

TOOLKIT

# Biodiversity Mainstreaming for Healthy & Sustainable Food Systems

A **Toolkit** to Support Incorporating Biodiversity into  
Policies and Programmes

Contains:

Biodiversity's connections to Nutrition,  
Agriculture, Livelihoods, the Environment

Case Studies

Successes and Challenges

Links to Key Resources



**Bioversity International** is a global research-for-development organization. We have a vision – that agricultural biodiversity nourishes people and sustains the planet.

We deliver scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security. We work with partners in low-income countries in different regions where agricultural and tree biodiversity can contribute to improved nutrition, resilience, productivity and climate change adaptation.

Bioversity International is a member of the CGIAR Consortium – a global research partnership for a food-secure future.

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Cover photo: A school mural depicting wild edible plants in Turkey, 2014. Credit: Bioversity International/D. Hunter

Bioversity International Headquarters

Via dei Tre Denari, 472/a  
00054 Maccarese (Fiumicino),  
Rome, Italy

Tel. (+39) 06 61181  
Fax. (+39) 06 6118402  
[bioversity@cgiar.org](mailto:bioversity@cgiar.org)

[www.bioversityinternational.org](http://www.bioversityinternational.org)

**Toolkit Editorial Staff:**

Danny Hunter  
Teresa Borelli  
Nina Olsen Lauridsen  
Eliot Gee  
Giulia Rota Nodari

**Brazil:**

Daniela Moura de Oliveira Beltrame  
Camila Oliviera

**Kenya:**

Victor W. Wasike

**Sri Lanka:**

Gamini Samarasinghe

**Turkey:**

Ayfer Tan  
Birgül Güner

**Design and Layout:**

Luca Pierotti



Convention on  
Biological Diversity

The BFN Project contributes to the implementation of the Cross-Cutting Initiative on Biodiversity for Food and Nutrition of the Convention on Biological Diversity (CBD)

# Acknowledgments

This toolkit would not have been possible without the hard work of many individuals and partners in the four countries making up the Biodiversity for Food and Nutrition (BFN) Project – Brazil, Kenya, Sri Lanka and Turkey. Each country has employed a range of approaches, across multiple sectors, to promote biodiversity mainstreaming for food and nutrition. This toolkit brings together their efforts and experiences, with the aim of inspiring and supporting other countries.

We are grateful to the many international organizations that have provided useful support including Bioversity International, FAO and UN Environment. In particular we would like to single out the International Institute for Environment and Development (IIED), who have been leaders in supporting countries to achieve biodiversity mainstreaming for improved development outcomes. The materials they have provided free access to, in particular the “Ten steps to biodiversity mainstreaming”, have been highly valuable to the BFN Project’s mainstreaming endeavours.



Traditional Sri Lankan dishes, paired with the vegetables used.  
Credit: Bioversity International/S. Landersz

# Foreword

There has never been a timelier moment for the *Biodiversity Mainstreaming for Healthy & Sustainable Food Systems*. Recent research by Bioversity International and the Food and Agriculture Organization of the United Nations reveals that over 90% of the world's cultivated plants are threatened, under-researched and poorly integrated in markets and diets, as are many underutilized animal source foods. Yet these “forgotten” species represent valuable resources to reduce malnutrition, a requisite target for achieving Sustainable Development Goal 2 by 2030. Sustainable development must make better use of agricultural biodiversity to nourish people and sustain the planet.

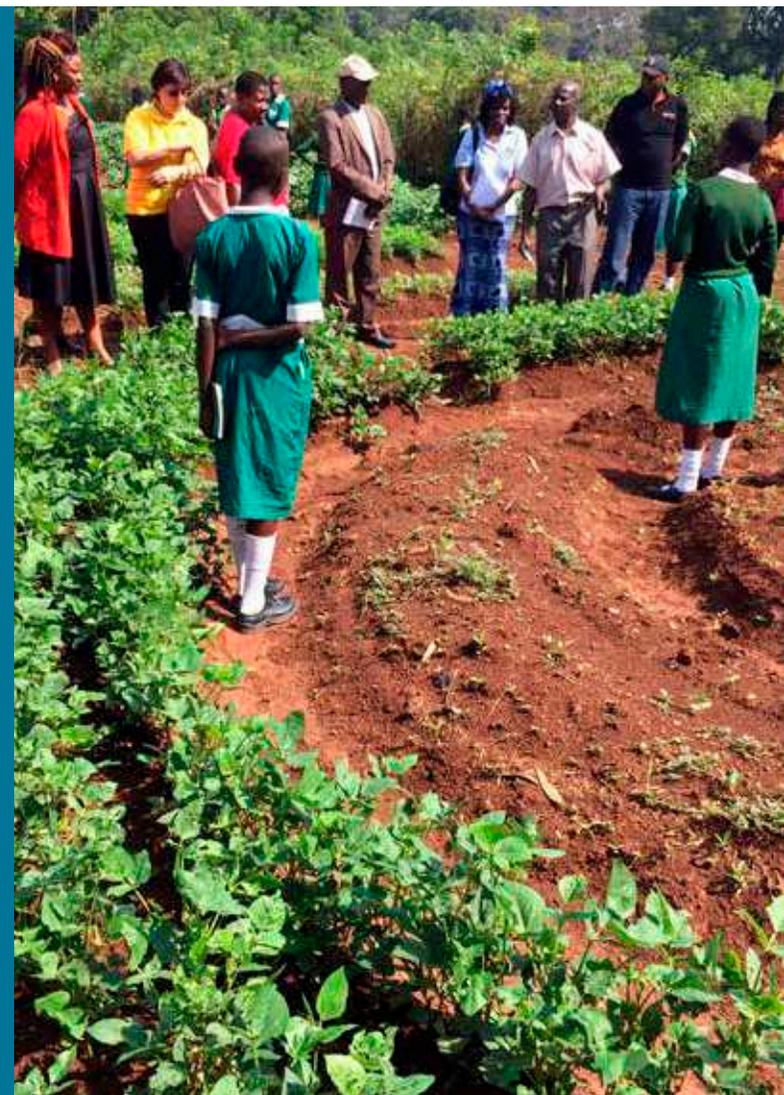
We need the “best available evidence”<sup>1</sup> to achieve the multiple goals and targets of the 2030 Agenda for Sustainable Development and contribute to the Post-2020 Biodiversity Framework. Mainstreaming agricultural biodiversity is central to this.

This toolkit captures the experiences and evidence collected by four countries – Brazil, Kenya, Sri Lanka, Turkey – during implementation of the Global Environment Facility-funded *Biodiversity for Food and Nutrition Project*. It highlights how countries have addressed sectoral barriers, nurtured partnerships and produced tangible biodiversity for food and nutrition solutions. We believe this is the first publication to provide a comprehensive country approach that links food biodiversity, diets and nutrition, and sustainable food systems.

The four countries have developed a set of best practices and methodologies that put the conservation and sustainable use of nutritious biodiversity on a much stronger footing. These unique approaches promote wider appreciation of biodiversity in health, nutrition, agriculture and food security programmes and strategies. I strongly encourage other countries to use these as inspiration to work together towards a global food system transformation.

M. Ann Tutwiler

Director General, Bioversity International



Mandala plots at Mundika Girls  
Credit: Bioversity International/T. Borelli

<sup>1</sup> (COP recommendation XX/1, para. 8)

# Contents

<b>1</b>	<b>Introduction</b>	<b>7</b>
	Why mainstream Biodiversity for Food and Nutrition? Why now? The project, challenge, and context.	
<b>2</b>	<b>Getting Started</b>	<b>11</b>
	What do you need to know first? BFN methodology and factors that create an enabling environment.	
<b>3</b>	<b>Making Mainstreaming Biodiversity Relevant</b>	<b>17</b>
	What can mainstreaming accomplish? Targeted outcomes, school feeding, and business ramifications.	
<b>4</b>	<b>Providing Evidence</b>	<b>27</b>
	How can you facilitate research on biodiversity for food and nutrition? Focus on research partnerships.	
<b>5</b>	<b>Influencing Policy</b>	<b>35</b>
	What sectors and policies offer the best entry points? NBSAPs and examples of country-specific policies.	
<b>6</b>	<b>Raising Awareness</b>	<b>41</b>
	How do you increase producer and consumer capacity? Examples of food festivals and businesses.	
<b>7</b>	<b>Summing Up</b>	<b>45</b>
	How do you keep track of the implementation process? Conclusion and further resources.	



Sri Lankan biodiversity, Colombo Food Fair. Credit: Bioversity International/D.Hunter

# 1

# Introduction

This introductory section poses the question “Why Mainstream Biodiversity for Food and Nutrition?” The context for the BFN Project, this toolkit, and its organization are provided.

1.0 Introduction

1.1 How to use this toolkit

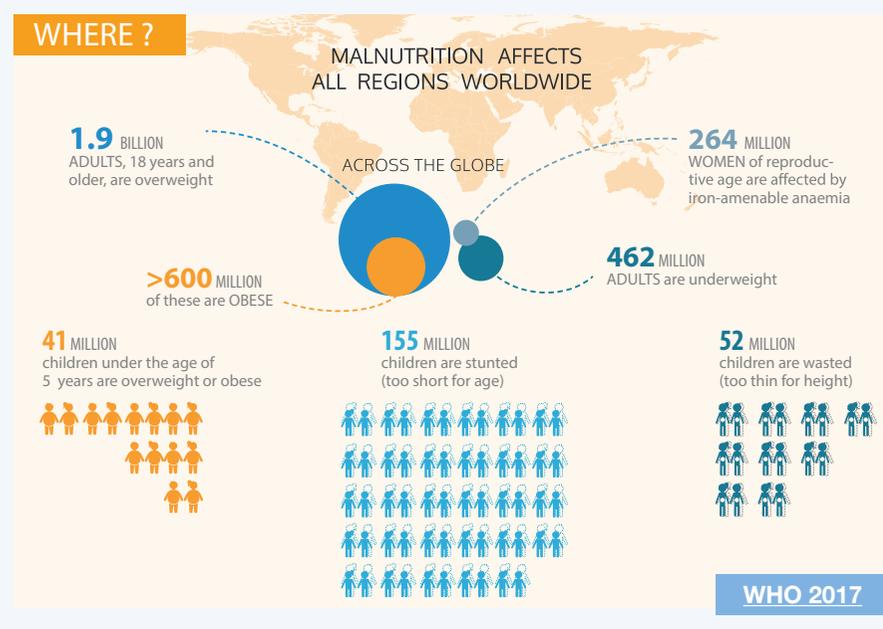


# 1.0 Introduction

## The Context

Current agricultural yields of rice, wheat, and maize are plateauing, fueling concerns as to how we can produce food of sufficient quantity—and quality—to maintain a growing population. Simultaneously, 1 in 3 people worldwide suffer from micronutrient deficiencies, while nearly 2 billion people are overweight or obese.

In order to tackle this crisis, new approaches must prioritise nutrition in multiple levels and sectors, building local and national government support and strong economic policies. We can move one step closer to achieving the Sustainable Development Goals if we strengthen the connection between agricultural production and diets, with particular focus given to the multi-faceted (particularly health) benefits of biodiversity. This link is logical in the midst of both the United Nations' International Decade on Biodiversity (2011-2020), and Nutrition (2016-2025), yet a coherent, holistic approach remains largely unfulfilled.



## The Project

The Biodiversity for Food and Nutrition Initiative (**BFN Project**)\* was launched in 2012 to address this gap, envisioning a food system that addresses malnutrition, farmer livelihood resilience, and sustainability through the lens of agricultural biodiversity; in short, by documenting information on the nutrient content of a wide variety of indigenous foods and sharing the information with policy makers and consumers.

Spearheaded by governments and research organizations in Brazil, Kenya, Sri Lanka, and Turkey, BFN's approach to the conservation, revival, and promotion of these nutrient-rich underutilised species falls under three main goals: Providing Evidence, Influencing Policy, and Raising Awareness (**See 2.0 Methodology**).

\*The BFN Project, formally titled "Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Nutrition and Wellbeing", is funded by the Global Environment Facility (GEF) with implementation support from the United Nations Environment Programme and the Food and Agricultural Organization of the United Nations.



*With this **toolkit** we wish to share lessons learned from the BFN approach and to inspire any individuals or organizations interested in **Biodiversity Mainstreaming** in order to improve food systems and diets.*

# 1.1 How to use this toolkit

This toolkit is not a prescriptive step-by-step manual, but rather an inspiration that brings together field experiences from Brazil, Kenya, Turkey, and Sri Lanka, accrued during project implementation, along with insights from organizations working on related issues.

Each **key aspect** of the mainstreaming process is presented as a numbered and colour-coded section. Details and challenges faced during project implementation are provided through relevant **case studies**, “**focus on**” examples, and **resources**. The resources can be accessed online by clicking on the URL links that accompany their descriptions.

This multi-level, cross-sectoral content reflects the wide-ranging approach necessary for mainstreaming biodiversity. While the recommendations and resources offer a starting point, readers are strongly encouraged to adapt this knowledge to their respective country contexts, as each location may present different opportunities and challenges.



Rice biodiversity in Sri Lanka. Credit: Bioversity International/D. Hunter

## What does this toolkit offer?

By the end of this guide, you will be able to:

- Supply factual **evidence** that justifies mainstreaming biodiversity for the specific purpose of food and nutrition
- Identify **Nutrition and Biodiversity Outcomes** = benefits attainable through mainstreaming at different levels
- Recognize factors that are conducive to an **enabling environment**
- Convince **stakeholders** and **partners** to collaborate and support your efforts
- Target **particular sectors and policies** for mainstreaming
  - Choose **entry points** within receptive ministries or organizations
  - Adapt actions to fit into your country's **National Biodiversity Strategy and Action Plan (NBSAP)**
  - Integrate biodiversity awareness into **school feeding** and **procurement** programmes
- Select the **programmes** and **activities** best-suited for effective implementation
- Develop a wide-reaching **awareness raising** strategy
- Identify methods for **building capacity** (in markets, research institutes, etc.)
- Evaluate **implementation** of mainstreaming activities.

# 1.2 Why Biodiversity for Food and Nutrition?

## What do we mean by

### ... Biodiversity Mainstreaming?

“Mainstreaming” here means integrating actions that **conserve** and **sustainably use** biodiversity into strategies for production sectors such as agriculture, fisheries, and forestry. Including biodiversity awareness in plans, policies, and programmes increases **recognition** of biodiversity’s importance for human well-being, while ensuring the sustainability of the **production sectors** and the **people** who depend on them for their livelihoods.

### ... Biodiversity Mainstreaming for Food and Nutrition?

With the specific purpose of reducing malnutrition, we focus on the appropriate use of a wide range of **plant varieties** (including wild, neglected, and underutilized species) and **animal breeds** in the mainstreaming process.

Although Biodiversity Mainstreaming into production sectors has gained support, there has been—so far—limited attention to the role mainstreaming may take in **improving nutrition outcomes**. As a result, there are few examples of good practice and few resources dedicated to mainstreaming biodiversity for food and nutrition.

Initiating the mainstreaming process requires a clear understanding of the **context** in each country, particularly which aspects of biodiversity can contribute to which objectives of nutrition. There is a strong need for more evidence supporting biodiversity’s nutritional potential, and cooperation across many different ministries/sectors.

### Why now?

Increased attention given to nutrition-sensitive agriculture situates Biodiversity for Food and Nutrition firmly within the **2030 Agenda for Sustainable Development**, with implementation fulfilling many of the SDGs, as well as the **Aichi Biodiversity Targets** (established by the Convention on Biological Diversity). There has never been a better, or more urgent, time to emphasize the contributions of biodiversity mainstreaming for the sake of healthier, sustainable diets.



*Mainstreaming biodiversity for food and nutrition contributes to the achievement of a number of the Sustainable Development Goals and CBD Aichi Biodiversity targets.*

# 2

## Getting Started

This section contextualizes the BFN Project's Methodology, then discusses pre-requisites and first steps for interested parties initiating mainstreaming biodiversity.

2.0 Where to begin? Methodology

2.1 The BFN Approach

2.2 How can you ensure an enabling environment?

2.3 Factors to consider



## 2.0 Where to begin? Methodology

The sections of this toolkit are organized around the three-pronged BFN approach, in which the following actions are taken to **conserve** and **use** indigenous biodiversity:

### 1. PROVIDE EVIDENCE:

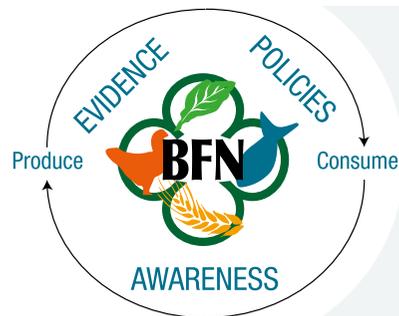
Fill in knowledge gaps relating to country-specific nutrition issues, food composition data, traditional knowledge and the benefits of using plant and animal species to tackle malnutrition.

### 2. INFLUENCE POLICY:

Integrate biodiversity for food and agriculture in nutrition-related policies, programmes and action plans.

### 3. RAISE AWARENESS:

Communicate the multiple benefits of biodiversity for food and nutrition to the public and other stakeholders.



The following section (2.1) displays actions taken to provide evidence, influence policy, and raise awareness. The graphic shows how this approach engages diverse actors across the production-consumption spectrum.



Foraging wild edible plants in Turkey. Credit: Bioversity International/D. Hunter

# 2.1 The BFN Approach - Graphic



## 2.2 How can you ensure an enabling environment?

The determinants of good nutrition cut across sectors. Good nutrition results from a healthy diet, proper hygiene and health care. Access to a healthy diet depends on decent employment, education and connections to a thriving, resilient, sustainable food system. Proper hygiene and health care likewise rely on income, public awareness and transportation, along with provision of quality health services, safe water and adequate sanitation.

Certain key principles need to be considered when planning for mainstreaming such as strong political will, governance and leadership, cooperation and dialogue at all levels and mutual supportiveness between biodiversity and development priorities. There are also certain pre-requisites, such as adequate scientific knowledge and understanding and adequate institutional capacity, without which mainstreaming cannot happen.

The FAO Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans on Nutrition identify the following key principles to take into account when planning mainstreaming activity include:

- Target development goals and sectors where biodiversity for food and nutrition can be mainstreamed, and identify the follow up actions of countries involved in prominent meetings such as the International Conference on Nutrition (ICN2).
- Establish an effective institutional set-up, along with dialogue and cooperation at all levels and identify relevant entry points.
- Recognize and address malnutrition issues and related micronutrient deficiencies.
- Develop a national action plan involving all relevant stakeholders and including resource mobilization and design a monitoring and evaluation system.
- Spread awareness on achieving more nutrition-sensitive agriculture and reinforce the scientific evidence demonstrating the importance of biodiversity for nutrition outcomes.
- Communicate the benefit of using different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species, and



Cooking demonstration at the BFN symposium, Brazil 2017. Credit: BFN/S. Landersz

their specific nutrient compositions to tackle malnutrition at the public and scientific level.

- Strengthen individual and institutional capacity.
- Establish a partnership with the Ministry of Planning and/or Finance. This can lead to stronger budgetary support and programmatic collaboration during activity implementation.

### Sources:

FAO, [Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition](#)

UNDP (2012), [What drives institutions to adopt integrated development approaches? UNDP Discussion Paper](#). UNDP (2012)

IIED (2014). [Defining and assessing success in mainstreaming - Background paper](#)

UNSCN (2018). Expert Group Meeting on Nutrition and SDGs under Review in Preparation for the High-Level Political Forum

# Key resources



## FAO - VOLUNTARY GUIDELINES FOR MAINSTREAMING BIODIVERSITY INTO POLICIES, PROGRAMMES AND NATIONAL AND REGIONAL PLANS OF ACTION ON NUTRITION

This brief document provides guidelines to support countries in the integration of biodiversity into all relevant policies, programmes and national and regional plans of action addressing malnutrition. Specifically, the objective is to promote knowledge, conservation, development and use of varieties, cultivars and breeds of plants and animals used as food, as well as wild, neglected and underutilized species contributing to health and nutrition.



## ENABLED OR DISABLED: IS THE ENVIRONMENT RIGHT FOR USING BIODIVERSITY TO IMPROVE NUTRITION?

This perspective paper discusses the benefits of biodiversity for nutrition and explores what an enabling environment for biodiversity to improve nutrition might look like. The BFN project has developed a conceptual framework with three domains that can be used to guide biodiversity mainstreaming for this purpose. This article briefly summarizes the kinds of things Brazil, Kenya, Sri Lanka and Turkey have been doing to enable biodiversity mainstreaming for nutrition.



## IIED - INTRODUCTION TO MAINSTREAMING BIODIVERSITY AND DEVELOPMENT

The UK-based International Institute for Environment and Development (IIED) is one of the foremost organizations working on developing approaches, methods and tools for mainstreaming biodiversity. Their website makes available considerable useful resources.

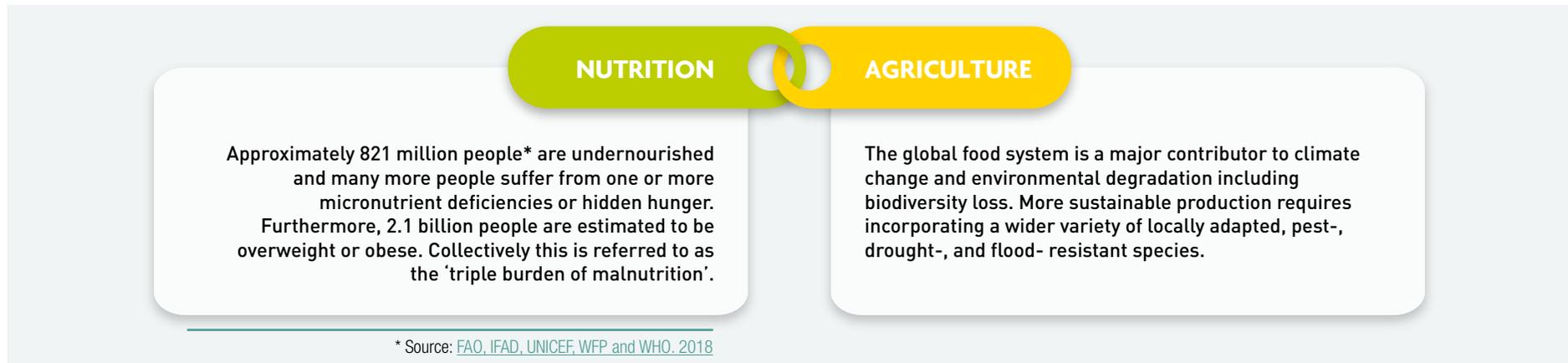


## FAO - FUTURE SMART FOOD: REDISCOVERING HIDDEN TREASURES OF NEGLECTED AND UNDERUTILIZED SPECIES FOR ZERO HUNGER IN ASIA

This report provides the overall context of the Sustainable Development Goals, highlights the main features of agriculture and food systems, and justifies neglected and underutilized species (NUS) as entry points for addressing hunger and malnutrition from a food system perspective. It also lays out the global policy frameworks and their integration of NUS, and describes the origin, criteria, process and outcome of the regional priority-setting exercise on NUS: Future Smart Food.

## 2.3 Factors to consider

As we sit on the cusp of the 2030 Agenda for Sustainable Development, this is the moment to reshape our food and agricultural systems. To move beyond business-as-usual towards sustainability and the provision of diverse diets, a major cornerstone will be a strong link between the following two fields:



### Questions to help you plan

- What **malnutrition problems** are prominent in the target location?
- How **feasible** and **practical** it is to address these problems using biodiversity?
- What **kinds of biodiversity** are present that could contribute to solving identified malnutrition problems?
- How easy is it to **mobilize** and **promote** the identified biodiversity to make it more available to address malnutrition problems?
- At which **scale** would mainstreaming be most effective (diversifying households, markets, or entire landscapes)?

### Examples

#### Example A

##### Proposed objective

Promote **home consumption** of more diverse and nutrient-dense diets

##### Possible intervention

Mobilization through **home gardens**, integration of **homestead production** with aquaculture/small livestock

#### Example B

##### Proposed objective

Diversify **public food procurement** or **school feeding**

##### Possible intervention

Strategic targeting of **public policies, capacity** and **infrastructure** to promote the production and marketing of a wider variety of food species, especially nutritious biodiverse foods

# 3

## Making Mainstreaming Biodiversity Relevant

This section offers a rationale for connecting agriculture and nutrition through mainstreaming biodiversity, and how this can lead to multi-level benefits. It offers a deep dive into school feeding as one prime example and making a business case for biodiversity.

3.0 Identifying mainstreaming outcomes

3.1 Which programmes and activities are best suited for mainstreaming?

3.2 Focus on: School Feeding

3.3 Focus on: Making a business case

3.4 Case study: Green employment in Turkey



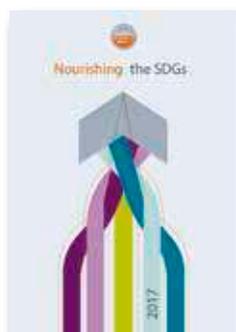
## 3.0 Selecting Mainstreaming Outcomes

Before beginning, it is important to identify which biodiversity and development outcomes one wishes to achieve through the mainstreaming process. These should be specific, feasible objectives that can range from the level of community to national policy. Below are several examples; bear in mind that multiple actions may occur simultaneously.

UPSTREAM	<b>Governance outcomes</b>	Relevant international forums that promote biodiversity and nutrition linkages include the Committee on World Food Security, CBD and SDGs;	
	<b>Policy and political outcomes</b>	Improved public and private policies give consideration to biodiversity for food and nutrition; Policies in schools promote healthy and diversified food choices; Food procurement policies give consideration and incentives for biodiversity for food and nutrition; Food subsidies favour biodiversity for food and nutrition;	
	<b>Plan outcomes</b>	Improved biodiversity and nutrition considerations included in: NBSAPs; National Plans of Action on Nutrition; Relevant Sectoral Plans; other Health Plans; National food-based dietary guidelines promote biodiversity for food and nutrition;	
	<b>Budgetary and resource outcomes</b>	Improved public-private sector resource mobilization for biodiversity and nutrition considerations; Improved inclusion of biodiversity-nutrition linkages in national public and sector budgets;	
	<b>Research and development outcomes</b>	Improved national research activities that focus on improving the knowledge and evidence for biodiversity and nutrition including more food composition analysis, dietary intake data and better research to understand the complex pathways that link biodiversity and nutrition;	
	<b>Institutional and capacity outcomes</b>	Improved capacities to undertake the mainstreaming and promotion of biodiversity for food and nutrition, from production through to consumption; Improved inclusion of biodiversity-nutrition concerns in schools and universities curricula; Improved understanding of biodiversity-nutrition linkages among policy and decision-makers;	
	<b>Infrastructure outcomes</b>	Improved infrastructure in place to handle biodiversity for food and nutrition from production to consumption including quality seed systems through to the ability of public procurement and school feeding programmes to access and handle biodiversity;	
	<b>Program and action outcomes</b>	Improved guidelines, support and regulations to support diversification through school feeding programmes; institutional and other markets; school gardens; home gardens; urban agriculture;	
	DOWNSTREAM	<b>Behavioural outcomes</b>	Key patterns and processes of production, consumption and waste management are informed by biodiversity-nutrition considerations; Individuals are consuming more diversified diets, making healthier choices; Local biodiversity markets are reducing food waste; Biodiversity-nutrition linkages made through food fairs, farmer markets; Restaurants, food outlets serving up more biodiversity; General public understand biodiversity-nutrition linkages;
		<b>Community and farmer biodiversity management outcomes</b>	Community and farmer management of biodiversity benefits from realized biodiversity-nutrition considerations; Improved markets and incentives such as Payment for Agrobiodiversity Conservation Services mean farmers produce and conserve more biodiversity; proved incomes for farmers;
<b>Ultimate impacts of all these outcomes</b>		Improved productivity, availability and sustainability of use of biodiversity for food and nutrition; Improved conservation and protection of priority species; Improved nutrition and health of citizens; Local food cultures valued and preserved;	

**Note:** Adapted from [Ten steps to biodiversity mainstreaming \(p. 4\)](#), by Abisha Mapendembe, Dilys Roe, Steve Bass, 2013: IIED. Copyright 2013 by IIED.

# Key resources



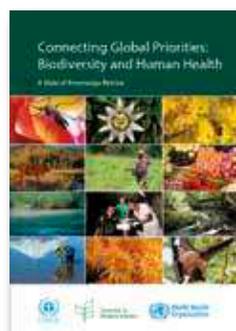
## IFPRI - THE GLOBAL NUTRITION REPORT (2017)

This yearly report gives an overview of the global status of nutrition, providing an exhaustive amount of data on malnutrition including undernutrition and obesity. It suggests how investing in nutrition interventions to end malnutrition will lead to improved outcomes across the Sustainable Development Goals.



## UNEP - HEALTHY ENVIRONMENT, HEALTHY PEOPLE THEMATIC REPORT (2016)

This report summarizes for Governments, policy makers and stakeholders the evidence of the linkages between environmental quality and human health and wellbeing (SDG 3). It provides data for the diseases with the largest total health burden from environmental factors and concludes the findings in 10 recommendations.



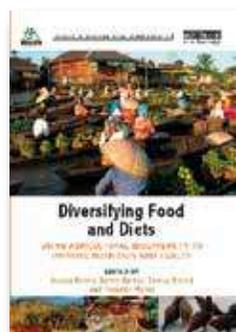
## WHO/CBD - CONNECTING GLOBAL PRIORITIES: BIODIVERSITY AND HUMAN HEALTH, A STATE OF KNOWLEDGE REVIEW (2015)

This State of Knowledge Review assembles insights from numerous researchers, practitioners, policy-makers and experts from the fields of biodiversity conservation, public health, agriculture, nutrition. It provides an overview of the importance and scientific evidence for linkages between biodiversity and health and it suggests how to facilitate and promote cross-sectoral approaches to health and biodiversity conservation.



## THE ROCKEFELLER FOUNDATION-LANCET COMMISSION ON PLANETARY HEALTH - SAFEGUARDING HUMAN HEALTH IN THE ANTHROPOCENE EPOCH (2014):

This paper claims that the management of natural systems to protect biodiversity is an important cornerstone to the protection of global nutrition and that interdisciplinary collaboration between public health, agriculture, environmental, and nutritional strategies will be needed to develop and implement appropriate policies.



## BIOVERSITY INTERNATIONAL - DIVERSIFYING FOOD AND DIETS: USING AGRICULTURAL BIODIVERSITY TO IMPROVE NUTRITION AND HEALTH

This comprehensive book presents a range of examples and case studies that illustrate how the many elements of biodiversity for food and nutrition (fish, crops, trees, wild plants, livestock breeds, insects and aquatic species) can be mobilized and mainstreamed to improve nutrition.



## IIED - TEN STEPS TO BIODIVERSITY MAINSTREAMING

This guide presents ten key steps to biodiversity mainstreaming derived from the experience and good practice of participants of the first NBSAPs 2.0 Mainstreaming Biodiversity and Development project workshop held in Maun, Botswana in November 2012.

## 3.1 Which programmes and activities are best suited for mainstreaming?

Improved research, knowledge and evidence will greatly facilitate biodiversity mainstreaming into ongoing initiatives, strategies and activities aimed at improving nutrition outcomes. This is important in order to take advantage of the increasing global focus on diversifying food systems and healthy diets especially the increased attention being given to improving agriculture for enhanced nutrition outcomes, often referred to as 'nutrition-sensitive agriculture'.

Typical opportunities that exist include:

- Promote the **incorporation of foods** from specific varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species into relevant **nutrition activities** (e.g. food composition analysis, food-based dietary guidelines, nutrition education, dietary assessment and nutrition policy development).
- Support the provision of **nutrition-sensitive agricultural extension services** and innovation systems to favour the inclusion of biodiversity for food and nutrition.
- Identify and put in place mechanisms to re-introduce and promote backyard/ homestead **gardening** of local/traditional fruits and vegetables, and where possible, integrated homestead gardening with fish farms and small animal management.
- Support and promote **educational programs** aimed at showing the benefits of foods from specific varieties and breeds to young people through initiatives such as school gardens/farms.
- Support the **production** of local/traditional vegetables and promote urban agriculture, and guarantee the easy availability of planting materials to those groups and individuals involved.
- Support the setting up of **market infrastructure** for those wild foods or specific varieties and breeds with suitable nutrient profiles also identifying opportunities in public and private food procurement.
- Support and promote initiatives aimed at diversifying **school feeding**.

Source: FAO, [Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition](#)



School feeding in Brazil. Credit: Ministério do Desenvolvimento Social/U. Machado

## 3.2 Success Stories with School Feeding

*Public institutions, particularly schools, can be an effective platform for far-reaching interventions that unite different sectors around health and education. The following two examples of school procurement illustrate how mainstreaming action can successfully bridge supply and demand.*

In **Kenya**, a farmer business school run with a local partner trained 4,000 farmers on sustainable practices, cultivation, use, and health properties of indigenous species. Farmers trialed a direct procurement model in which local schools agreed to buy African Leafy Vegetables from the farmers for a fair, fixed price, avoiding any market intermediaries. The leafy vegetables would then be cooked for school meals, contributing to student nutrition and knowledge of indigenous crops. In some cases, farmers would even cultivate on school-owned property, increasing accessibility and knowledge-sharing.



Source: Prof. Veridiana Vera de Rosso, University of São Paulo

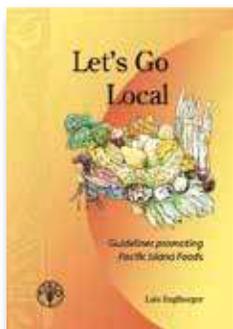
**Brazil** is fortunate to have a pre-existing policy framework (as detailed in [Case Study 5.3](#)) that supports mainstreaming indigenous species into school feeding. Crops that have been successfully integrated into school meals include the vitamin-rich juçara, a fruit from a tropical palm tree, which can be consumed in smoothies or juices and is enjoyed by students for its vibrant purple colour. Farmers and the environment also profit; while the typical crop of palm hearts can only be harvested once, juçara can repeatedly yield as much as 5kg of fruit per stem, which sells at US\$1.50, three times the price of palm heart (\$0.55 kilo). The chart above shows how indigenous foods remain a small but growing percentage of procurement purchases.



[Click here for more on the IPEMA Juçara Project.](#)

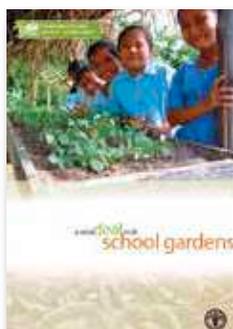


# Key resources



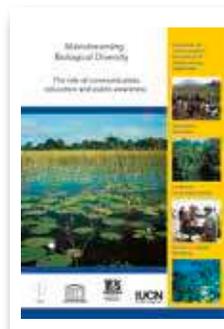
## IFCP - LET'S GO LOCAL: GUIDELINES PROMOTING PACIFIC ISLAND FOODS

This booklet is based on the “go local” concept developed by the Island Food Community of Pohnpei. Food and dietary patterns in Micronesia have undergone major changes in recent decades as traditional diverse diets have largely been replaced by imported, often highly processed foods, leading to increased dietary-related diseases. A nation-wide campaign to “go local” mobilized a wide range of communication techniques, from radio messages to cooking and community outreach events. These guidelines suggest how people and groups in other countries or regions can adapt the “go local” approach to their own contexts.



## FAO - A NEW DEAL FOR SCHOOL GARDENS

This document explains the many benefits of school gardens including the promotion of diets, the development of livelihood skills, and environmental awareness. It further suggests what governments and their development partners can do to promote school gardens as a seed ground for the nation's good nutrition and better health.



## IUCN - MAINSTREAMING BIOLOGICAL DIVERSITY: THE ROLE OF COMMUNICATION, EDUCATION AND PUBLIC AWARENESS

Although not specific to food and nutrition, the IUCN has produced this guide on effective communication for biodiversity mainstreaming.



## UNSCN- SCHOOLS AS A SYSTEM TO IMPROVE NUTRITION

This 2017 paper focuses on the unique potential of schools to unite different sectors under a healthier food system.



## HOME GROWN SCHOOL FEEDING RESOURCE FRAMEWORK

This 2018 guide led by WFP and FAO includes principles and examples of HGSF models for further design, implementation, and upscaling.

## 3.3 Making a business case for Biodiversity and Nutrition

### *How do you make a convincing and compelling argument in favour of biodiversity for healthy diets and better nutrition?*

One cannot assume that the relevance of biodiversity is clear to everybody; in fact, it is an often under-appreciated resource. Therefore it is important to demonstrate how biodiversity has direct benefits, for example, to someone whose work might involve ensuring the productivity of a few staple crops, or whose job it is to prevent a young child from suffering a debilitating micronutrient deficiency.

If policy and decision makers are unaware of the nutritional value of biodiversity, they have little incentive to prioritise it in their policies and actions. This translates into fewer resources devoted to the conservation of neglected and underutilized species and related research. The end result: not only will a valuable resource be overlooked and undervalued, but considerable money will be lost due to environmental and health-related expenses.

A **business case** can influence powerful but difficult-to-convince stakeholders by telling a compelling narrative that highlights the value and benefits of biodiversity for healthy diets and nutrition. It is important to have a strong core message that emphasizes clear and deliverable outcomes of integrating biodiversity, adapted to the interests and language of the intended audience.

The **resources** and tools provided in this section can help guide you in creating a well written, well-structured document that presents a business case. The resources provide guidance on writing about biodiversity for different target audiences, including the development of a policy brief.

A business case might include:

- Tangible **economic benefits** (How can biodiversity contribute to income generation, new job creation, GDP, poverty reduction, cheaper services?)
- Practical **social, political, cultural value** (Why is biodiversity a national asset, how can it add to identity or social cohesion?)

- Concrete **achievable actions** (rather than “doom and gloom”)
- Anticipated **counter-arguments** and trade-offs



EMBRAPA researcher Nuno Madeira speaks at a BFN Symposium in Brazil. Credit: S.Landersz



## 3.4 Green Employment in Turkey

*When adapted to educational and training activities, green learning can initiate a systematic process of change, as can be seen in the example at a Turkish vocational college.*

Two million students are currently enrolled in vocational training programmes in Turkey, making these effective platforms to reach Turkish youth and increase environmentally-friendly attitudes and activities. Particularly within the food and beverage and agricultural sectors, “green” training can offer young workers high-demand knowledge, skills and competencies that translate into a competitive advantage within green-oriented occupations. Involving youth and offering them viable work contributes to both long-term environmental protection and future economic benefits.

In March 2017, the Aegean Team of BFN Turkey partnered with the Halim Foçalı Anatolian Vocational and Technical College to deliver a 3-day training to 16 student chefs. Lectures and handouts informed students about plant diversity, the variety of aromatic and medicinal plants existing in Turkey, their use, harvest techniques and production, the nutritional value of vegetables and wild edible plants and their importance in food-based approaches to tackle malnutrition. Lectures were reinforced by practical activities and nature walks led by the BFN Team, school teachers, local foragers and research staff from the Foça District National Education Directorate. During the walks, students were trained to identify the species, collect and photograph the plants to start a school herbarium, and use the plants in cooking demonstrations and workshops for the preparation of traditional dishes.

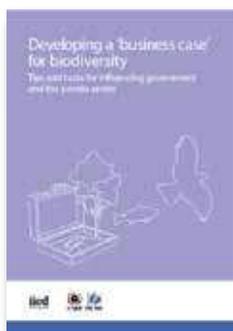
Including greener options in vocational training could lead to the creation of sustainable and social enterprises working for the common good of society, and contribute to existing national policies in accordance with the Sustainable Development Report developed by the Ministry of Development of Turkey. Broadening access to vocational training as a way to improve education and thus sustainable growth through more and better jobs is addressed in a line of national

plans and strategies such as the VET strategy 2014-2018, The Higher Education Strategy 2007-2025 and the Action Plan for Strengthening the Link between Education and Employment (IMEIGEP). A business case can be considered effective when one is able to demonstrate that greater integration of biodiversity can generate benefits at multiple levels in line with national strategies and objectives.



Student chefs cooking with wild edible species. Credit: BFN Turkey

# Key resources



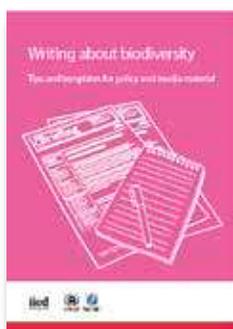
## IIED - DEVELOPING A BUSINESS CASE FOR BIODIVERSITY

This guide provides helpful examples for those who need to build a case for integrating biodiversity into decision-making processes and policy development. The guide enables you to follow a simplified process for generating and presenting compelling evidence, while consulting other sources for details.



## BIOVERSITY INTERNATIONAL - IMPROVING NUTRITION AND HEALTH THROUGH AGRICULTURAL BIODIVERSITY – A POLICY BRIEF

This policy brief prepared by the GEF-funded Biodiversity for Food and Nutrition project, gives an example of how to build a compelling business case for biodiversity.



## IIED - WRITING ABOUT BIODIVERSITY. TIPS AND TEMPLATES FOR POLICY AND MEDIA MATERIAL

This IIED booklet can help guide you in the preparation of materials to raise awareness of the benefits of the sustainable use of biodiversity for healthy diets and nutrition. The booklet provides advice for writing for different audiences and different sectors, with practical tips that will give your content a better chance of being read. Read about general good practice for writing clearly, and then follow specific tips and templates for writing policy briefings, press releases and media briefings.



## BIOVERSITY INTERNATIONAL - THE IMPORTANCE OF BIODIVERSITY FOR FOOD AND NUTRITION: WHY INVEST IN PROTECTING AND PROMOTING BIODIVERSITY? – A BUSINESS CASE

An example of a business case prepared by the GEF-funded Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Nutrition and Wellbeing (Biodiversity for Food and Nutrition – or BFN for short) project.



Brazilian smallholder farm. Credit: Ministério do Desenvolvimento Social/Rafael Zart

# 4

## Providing Evidence

More research can convince producers, consumers, and policymakers that biodiversity can combat malnutrition. Here we discuss ways to generate substantial evidence with an emphasis on research partnerships.

4.0 How can we maximize research opportunities?

4.1 Identifying Neglected and Underutilized Species

4.2 Case Study: Reviving Bambara groundnut and indigenous leafy vegetables in Kenya

4.3 Focus on: Research partnerships

4.4 Market surveys and prioritisation



## 4.0 How can we maximize research opportunities?

To seriously enhance biodiversity mainstreaming for food and nutrition, significant knowledge and evidence gaps and how to frame and communicate them remain. These must be addressed through greater commitment to research. Among these are the need for more food composition data (as data currently exists for only a fraction of the world's edible biodiversity), dietary intake data and better research to understand the complex pathways that link biodiversity to nutrition and health.

Addressing these gaps will take time and money and advocacy and lobbying is important. Some priority actions for improving research include:

- Support research on nutrient contents of foods from different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species including from forest-derived foods and aquatic genetic resources.
- Collaborate with regional and international bodies in the funding and organization of regional courses on the development of food composition databases on biodiversity.
- Support research on the sustainable use of local cultivars/breeds and wild biodiversity for food and nutrition and public health in order to identify ways of promoting valuable food varieties or wild foods to consumers.
- Support research related to nutrition-sensitive production systems on the identification, characterization, conservation, development and use of varieties and breeds including of crops, livestock, forest-derived foods and aquatic genetic resources potentially useful in addressing existing malnutrition issues.
- Identify opportunities to improve the seed production system of plant varieties with suitable nutrient profiles for their use into large-scale production.



Species presented at the Diversity Fair in Gambola, Sri Lanka. Credit: Biodiversity International/R. Vermooy

Source: FAO (2016) [Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition](#)

## 4.1 Identifying Neglected and Underutilized Species

*Identifying and re-valuing underutilized local species maintains biodiversity on-farm and increases local diet diversity.*

Many local species have not achieved the level of attention in terms of research that we know from familiar crops such as maize and rice. As a result, often no information is available on the nutrient content of the species or on their contribution to the ecosystem in which they are traditionally grown. Without sufficient awareness of the consequences, such species are often eradicated in cultivation management when new cash crops are introduced. This can have a significant impact on local diets since locally existing and adapted species often contain a surprisingly high level of beneficial micro-nutrients with important contributions to traditional diets. Besides the lack of knowledge, native species are also often perceived as poor man's food or foods eaten in times of famine, and thus rather eaten out of need than out of pleasure. This stigma contributes to their depreciation.

Enlightening people about the nutrient benefits of species has proven an effective way to convince people to maintain growing and eating native species. Therefore, a large component of the BFN project was devoted to producing evidence of the contribution of native species to local ecology and diets and secondly, to make this evidence available to society. This includes to identify neglected and underutilized species that can contribute to local diets particularly in disadvantaged communities

Documenting and presenting the findings back to the communities can allow them to incorporate the information into their food systems (e.g. by improving value chains and diets) and thereby optimizing local use.

Thus far, the BFN Project has provided evidence on food composition and cultivation strategies for 195 targeted species for 195 neglected and underutilised species. To select the most promising species for further research the BFN project used the Sustainability Index presented below.

ENVIRONMENTAL	ECONOMIC	FOOD & NUTRITIONAL
<b>1. Conservation</b> <ul style="list-style-type: none"> <li>ex situ, in situ/on farm</li> <li>ex situ, in situ/on farm</li> </ul>	<b>1. Collection/production continuity</b> <ul style="list-style-type: none"> <li>collection/production constraints</li> <li>distance from collection/production site</li> <li>collection/production continuity</li> </ul>	<b>1. Iron content</b>
<b>2. Cultivation</b> <ul style="list-style-type: none"> <li>ease of production</li> <li>growth rate</li> <li>high adaptability</li> <li>vegetation period</li> <li>annual growth</li> </ul>	<b>2. Market characteristics</b> <ul style="list-style-type: none"> <li>recognizable</li> <li>easily packed</li> <li>suitable for storage</li> </ul>	<b>2. Calcium content</b>
<b>3. Disappearance/threat</b> <ul style="list-style-type: none"> <li>habitat destruction and fragmentation</li> <li>pollution, exploitation</li> <li>destructive harvesting practices</li> </ul>	<b>3. Processing industry available</b>	<b>3. Fibre ratio</b>
<b>4. Widespread distribution</b>	<b>4. Marketing opportunities of collected/produced species</b>	<b>4. Antioxidant ratio</b>
<b>5. Habitat preference</b>	<b>5. Distance from market (km)</b>	<b>5. Vitamin A</b>

*The sustainability index developed by BFN Turkey takes into account the environmental, economic and nutritional characteristics of the species to select the most suitable species for further marketing and use.*

Within countries, there will usually be one of more agrobiodiversity nutritional data holders, which can serve as platforms for hosting the nutrition information collected for local neglected and underutilised species. Developing collaborative agreements with these is useful for information access, sharing and exchange. Global data holders such as FAO/INFOODS are effective channels to the broader agriculture and food community ([see section 4.4](#)).



## 4.2 Market Surveys and Prioritisation, Turkey

*A regionally-specific survey and selection process informed BFN Turkey's prioritization of wild edible plant species.*

Wild edible plants are still consumed in many Turkish households and can be found in local markets, however, fragmented knowledge of their uses and attributes means that their presence in the marketplace is limited.

Researchers for BFN Turkey conducted a series of surveys in the geographically diverse Aegean, Mediterranean, and Black Sea pilot sites in order to determine which species had the greatest market potential per region. Initial market observation determined the prevalence and varieties of wild plants already being sold (presented in the table). Next, a list of the most promising species per region was compiled, and then matched with food composition data. 2,334 surveys targeted market operators and consumers, asking them to rank the selected species according to attributes including health benefits, culinary use, and marketability. Subsequent analysis led to the selection of three target species (golden thistle, foxtail lily, einkorn wheat) as the most favourable and feasible for further cultivation and integration into the market.

Evidence collected on targeted species has consolidated traditional knowledge about foraging, cultivation, harvesting, seasonality and preparation into a comprehensive inventory. Paired with nutrition and market feasibility data, this information has been used to approach members of the private sector, such as grocery store suppliers, to create new opportunities for cultivating and selling more underutilized species.

Pilot Site	English name	Scientific name	Turkish name	Part used	Preparation and use
MEDITERRANEAN REGION	Rush skeletonweed	<i>Chondrilla juncea</i>	Karakavuk	Leaves	Salad, omelette
	Black bryony	<i>Dioscorea communis</i>	Dolambaç	Young shoots	Roasted, flour
	Foxtail lily	<i>Eriogonum spectabile</i>	Çiğir	Young leaves	Roasted with yogurt, flour, omelette
	Watercress	<i>Nasturtium officinale</i>	Sütesesi	Leaves	Salads, raw
	N/A	<i>Scorzonera cana</i>	Tekesakal	Leaves	Salads, raw
	Purple saxifrage	<i>Trogonopsis pinnatifida</i>	Helinva	Leaves	Roasted with yogurt, salads
	Berberis	<i>Berberis crataegina</i>	Karamuk	Fruits/seeds	Raw
	Caper bush	<i>Capparis spinosa</i>	Kobere	Fruits/seeds	Pickled
	Crab apple	<i>Eriolobus trilobatus</i>	Arelmas	Fruits/seeds	Raw
	Syrian juniper	<i>Juniperus drupacea</i>	EneK/andiz	Fruits/seeds	Molasses
	N/A	<i>Pyrus senkensis</i>	Zingit	Fruits/seeds	Raw
	White lupin	<i>Lupinus albus</i>	Termiye	Fruits/seeds	Used for pickling food
	Elm-leaved sumach	<i>Rhus coriaria</i>	Sumak	Fruits/seeds	Spice
	N/A	<i>Gypsophila arrostii</i>	Çöven	Roots	Medicinal and food
N/A	<i>Ferula trichocarpa</i>	Kuzukemirdi	Fruits/seeds, leaves	Medicinal and food	
N/A	<i>Ferula elaeochrysis</i>	Çall	Roots	Medicinal	
AEGEAN REGION	Callamus or Sweet flag	<i>Acorus calamus</i>	Eğir otu	Rhizomes	Medicinal
	Tumbleweed	<i>Gundelia tournefortii</i>	Kenger	Root collar	Raw
	Taro, Elephant ear	<i>Colocasia esculenta</i>	Gölevez	Corm	Fried, roasted
	Fennel	<i>Foeniculum vulgare</i>	Ricene, Atapaç	Leaves	Flour, roasted, pilaf, seasoning
	Chicory	<i>Cichorium intybus</i>	Hindibo	Leaves and roots	Flour, salad, omelette
	N/A	<i>Oxypetalum hispidus</i>	Kaymaçık	Young basal leaves	Flour, roasted, omelette
	Sea Beet	<i>Beta maritima</i>	Kıy pancarı	Young basal leaves	Stuffed, pancake, pie, raw with salad, roasted
	Golden thistle	<i>Scalymus hispanicus</i>	Sevketi bostan	Roots and young leaves	Stew, salad, soup, omelette, flour
	Saffron milk cap	<i>Lectonius deliciosus</i>	Çintar, Kanlıca	Cap and stem	Fried, grilled, roasted, pie, soup, omelette
	Cowpea	<i>Vigna unguiculata</i>	Börülice	Grains and fresh legumes	Salad, roasted, flour
	Crown Daisy	<i>Glebionis coronaria</i>	Allagömeç	Young sprouts	Stew, salad, roasted, flour, omelette
	Rock samphire	<i>Critillum maritimum</i>	Deniz teresi, Kaya koruğu	Young plant and leaves	Stew, pickle, salad, omelette
	Glasswort or Samphire	<i>Spilcomia omerici</i>	Deniz börülçesi	Young plant	Raw, stew, salad
	Allianders, Hoise parsley	<i>Smyrnium olusatrum</i>	Deñi kereviz	Shoots and leaves	Stew, pie, salad, roasted, flour, fried
Sorrel	<i>Rumex acetosella</i>	Kuzukulağı	Leaves	Roasted, stuffed, pie, soup, flour, salad	
Wild Radish	<i>Raphanus raphanistrum</i>	Eşek turpu	Shoots and leaves	Roasted, salad, flour, omelette, stew, soup	
BLACK SEA REGION	Starflower	<i>Borago officinalis</i>	Hodan	Leaves	Omelette
	Bladder Campion	<i>Silene vulgaris</i>	Eolbücü	Leaves	Roasted
	Star-of-Bethlehem	<i>Oryzihogonum umbellatum</i>	Sünbala	Leaves and bulbs	Omelette, roasted
	Einkorn wheat	<i>Triticum monococcum</i>	Siyez	Seeds	Soup, flour, pilaf
	Shepherd's purse	<i>Capsella bursa-pastoris</i>	Çoban çantası	Aerial part, leaves	Roasted
	Ground elder	<i>Aegopodium podagraria</i>	Koçi ayacı	Young leaves	Omelette, roasted
	Curly dock, yellow dock	<i>Rumex crispus</i> L.	Labada	Leaves	Omelette, roasted
	Corky-fruited water-dropwort	<i>Oenanthe pimpinelloides</i>	Deñi maydanoz	Leaves	Raw, salad, flour
	Catbriers, greenbriers	<i>Smilax excelsa</i>	Dikenucu	Young shoots	Salad, omelette, raw
	Lamb's quarters	<i>Chenopodium album</i>	Ak sirkon	Leaves and young shoots	Omelette, roasted
Indian knotgrass	<i>Polygonum cognatum</i>	Mademak	Leaves	Raw, salad, flour	

List of priority species identified in the three pilot sites used for food and medicinal purposes

## 4.3 Reviving Bambara groundnut and indigenous leafy vegetables in Kenya

*Through a research partnership in Kenya, farmers have been made aware of the health benefits and cultivation opportunities of indigenous crops that can contribute to local income generation.*

In Western Kenya, traditional delicacies such as [bambara groundnut \(\*Vigna subterranea\*\)](#) and leafy vegetables such spider plant (*Cleome gynandra*) are still consumed, but generally only during celebrations and cultural or religious festivals. Nevertheless, pockets of farmers still value and grow these traditional African crops, mostly for home consumption. In Busia County, small-scale entrepreneurs— mostly women and youth- belonging to community-based the organization Sustainable Income and Generating Investment (SINGI) have expressed ambitions to grow their small enterprises using indigenous crops and have identified the lack of evidence of the nutritional value of indigenous crops as one of the main barriers to their successful marketing and to the lifting of their stigma as “food for the poor”.

The Kenya Agricultural and Livestock Research Organization (KALRO), in collaboration with BFN, provides nutritional information for those species with the most promising market potential; in turn SINGI creates awareness of these crops through garden demonstration plots that display various ecological methods (e.g. intercropping) and improved gardening technologies (e.g. mandala, multi-storey and keyhole gardens) that integrate indigenous food with medicinal crops. Among the most promising species is Bambara groundnut, a very nutritious and resilient legume similar to the peanut, which can grow in dry areas and poor soils, with little or no need for external inputs. William Buluma, the co-founder of SINGI, says *“We are focusing on growing Bambara nut because recent studies show that it is medicine for our bodies and can prevent disease”*.

Source: [BFN Kenya](#), for further information including the role of FAO, see [here](#).

As the demonstration garden has aesthetic value and provides healthy yields, others in the community are adopting similar practices and are beginning to reintroduce indigenous crops in their gardens and on their plates. The biggest hurdle now is creating markets and the BFN project is exploring the possibility of linking smallholders to institutional markets such as schools and health clinics, promoting these crops in school and hospital meals as part of healthy and balanced diets.



Demonstration of a mandala garden. Credit: BFN/T. Borelli



## 4.4 Developing research partnerships for nutritional analysis

*In collaboration with research partners, new evidence was gathered on the nutrient content of a long list of indigenous edible species.*

As part of the BFN Project, an alliance of universities and government agencies are undertaking comprehensive nutritional analysis of over 195 species and compiling national information systems to make available and communicate this knowledge to relevant sectors and decision-makers. At the same time, the project is contributing to the global [FAO/INFOODS Food Composition Database for Biodiversity](#) (International Network of Food Data Systems of the Food and Agricultural Organization). Brazil alone has collected nutrition data for over 70 underutilized species, which were originally prioritized by the national [Plants for the Future](#) initiative.

Food composition data and recipes generated by the BFN Project in Brazil is hosted in the Biodiversity Nutritional Composition Database as part of the [Information System on Brazilian Biodiversity](#) (SiBBBr) created by the Ministry of Science, Technology and Innovation to gather information on Brazilian biodiversity and ecosystems currently scattered across databases in various government agencies and other sources.

This information has helped strengthen the inclusion of nutritious species in public policies and programmes focused on food security and nutrition. This has included public procurement and school feeding, such as with Brazil's 2018 Ordinance 284 (see Section 5.3 for the country context).

Source: [BFN Brazil](#)



Brazilian School Feeding. Credit: Ubitajara Machado

# Key resources



## FAO - NUTRITION AND BIODIVERSITY WEBPAGE OF INFOODS

The FAO/INFOODS website contains a large number of freely-available publications and other resources highlighting the important nutritional role of biodiversity including food composition tables for a variety of species and countries.



## FAO - DESIGNING NUTRITION-SENSITIVE AGRICULTURAL INVESTMENTS, CHECKLIST AND GUIDANCE FOR PROGRAMME FORMULATION (2015)

This document present 10 Key Recommendations for Improving Nutrition through Agriculture and serve as a tool to guide programme planners to apply these recommendation in the design of agricultural investments and programmes. The checklist provide questions and tips, which can guide practitioners in finding the most locally appropriate solutions to complex challenges.



## FAO - IMPROVING NUTRITION THROUGH HOME GARDENS

This website is no longer maintained but it still serves as a useful repository for resources related to home gardening, Home gardens are found in many parts of the world and offer great potential for improving household food security and alleviating micronutrient deficiencies through the introduction of nutritious food biodiversity.

See also FAO's Food-Based Dietary Guidelines: <http://www.fao.org/nutrition/education/food-based-dietary-guidelines/en/>



## BIOVERSITY INTERNATIONAL - DIET DIVERSITY FOR NUTRITION AND HEALTH WEB PAGE

Biodiversity International researches how agricultural and tree biodiversity can be better used within local food production systems to improve access to nutrient rich food sources and increase dietary diversity, with a particular focus on women of reproductive age and children under two. They work with partners to mainstream locally available food biodiversity for sustainable food systems and healthy diets into national programmes and policies on food and nutrition security. More information and resources can be found here.



## BFN PROJECT WEBSITE - BIODIVERSITY FOR FOOD AND NUTRITION

Documents the activities of 4 countries - Brazil, Kenya, Turkey and Sri Lanka - at the forefront of mainstreaming biodiversity for improved nutrition. Also contains case studies illustrating what other countries are doing to promote and mainstreaming biodiversity to address malnutrition.



Sri Lankan rice diversity. Credit: Bioversity International/D. Hunter

# 5

## Influencing Policy

Policy that supports sustainable conservation and use of biodiversity is critical. However, it can be a major challenge to bring together many different sectors and create effective, long-lasting actions. This section outlines several productive strategies for targeting receptive policies.

**5.0 What Entry Points Ensure Mainstreaming Support?**

**5.1 Focus on: National Biodiversity Strategy and Action Plans (NBSAPs)**

**5.2 Case Study: Endorsing Kenya's first Biodiversity Conservation Policy**

**5.3 Case Study: Building off a Pre-existing Policy Framework in Brazil**



## 5.0 What Entry Points Ensure Mainstreaming Support?

Nutrition is often referred to as “everyone’s problem, but no one’s responsibility.” There is no single sector that can solve malnutrition. Nutrition is everyone’s responsibility. This makes it a challenge when it comes to mainstreaming biodiversity for improved nutrition outcomes. There are many sectors, as well as other stakeholders including civil society and the private sector, which can be targeted, as there are policies, programmes and plans (see table below).

This means it is important that you understand the nutrition policy landscape well in your country so that you can be strategic in determining which sectors to work with, and which policies and programmes to target when mainstreaming biodiversity.

What we do know is that biodiversity has much to offer when it comes to improving diets and healthy eating and contributing to better nutrition outcomes. In addition to targeting food security and nutrition policies or specific sectoral policies, a country’s National Biodiversity Strategy and Action Plan (NBSAP) can be a useful tool to promote the importance of biodiversity for food and nutrition and the need for its mainstreaming into relevant production and service sectors.

This section’s case studies highlight how BFN project countries decided which sectors, policies and programmes to work with when it comes to mainstreaming biodiversity for food and nutrition.

LEVEL	PLANNING/POLICY TARGET
<b>National</b>	
	National Biodiversity Strategy and Action Plan (NBSAP); National Dietary Guidelines; National Development Plans; National Poverty Reduction Strategies; Multi-sectoral Nutrition Strategies and Policies; Food and Nutritional Security Policies and Councils; Scaling up Nutrition (SUN);
<b>Sectoral</b>	
<b>Sectoral Ministries</b>	National Agricultural/Forestry/Fisheries Plans and Policies; Health Sector Policies and Strategies; Environmental Sector Policies; Education Sector Strategy and Policies; School Meals Plans and Programs; Public Food Procurement Plans;
<b>Private Sector</b>	Food industry, especially those focused on sustainable practices and products with organic/fair trade certifications; Private and Public universities with courses on nutrition; National Associations of Professionals – Nutritionists; Dietitians; Agronomists etc.
<b>Sub-national</b>	
<b>Local Government</b>	County-level policies; District development plans; Municipality Policies; Urban Food Policies; Regional Food and Nutrition Security Councils; Decentralised sector policies;
<b>Private Sector</b>	Farmers markets; food fairs and cultural events; Local chefs; Private schools; School and home gardens programs; National Food Promotion Boards

Possible entry points for mainstreaming biodiversity for food and nutrition at the national, sectoral and sub-national levels.

**Note:** Adapted from *Ten steps to biodiversity mainstreaming* (p. 3), by Abisha Mapendembe, Dilys Roe, Steve Bass, 2013: IIED.

## 5.1 Using National Biodiversity Strategy and Action Plans (NBSAPs)

*The NBSAP revision process represents an excellent example of how to facilitate mainstreaming into an important national policy instrument, with an example from Brazil.*

National Biodiversity Strategy and Action Plans (NBSAPs) are an excellent entry point for mainstreaming biodiversity for food and nutrition. All countries who are signatories to the Convention on Biological Diversity (CBD) are required to develop a NBSAP to mobilize resources and activities to achieve their commitments to the Strategic Plan for the CBD and associated Aichi Biodiversity Targets.

During the latest NBSAP revision process in Brazil a broad policy consultation, spearheaded by the Ministry of the Environment, was carried out to reach collective agreement on the approach and definition of the new National Biodiversity Targets for 2011-2020.

The process, named 'Dialogues on Biodiversity' involved 12 national events with the private sector, different levels of government, academia, civil society, local communities and indigenous peoples to discuss the National Biodiversity Targets. More than 280 institutions and 400 people participated in the process through meetings held between April 2011 and May 2012. A virtual public consultation on the National Biodiversity Targets was also conducted, expanding further the participation of the civil society. During the revision process the "limited appreciation of the use of biodiversity for food and nutrition" was included as one of the main causes for biodiversity loss in the country and a number of factors contributing to this were captured.

Source: Camila Oliveira, [BFN Brazil](#)

Later, during the process for the construction of the Governmental Action plan, also as part of the revision of the NBSAP, 32 institutions of the federal government identified 23 priority actions to reverse biodiversity loss and help achieve the National Biodiversity Targets. Since the meeting, more that USD\$ 60 million were pledged to protect biodiversity for food and nutrition.

According to Brazil's experience, the Ministry of Planning played a crucial role in facilitating the process and in translating it into appropriate targets and indicators with resources and budgets to support [implementation of actions](#).



NBSAP indicators meeting in Brazil. Credit: BFN Brazil/C. Oliveira



## 5.2 Endorsing Kenya's first Biodiversity Conservation Policy

*Busia County's 2018 Biodiversity Policy sets an example for future cross-sectoral policies. Here, the BFN Kenya Project Coordinator describes the county-level policy environment and how it offered a mainstreaming opportunity.*

Decentralization of government in Kenya to the county level—a recent phenomenon enacted under the new constitution in 2010—provided an opportunity for the BFN project to leverage the work it was already doing on biodiversity and nutrition. Decentralization means that most decisions relating to agriculture, health, education, and environment are decided and implemented at the county level, the exception being matters of policy which are a national function. However, when deemed necessary policies that are believed important to better serve the interests of individual counties can be formulated at the county level with the provision that they do not in any way conflict with national sectoral policies.

This political change was seen as the entry point for better mainstreaming biodiversity into sectoral programmes and projects by engaging the county governments' ministries of education, agriculture, health and environment to develop a biodiversity policy for Busia, a county which still has significant diet-related malnutrition problems. This came out of a sensitization process involving respective county ministers on the need to conserve and to utilize biodiversity for improved nutrition and human welfare through mainstreaming into projects and programmes. The process involved formation of a multi-sectoral biodiversity policy platform comprising the directors of education, health, environment and agriculture. The process was spearheaded by the County Ministry of Agriculture which had set itself the goal of putting a biodiversity policy in place as its 5-year performance target.

Source: Victor Wasike, [BFN Kenya](#)

This policy process has helped the BFN project to better mainstream indigenous vegetables into schools meals by better linking farmer groups to institutional markets (schools, hospitals, hotels and community clinics) to ensure the supply of highly nutritious indigenous vegetables to improve nutritional outcomes. This process is also supported by provision of scientific nutritional analysis data generated by the project and awareness-raising and behavioral change activities on the value of indigenous biodiversity in improving nutritional outcomes in Busia County.

An overview report on the policy can be found [here](#)



Kenya's first lady visits the BFN stand at the Scaling Up Nutrition event in 2015. Credit: BFN Kenya

## 5.3 Building off a Pre-existing Policy Framework in Brazil

*In Brazil, biodiversity for food and nutrition was mainstreamed into already existing cross-sectoral platforms, with strategic targeting of public policies.*

Under the Zero Hunger Strategy Brazil had already established important cross-sectoral policy collaborations with a focus on food security and nutrition. These provided an excellent entry point for mainstreaming biodiversity, especially considering that a guideline of the strategy was to promote greater integration and collaboration among relevant actors.

The Ministry of the Environment took the initial step by organizing a meeting to discuss target sites and species. This meeting gathered future BFN partners and representatives of the ministries of the environment, agriculture, social development, agrarian development, education and health. These Federal institutions were all linked to initiatives that aim to increase access to food for the poorest Brazilians, improving the eating habits and nutritional status of the population, and promoting sustainable development.

Because relevant sectors such as environment, education, agriculture and health showed poor horizontal policy and programme coherence, these initiatives were extended to the national level. Brazil's 2011 anti-poverty campaign (Plano Brasil sem Miséria) was released with the primary objective of expanding access to the initiatives under the Zero Hunger Strategy and to strengthen the public policies aimed at eradicating extreme poverty. The main policies within the Strategy are: the Family Fund (Bolsa Família), the Food Acquisition Program (PAA) and the National School Feeding Program (PNAE). The last two programmes established partnerships with the BFN Project in Brazil and now incorporate considerations on biodiversity conservation and its sustainable use into their programme of work. Other related policies are the National Food and Nutrition Policy (PNAN), Minimum Price Guarantee Policy for Sociobiodiversity Products (PGPM-Bio), National Plan

for the Promotion of Sociobiodiversity Value Chains (PNPSB) and Development of Organic Agriculture (Pro-Orgânico). The Ministry of the Environment also identified an important connection to Brazil's multi-year budget planning, which is organized by the Ministry of Planning and involves the participation of all agencies and ministries of the federal government. One thematic programme covers biodiversity and has gathered interested ministries who created actions and initiatives and drew up a budget, creating an opportunity for cross-sectoral mainstreaming of biodiversity for food and nutrition.

Important BFN contributions were to the National Conference on Food and Nutrition Security (CNSAN 2015), the 2016 publication of [PLANAPO](#), and the updated Dietary Guidelines.



School feeding in Brazil. Credit: Ministério do Desenvolvimento Social/U. Machado

Source: Daniela Moura de Oliveira Beltrame, [BFN Brazil](#)



# Key resources



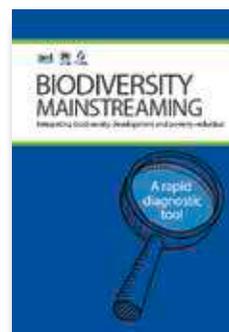
## IIED - PUTTING BIODIVERSITY AT THE CENTRE OF DEVELOPMENT: A CHECKLIST FOR REVIEWING THE MAINSTREAMING POTENTIAL OF A COUNTRY'S NBSAP

The Convention on Biological Diversity (CBD) recommends that the second generation of National Biodiversity Strategy and Action Plans (NBSAPs) should be used as instruments for mainstreaming biodiversity into key development policies, plans and processes. As countries like Brazil and Sri Lanka have demonstrated already, this can be for the purpose of mainstreaming biodiversity for food and nutrition. But how do you know that your NBSAP will be fit for this purpose? Does it address key food security and malnutrition issues – those that create potential for food biodiversity? This checklist, developed by IIED, provides a simple structure for reviewing a country's NBSAP and the process by which it is being developed to make sure it contains the essential ingredients for biodiversity mainstreaming.



## CBD TRAINING MODULE - MAINSTREAMING BIODIVERSITY INTO NATIONAL SECTORAL AND CROSS-SECTORAL STRATEGIES, POLICES, PLANS AND PROGRAMS

This module provides an overview of mainstreaming and its importance for the implementation of the Convention on Biological Diversity, and gives practical guidance on how to approach this task. The module explains what mainstreaming is, and gives examples of what it means to mainstream biodiversity into sectoral and cross-sectoral strategies.



## IIED - A RAPID DIAGNOSTIC TOOL: BIODIVERSITY MAINSTREAMING, INTEGRATING BIODIVERSITY, DEVELOPMENT AND POVERTY REDUCTION

For biodiversity mainstreaming to be effective, understanding the political context and development objectives are as important as making the case for biodiversity. This rapid diagnostic tool developed by IIED is intended to address this issue, helping policy makers — and other stakeholders — understand the extent to which biodiversity and development objectives are already integrated at the national level and the obstacles and constraints that need to be overcome to promote further, and more effective, integration.



## IIED - MAINSTREAMING BIODIVERSITY AND DEVELOPMENT: TIPS AND TASKS FROM AFRICAN EXPERIENCE

If you want to mainstream biodiversity concerns into development policy and planning or to highlight how biodiversity contributes to nutrition and social development or are involved in developing or revising an NBSAP then this IIED guide will be of use to you. It even includes examples of mainstreaming biodiversity for food and nutrition from BFN's very own Camila Oliveira from the Ministry of Environment, Brazil.



## BIOVERSITY INTERNATIONAL - MAINSTREAMING AGROBIODIVERSITY IN SUSTAINABLE FOOD SYSTEMS

This downloadable book summarizes the most recent evidence on how to use agrobiodiversity to provide nutritious foods through harnessing natural processes.

# 6

## Raising Awareness

Without widespread recognition of biodiversity's benefits for food and nutrition, it is unlikely that interventions will achieve long-term uptake. Consider which forms of awareness-raising can reach important entry points and convince those who may not have otherwise accepted mainstreaming biodiversity.

6.0 What are effective ways of creating awareness to enhance mainstreaming?

6.1 Case Study: Alaçatı Wild Herb Festival in Turkey

6.2 Case Study: Hela Bojun - True Sri Lankan taste



## 6.0 What are effective ways of creating awareness to enhance mainstreaming?

Communicating the multiple benefits of biodiversity for food and nutrition is paramount to mainstreaming. With so much interest, and growing, in many aspects of our food – the diversity, health, sustainability, origins, tourism – there has never been a better time to promote biodiversity to heighten and widen these aspects. It is not always necessary to create something new. With so many ongoing activities there are many entry points for biodiversity – food fairs, food tours, chef collaborations, national and regional campaigns to name a few. Below are additional suggestions for creating awareness.

- Develop a communication strategy that supports the nutrition and health attributes of biodiversity for food and nutrition and possible uses in everyday meals.
- Organize special events such as fairs, festivals or a national ‘Traditional Biodiversity Food Day’ and promote awards and competition for recipes with biodiversity foods.
- Target the development and revision of national dietary guidelines to include more on nutritious biodiversity ([example from Brazil](#)).
- Organize initiatives such as policy advocacy workshops, round table discussions and stakeholder meetings to increase awareness of the public sector and of decision makers.
- Organize national and regional workshops that target the promotion of biodiversity for food and agriculture.
- Expand existing curriculum guides for health and nutrition education in primary and secondary schools to include the teaching of biodiversity for food and agriculture.

- Form alliances with high profile chefs and restaurateurs to promote biodiversity for food and nutrition.
- Organize for students to see and handle biodiverse foods; arrange practical cooking and tasting sessions for children and their parents to promote their integration into food preparation and eating patterns.
- Circulate research findings and involve the scientific communities of nutrition, agriculture, health and environment through conferences, seminars, websites, scientific articles and guidance documents.



Seed exchange event in Brazil. Credit: BFN Brazil

Source: FAO, [Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition](#)

## 6.1 Alaçatı Wild Herb Festival in Turkey

*Alacati Wild Herb Festival is a widely popular and well-publicized annual event that acts as a platform for sharing knowledge about wild biodiversity and Turkish culture.*

The Western region of Turkey is characterized by the lowest prevalence of stunting, underweight, wasting and diet-related illnesses. A significant factor for this is the regional diet of local vegetables, herbs, and fruit, which includes a wide variety of wild edible plants. This biodiversity has a long cultural tradition of collection and consumption, and is on full display each year in stalls at the [Alaçatı Herb Festival](#), a four-day event devoted entirely to the celebration of wild edibles.

Rapidly becoming a major national happening, the festival attracts tourists, food gourmets, TV food channels and chefs from all over Turkey eager to taste the enormous variety of böreks (home-baked pastries that can be filled with a variety of greens), dolma (wrapped in grape, herb, and vegetable leaves) and jams made from fruits and flowers and to enjoy cooking workshops, food tastings, music concerts and dancing. The BFN Turkey team has successfully partnered with Alaçatı festival organizers to ensure that key BFN messages and products are disseminated to the thousands of attendees.

Awareness-raising material and recipe books produced by BFN Turkey for the occasion help visitors appreciate underutilized wild species and learn more about their nutritional value. The festival has opened up the market for wild edibles, an opportunity which has been mostly taken up by the enterprising women of Alaçatı who produce and sell local and traditional products/foods and have organized as a group.

Source: [BFN Turkey](#)



Fruit jams sold at one of the many stalls in Alaçatı. Credit: BFN/S. Landersz





## 6.2 Hela Bojun - True Sri Lankan taste

*This Sri Lankan business demonstrates economic potential and women empowerment from local indigenous produce.*

Sri Lankans are turning away from fast food chains and choosing “Hela Bojun- True Sri Lankan taste”, a group of 18 BFN-supported market outlets that sell freshly-prepared local foods and empower rural women. The female employees earn a living while conserving and protecting biodiversity and making healthy food available at competitive prices.

Working at Hela bojun, women can earn between \$600-800 a month, enough to become the main breadwinners in the family. Rotas allow everyone to earn much needed money for children educations and to manage the family household. Women who enroll in the programme are trained by the Women Farmers Extension Program of the Department of Agriculture on the nutritional value of traditional foods, food preparation, food safety, and other business practices.

The Hela Bojun outlets in Colombo and Peradeniya have become so popular they are highlighted by [Trip Advisor](#), creating additional market demand for traditional foods such as honey, jaggery, treacle, bananas and organic products and boosting production for smallholders.

The outlets also promote underutilized crops identified by BFN Sri Lanka, including medicinal plants such as the water lily *Nymphaea pubescens* (olu in Sinhala) used in Ayurvedic medicine and a variety of pulses, such as cowpea, black gram and green gram, as well as traditional rice varieties. In addition, BFN Sri Lanka has collected [nutritional information](#) on the foods sold at the outlets, which is further passed on to the costumers.

Source: [BFN Sri Lanka](#)



Tender jackfruit cutlet being served in Hela bojun. Credit: Courtesy of: Malaka Rodrigo. Window to Nature, World Press

# 7

## Summing Up

Finally, how do all of these elements come together? We discuss evaluation of the mainstreaming process before concluding with a checklist of topics covered.

7.1 How can we keep track of the mainstreaming process?

7.2 Conclusion

Additional Resources



## 7.0 How can we keep track of the mainstreaming process?

A proper monitoring and evaluation system helps us keep track of, and guide, how mainstreaming is implemented. This should focus on important elements including the approach, the earlier identified enabling factors, and any desired nutrition and biodiversity outcomes. Stakeholders involved in the mainstreaming process should identify a **SMART\*** set of indicators that will help monitor progress towards the desired outcomes previously identified. As an example these might include indicators such as:

- Level of country's funding/resource mobilization to support agricultural biodiversity for improving diets/nutrition in research and interventions.
- Consideration of agricultural biodiversity in a country's National Dietary Guidelines.
- Consideration of agricultural biodiversity for diets/nutrition in relevant public policies.
- Extent of agricultural biodiversity mainstreaming for healthy diets and nutrition in relevant national instruments including NBSAPs or multi-sectoral nutrition action plans and strategies.
- Relevant sectoral policies demonstrate nutrition-sensitivity using agricultural biodiversity for healthy diets and nutrition.
- Level of diversification in public food procurement and school feeding programmes.
- Monitoring of the number of scientific journal articles/literature that study the composition or consumption of biodiverse foods. E.g. categorised 1) below species level according to their biological taxonomy, i.e. foods at subspecies/variety/cultivar/breed level; 2) as wild foods, i.e. gathered, collected, caught in the wild; and 3) as underutilized foods.

The lessons learnt and good practices identified through the monitoring and evaluation process can help stimulate a process of continuous improvement and provide valuable experience to share with others.

**[See also Bioversity International's 2017 Annual Report](#)**

### \* SMART Criteria

S	P	E	C	I	F	I	C												
M	E	A	S	U	R	A	B	L	E										
A	C	H	I	E	V	A	B	L	E										
R	E	L	E	V	A	N	T												
T	I	M	E	-	B	O	U	N	D										



Food diversity in Sri Lanka. Credit: S.Landersz

## 7.1 Conclusion

We hope that this toolkit has been of use. It is a challenge to represent the full scope of activity and engagement needed to successfully implement biodiversity mainstreaming, so there are doubtless unmentioned possibilities waiting to be explored. However, the aim of this guide is to offer inspiration through general focus areas and key case studies, primarily from the BFN Project. Readers are encouraged to follow the resource links and visit the [BFN website](#) for further information, as well as to send comments/suggestions or share other examples of BFN mainstreaming with [t.borelli@cgiar.org](mailto:t.borelli@cgiar.org).

### Checklist

After this toolkit you should have a greater understanding of:

- The relationship between agrobiodiversity and diets
- The importance of context in determining mainstreaming action
- How to demonstrate to others the value of mainstreaming biodiversity for food and nutrition
- Challenges and ways to overcome them
- Achievable nutrition and biodiversity outcomes
- Which sectors and policies to target
- How research can be strengthened or improved
- Which programmes and activities to prioritise
- How to maximize awareness for different audiences
- Steps to best create an enabling environment
- How to assess mainstreaming implementation



Species presented at Busia food fair. Credit: BFN/T. Borelli



Kenyan Food Fair. Credit: John Ndungu



Brazilian School Feeding. Credit: Sergio Amaral



Sri Lankan Food Festival. Credit: Bioversity International/D. Hunter

# Additional resources

## Publications

- [Are Neglected Plants the Food for the Future?](#)
- [Global School Feeding Sourcebook: Lessons from 14 Countries](#)
- [Sustaining Healthy Diets: The Role of Capture Fisheries and Aquaculture for Improving Nutrition in the Post-2015 Era](#)
- [Understanding the Roles of Forests and Tree-based Systems in Food Provision](#)

## Videos

BFN Official Youtube Channel:

- [The Alaçati Herb Festival: promoting traditional foods in Turkey](#)
- [2nd International Biodiversity and Nutrition Conference](#)
- [Why conserving agrobiodiversity matters in Sri Lanka](#)

## Useful links

- [Biodiversity for Food and Nutrition website](#)
- [Helen Keller International's Enhanced Homestead Food Production programs](#)

## Fact sheets

- [Biodiversity for Food and Nutrition Initiative: Harnessing agricultural biodiversity to reduce hunger and malnutrition](#)
- [Improving nutrition with the Thursday Island Donut Garden](#)
- [Feasibility study on increasing the consumption of nutritionally-rich leafy vegetables by indigenous communities in Samoa, Solomon Islands and Northern Australia](#)

# In partnership with

## Brazil



## Kenya



## Sri Lanka



## Turkey





