareness materials, such as environmental comic books ("garbage monsters"), sketchbooks, and environmental-friendly cotton shopping bags were distributed among stakeholders and communities.

Awareness-raising for students

Students and children are change agents for biodiversity, and can play a vital role to conserve biodiversity for future generations. For awareness-raising on conservation of wildlife, the KP Wildlife Department has established a network of 200 School Nature Clubs in the province, involving students from schools, colleges and universities in conservation measures.

On the International Day for Biological Diversity (IDB) 2015, the project supported the Wildlife Department in conducting extensive awareness-raising events for students in Shamozai Valley, Swat (see the report on the CBD website: www.cbd.int/idb/2015/celebrations/pk). Two puppet-shows and an environmental game were organized for male and female students of two secondary schools in Swat to increase their level of understanding of biodiversity and to enable them to further convey the message to others. The audience of around 1,150 students, government officials, local elders and community members were enthralled with the performances and other activities. Topics relating to biodiversity and its importance, climate change, water use, and environmental pollution were addressed in an interactive and entertaining way. It was the first awareness-raising activity of this kind

in the area and left a positive message in the students' mind.

A "biodiversity drawing competition" was part of the IDB programme. It provided students the opportunity to express their ideas and thoughts on biodiversity and, in turn, revealed the students' thoughts on biodiversity and how they discern different components in an ecosystem. The students' drawings portrayed biodiversity and threats to the environment and to the ecosystem. The project compiled the artwork of the students in a book Biodiversity Through The Eyes Of Our Children and distributed it widely in the schools for further awareness among the students.

On the eve of the celebration of World Wildlife Week, the project supported an exposure visit of students to the Malakand Wildlife Safari Park in Swat District, organized by the Swat Wildlife Division. The objective of the visit was to raise awareness among the students on biodiversity and wildlife and to familiarize them with local biodiversity hotspots. The students were briefed in detail about protection, conservation and management of wildlife and natural resources; and their role in balancing the ecosystem.

Awareness-raising among farmers

Farmers have a significant role to play in the preservation and conservation of biodiversity, agrobiodiversity and ecosystems. The project involved farming communities right from the beginning. Several courses, workshops, exposure visits and agri-exhibitions aimed to equip them with modern knowledge. Education and awareness creation campaigns were conducted in all project villages in Swat and Chitral on the topic of biodiversity conservation, with the intention of sensitizing them on the causes and effects of climate change, and adaptation and mitigation measures.

Farmer Field School (FFS) formation

A Farmer Field School (FFS) is a capacity-building method based on adult education principles; it provides opportunities to farmers for learning by doing. In an FFS, farmers learn to improve their agricultural and management skills through participatory observations and experimentation in their own field.

Farmer exposure visit to olive orchard.

The project established five FFSs (three for men, two for women) in four villages in Chitral, implemented by the NGO CABI, and one Livestock Farmer Field School (LFFS) for women in Swat, implemented by the Livestock Department (see Best Practice 2), to equip the local farmers with good agricultural techniques and practices, and promote biodiversity-sensitive natural resource management. Among the topics covered were biodiversity-friendly, soil conserving and integrated farming methods; agro-forestry practices for adaptation to climate change; conservation and management of biodiversity and agrobiodiversity; as well as soil stabilization.

The project produced and distributed an extensive and comprehensive awareness-raising manual in Urdu language for FFS members and other farming communities, which aims to provide guidance in agricultural practices (GIZ BKP and CABI, 2015). The manual covered important topics like agrobiodiversity, agro-forestry, value chain development, honey bee keeping, livestock management and vaccination, orchard management and fruit marketing, kitchen gardening, and effective use of fertilizers. The manual provides useful inputs to farmers about how to increase yields from their livestock and agricultural fields without harming the environment.

Exposure visits

The project facilitated several exposure visits for farmers as opportunities for learning about modern agricultural techniques, rare variety demonstrations, and good farming practices. For example, the project brought olive farmers from Shamozai Valley to the area of Talash on a one-day exposure visit to introduce them to modern techniques and tools of olive farming. The visit was also attended by key staff from Agriculture

Extension, the NTFP Directorate, and the Oil Seed Section of the Agriculture Research Institute. The participants visited a hillside olive plantation and an olive products store. The visitors took keen interest and witnessed different products being extracted from the olives as well as olive farming tools and techniques (see also Best Practice 1).

Agri-exhibitions

Agricultural exhibitions *(Kisan Mela)* also serve an awareness-raising function, for farmers as well as for consumers. Supported by the BKP Project, the Agriculture Extension Department organized a *Kisan Mela* at Swat District in 2015 to initiate healthy competition among the farmers. Farmers from different districts and government departments displayed their best-quality agriculture products. Their achievements were widely publicized through print and electronic media for further awareness and encouragement. Local and national media covered the three-day exhibition and highlighted the best varieties of Malakand Region and KP Province. They also reported on the visit of a member of the Provincial Assembly of KP, along with other government officials, to different stalls at the *Kisan Mela.*

Awareness-raising for religious leaders and teachers

Religious leaders *(Ulema)* and teachers are a source of inspiration for their audience, having strong presence in the communities in the Pakistani Muslim society. Using the experiences of the KP Wildlife Department's program for religious leaders, the *Ulema* were sensitized on the values of biodiversity and conservation of natural resources, and now use Friday Sermons and classroom lectures as opportunities to address environmental protection and biodiversity conservation. The project re-printed the WWF book Conservation and Islam in Urdu and widely distributed it among students, religious leaders and community members at village, district and provincial level.

Photo database

The project has developed a well-sorted photo database which comprises appealing high-quality photos of project activities and of biodiversity. The database allows the project to select in a short time suitable photos for publications and information materials. These photos help to raise awareness on biodiversity at all levels ("A picture is worth a thousand words"). They will be uploaded to the website server of KP Wildlife Department, to be easily available to partner departments, academics and researchers, and so that they can be used for publications.

Results – what has been achieved?

After successful implementation of awareness campaigns at all levels (see above), a post-baseline survey was conducted to quantify the increase in awareness on biodiversity, its conservation and sustainable use for human well-being (see GIZ BKP, 2016).

Agri-exhibition covered by local media.

At government level

As a result of increased awareness on biodiversity, the Government of KP has decided to develop the Khyber Pakhtunkhwa Biodiversity Strategy and Action Plan (KP-BSAP) and to establish at provincial level a Biodiversity Working Group. (see Best Practice 5).

At school level

A survey conducted at the two secondary schools in March 2016, ten months after the celebration of the IDB 2015, showed that the students' level of understanding on biodiversity had tremendously increased. Before the IDB 2015, only one male student (2%) of the 50 students interviewed (25 male, 25 female) had ever heard the term "biodiversity". Ten months after participating in the celebration of the IDB 2015, almost all (90%) students could explain the term to some extent, with the exception of five girls. Most of the students (82%) could also explain the importance of biodiversity for our lives. The majority of the respondents stated that they are committed and motivated to play a part in the conservation of biodiversity.

At village / farmers level

Pre- and post-baseline data from surveys conducted in four project villages in Swat District, covering 10% of all village households (n=83 farmers, 41 male, 42 female), showed that farmers' awareness on biodiversity had considerably increased. More farmers are now aware of the reduction of biodiversity and agrobiodiversity, whilst appreciating the importance of both for their own lives. Farmers' knowledge on integrated pest management has considerably improved. More farmers are aware about possibilities of reducing soil erosion, and more farmers have practical knowledge of soil erosion control as well as on soil conservation.

Several monitoring visits for qualitative data-collection revealed that the different biodiversity-related activities had led to unity and positive change in the behaviour of the local farmers. Closer links and better coordination of the villagers with government departments have been established. Also women improved their practical skills through several courses; the women attending the Livestock Farmer Field School (see Best Practice 2) now manage their animals in a better manner and, as a result, the production of milk has considerably increased.

Recommendations for implementation and up-scaling

For effective awareness and education programs on biodiversity and agrobiodiversity, the following steps and activities are recommended for implementation and up-scaling:

- Publications targeting different groups should consider their local language, culture and social norms.
- Appealing photos, sketches and posters on biodiversity better convey the message. They are easily picked by community members.
- Regular publications such as newsletters, biodiversity related posters, and flyers in local language help to build constant awareness among key stakeholders.
- Media should be engaged from the beginning in awareness creation. However, they need to be supported, e.g. by providing regularly up-dated special information folders which include background of the sector as well as current status, activities, achievements and results of the project.
- Media should be encouraged to conduct talk shows and debates on electronic media and publish special print editions on biodiversity events.
- Courses on media management and awareness-raising exercises for Information and Communications Officers in partner departments and key journalists.
- Special days provide a good opportunity for awareness creation events on biodiversity: International Day for Biological Diversity (May 22), World Environment Day (June 5), World Nature Conservation Day (July 28), Endangered Species Day (May 20), World Water Day (March 22), World Wildlife Day (March 3), World Wetlands Day (February 2), and International Day of Forests (March 21).
- Social media: project activities and achievements should be highlighted by using social media (e.g. creating a Facebook group, uploading project

films on YouTube, and using Instagram apps for disseminating good photos with key messages on large scale).

- Political leaders as well as celebrities (such as film stars, singers, poets and cricket players) should be involved in awareness campaigns to give biodiversity issues more weight.
- Study tours support exchange of knowledge and exposure to new ideas and best practices, and should be held on a regular basis for government officials, farmers, teachers, students and other community members.
- Agri-exhibitions should be regularly organized at village, districts and provincial levels as they attract the public and are a great means of awareness creation.
- Biodiversity topics should be included in the curriculum of schools, academia and related institutions.
- In future, mobile vans with local artists and cultural music should visit the villages and create awareness among the general public with special biodiversity-related performances. At these events, information and awareness materials on biodiversity could be distributed.
- The Agriculture Department should consider conducting seed fairs: these have proven very successful for awareness-raising on agrobiodiversity in other countries.
- The agricultural extension newsletter *Zarat Nama* should be used also by other departments for widespread publicity and awareness-raising regarding biodiversity.

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Awareness-raising for biodiversity conservation

Recommended implementation steps

- Conduct surveys and analyse the level of awareness and understanding on biodiversity at the different levels
- Identify the key target audience, and the messages and channels for awareness-raising
- Develop concrete steps to reach different target groups such as farmers, government officials, religious leaders, students and the general public
- Organize awareness-raising activities on global environmental days, e.g. International Day for Biological Diversity on May 22
- Involve the Education Department in organizing drawing and speech competitions on biodiversity for students
- Organize exposure visits and experience sharing for farmers and students to learn about sustainable farming practices and the benefits of biodiversity conservation
- Encourage participation of religious leaders, teachers and locally elected representatives in the awareness-raising activities on biodiversity
- Use all available media, formats, and channels to reach the general public
- Use local language and simple words in campaigns and publications for effective awareness-raising at community level
- Conduct agri-exhibitions as well as livestock and seed fairs at district, provincial and national level

5. Mainstreaming biodiversity

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Biodiversity is strongly linked to human wellbeing. Its unabated loss has to be reversed in Khyber Pakhtunkhwa. The BKP Project played a crucial role in incorporating biodiversity considerations into policies and practices of key stakeholders, and in mainstreaming biodiversity at sub-national level.

Background

Sustainable use of biodiversity can only be ensured by bringing its abuse to an end. In other words, diverse species and ecosystems must survive in order to keep on providing the much-needed ecosystem services for dependent communities. The ways in which biodiversity is managed and governed has crucial implications for the possibility of eradicating hunger and poverty (CBD, 2011a).

Mainstreaming biodiversity is about incorporating biodiversity considerations into the policies, strategies and practices of the public and private actors that rely on (and impact) biodiversity, so that it is conserved and sustainably used (Huntley and Redford, 2014). Getting biodiversity concerns into the policies and plans of government ministries and private sector companies is a goal that can take many years to achieve. Huge amounts of energy and determination are needed to bring the right people together (IIED, 2015).

Mainstreaming biodiversity means the incorporation of conservation and biodiversity-protection into other cross-sectoral plans (such as poverty reduction or climate change adaptation) as well as sector-specific plans (such as agriculture, fisheries, education, mining, energy, tourism, transport; see CBD, 2014). Mainstreaming is not about creating parallel and artificial processes and systems, but about integrating biodiversity into existing and/or new sectoral and cross-sectoral structures, processes and systems (CBD, 2011a).

Workshop on agrobiodiversity and the role of seeds.

In the province of KP, habitat fragmentation, land use conversion, introduction of invasive species, high population pressures, unsustainable agricultural practices and climate change pose serious threats to unabated loss of biodiversity. The situation is largely attributable to a lack of integrated policy framework; weak or missing institutional coordination; and low awareness at various levels, ranging from village communities to political decision-makers. When the project began, there was no inclusive policy at the provincial level that considered the various sectors and components of biodiversity. The existing policies were sector-based and did not have the essential link with each other to take into account the ecosystem landscape in totality (see GIZ BKP, 2013; Iqbal et al., 2014).

For example, agriculture and livestock policies were mainly driven by production increases with little or no attention given to (agro-) biodiversity conservation;

and forest policies focussed on timber harvest and revenue generation. This compartmentalised approach to natural resource management exacerbated the biodiversity situation, which posed serious threats to the food security of the dependent communities. Government departments with responsibility for biodiversity conservation did not regularly meet to coordinate their activities and plans; also, non-governmental organizations in the civil society did not coordinate their projects.

Government, civil society, and the private sector are the three pillars of services delivery in biodiversity conservation – but in KP they have worked in isolation and often at odds with each other (see GIZ BKP, 2013). Awareness of biodiversity was negligible, if existent at all, in spite of the fact that some civil society organizations claimed to have contributed to awareness-raising in some pockets of KP Province. The Pakistani media, both print and electronic, seldom covered biodiversity issues. Children and youth, when properly educated on biodiversity issues, can play an instrumental role; but biodiversity had not been given due consideration in the school and college level curricula.

Concept and implementation – what has been done and how?

To mainstream biodiversity, the BKP Project concentrated its efforts on policy support; establishment of steering structures; institutional alignment; capacity building and awareness-raising. The project approached the situation in an inclusive way to mainstream biodiversity in the relevant sectors at the policy, institutional and operational levels. Stakeholders at national, provincial and district levels were involved in the planning workshop that paved the way for ownership among the relevant entities. The project conducted an in-depth analysis of the current status of biodiversity policies and legal frameworks; and the institutional set-ups and capacities, both at the individual as well as institutional levels (see GIZ BKP, 2013). The following measures were undertaken stepwise by the project for mainstreaming biodiversity.

Establishment of a steering structure for biodiversity

The Planning and Development Department (P&DD) is the main body for coordinating the activities of the line departments of KP government. It allocates funds to their projects and programs under Annual Development Plans (ADP). P&DD's Agriculture and Environment Section coordinates the biodiversity-related activities of the Agriculture, Livestock and Cooperation Department and the Forest, Environment and Wildlife Department (with their respective structures).

In consultation with these government institutions, the project established a steering structure which could ensure coordination among relevant stakeholders at the province level while, at the same time, establishing two-way communication with the operational units at the district levels. The departments and directorates at the provincial level were embedded into the steering structure with a formation called Technical Expert Team (TET) under the chairmanship of the Chief of P&DD's Agriculture and Environment Section. The TET was guided by the BKP Provincial Steering Committee, which was headed by the Additional Chief Secretary of KP Government and met twice a year. District level operational units were integrated into the structure under a formation called District Expert Team (DET), which would report directly to their respective department heads sitting in the TET.

In December 2015, the TET was officially integrated into the newly established Biodiversity Working Group (BWG). The BWG is a strategic advisory committee on biodiversity matters to the government of KP. It includes members from civil society, private sector, and academia, and is convened by the Chief of P&DD's Agriculture and Environment Section. It meets at least twice a year. The BKP Provincial Steering Committee is planned to transform into a Biodiversity Steering Committee, liaising with the parliamentary standing committee on biodiversity issues; and the DET members plan to continuously use the DET for biodiversity coordination at district level, as well as with the Biodiversity Focal Points at provincial level. Thus, a robust, vibrant and integrated institutional set-up is established at provincial level under the P&DD, which will continue to exist after the end of the project. The set-up liaises with the Federal Ministry of Climate Change and the

National Biodiversity Working Group to mainstream biodiversity across the important stakeholders within the province; it also links provincial efforts and priorities with national endeavours (see Figure 3 below).

Development of Khyber Pakhtunkhwa Biodiversity Strategy and Action Plan (KP-BSAP)

Institutions cannot concentrate their efforts for biodiversity conservation and sustainable management until and unless they have developed a strategic framework and designed a comprehensive plan of action. Pakistan had developed a Biodiversity Action Plan in 2000 which was updated in 2015 as the National Biodiversity Strategy and Action Plan (NBSAP). The NBSAP provides broad guidelines to the provinces on conservation and sustainable management of their biodiversity. However, the provinces cannot effectively use it, as it does not address the specific local needs. Therefore, the BKP Project promoted and facilitated the development of a province-level biodiversity strategy and action plan, the Khyber Pakhtunkhwa Biodiversity Strategy and Action Plan (KP-BSAP).

Six consultative workshops were held for the preparation of the KP-BSAP.

The Steering Committee of the BKP Project decided that the BWG should guide the process of developing the KP-BSAP according to the CBD guidelines for sub-national biodiversity planning (see CBD, 2011b). The KP-BSAP development process was highly participatory, involving consultations with field level experts of the line departments and community representatives, as well as policy makers.

For primary consultations the whole province was divided into six regions based on their ecological characteristics to consider the different geo-specific biodiversity issues, statuses and conservation needs. A biodiversity assessment of the whole province was developed, showing the status and trends of biodiversity of the six regions, based on the available information from secondary sources and technical experts. Based on the regional consultation report and the biodiversity assessments, the draft KP-BSAP was developed. After detailed review in the BWG meetings and by the relevant stakeholders, the KP-BSAP is in the process of being approved by the Biodiversity Steering Committee for implementation.

The development of the KP-BSAP was appreciated as the only process where all relevant stakeholders were involved and their views were mainstreamed into biodiversity conservation. The KP-BSAP is closely linked to Pakistan's NBSAP, with its targets aligned to the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets.

Mainstreaming biodiversity into the agricultural sector

Biodiversity and agrobiodiversity, and genetic resources and the ways farmers manage these resources, are essential to food security. The recent drive of improved varieties and F1 hybrids in the KP province, and excessive use of agro-chemicals, are major threats to biodiversity. Therefore, the actors associated with agriculture – whether they are farmers or technical experts from the government – need to pay appropriate attention to the conservation and sustainable use of biodiversity and agrobiodiversity, and come up with supporting policies. The recently developed KP-BSAP explicitly mentions the need for conservation and sustainable use of agrobiodiversity.

When the BKP Project started, biodiversity was considered a forest and wildlife-related issue with no or very little role of the Agriculture Department, and most of the staff of the Agriculture Department never had heard the term "agrobiodiversity". Through orientation activities with district and provincial cadres of the Agriculture Department, the BKP Project highlighted the role of agrobiodiversity in overall biodiversity conservation. A workshop on agrobiodiversity and the roles of seeds provided a platform for exchange, highly appreciated by the participating agricultural professionals (see GIZ BKP, 2015a). Practical proposals were elaborated as to how improvements in the seed sector (variety development and seed production) can contribute to better agrobiodiversity management.

Mainstreaming biodiversity by training and sensitisation

Capacity-building of communities and staff of relevant departments on the concepts and values of biodiversity remained a focussed area of the project (see Best Practice 1). The staff of the line departments (district as well as provincial cadres) were sent on international courses and workshops to get exposure to international efforts on biodiversity conservation and reflect back on their local situation (e.g., training course on basics of biodiversity conservation for human wellbeing, Bangkok). Various adaptation measures, such as olive plantation, soybeans promotion, composting/green manuring courses and effective technologies, were imparted to community groups in the districts of Swat and Chitral (see Best Practice 1 and 2). The walnut value chain workshops attended by key stakeholders such as agricultural experts, growers and walnut traders provided an ideal stage for fruitful discussion and effective strategy formulation, expected to prove vital in the not-very-far future (see Best Practice 3). Numerous activities have been conducted on awareness-raising for biodiversity conservation (see Best Practice 4). All these measures contributed to further mainstreaming.

Results – what has been achieved?

The biodiversity steering structure was established under the P&DD in KP, keeping in view the roles and responsibilities of different stakeholders from government, academia and civil society. Since biodiversity is a cross-sector theme, the P&DD has greater leverage compared to other departments to coordinate and mainstream biodiversity at policy as well as at operational levels. P&DD took a proactive role in the project by chairing the project's provincial steering committee and appointing the Chief of P&DD's Agriculture and Environment Section to lead the TET and the BWG.

The approach provided an effective coordination structure for the stakeholders to collaboratively work for biodiversity mainstreaming, and to implement the BKP Project in an integrated way. Biodiversity-related matters are coordinated between the Federal Ministry of Climate Change and the P&DD. The Pakistani judiciary (Punjab High Court) also reinforced the steering structure installed for biodiversity-related issues when it decided, in 2015, that in each province P&DD should establish a Climate Change Cell to

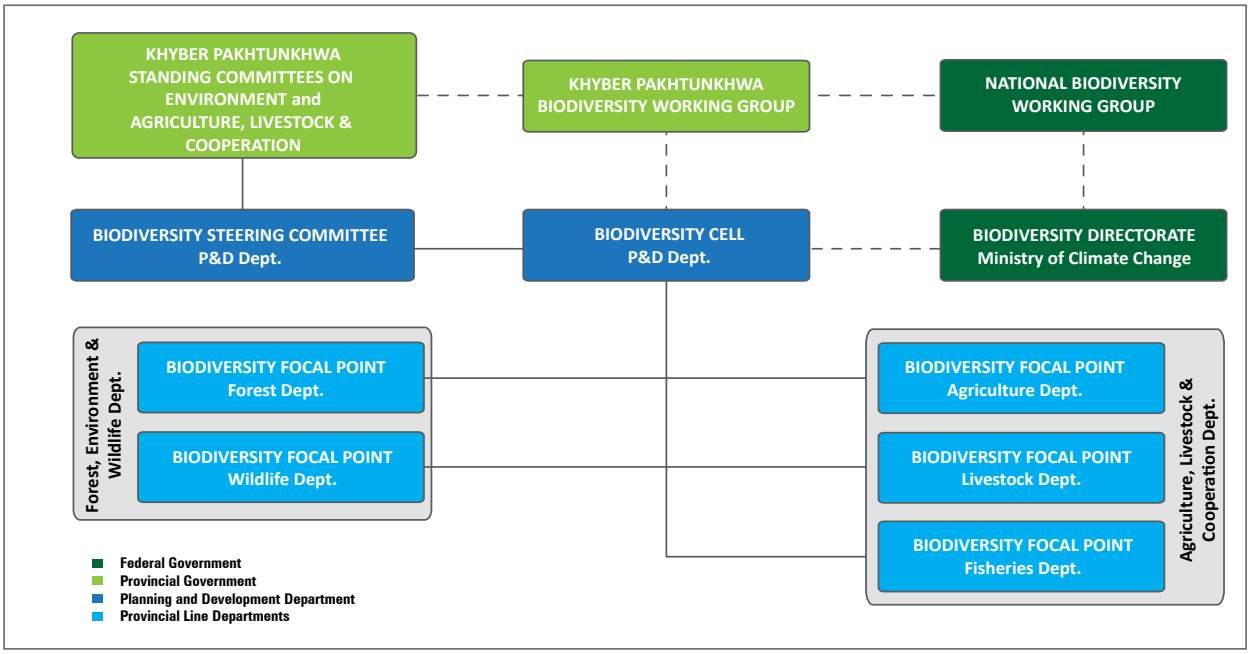

Figure 3: KP-BSAP coordination mechanism as agreed by KP government. Source: GIZ BKP (2016: 107).

curtail the disastrous impacts of climatic change. The BWG, a notified body by P&DD with advisory functions on biodiversity issues, will provide an effective forum for mainstreaming biodiversity in general, at public, civil society, and private sector organizations. The BWG successfully guided the development of the KP-BSAP, through periodic reviews of the different draft versions and providing valuable inputs. The KP-BSAP coordination mechanism (see Figure 3) as agreed by KP government in early 2016 is the continuation of the BKP steering structure.

KP is the only province in Pakistan which has a detailed Biodiversity Strategy and Action Plan available for implementation. The KP-BSAP, which is based on ecological and geographical realities of the province, facilitates the stakeholders to work in an integrated manner under the NBSAP, and enables Pakistan to fulfill its commitments towards the Multilateral Environmental Agreements (MEAs) – particularly the CBD. At the same time, it ensures the livelihoods of the majority of its population against climate change and biodiversity degradation. It is too early for the KP-BSAP to provide results; nevertheless, the process of its development has improved capacity and awareness.

Student receives "Champion of Change" award.

The project's awareness-raising and capacity-building on biodiversity issues led to better planning and execution of adaptation measures. It proved very instrumental in helping the staff of the partner departments to wear "biodiversity lenses" during designing and implementing development activities and supported mainstreaming biodiversity. It resulted in biodiversity no longer being considered as an issue which is purely related to the Environment Department with no or little role of the Agriculture Department. The BKP Project succeeded to a great extent in diverting the attention of key KP stakeholders to the important role of biodiversity in daily life.

Recommendations for implementation and up-scaling

- A thorough analysis of the main stakeholders, e.g. by stakeholder mapping, is necessary to know their relationships and knowledge levels. This will help involving the right stakeholders at the right time in project activities.
- Assessing capacities and knowledge-levels of the stakeholders on biodiversity conservation and its sustainable use is very helpful in building capacities accordingly. Capacity-building and awareness-raising activities should be organized according to the specific needs of the stakeholders to bring them compatible to play their specific roles in a particular frame. The Wildlife Department of KP, University of Peshawar, University of Swat, University of Agriculture Peshawar and Pakistan Forest Institute are suitable organisations for awareness-raising and capacity-building on biodiversity.
- Frequent transfers of top cadres of government staff often disrupt the smooth implementation of project activities; therefore, the tier below the top leadership should also be actively involved in project activities for smooth functioning of the project, as well as for keeping new arrivals informed.
- Since biodiversity conservation is a cross-sector issue, stakeholders who are working in different but related sectors have to work together to achieve common goals. However, setting common goals by the stakeholders which have their own priorities can be difficult and time-consuming. A great amount of leverage is required to coordinate and align them. This role can be best played by a central coordination and decision-making body; in the project case it has been the P&DD of KP.

- The greater the structural distribution of the steering bodies, the greater the time it takes to pass on information from one level to another. Strong follow-up is always needed, e.g. by the Biodiversity Focal Points, to make sure that the information reaches the intended recipient for making decisions.
- In order to make the coordination and decision-making process speedy and effective, awareness-raising and capacity-building activities should be simultaneously targeted by the project at all levels along the government hierarchy, political decision makers and community for mainstreaming biodiversity. These levels can be approached with different communication strategies whilst sharing common goals.
- Awareness campaigns should be a top priority, as they provide the first building blocks for mainstreaming biodiversity.

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Mainstreaming biodiversity

Recommended implementation steps

- Assess the capacity of individuals and institutions regarding conservation and sustainable management of biodiversity
- Raise awareness on biodiversity management along the mainstreaming process among the important stakeholders
- Build capacity of the key stakeholders on biodiversity
- Develop a steering structure including representatives from policy, advisory and operational levels and a focal person from the advisory level to coordinate with higher levels
- Develop a road map for mainstreaming biodiversity in strategies and plans of the stakeholders in a participatory way
- Facilitate approval of mainstreaming measures from policy level

Outlook

Pakistan, like many other countries in the world, is losing its rich biodiversity and is under growing anthropogenic pressures: a trend which persists in spite of the country's relatively long history of biodiversity conservationism. In the past, the main focus was on protected areas such as game reserves, wildlife sanctuaries and national parks, which spread over 11% of the area of the country. Accordingly, it was expected that the Forest, Environment and Wildlife Department would take care of biodiversity.

The experiences and best practices derived from the BKP Project have shown an array of success factors for the conservation and sustainable management of biodiversity: the multi-level approach (from grassroots to policy level, influencing each other); a mix of different methods (from field demonstrations in FFS via puppet-shows for awareness raising to the process of developing the KP-BSAP); the participatory approach (leading to transfer of responsibility for local action); support of need-based and demand-driven activities (reducing the vulnerabilities of the different locations); as well as a new integrated approach in place of sector-specific work. Everybody has to play his or her role in biodiversity conservation, be it through avoiding the use of plastic bags, or through informing the public on biodiversity issues in a motivating, appealing way, e.g. during the "environmental days" that provide a good opportunity for organizing biodiversity events.

Women especially have to be motivated and capacitated for the conservation and sustainable use of biodiversity – whilst men have to be sensitized to listen more carefully to the voices of women. It has proven useful to make people aware of the need for conservation and sustainable management of biodiversity at an early age – biodiversity issues should be included in curricula of schools and high schools. Mention of biodiversity in Friday prayers should be further promoted as the Holy Qur'an contains many references to biodiversity conservation. Finally, the need for demonstrated economic returns is the key factor determining the motivation of smallholders to support the conservation and sustainable management of biological diversity.

The BKP Project has provided a forum for learning. It has encouraged the spread of ideas from the specifically protected areas; into the consciousness of government actors; and to the wider farming community (both male and female) and the public. This will hopefully lead to reduced biodiversity loss, restoration of ecosystems, and promotion of sustainable use of natural resources, for the wellbeing of present and future generations.

The five best practices presented summarise the wealth of lessons learned from the experiences of this Pakistani-German project, further enriched by other successful approaches. They provide recommendations for future actions to be taken by decision-makers, development agencies and practitioners, farmers and other stakeholders globally. Those government institutions involved in this project now possess the skills and experience they need to assume responsibility for the management of KP's biodiversity on their own. Policy making, financing and actions taken should be tailored to local conditions, thereby reflecting the challenges described throughout this publication. The KP-BSAP has paved the way for combining forces for biodiversity conservation. Upscaling this project's outcomes and best practices will support Pakistan in its commitment towards the CBD, by contributing to the implementation of the Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Targets.

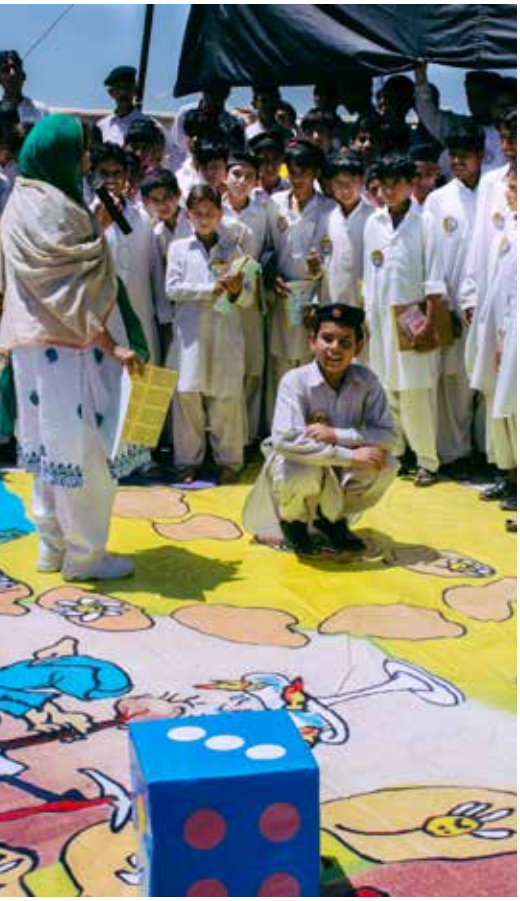
Successful and sustained efforts within Pakistan and abroad will contribute substantially to the conservation and sustainable management of biodiversity in Pakistan and worldwide, which is the key for safeguarding food security and adaptation to climate change. Besides, as one participant of the validation workshop for the present Best Practices report has concluded: "Protect biodiversity and it will protect the beauty of your world for you!"















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