Food and Agriculture Organization of the United Nations

ES:GCP/GLO/805/GFF
Terminal Report

FAO/GOVERNMENT COOPERATIVE PROGRAMME

MAINSTREAMING BIODIVERSITY CONSERVATION AND SUSTAINABLE USE FOR IMPROVED HUMAN NUTRITION AND WELL-BEING

GLOBAL

PROJECT FINDINGS AND RECOMMENDATIONS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ROME, 2020

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Report prepared for
the participating governments
by
the Food and Agriculture Organization of the United Nations

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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The Food and Agriculture Organization is greatly indebted to all those who assisted in the implementation of the project by providing information, advice and facilities.

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LIST OF ABBREVIATIONS

ALV	-	African Leafy Vegetable
ATK	-	Associated Traditional Knowledge
BFN	-	Biodiversity for Food and Nutrition
CBD	-	Convention on Biological Diversity
CGRFA	-	Commission on Genetic Resources for Food and Agriculture
COP	-	Conference of the Parties
FBS	-	Farmer Business School
GEF	-	Global Environment Facility
GPC	-	Global Project Coordinator
GPMU	-	Global Project Management Unit
ISC	-	International Steering Committee
NBSAP	-	National Biodiversity Strategy and Action Plan
NGO	-	Non-governmental Organization
NSC	-	National Steering Committee
PIR	-	Project Implementation Review
SBSTTA	-	Subsidiary Body on Scientific, Technical, and Technological Advice
SDG	-	Sustainable Development Goals
SINGI	-	Sustainable Income and Generating Investment Group
TCP	-	Technical Cooperation Programme
UNEP	-	United Nations Environment Programme

A. OVERVIEW

A.1 PROJECT PROFILE

Country	Brazil, Kenya, Sri Lanka and Turkey
Project Symbol	GCP/GLO/805/GFF
Project Title	Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Human Nutrition and Well-being
Actual EOD	18 March 2013
Actual NTE	30 June 2019
Participating Organizations (e.g. Ministry of Agriculture, etc.)	Ministry of the Environment (Brazil), Ministry of Mahaweli Development and Environment (Sri Lanka), General Directorate of Agricultural Research and Policies (Turkey), Kenya Agricultural and Livestock Research Organization (Kenya)

Implementing partners (list):

Name	Type (NGO/Community Based Organization/Gov.)	Total Funds Transferred
Bioversity International	Intergovernmental organization	USD 2 639 077

Contribution to FAO's Strategic Framework ***Indicate the title of each higher level result to which the project contributes***	
Sustainable Development Goals (SDGs)	SDG 2, 3, 4, 5, 8, 12, 13, 15 and 17
Organizational Outcome(s)	SP2, Organizational Outcomes 203 and 204
Regional Priority Area/Initiative	N/A
Country Programming Framework Outcome(s)	N/A
UNDAF Outcome(s)	At the outset of the project, linkages were identified with Brazil UNDAF (2007-2011), Outcome area 1.2; Kenya UNDAF (2009-2013) – Priority Area 3; Sri Lanka UNDAF (2008-2012) – Outputs 1.3 (Food Security), 1.5 (Sustainable Natural Resources Management), 2.2 (Health and Nutrition) and 4.5; and Turkey UNDAF (2011-2015) – Result 3: Strengthened policy formulation and implementation capacity for the protection of the environment and cultural heritage. However, there is no evidence that effective sharing of information and coordination between project countries and relevant country UNDAF programmes occurred.

A.2 FINANCIAL DATA in USD[1]

(as at January 2020)

Budget	USD 2 639 077

A.3 EXECUTIVE SUMMARY

The approach developed to implement the project "Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Human Nutrition and Well-being" (hereafter the Biodiversity for Food and Nutrition (BFN) project) is a timely and important legacy product, consistent with global, regional and national priorities with respect to biodiversity and health and nutrition concerns. These priorities include the Convention on Biological Diversity (CBD) Post-2020 Framework, which is currently being discussed in the international arena, the FAO Strategy on Biodiversity Mainstreaming across Agricultural Sectors, the Voluntary Guidelines on Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition, as well as the forthcoming Voluntary Guidelines on Food Systems and Nutrition, which are to be endorsed by the Committee on World Food Security in 2020. The BFN project demonstrated the often superior nutritional value and additional benefits of underutilized food biodiversity by using innovative research partnerships and approaches to increase the knowledge, appreciation, awareness and utilization of this diversity, encompassing both cultivated and wild edible species.

The project's partner countries – Brazil, Kenya, Sri Lanka and Turkey – prioritized a rich diversity of neglected and underutilized species and varieties for healthier diets and improved nutrition, and used this knowledge to mainstream these species and their diversity into production and consumption systems, including linking biodiversity to school meals and public food procurement, into food-based dietary guidelines and into markets using sustainable gastronomy and tourism. It has also bolstered global information on the nutritional value of forgotten crops currently maintained in the FAO/INFOODS database. The information collected by the countries of 195 native species is probably the single largest contribution to the FAO database.

Recent global reports and scientific literature on food system transitions call for holistic and alternative models that focus on sustainable production and rural development, while empowering consumers to make better decisions around diets that are healthier for people and for the planet. Although it is understood that solutions to engender this transformation will

[1] Data source: FPMIS/ Data Warehouse

need to be tailored to different contexts, reports converge towards a single set of shared goals and key recommendations. Many of these have been addressed by the comprehensive approach used by the BFN to better mainstream biodiversity for food and nutrition into practices and programmes. The BFN has made a number of highly significant contributions to global policy, including the Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action (which was tabled at the 15th Session of the Commission on Genetic Resources for Food and Agriculture (CGRFA 15) and inputs to the document UNEP/CBD/SBSTTA/19/INF/1, "Strategic Scientific and Technical Issues Related to the Implementation of the Strategic Plan for Biodiversity 2011-2020: Biodiversity, Food Systems and Agriculture".

Through the focus on mainstreaming biodiversity in the different sectors, the project is also supporting the Sustainable Development Goals (SDGs), in particular Goals 2, 3, 12 and 15. At the national level, the project's mainstreaming efforts resulted in the endorsement of national policy instruments (in Brazil and Kenya) that promote the conservation and sustainable use of food biodiversity. A food system transformed in this way contributes to environmental conservation, while providing income generation benefits, especially for the youth, as a result of diversification options. It also contributes to the empowerment of vulnerable groups, including women and indigenous people, and local communities, reviving traditional knowledge and cultural heritage, supporting rural development and strengthening local economies.

B. RELEVANCE

The problem

As hotspots for biodiversity, Brazil, Kenya, Sri Lanka and Turkey are home to a vast array of agricultural biodiversity, which is scarcely explored, appreciated or conserved. At the same time, these countries are burdened with serious malnutrition problems that this biodiversity could sustainably address. The nutritional potential of many plants and animals remains untapped, yet many of these species are rapidly disappearing due to environmental pressures or lack of use. The project sought to address the issue of diminishing local agrobiodiversity by contributing to the improvement of global knowledge of biodiversity for food and nutrition and, in so doing, enhancing the well-being, livelihoods and food security of target beneficiaries in the four countries through the conservation and sustainable use of this biodiversity and the identification of best practices for up-scaling.

The response

The project's objective, which remained unchanged during the project, was to strengthen the conservation and sustainable management of agricultural biodiversity through mainstreaming into national and global nutrition, food and livelihood security strategies and programmes. The strategy identified to meet this objective involved the use of a three-pronged approach. Its aims were (i) to increase evidence of the nutritional value and biocultural importance of locally important but marginalized nutritious biodiversity, (ii) to better link research to policy to ensure that biodiverse foods are considered in national food and nutrition security strategies and actions and (iii) to improve consumer awareness of the desirability of these alternative foods so that they may more easily be incorporated in diets, food systems and markets.

The intended beneficiaries of this project were individuals (particularly smallholder farmers), households and communities in pilot sites, especially women and children. The scaling-up and promotion efforts, as well as awareness campaigns to increase the consumption of such foods at national level, also benefited general public health. The project built on pre-existing national efforts in the sector and underwent a stakeholder mapping at project inception to identify suitable country partners for project implementation. In Sri Lanka, for example, the BFN project partnered with another Global Environment Facility (GEF)-supported project, "Mainstreaming agrobiodiversity conservation and use in Sri Lankan agro-ecosystems for livelihoods and adaptation to climate change", which was implemented in the country around the same period and at the same sites. Collaboration between the two projects ensured that baseline data was shared, thereby saving time, resources and duplication of efforts, in addition to providing an enhanced climate-resilience focus to the BFN project. In Brazil, the project took advantage of the horizontal and cross-sectoral governance mechanisms established under the Zero Hunger umbrella and began by strategically targeting relevant public policies and instruments with the potential to mainstream agricultural biodiversity.

Activities implemented by the project contributed to multiple environmental outcomes linked to several SDGs and Aichi Biodiversity targets, as well as social and economic benefits. These include limiting biodiversity loss, mitigating climate change, strengthening seed systems to ensure that biodiversity is conserved, available and accessible (particularly for female and male smallholder farmers), developing markets that ensure that a diversity of foods is available and affordable, reviving traditional knowledge and cultural heritage and supporting rural development and strengthening local economies.

Specifically, the project contributed to different SDGs in the following ways:

- SDG 2: Tackled food insecurity and malnutrition by including a broader range of neglected and underutilized species in diets and cultivation practices.
- SDG 3: Used biodiversity to increase dietary diversity in schools, households and social programmes aimed at improving public health and nutrition.
- SDG 4: Increased research capacity to analyse biodiverse foods, developed farmer training and youth training programmes on biodiversity for nutrition.
- SDG 5: Developed markets and agribusiness for biodiverse foods, enhancing the capacity of female farmers to operate traditional food businesses.
- SDG 8: Supported smallholder farmers in linking to institutional and conventional markets, thereby enhancing rural development and strengthening local economies.
- SDG 12: Strengthened the role of biodiversity in responsible consumption and production systems, ensuring that a diversity of foods is available and affordable.
- SDG 13: Supported the inclusion of climate change-resilient crops in smallholder production systems.
- SDG 15: Biodiversity for food and nutrition conserved and protected in four countries.
- SDG 17: Improved dialogue around biodiversity for food and nutrition and strengthened multistakeholder partnerships in support of conservation.

C. ACHIEVEMENT OF RESULTS

Progress was made in all countries towards meeting the project objectives, in some cases exceeding expectations, with ratings either satisfactory or highly satisfactory for all outcomes.

Outcome 1: Relevant sectors, including agriculture, environment and public health in the four partner countries, adopt and utilize the integrated knowledge base on biodiversity for food and nutrition to build support for biodiversity conservation and enhanced well-being

Brazil, Sri Lanka and Turkey submitted nutrition data on local edible biodiversity to the FAO/INFOODS database. National databases on biodiversity for food and nutrition and associated traditional knowledge were developed in three countries, while Kenya used the information generated to update its national Food Composition Tables in collaboration with FAO.

Outcome 2: Enhanced policy frameworks and markets support the mainstreaming of biodiversity conservation and sustainable use across sectors

The target countries were successful in influencing national strategies in support of BFN conservation, chiefly the revision of their National Biodiversity Strategies and Action Plans (NBSAPs) and other important policy documents, such as Ordinance number 284 in Brazil and the endorsement in early 2018 of the first ever Biodiversity Conservation Policy by Busia County in Kenya, which recognizes the importance of nutrient-rich, underutilized species to combat food and nutrition security. Key messages around mainstreaming biodiversity for food and nutrition were also included in strategic policy and conference papers presented at international meetings including the Conference of the Parties (COP) 14 of the CBD (held in Egypt in November 2018), the 17th Regular Session of the CGRFA (February 2019, Rome, Italy), the High-Impact and Underrepresented Nutrition-Sensitive Food Systems in South Asia (17-18 June 2019, Bangkok, Thailand) and the Subsidiary Body on Scientific, Technical, and Technological Advice (SBSTTA) 23 meeting of the CBD (25-29 November 2019, Montreal, Canada).

Outcome 3: Tools, knowledge and best practices adopted and scaled up in development programmes, value chains and local community initiatives

All countries organized seminars, workshops and food fairs to promote biodiversity for food and nutrition. The documenting of best practices continues at country and global levels, with countries developing training manuals and guidelines for the collection and sustainable use of targeted biodiversity and documenting recipes and information based on traditional knowledge. The project is creating opportunities for institutions and individuals at national level to bring about change. Indeed, change in behaviour and attitude is evident among stakeholders and several initiatives/examples existing within the project are good contenders for replication and scaling-out.

D. IMPLEMENTATION OF WORK PLAN AND BUDGET

Work plan and budget

FAO and the United Nations Environment Programme (UNEP) were the joint GEF agencies assisting Brazil, Kenya, Sri Lanka and Turkey in the implementation of this project. The full description of the project, including the results budget is described in the UNEP Project Document. This FAO report focuses on the components and outputs for which FAO was responsible.

Based on the comparative advantage of each agency and on an equitable share of responsibilities, UNEP and FAO shared the responsibility for overall management and supervision of the project.

FAO was responsible for two outputs under Outcome 1 – Output 1.2, “National portal on local foods, containing databases on nutritional properties of agricultural biodiversity and associated traditional knowledge, developed in each country and linked to relevant national and global nutritional databases” and Output 1.3, “Information generated by the project contributes to global knowledge generation and is reflected in an increase of the Nutritional Indicators for Biodiversity on food composition and consumption”. FAO was also responsible for the entire Outcome 3, “Tools, knowledge and best practices adopted and scaled up in development programmes, value chains and local community initiatives”.

For these components/outputs, FAO provided supervision and technical guidance services throughout project implementation. The FAO Nutrition and Food Systems Division served as the Lead Technical Unit and the Budget Holder for the project.

Bioversity International (Bioversity) served as the executing agency for the overall project, while FAO and UNEP, respectively, concluded agreements with Bioversity to transfer the GEF resources. Bioversity was responsible for the overall coordination and execution of project activities, day-to-day monitoring and financial management. FAO transferred the resources to Bioversity through an Execution Agreement.

The project established an International Steering Committee (ISC) composed of representatives from UNEP and FAO as GEF agencies, Bioversity International as the global executing agency, as well as national executing agency representatives from and for each of the countries. The national executing agencies included the Biodiversity Conservation Department, Biodiversity and Forestry Secretariat, Ministry of Environment, Brazil; Kenya Agricultural and Livestock Research Organization (KALRO) in Nairobi, Kenya; the Ministry of Environment through the Department of Agriculture, Sri Lanka; and the General Directorate of Agricultural Research and Policies, Ministry of Agricultural and Rural Affairs, in Ankara, Turkey.

Bioversity established and oversaw a Global Project Management Unit (GPMU), which was hosted at Bioversity Headquarters in Rome, Italy. The GPMU was responsible for the overall day-to-day management and execution of the project, working closely with national project management units set up within each national executing agency (Brazil, Kenya, Sri Lanka and Turkey). The GPMU prepared contractual arrangements/agreements with national executing agencies for the execution of project activities at national level. The

GPMU consisted of a Global Project Coordinator (GPC), a Global Research Officer and short-term consultants, who were appointed as necessary.

The logical framework and work plan were discussed at every ISC meeting after the start of the project, illustrating the use of the logical framework as a monitoring and evaluation tool. As the project progressed, changes were made to the logical framework and work plan in order to improve implementation. Indicators and targets that were unrealistic were removed or modified, mainly because of the two-year interval between project design and the commencement of activities. Despite these adjustments, however, the project incurred two no-cost extensions, mostly the result of delays in carrying out the nutritional analysis, which themselves were caused by countries electing to carry out their own analysis in-country. Despite this, activities were implemented within the planned budget. Technical guidance and backstopping were provided through country visits by the GPMU and by meetings of the ISC. Bioversity International, UNEP and FAO provided technical project supervision, as outlined above. FAO provided technical guidance for activities in Component 1 using Technical Cooperation Programme (TCP) funds, while UNEP was closely involved and supportive in terms of facilitating partnerships and ensuring commitment from all partners in the design phase, as well as in forging relationships with the governments in each country and supporting mainstreaming efforts. UNEP and the GPC also provided monitoring and evaluation guidance to assist interaction and strengthen relationships with national governments during supervision missions. The participation of FAO and UNEP in all ISC meetings also ensured that any procedure-related questions were promptly addressed. The involvement of the two implementing agencies added value to the project, particularly in the area of policy-making.

The project reached a range of target groups and beneficiaries, including women and children at risk of malnutrition in rural areas, farmers, farmer groups/cooperatives and private and public sector groups involved in value chains, key policy and decision-makers from relevant line ministries and other agencies. Other target groups and beneficiaries include universities, schools, Non-governmental Organizations (NGOs), international agencies in broad areas related to education, awareness and scaling-up. Appendix 3 gives a proxy measure of the breadth of project outreach at national level. Another proxy measure is the increase in scientific literature and attention given to food biodiversity in recent years. Unfortunately, changes to the logical framework and work plan included the elimination of Activities 3.2.6 and 3.3.7, which focused on monitoring and evaluating the capacity-building plan and the national campaign strategy to improve the impact assessment component of the

project and the potential lessons learned. Despite this, the project is considered to have significantly exceeded expectations.

Resource partner contribution

The total project budget of USD 2 639 077 was provided by the GEF to FAO. The total GEF allocation was USD 5 517 618, with UNEP receiving USD 2 878 541.

Due to the project's relevance and success, considerable co-funding was raised and increased budgetary support provided to agrobiodiversity conservation in Brazil and Kenya.

Risk management

Despite being politically driven, project implementation was affected to a limited degree by the commitment and buy-in of country partners and other stakeholders. The unrest in Turkey in 2016 created some concerns, especially in relation to the Mid-Term Review and ISC planned around that period. Both events went ahead without any significant problems. In Kenya, meanwhile, the build-up to the August 2017 elections also required monitoring of the situation, though activities were able to proceed smoothly. In Brazil, although the political environment remains unsettled, the day-to-day activities of BFN country partners was largely unaffected.

The project's strategy for minimizing risk was to work closely with communities and local institutions for the implementation of activities. This ensured that countries took ownership of the project and national capacity was in place to run basic project activities in the context of political instability and other economic and environmental downturns. Ensuring that governments, communities and local institutions understood the importance of project outputs also, to some extent, reduced the risk deriving from political and economic instability. The Project Implementation Review (PIR) 2015-2016 highlighted the worsening of the political and economic situation in Brazil and Turkey, which increased the level of risk for certain activities, including delays in implementation. A similar situation occurred in 2017 with the elections in Kenya and the potential implications for agricultural budget reductions. However, during project implementation, delays caused by political events were not evident, indicating the ownership and buy-in by countries and the strength and enthusiasm of the project teams. In addition, discussions were held with further development agencies, such as the Australian Centre for International Agricultural Research, to minimize these potentially negative effects by securing additional funding.

Other potential risks identified prior to implementation included inadequate collaboration between the environment, health and agriculture sectors, which the project

mitigated by seeking early inclusive engagement with health partners, and the impact of climate change. For the latter, the project aimed to target its conservation efforts at wild and local diversity, which is well adapted, as well as putting forward community-based conservation actions for the identification of particular species adapted to cope with extreme climatic events.

E. SUSTAINABILITY

a. Capacity development

The outreach and capacity-building achieved through the project was remarkable. By partnering with national universities to document and analyse the target biodiversity, countries extended partnerships with implications for sustainability, extended project outreach and strengthened country ownership. Similarly, the development of the Farmer Business School (FBS) model in Kenya has implications for the sustainability of the approach beyond the end of the project. This was achieved by (i) building capacity in sustainable production of nutrient-rich crops, (ii) strengthening smallholder farmers' capacity to respond to market demands for these crops and (iii) nutritional education in schools and communities to increase awareness and use of local nutritional biodiversity to improve dietary diversity.

In Sri Lanka, the success of the Hela Bojun food outlets, both nationally and internationally, as well as the project's engagement with this initiative, will sustain project results and aid progress towards impacts. Sri Lanka is also engaging with a national homegardens and a school feeding programme, which will add to the sustainability of project results and impact. The e-learning course[2] on mainstreaming biodiversity conservation into nutrition practices developed by Brazil with support from the project is an excellent tool for promoting the mobilization of the BFN, and its use and value will last beyond the project's time frame.

b. Gender equality

The project document states that project interventions will pay particular attention to gender and youth mainstreaming, with one of the project objective indicators stipulating that "by the end of the project, relevant Ministries, NGOs and private sector routinely promote gender-sensitive good practices to deploy nutritionally rich biodiversity". Indeed, the project focused (and continues to focus) mostly on women.

[2] http://www.b4fn.org/e-learning/

In Sri Lanka, several gender-sensitive income-generating programmes were implemented. Business training was offered to women working in the Hela Bojun outlets, with additional support offered to women through a partnership with the Department of Ayurveda to produce herbal products. The Community Development Centre, another national partner, supports female community leaders and farmers in the cultivation and marketing of local root and tuber crops.

The community-based organization Sustainable Income and Generating Investment Group (SINGI), a national project partner in Kenya, supports a number of young people and women's groups in the sustainable production and marketing of indigenous crops.

BFN Turkey, working in collaboration with the agricultural extension services, is promoting gender-sensitive good practices in its trainings on sustainable agricultural production of several target species.

In Brazil, meanwhile, public policies and programmes already promote gender-sensitive good practices and consider the intellectual property rights of indigenous people to traditional knowledge regarding nutritionally rich biodiversity.

c. Environmental sustainability

In terms of environmental sustainability, the project routinely promoted sustainable agricultural and climate-smart practices in value chain development. In Brazil and Turkey, where target species were either managed by extractivist communities or foraged from the wild, guidelines were produced for their sustainable management and collection, while in Turkey domestication programmes were set up for the most promising species in an effort to reduce their excessive exploitation in the wild. The project's focus on strengthening the knowledge of the target species' nutritional value, as well as the work carried out to increase demand for food biodiversity, together with other incentives, should have upstream impacts on their conservation.

d. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

The approach of the BFN and its focus on local biodiversity addressed many of the issues related to the provision of nutritious food that is culturally appropriate. This is embedded in the articles of the Human Right to Food, in the Convention on the Rights of the Child as well as the Declaration on Indigenous Rights.

e. Economic sustainability

Linking farmers to markets and embedding the BFN in government initiatives is likely to secure financial resources beyond the project. At the institutional framework level, all four countries, to varying degrees, established strong partnerships and institutional linkages and it is likely that cross-sectoral platforms, working groups, partnerships and collaborative arrangements established within the countries will be continued beyond the project's completion. Country buy-in is high, with signs of budgetary support and market opportunities that might also provide the required financial sustainability. As a result of the project, all four countries have strengthened their political commitment to promote the multiple benefits of biodiversity for food and nutrition. The level of ownership among key stakeholders in the countries, particularly at government level, is very high. The extent to which food diversity is mainstreamed into the different sectors is also indicative of sustainability and the environment for fostering and strengthening the link between food, nutrition and health is very supportive.

In Brazil and Kenya, for example, school feeding programmes provided an excellent opportunity for the project to enhance the nutritional quality of meals and secure local procurement from smallholders, specifically mentioning the target "to enhance the sustainable utilization of biodiversity for improved nutrition and livelihoods". The Kenya National Strategy on Plant Genetic Resources also supports this target through several strategic actions, such as establishing and enhancing on-farm conservation of genetic resources to ensure continued availability of traditional farmer varieties for broadening of the genetic base and increasing the resilience of agricultural production systems.

In Sri Lanka, the NBSAP submitted within the project framework includes actions of relevance to the BFN under Strategic Objective 3 (Conserve agrobiodiversity), which include "promote and mainstream underutilized, lesser known or neglected food crops, livestock and food fishes which provide nutrition", "establish and maintain a searchable database linked with global databases on nutritional quality of food" and "promote useful elements of traditional knowledge/practices of unique agro-ecosystems to address current issues".

In Turkey, one of the main research areas established by the Strategy on Agriculture (2013-2017) is biological diversity and genetic resources. The strategic plan encourages research activities on agricultural biological diversity related to traditional knowledge having value for nutrition, food security and safety, as well as agricultural production. In addition, Turkey has made significant progress in establishing linkages with farmers and producers, with major supermarket chains, such as Metro Market and Ülker (the country's largest food and beverage company) showing an interest in developing value chains for the target species. BFN Turkey is also working closely with schools and is engaged in a number of initiatives,

such as the Friendly Schools Initiative of the Ministry of Health and a new education tool, “School Children in Nature, in the Garden and in the Kitchen”, which is being developed in collaboration with the Alaçatı Art and Cultural Association and the Çeşme Education Directorate of the Ministry of Education and Schools.

Examples of increased budgetary support for BFN include a sum of more than USD 60 million pledged to protect biodiversity for food and nutrition in Brazil between 2012 to 2015, as well as a further USD 2.4 million made available by the Ministry of the Environment through the “EcoForte Extrativista” drive to build capacity among local extractivist communities and cooperatives in the Amazon for the production of socio-biodiversity products.

In Turkey, project efforts resulted in the National Biodiversity and Genetic Resources Program of Turkey being one of the priority programmes supported by both the Ministry of Forestry and Livestock and the Ministry of Development.

In Sri Lanka, where the BFN project was a major stakeholder in the revision process of the NBSAP 2016-2022, there were increased national budget allocations for the conservation and deployment of nutritionally rich biodiversity.

In Kenya, meanwhile, the county-level Ministry of Agriculture provided funds to support the implementation of the Biodiversity Policy for Busia County developed and endorsed under the project.

F. LESSONS LEARNED

LESSONS LEARNED – elements of success

The three-pronged, multistakeholder implementation approach used in the four countries highlighted the viability of integrating biodiversity for food and nutrition, including orphan crops and wild edible plant species, into production and consumption systems. It has also led to the development of a set of best practices and methodologies that put the conservation and sustainable use of nutritious biodiversity on a much stronger footing.

It was crucial both to identify strategic partnerships at the project design stage and to nurture those partnerships in order to influence country buy-in. All four countries established cross-sectoral policy platforms, which provided the institutional framework for the country projects, ensuring the positioning of the mainstreaming programme within relevant sectoral mandates. These platforms were also useful for the development and implementation of national strategies to promote mainstreaming of biodiversity for food and nutrition, ensuring

broad participation and, more importantly, sustainability. The GPMU was highly supportive of countries in developing and strengthening institutional frameworks. Indeed, the expertise in within the Unit in establishing and strengthening policy frameworks that support the mainstreaming of biodiversity conservation and sustainable use across sectors proved a very significant factor contributing to the countries' success in this area.

Another key factor in the project was the value of building a strong national team, based on skills, expertise and experience. Guidelines were developed, describing the type of stakeholders and actors that the project should ideally engage. Based on this guidance, the national executing agencies, together with Bioversity International, undertook extensive stakeholder consultations with potential partners and actors, at both national and international levels, to explore roles and inputs and ways to create added value and synergies. Collaborative agreements with identified stakeholders were established, where appropriate. The project management and public involvement plan in the project document provides detailed descriptions of stakeholders, their potential roles and contributions, including their participation in management and coordination at both national and global levels.

It was important to align the project's objectives with the Government's strategy and goals while at the same time maintaining project adaptability and flexibility.

To increase country ownership and the probability of the project's success, it was recommended that the coordination and implementation of activities complement, supplement, or be aligned with those of existing institutions and initiatives and that a wide range of actors and sectors be engaged. An example of this was the alignment of project objectives and outcomes with the NBSAP.

An effective project management and coordination structure, the ISC, was put in place to guide the project. Steering committees should represent all partners in the country team. A National Steering Committee (NSC) and, where relevant, thematic and other committees, were established in the participating countries. Each NSC consists of representatives of major partners actively involved in the activities of the project.

Some of the other factors crucial to the successful implementation of the project were as follows:

- Good coordination at the national level with adequate funding support.
- Comprehensive planning at the national level.
- Using the logical framework as a monitoring and evaluation tool to ensure that logical framework indicators and mid-term and end-of-project targets are realistic, attainable and measurable.

– Recognition of the benefits to be gained from focused interventions rather than attempts to achieve too much and spreading resources too thinly.

These unique experiences and approaches, which promote wider appreciation of biodiversity in health, nutrition, agriculture and food security programmes and strategies, have been captured in a significant amount of national and international literature, as listed in Appendix 2. Chief among these publications, some of them awaiting publication, are the following:

– Biodiversity Mainstreaming for Healthy and Sustainable Food Systems. A Toolkit to Support Incorporating Biodiversity into Policies and Programmes. 2018. http://www.b4fn.org/the-mainstreaming-biodiversity-toolkit/
– Mainstreaming biodiversity for food and nutrition e-learning course. 2018. http://www.b4fn.org/e-learning/
– The potential of neglected and underutilized species for improving diets and nutrition. 2019. https://link.springer.com/article/10.1007/s00425-019-03169-4
– Local solutions for sustainable food systems: The contribution of orphan crops and wild edible species. Special Issue Agronomy. 2020. https://www.mdpi.com/2073-4395/10/2/231
– Agrobiodiversity, school gardens and healthy diets. (In press). https://www.routledge.com/Agrobiodiversity-School-Gardens-and-Healthy-Diets-Promoting-Biodiversity/Hunter-Ora-Burgos-Roel-Calub-Gonsalves-Lauridsen/p/book/9780367148867
– Biodiversity for food and nutrition. A new agenda for Sustainable Food Systems. (In press). https://www.routledge.com/Biodiversity-Food-and-Nutrition-A-new-agenda-for-Sustainable-Food-Systems/Hunter-Borelli-Gee/p/book/9780367141516

LESSONS LEARNED – impediments/constraints

One of the main barriers to the effective integration of biodiversity for food and nutrition into modern food production systems is the disconnect that exists between the agriculture, environment, health and nutrition sectors and the lack of coordination between the many actors that need to be involved. In order to support the process and drive the effective mainstreaming of agricultural biodiversity for improved nutrition into sector-specific plans, enabling environments were created by building capacity and partnerships and by improving awareness and understanding among the many different stakeholders, who include

researchers, universities and government agencies, relevant national ministries, local governments, municipalities, small-scale producers and civil society.

G. FOLLOW-UP ACTIONS

Innovations and approaches such as the BFN project are far-sighted in as far as they meet the challenges of environmental sustainability, improved diet-related health and nutrition and improved livelihoods in the 2030 sustainable development context. Mainstreaming biodiversity not only brings health and nutrition benefits, but also contributes to reducing the environmental impact of the food system, as well as improving its resilience. Much of this food biodiversity is maintained by smallholder farmers, including indigenous peoples and local communities, using agro-ecological principles and practices, in diversified farming systems and landscapes, with limited external inputs of water and chemicals, and is locally adapted to climate variations. A food system transformed in this way contributes significantly to reducing biodiversity loss, greenhouse gas emissions, contamination and shortages of water, ecosystems pollution and land degradation. In addition, it provides income generation benefits, in particularly for the youth, as a result of diversification options. It also contributes to the empowerment of vulnerable groups including women and indigenous people, as well as local communities.

Despite this, players in the global food system are slow to respond to the necessary change. Harmful subsidies and perverse incentives are still employed, while structural barriers to diversification are still present in the system. The global food system remains locked into delivering largely cheap, unhealthy food with a huge environmental footprint and escalating public health budgets, to the detriment of diversity on farms and in agricultural landscapes. Achieving the transformative change needed requires certain key actions and pathways, including the diversification of food production and consumption, as proposed by FAO and others. In order of priority the key issues to address are as follows:

- Urgently safeguard and conserve the remaining globally important genetic diversity including varieties, landraces and breeds, and wild relatives of crops and livestock *in s*itu (in protected areas under sustainable management and use, on farm and through other effective area-based conservation measures) as well as *ex situ* in order to halt and reverse biodiversity loss.
- Provide support for more comprehensive biodiversity mainstreaming innovations, as well as investments in sustainable and diverse production landscapes and practices

that value, conserve and creatively and sustainably use genetic resources for food and agriculture. For instance, this includes support for biodiversity-friendly management practices in crop, livestock, forestry and aquaculture productions systems that make use of nutrient-rich species and varieties. This, in turn, involves the identification of innovations such as public food purchasing to drive diversification, the linking of smallholders to school markets to supply local foods derived from native biodiversity for healthier school meals, the education and public awareness of consumers, leveraging peoples' attachment to food cultures, traditions, and the identity of terroir and the incorporation of food biodiversity and traditional knowledge into food-based dietary guidelines and additional market opportunities.

- Promote sustainable and healthy diets, empowering consumers to improve the healthiness and biodiversity of their diets, thereby creating greater demand and desirability for food biodiversity.

H. GOVERNMENT ATTENTION

Strategic actions that can be taken by governments in order to promote the greater utilization of biodiversity for food and nutrition to address healthy diets and improved nutrition are as follows:

- Support research aimed at analysing the nutritional value of biodiversity for food and nutrition, as well as domestication efforts to make wild edibles or partly domesticated orphan crops available and affordable for all consumers.
- Promote the use of biodiversity for food and nutrition through food-based dietary guidelines to diversify food and agricultural production systems at local and national levels.
- Develop policy incentives for biodiversity for food and nutrition that support the diversification of agriculture and food systems.
- Invest in short supply chains for new and healthy biodiversity products and support small and medium-scale agribusinesses around local biodiversity to improve farmers’ livelihoods and strengthen local economies.
- Encourage public food procurement systems that support the sourcing of local, sustainable and healthy food and stimulate the production and consumption of biodiversity for food and nutrition.

- Integrate culturally appropriate biodiversity for food and nutrition into existing national school meal programmes and nutrition education activities, including school gardens.
- Develop awareness-raising campaigns focusing on the importance of biodiversity for diet diversification, nutrition, culture and economic development.

I. HUMAN INTEREST STORY

Farmers are increasingly willing to invest greater resources in the production and marketing of indigenous vegetables now that they have better knowledge, capacity and networks. “I never imagined I could go out and find my own market,” says one female farmer from Busia, who took part in the FBS implemented by partners in the BFN project, with additional support from the McArthur Foundation and the Australian Centre for International Agricultural Research. In 2017, over a six-months period, 547 male and female farmers from Busia’s seven subcounties took part in training and are now better equipped to penetrate local markets, apply and win tenders from public institutions and compete with other suppliers. Since the roll-out of the FBS, 14 contracts and tenders have been secured with schools and hospitals for the provision of African leafy vegetables (ALVs). The quantities supplied vary between 10 kg per week to six times that amount, while the agreed cost per kg varies between KSH 30 (around USD 0.30) and KSH 50 (around USD 0.50) depending on the season. Thanks to the numerous nutrition education and awareness-raising activities, the demand for indigenous vegetables in schools has also risen, with specific tenders for ALVs being advertised for the first time. The approach was launched in one pilot school in mid-2016 catering for 400 students, and the farm-to-school network now provides healthy school meals to approximately 5 500 pupils. The linking of farmers’ groups to schools and health clinics has created employment opportunities for the farmers, who now have a steady market for their produce while schools see the relationship of linking to local farmers as part of their corporate social responsibility.

Students from Mundika Boys secondary school in Busia, Kenya, wait in line for their African leafy greens. Credit: Bioversity/A.Manjella

Appendix 1

LOGFRAME MATRIX– ACHIEVEMENT OF INDICATORS

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
Impact[3]	Enhanced well-being, livelihoods and food security for target beneficiaries in Brazil, Kenya, Sri Lanka and Turkey through conservation of biodiversity and sustainable use and identification of best practices for up-scaling.					
Outcome 1 Relevant sectors, including agriculture, environment and public health in the four partner countries, adopt and utilize the integrated knowledge base on biodiversity for food and nutrition to build support for biodiversity conservation and enhanced well-being.	Local communities, and national agencies have contributed to the documentation of the value and benefits of nutritionally rich biodiversity for improving food security and income generation.	No integrated knowledge base exists in any of the four countries.	At least seven local communities and 20 national agencies have contributed information to the database/national portal development.	100% achieved. Collaboration with over 50 national universities and agencies was established for data collection across the four countries, leading to the generation of new food composition data and to the update of national food composition tables and databases. This contributed to widening the knowledge base on local agricultural biodiversity of nutritional importance. In addition, four communities in Kenya, 121 villages in Turkey, quilombola communities in the Centre-West region of Brazil and communities at the three pilot sites in Sri Lanka provided information used to document traditional knowledge associated with the target species.	N/A	N/A
	Relevant sectors and agencies in the four partner countries use information on the value and benefits of nutritionally rich biodiversity for relevant plans and strategies.		At least one national sectoral plan or strategy highlighting the importance of nutritionally rich biodiversity developed in each country.	100% achieved. Data generated by the project is informing relevant national plans and strategies. In Brazil, the status of BFN conservation was included as an indicator of biodiversity health in the national revisions to the NBSAP, while Socio-biodiversity Ordinance 284[4], approved in May 2018 by the federal government, defines and supports measures for the production and sale of native "neglected and underutilized" species with nutritional value. In addition, the		

[1] The impact level should always reflect the higher programmatic outcome to which the project contributes. For example, at the country level, this is expressed as the CPF outcome to which the project contributes and can also reflect other elements of impact that are defined at a higher programmatic level (UNDAF/national goal/FAO Strategic Framework).

[4] https://alimentusconsultoria.com.br/wp-content/uploads/2018/07/PORTARIA-INTERMINISTERIAL-N%C2%BA-284-DE-30-DE-MAIO-DE-2018-Di%C3%A1rio-Oficial-da-Uni%C3%A3o-Imprensa-Nacional.pdf

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
				National Plan for Agro-ecology and Organic Production includes a number of activities and targets from different ministries and federal agencies that aim to promote the sustainable production and use of socio-biodiversity species. In Kenya, the Busia Biodiversity Policy[5], which highlights the importance of nutrient-rich, local biodiversity, was endorsed by the County Assembly, while two interministerial meetings were held to discuss options of promoting biodiversity through policy using the integrated knowledge base. BFN Sri Lanka provided substantial contributions to the revision of the NBSAP for 2016-2022. The document now addresses BFN project objectives and has recognized BFN as a key project for mainstreaming biodiversity conservation. In Turkey, BFN activities are well integrated into the Strategy on Agriculture (2013-2017) of the Ministry of Food, Agriculture and Livestock, as well as the GDAR Agricultural Research Master Plan 2016-2020, with different research opportunity areas related to the BFN. The Master Plan encourages research activities on agricultural biological diversity related to traditional knowledge having value for nutrition, food security and safety, as well as agricultural production. Other relevant policies and strategies with strong links to BFN are the 10th Development Plan of Turkey (2014-2018), Nutrition and Health Research of Turkey, the Healthy Nutrition and Active Life Programme, (2014-2017), the Nutrition Friendly School		

[5] http://www.b4fn.org/fileadmin/templates/b4fn.org/upload/documents/Country_additional_resources/Kenya/Busia_County_Biodiversity_Policy_10_Oct_2017_Final.pdf

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
				Programme, the Agricultural Extension and training programme for women farmers and the Youth Leadership Agricultural Camps, Technical and Vocational Education and Training programmes, the Higher Education Strategy 2007-2025, the VET Strategy 2014-2018, Turkey Skills Vision 2020, Action Plan for Strengthening the Link between Education and Employment, Mainstreaming and promoting biodiversity for food, nutrition and health, the Students' Awareness Programme and the Strengthening Women's Initiative in Agriculture Programme.		
Output 1.1 Assessments of nutritional value of agrobiodiversity and associated traditional knowledge (ATK) of prioritized species is carried out in three ecosystems in Turkey and Sri Lanka, one in Kenya and at national level in Brazil.	Prioritized species analysed for nutrient content in four countries and incorporated in national and international databases.	Data on the prioritized species is not systematically compiled.	Compositional data for at least 130 prioritized species generated/compiled across the four countries.	100% achieved. Data is now available for 195 prioritized species, either through food composition analysis or data compilation. In Kenya, dietary intake surveys were not completed due to budget constraints.		
	Data on classification, local uses and traits of prioritized species is collected and analysed in ecosystems in the four countries.	No such data for the prioritized species has been collected.	Data for at least 130 prioritized species, varieties or breeds, and other associated biodiversity collected and analysed.	100% achieved. Data on traditional knowledge and loss of food options is documented in all countries included either in national databases or in recipe books. Best practices for managing and deploying native biodiversity with nutrition potential were developed by all countries.		
Output 1.2 National portal on local foods, containing databases on nutritional properties of agrobiodiversity and ATK, developed in each	Data on nutritional value of prioritized species are included in the national database by end of project in four countries.	No portal/database exists in any of the four countries.	Published databases include data on the nutritional value of at least 130 prioritized species across the four countries.	100% achieved. Key data holders were identified in all countries and national databases established in Brazil, Turkey and Sri Lanka. Kenya updated and launched its revised national food composition table in September 2018. Data entry with nutrition information, ATK, recipes and best practices for agrobiodiversity conservation		

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
country relying on pre-existing infrastructure and linked to relevant national and global nutritional databases.	Data on associated traditional knowledge of prioritised species are made available through national portals for further use in four countries.	No database on associated traditional knowledge of target species exists in any of the four countries.	Data on associated knowledge of at least 130 prioritised species, varieties or breeds across the four countries, are made available through national portals/databases for further use.	were completed for Sri Lanka, Turkey and Brazil.		
Output 1.3 Information generated by the project contributes to global knowledge generation and is reflected in an increase of the Nutritional Indicators for Biodiversity on food composition and consumption.	Nutritional Indicators for Biodiversity (FAO and others) show increased information on composition and consumption for the prioritized species.	At baseline, country information on Nutritional Indicators for Biodiversity on composition and consumption is available but incomplete.	At least two countries have prepared a national progress report on the Nutritional Indicators for Biodiversity on composition and consumption for the prioritized species.	100% achieved. Three of the four countries have submitted a national progress report of Nutritional Indicators for Biodiversity on composition and consumption. The activity was not carried out in Kenya, as agreed during the fifth ISC meeting.		
Outcome 2 Enhanced policy frameworks and markets support the mainstreaming of biodiversity conservation and sustainable use across sectors.	Policy recommendations developed by the project with support to cross-sectoral mainstreaming of nutritionally rich biodiversity.	No policy recommendations developed.	At least one policy recommendation per country developed by the project, which supports cross-sectoral mainstreaming of nutritionally rich biodiversity, is under consideration in at least one country.	100% achieved. In Brazil, the project contributed recommendations to a number of cross-sectoral programmes and action plans such as the National Plan for Agro-ecology and Organic Production, the National Food and Nutrition Security Plan and the School Feeding Programme and provided inputs for the revision of its NBSAP. In Kenya, the Busia County Biodiversity Policy was endorsed in March 2018 supporting BFN-related concerns and activities. National policy briefs were finalized by all countries and launched at COP 14		

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
				of the CBD in November 2018.		
	New markets are contributing to improving the income-generation of smallholders.	No new markets exist in pilot sites.	Economic survey/analysis in target areas indicates income levels changing due to sales of nutritionally-rich biodiversity	100% achieved. All countries have identified new markets for nutritionally rich biodiversity. Brazil is monitoring purchases of the prioritized species in the National School Meals and the Food Procurement Programmes as an indirect measure of increased supply and raised income for family farmers. The publishing of Ordinance 284 in 2018 encourages the cultivation of native species by smallholder farmers, and links producers with schools and development organizations through a direct procurement model. This is expected to have important repercussions on the commercialization of target crops. In Kenya, 8 farmer group secured 14 tenders with institutional market for the supply of ALVs. The demand for indigenous vegetables in schools has also grown, with specific tenders for ALVs being advertised. In 2017, the farm-to-school network was providing healthy school meals to approximately 5 500 students and having positive repercussions on farmers' livelihoods. In Turkey, the private sector, farmers' groups and rural collectors are engaged in the marketing of einkorn wheat, golden thistle and other wild edibles. Producers, suppliers, and consumers are making greater use of BFN and new agrobiodiversity products have been released. Sri Lanka now has 32 market outlets between the Hela Bojun (18) and the National Food Promotion Board stores (14), along with one new outlet belonging to the Community Development Centre,		

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
				which sells organic local food crops as well as novel products made from traditional crops. The newest Hela Bojun outlet opened in Udukumbura, one of the project pilot sites, and houses a fruit and vegetable corner where local farmers can sell their homegarden produce. The approach is also gaining media attention with an e-article[6] published in Nutrition Exchange in June 2019.		
Output 2.1 Cross-sectoral national policy platforms for mainstreaming agricultural biodiversity conservation and sustainable use into nutrition, health and education programmes established.	Institutional mechanisms for linking different sectors are identified and implemented in at least one country.	No such platforms currently exist in the project countries.	Institutional mechanisms for linking different sectors implemented in at least one country.	100% achieved. Progress in this output is excellent, with all four countries' national project management unit well embedded in cross-sectoral national working groups.		
Output 2.2 National and international policy guidelines and recommendations that promote the mainstreaming of agricultural biodiversity conservation and sustainable use into nutrition, health and education developed.	National and international policy guidelines and recommendations developed in four countries and under consideration by year 5.	No such policy guidelines that promote the mainstreaming of nutritionally rich biodiversity into nutrition, health and education programmes exist.	National policy recommendations reviewed in four countries and revised policy under consideration in at least one country by year 5.	100% achieved. This output builds on Output 2.1. Significant progress was made in developing policy guidelines and recommendations and establishing an enabling environment for mainstreaming biodiversity. Collaboration continues with international agencies and treaties to promote BFN in the relevant sectoral programmes and strategies, particularly with the CBD.		

6 https://www.ennonline.net/nex/12/truesrilankantaste?version=current

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
Output 2.3 New marketing options for biodiversity foods with high nutritional value identified and developed.	Markets identified and developed for at least four target species with high nutritional value by year 5.	No such markets for target species identified in the four countries.	Markets developed for at least four target species with high nutritional value across the four countries.	Significant progress was made in this output in all countries where market assessments were carried out and value chains identified and developed for a select number of target species.		
Outcome 3 Tools, knowledge and best practices adopted and scaled up in development programmes, value chains and local community initiatives.	Increased number and types of relevant programmes mobilizing nutritionally rich biodiversity using best practices developed by the project.	Limited knowledge and awareness available to programmes to deploy nutritionally rich biodiversity at the beginning of the project.	At least one initiative promoting the mobilization of biodiversity for food and nutrition using project-developed best practices underway in each country.	Countries and the GPMU developed a number of knowledge tools and organized a number of events to mobilize nutritionally rich biodiversity. A range of peer-review papers and books have been published, capturing the experience of the BFN project. Highlights in Brazil include finalization of the e-learning course on mainstreaming biodiversity for food and nutrition, which is now online. Guidelines for the sustainable collection of wild foods were published in Brazil and Turkey, while Kenya has completed the pilot testing of an approach for linking farming communities to institutional markets. In Sri Lanka, the Hela Bojun campaign successfully mobilizes traditional foods, while an alignment with the national school feeding programme is being sought for the homegarden and school garden programmes being implemented in project sites. Awareness-raising activities are organized in schools in Sri Lanka while food festivals and diversity fairs celebrating local biodiversity for food and nutrition were organized in Kenya (June 2018) and Turkey (April 2019). In May 2019, Sri Lanka organized a symposium on agro-biodiversity for climate change adaptation, food and nutrition. Other awareness-raising activities in the reporting period		

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
				include developing billboards advertising the importance of fruit and vegetable consumption, an educational CD for children with BFN content, recipe booklets focusing on traditional foods and local yams and marketing outlets for agro-biodiverse food items. This body of knowledge is routinely used to inform global panels and fora that focus on food security and nutrition, such as the CBD, CGRFA and mention of the project in the State of the World Report on Biodiversity for Food and Agriculture.		
Output 3.1 Best practices for mobilizing nutritionally rich biodiversity to improve dietary diversity identified and promoted.	At least four best practices tested, documented and implemented in pilot sites.	No best practices tested in pilot sites.	At least four best practices analysed, evaluated and documented in pilot sites.	Progress was made in all countries and globally in relation to assessing and identifying best practices that are routinely promoted on national/international portals and events, such as COP14 of the CBD (Egypt, November 2018) on Health Day[7] (24 November) and Agriculture Day[8] (25 November). Inputs were provided to the CGRFA17 and a special side event on BFN was organized during the meeting (21 February 2019). The project was also profiled at the Second Global Conference of the One Planet Sustainable Food Systems Programme (Costa Rica, 5-7 February 2019).		
Output 3.2 Capacity of beneficiaries and stakeholders to deploy and benefit from nutritionally rich biodiversity enhanced.	Beneficiaries and stakeholders trained by the project to deploy and benefit from nutritionally rich biodiversity.	No target beneficiaries or stakeholders trained by the project.	Training to address capacity needs conducted in each country.	All countries have strengthened farmer/producer capacity to use and benefit from BFN. 24 farmer groups in Busia, one quilombola community in Brazil, producers at pilot sites in Turkey and female farmer groups in Sri Lanka are now able to deploy and benefit from local biodiversity for food and		

[7] http://enb.iisd.org/download/pdf/sd/enbplus200num46e.pdf
[8] http://enb.iisd.org/download/pdf/sd/enbplus200num47e.pdf

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
	Collaboration with at least four relevant farmer groups and/or other associations/institutions strengthened by the project to support the deployment of nutritionally rich biodiversity.	Farmer groups and/or associations have limited capacity to deploy nutritionally rich biodiversity.	At least four relevant farmer associations are strengthened by the project to support the deployment of nutritionally rich biodiversity.	nutrition.		
Output 3.3 Information events that foster greater appreciation of nutritionally rich biodiversity as a resource for development and well-being conducted.	Events that foster awareness among consumers, policy-makers and other actors about the positive benefits of nutritionally rich biodiversity at project completion.	Awareness among consumers, policy-makers and other actors about the positive benefits of nutritionally rich biodiversity is limited.	At least 10 major information events across the four countries to raise awareness among consumers, policy-makers and other actors about the positive benefits of nutritionally rich biodiversity implemented at project completion.	Countries have exceeded expectations in this regard. The number of national information events organized by the countries by far exceeds the endline target.		
Output 3.4 Guidelines developed for improved use of nutritionally rich foods from biodiversity with global significance, including processing, food safety measures, and recipes adapted to modern lifestyles based	Number of publications highlighting nutritionally rich biodiversity, recipes and processing methods developed.	No project-developed guidelines exist in the four countries and the availability of other relevant guidelines nationally is limited.	At least five publications across the four countries highlighting innovative approaches to enhancing use of nutritionally rich local foods and covering production,	Data generated on priority and target species has formed the basis of guidelines on aspects of production/collection and utilization in all countries. Recipe books were published in all countries. Food safety guidelines for native fruits were produced in Brazil. The publication of recipe books in Turkey remains outstanding, as does a global publication on project results.		

Results Chain	Indicators				If not achieved, explain why	If applicable/ follow-up action to be taken
	Indicators	**Baseline**	**End target (*expected value at project completion*)**	**Achieved**		
on traditional food systems.			and/or processing, marketing and utilization.			
Output 3.5 Tools and methods for mainstreaming biodiversity into food and nutrition strategies scaled up and disseminated.	Guidelines for mainstreaming biodiversity into relevant sectors adopted in four project countries.	No examples of guidelines for mainstreaming biodiversity into food and nutrition exist.	Project guidelines for mainstreaming biodiversity into food and nutrition developed and disseminated.	Mainstreaming approaches, tools and methods in all countries. The project also made significant progress in relation to mainstreaming at global level.		

Appendix 2

DOCUMENTS PRODUCED DURING THE PROJECT

A separate PDF document is attached detailing the main international and national publications stemming from the project.

Appendix 3

PROJECT STAFF

Name	Function	Dates of Service Starting Date	Concluding Date
International staff			
Danny Hunter	Global project coordinator	April 2012	June 2019
Teresa Borelli	Programme specialist	April 2012	June 2019
Hannah Gentle	Research fellow	June 2015	Dec. 2016
Eliot Gee	Research fellow	Feb. 2018	June 2019
Nina Olsen Lauridsen	Research fellow	Jan. 2018	June 2019
National staff			
Brazil			
Deborah Marcowicz Bastos	National project coordinator	2012	2013
Camila Neves Soares Oliveira	Deputy coordinator	2012	2019
Daniela Moura De Oliveira Beltrame	National project coordinator	2013	2019
Marcelo Rodrigues Soares de Sousa	Technical specialist	2014	2018
Alberto Jorge da Rocha Silva	Technical specialist	2014	2015
Graciela Cristina dos Santos	Technical specialist	2014	2014
Rafael Sousa Lima	Technical specialist	2014	2015
Priscila Pereira Pessoa	Technical specialist	2014	2015
Camila Pia Delgado da Silva	Technical specialist	2014	2015
Kátia Regina Biazotto	Technical specialist	2014	2016
Priscila Olin Silva	Technical specialist	2014	2015
Natália Menezes Silva	Technical specialist	2014	2015
Tarsilla Fernandes Silva Vasconcelos	Technical specialist	2015	2016
Renata Carmo de Assis	Technical specialist	2015	2016
Orlan Bertrand França Hansen	Technical specialist	2015	2015
Marcia Maria da Silva Cavalcante	Technical specialist	2015	2015
Julia Mercedes Pérez Florido	Technical specialist	2015	2015

Name	Function	Dates of Service	
		Starting Date	Concluding Date
International staff			
Luiz Gustavo Lima Nascimento	Technical specialist	2015	2016
Deyzilene Soares Gomes	Technical specialist	2015	2016
Raquel Cardoso Santiago	Technical specialist	2016	2018
Julceia Camillo	Technical specialist	2016	2016
Rafaela Soares	Technical specialist	2016	2016
Elba Cristina Cunha	Technical specialist	2016	2016
Aline Caetano	Technical specialist	2016	2016
Samuel Brito	Technical specialist	2016	2016
Claudia Barbosa Santos	Technical specialist	2016	2016
Rebeca Elster Rubim	Technical specialist	2016	2016
Carlos Henrique Pagno	Technical specialist	2016	2016
Fernanda Camboim Rockett	Technical specialist	2016	2016
Helena de Oliveira Santos Schmidt	Technical specialist	2016	2016
Juliana Severo	Technical specialist	2016	2016
Juscelaine Silva	Technical specialist	2016	2016
Matias Köhler	Technical specialist	2016	2016
Erika Fochezatto	Technical specialist	2016	2016
Patric Monteiro	Technical specialist	2016	2016
Isabela Camila Tudeschini Marques	Technical specialist	2016	2017
Rita Fernandes	Technical specialist	2016	2017
Juliana Furlaneto Benchimol	Consultant	2018	2018
Kenya			
Maureen Kemunto Miruka	National project coordinator	2012	2013
Victor Wasike	National project coordinator	2013	2019
Sri Lanka			
Anura Wijesekara	National project coordinator	2012	2014
Gamini Samarasinghe	National project coordinator	2014	2019
Azra Sartaj	Scientific assistant	2015	2018
Nethmini Samaradiwakara	Project assistant	2015	2019
D.K.N.G. Pushpakumara	Technical specialist	2015	2018
T. Madhujith	Technical specialist	2015	2018
R.D. Siripala	Technical specialist	2015	2016
W.A.G. Sisira Kumara	Technical specialist	2016	2016
Rohan Karawita	Technical specialist	2016	2018
D.S. Rathnasinghe	Technical specialist	2016	2018
R.P. Kasturiarchchi	Technical specialist	2016	2018
Sudeepa Sugathadasa	Technical specialist	2016	2018

Name	Function	Dates of Service	
		Starting Date	Concluding Date
L.H.P. Gunarathne	Technical specialist	2018	2018
Dilini Hemachandra	Technical specialist	2018	2018
Turkey			
Vehbi Eser	National project coordinator	2012	2013
Isa Ozkan	National project coordinator	2013	2014
Yusuf Arslan	National project coordinator	2015	2017
Hasan Gezginc	National project coordinator	2017	2018
Ayten Salantur	National project coordinator	2019	2019
Birgül Güner	Deputy coordinator	2012	2019
Kürşad Özbek	Black Sea Region coordinator	2013	2019
Nurcan Ayşar Güzelsoy	Food composition coordinator	2013	2019
Saadet Tuğrul Ay	Mediterranean Region coordinator	2013	2019
Ayfer Tan	Aegean Region coordinator	2014	2019
Harun Seçkin	Technical specialist	2014	2014
Bengü Koyuncu	Technical specialist	2016	2016
Süha Dinçer	Technical specialist	2016	2016
Gürcan Özdağ	Technical specialist	2016	2016
Sürur Kir	Technical specialist	2016	2016
İlhan Subasi	Technical specialist	2016	2016
Dr. Şerif Ozongun	Technical specialist	2016	2016
Tuncay Baran	Technical specialist	2016	2016
Muhammet Ali Ayan	Technical specialist	2016	2016
Koray Ünal	Technical specialist	2016	2016
Ali Çakir	Technical specialist	2016	2016

Appendix 4

TRAINING AND STUDY TOURS

2013

Global

Value chain promotion and marketing of agro-biodiversity. Rome, Italy. 24-26 November. 17 participants.

Assessing biodiversity indicators through food consumption surveys. Rome, Italy. 27-28 November. 17 participants.

Principles of food composition data and their use. Rome, Italy. 28-29 November. 11 participants.

Brazil

Workshop: Methodology for compiling food composition and nutritional data. São Paulo. 3-4 October. 27 participants.

Turkey

Collecting biodiversity indicators for food composition and consumption. Ankara. 9 December 2013. 15 participants.

2014

Brazil

Workshop: Fruits from the Cerrado Biome and CECANE Project. Goiania. 3 September. 19 participants.

Workshop on traditional vegetables. Lavras. 25 September. 35 participants.

Training on socio-biodiversity to school feeding policy agents. Brasilia. 6 November. 11 participants.

Health in schools programme workshop. Rio de Janeiro. 10-11 December. 32 participants.

Kenya

Training of trainers on sustainable agricultural practices. Busia. 16-17 December. 29 participants.

Sri Lanka

Collecting biodiversity indicators for food composition and consumption. Colombo. 5-6 December. 22 participants.

2015

Brazil

Workshop on the Action Plan for advertising the Dietary Guidelines for Brazil. Brasilia. 2 July. 30 participants.

Workshop on the on the National Pact for Healthy Foods. Brasilia. 17-18 August. 100 participants.

Workshop for the design of the urban homegardens. Brasilia. 18-19 September. 34 participants.

Workshop for urban homegardens in small spaces. Brasilia. 15 October. 20 participants.

Workshop: Biodiversity on the table. Brasilia. 4 November. 35 participants.

Kenya

Linking smallholders to institutional markets. Busia. 23-24 September. 43 participants.

Collecting biodiversity indicators for food composition and consumption. Nairobi. 17-20 November. 25 participants.

Sri Lanka

Workshop on integrating biodiversity into NBSAP preparation process. Kandy. 7 October. 21 participants.

Workshop on saving plant genetic resources for prosperity. Kandy. 28-31 October. 60 participants.

FAO training on collecting food composition data. Kandy. 5 December. 40 participants.

Turkey

13th international course on the production and use of food composition data in nutrition. Wageningen, the Netherlands. 4-16 October. 1 participant.

2016

Brazil

Plants for the Future: Evolution and new perspectives for the South Region. Florianópolis. 17-18 February. 34 participants.

Workshop: Market niches for the agro-industrial sector. Unicamp, Campinas. 21-22 September. 150 participants.

Kenya

Policy stakeholder sensitization workshop. Samia, Bunyala. 24 May. 30 participants.

Policy stakeholder sensitization workshop. Nambale, Matayos. 25 May. 23 participants.

Policy stakeholder sensitization workshop. Butula. 26 May. 32 participants.

Policy stakeholder sensitization workshop. Teso South/Teso North. 27 May. 23 participants.

Food composition training workshop on collection methodologies, sampling and handling. Machakos. 8-12 August. 31 participants.

Food composition training workshop on collection methodologies, sampling and handling. Nakuru. 15 October. 25 participants.

Between October and December 2016, 24 farmer groups from the seven subcounties of Busia were trained, using an adapted Farmer Business School model, to better incorporate local biodiversity into their diets and production systems, while managing their farms as a business and searching for market opportunities. Further details are provided below.

Part 1: Diagnosis and planning: Farmer Business School sessions/activities

- Understanding undernutrition.
- Food groups and nutrition.
- Healthy plate.
- Understanding marketing and markets.
- Market survey.
- Presenting the Market Survey Report, assessing current farm situation and translating analysis into action.
- Developing a vision and goal for the farm.
- Understanding enterprise profitability.
- Choosing an enterprise.
- Components of a farm business plan, Part 1: Farm production and marketing plan.
- Components of a farm business plan, Part 2: Financial plan (Profitability and cash flow & availability), risks and risk management.
- Preparing a farm business plan and action plan.
- Overview of record-keeping.
- Practice of keeping farm business records.
- Savings and mobilizing finance.
- Group marketing and buying.
- Group business plan development (adoption).

Part 2: Implementing

- Assessing and managing business risks

Part 4: Other activities

- Cooking demonstrations.
- Establishment of nuclear farms.

Sri Lanka

Training on Establishment of Homegardens for School Children. Kandy. 2 August. 30 participants.

Training on local root and tuber crops and awareness-raising for schoolteachers. Aranayaka. 10-11 August. 15 participants.

Popularization and self-employment to popularize use of nutritious herbal food and beverages. Giribawa. 15 August. 20 participants.

Training on local root and tuber crop production: Livelihood strategies for landslide victims. Aranayaka. 2-22 September. 100 participants.

Training on local root and tuber crops for pre-school children. Aranayaka. 3 October. 40 participants.

Workshop on Integrated Pest Management/organic cultivation. Udukumbura. 7 October. 100 participants.

Training on local root and tuber crops for women smallholder farmers. Udukumbura. 11 October. 100 participants.

Training on local root and tuber crops for school children of Rivisanda M.V. Udukumbura. 13 October. 20 participants.

Social mapping exercise workshop. Giribawa. 23 October. 12 participants.

Training on local root and tuber crops for officers of the natural waterways and natural resources. Aranayaka. 25 October. 8 participants.

Training on local root and tuber crops for agriculture instructors and Agriculture Research Officers. Aranayaka. 2 November. 8 participants.

Training on local root and tuber crops for officers of the Divineguma programme. Aranayaka. 4 November. 10 participants.

Popularization and self-employment to popularize use of nutritious herbal food and beverages. Gampola. 5 November. 20 participants.

Training workshop on local food preparation. Gampola. 6 November. 15 participants.

Training on local root and tuber crops for the Women's Group Aanlana "Isuru". Aranayaka. 10 November. 30 participants.

Training on local root and tuber crops for the Women Group Habalakkawa "Samagi". Aranayaka. 17 November. 15 participants.

Popularization and self-employment to popularize use of nutritious herbal food and beverages. Udukumbura. 22-23 November. 17 participants.

Gender and agrobiodiversity management. Kandy. 24-25 November. 52 participants.

Training on local root and tuber crops for the Medicinal Union. Aranayaka. 4 December. 20 participants.

Introduction and promotion of integrated pest management/organic cultivation. Gampola. 14 December. 120 participants.

Turkey

Training on production of food composition data. Bursa. 23 September. 27 participants.

2017

Sri Lanka

Training on cultivation planning. Aranayaka. 14 July. 10 community leaders.

Workshop on land preparation, soil conservation and nursery establishment. Aranayaka. 20 July. 15 community leaders.

Workshop on land preparation, soil conservation and nursery establishment. Habalakkawa. 21 July. 15 community leaders.

Workshop on introduction of traditional yam cultivation. Thalgaspitiya. 22 July. 13 community leaders.

Workshop on nursery management. Aranayaka. 24 July. 8 community leaders.

Training on home gardening techniques. Aranayaka. 24 July. 10 community leaders.

Workshop on traditional yam cultivation. Gammannagoda. 26 July. 15 community leaders.

Workshop on land preparation, soil conservation and nursery establishment. Thalgaspitiya. 28 July. 15 community leaders.

Workshop on introduction of traditional yam cultivation. Habalakkawa. 30 July. 12 community leaders.

Workshop on land preparation, soil conservation and nursery establishment. Narangammana. 31 July. 12 community leaders.

Workshop on land preparation, soil conservation and nursery establishment. Gammannagoda. 1 August. 10 community leaders.

Training on dietary diversity for balance diets and improved nutrition. Aranayaka. 10 August. 12 community leaders.

Workshop on soil conservation methods for sustainable homegardens. Thalgaspitiya. 12 August. 5 community leaders.

Workshop on planting and cultivation methods. Habalakkawa. 13 August. 10 community leaders.

Workshop on traditional yam cultivation. Attapitiya. 22 August. 7 community leaders.

Training on land management for yam cultivation and PGS. Aranayaka. 1 September. 10 community leaders.

Training on organic fertilizer preparation. Gammannagoda. 2 September. 10 community leaders.

Training on organic fertilizer preparation. Thalgaspitiya. 3 September. 12 community leaders.

Workshop Introduction to home gardening and improved nutrition. Udukumbura. 29 September. 50 participants.

Establishment of farmer organizations/CBOs. Aranayaka. 4 October. 8 community leaders.

Training on homegarden design. Udukumbura. 23 October. 50 participants.

Food production and enhancement of shelf life of food products. Udukumbura. 30 October. 50 participants.

Modernization of homegardens. Udukumbura. 14 November. 50 participants.

Training on marketing of products. Aranayaka. 18 November. 12 community leaders.

Training on planting methods for homegardens. Udukumbura. 21 November. 50 participants.

Training on pest and disease management. Udukumbura. 27 November. 50 participants.

Training on marketing of products. Thalgaspitiya. 12 December. 12 community leaders.

Training on agrobiodiversity products and non-market valuation. Kandy. 13 December. 150 participants.

Workshop on methods to support production and non-market benefits. Kandy. 14 December. 20 participants.

Turkey

Nutrition education activities for school children. Black Sea Region. 16-17 November. 120 participants.

2018

Brazil

Training workshop on the SiBBr database. Brasilia. 25-26 June. 50 participants.

Appendix 5

MAJOR ITEMS OF EQUIPMENT PROVIDED

Quantity	Item	Cost (USD)
1	Freeze dryer, LyoQuest – 55 ECO	15 626
1	Micro-plate reader spectrophotometer	15 392
1	Quaternary pump for liquid chromatography	15 000
1	Camera, Canon 5D	3 218
1	Laptop computer, Dell-NB	3 200