

# SUSTAINABLE AND RESILIENT INDIGENOUS PEOPLES' FOOD SYSTEMS FOR IMPROVED NUTRITION

2022



Indigenous Peoples' food systems (IPFS) have traditionally provided healthy diets in diverse environments around the world. However, historical and ongoing disruptions of IPFS have caused profound changes in dietary patterns of Indigenous Peoples. Continued loss of food biodiversity, combined with increasing consumption of processed foods, among other factors, lead to various forms of malnutrition. Indigenous women disproportionately bear the burden of malnutrition.

This toolbox provides guidelines for designing, implementing, monitoring, and supervising projects to improve the diets and nutrition of Indigenous Peoples, with emphasis on leveraging local food biodiversity in IPFS. The focus on biodiversity for food and nutrition is supported by research studies and aligned with Indigenous Peoples' aspirations to promote biodiversity of local foods, which is interlinked with traditional knowledge, practices, languages, culture, and environment.

The toolbox describes IPFS and key actions and approaches to strengthening IPFS, followed by step-by-step guidance on how to assess food biodiversity and dietary diversity, and design project activities together with local communities by taking into consideration their views, knowledge, and experiences. The toolbox includes participatory videos produced with Indigenous Peoples' communities in four different countries and livelihood contexts. Let's get started!

# About Digital Toolbox

Numbering over 476 million, Indigenous Peoples live in over 90 countries and seven sociocultural regions of the world. They often reside in sites of high biodiversity, and they steward rich traditional knowledge and biocultural diversity. Scientists found that 80% of the remaining world's biodiversity is located in the lands and territories of Indigenous Peoples. Yet, unfortunately, Indigenous Peoples often continue to face discrimination and are put into vulnerable situations.

Indigenous Peoples have unique food systems anchored in sustainable livelihood practices, which have evolved and adapted to the specific ecosystems in their territories. Indigenous Peoples' food systems are increasingly seen as holistic and regenerative food systems and possible game-changing solutions. The recent United Nations Food Systems Summit held in 2021 set the momentum for food systems transformation to achieve the Sustainable Development Goals by 2030. However, the UN Food Systems Summit has not paid sufficient attention to Indigenous Peoples' food systems. Coordinated by the FAO Global-Hub on Indigenous Peoples' Food Systems, Indigenous and non-Indigenous experts, scientists, and UN staff responded by developing White/Wiphala Paper on Indigenous Peoples' food systems. The document provided evidence and advocated that lessons can be learnt from Indigenous Peoples' food systems, which will contribute to the resilience and sustainability of food systems worldwide and support the wellbeing of Indigenous Peoples. At the end of the UN Food Systems Summit, several countries supported the emergence of the Coalition on Indigenous Peoples' Food Systems.

IFAD, in line with the UN 2030 Agenda for Sustainable Development, and particularly its commitment to "leave no one behind", supports Indigenous Peoples' self-driven

development through projects that strengthen their knowledge, culture, identity, natural resources, and human rights. In 2009, IFAD's Policy on Engagement with Indigenous Peoples was approved. It sets out the principles of engagement IFAD will adhere to in its work with Indigenous Peoples, and it aims to empower Indigenous Peoples through a development approach that builds on their culture and identity. In 2021, IFAD released Good Practices in IFAD's Engagement with Indigenous Peoples. It shares practical examples from IFAD's investment projects and small projects supported by the Indigenous Peoples' Assistance Facility (IPAF). Since 2007, IPAF has been providing small grants of up to US\$50,000 for projects which foster self-driven development and improve the wellbeing of Indigenous Peoples.

To further strengthen the partnership, IFAD has established an Indigenous Peoples' Forum, promoting dialogue and consultation among Indigenous Peoples' organisations, IFAD staff, and Member States. Through the creation of the Indigenous Peoples' Forum and IPAF, strong partnerships have been established between IFAD and Indigenous peoples' organisations, the UN Permanent Forum on Indigenous Issues, and other like-minded organisations.

IFAD has also been supporting the better use of agrobiodiversity with specific reference to neglected and underutilized species (NUS) and greater recognition of the traditional knowledge of Indigenous Peoples associated with the use of NUS and wild edibles as important resources for tackling food and nutrition insecurity, especially in the context of climate change. See the Operational Framework for Supporting Nutrition-Sensitive Agriculture through Neglected and Underutilized Species, Accompanied by five related How to Do Notes offering recommendations and methods, approaches, and tools for integrating NUS in the design and implementation of IFAD-funded projects to support nutrition-sensitive agriculture.

Nutrition is at the centre of IFAD's Strategic Framework (2016-2025). However, as nutrition and food systems approaches have evolved in the past years, there is a need for IFAD to deepen the knowledge on nutrition of Indigenous Peoples and establish a common understanding on how to improve nutrition outcomes in project areas that are home to Indigenous Peoples, taking into account their food systems, livelihood, knowledge, views, cultures, and governance systems.

The Government of Canada made available financial resources to IFAD for a project called Nutrition for Indigenous Peoples. The project aimed to develop digital guidance (the present toolbox) on sustainable and resilient Indigenous Peoples' food systems for improved nutrition to help IFAD's investments (and other organisations) elaborate pathways and methodologies on sustainable and resilient Indigenous Peoples' food systems for improved nutrition.

Therefore, this toolbox, which is a commentary to IFAD's How-to-do Note on mainstreaming nutrition into COSOPs and investment projects, has been developed to contain methodologies and resources that can be applied in designing, implementing, and evaluating Indigenous Peoples' nutrition and food systems development projects. The generated findings can also be used in advocacy and policy work at the local, regional, national, and global levels. The toolbox was developed for project designers, staff, project management units, consultants, and partners of IFAD, UN organisations, and development organisations operating in Indigenous Peoples' territories. Nevertheless, the toolbox is freely available for use by anybody interested. The methodology is best suited for rural contexts. It can design and support new nutrition-sensitive projects in Indigenous Peoples' territories, but it can also fit in the context of nutrition-sensitive agriculture strategies, NUS framework, diversification for climate resilience, agroecology and regenerative agriculture, and nature-based solutions.

As a leading Indigenous Peoples' Organisation, the Indigenous Partnership for Agrobiodiversity and Food Sovereignty (TIP) was commissioned by IFAD to develop the toolbox. The toolbox development was a collaborative effort by a multidisciplinary and intercultural team of Indigenous Peoples and non-Indigenous experts. It was led by Phrang Roy, Coordinator of TIP, and prepared by Lukas Pawera, Dunja Mijatovic, Alethea Kordor Lyngdoh, Harriet Kuhnlein, Francisco Rosado May, and Ajay Nayak. The production of participatory videos was led by Oihane de Gana Romero, Marco Antonio Arango, Tyrel Lyngdoh, Karl Vaekesa, and Michael Tiampati. The participatory videos were supported by logistics or technical inputs from Viviana Sacco, José Sialer Pasco, Christopher Duche Perez, Joel Njojo, Pitakia Tikai, Merrysha Nongrum, and Rimchi Chenxiang Marak. The toolbox was developed with the administrative help of Andrea Selva. The whole team gratefully acknowledge the review and recommendations by IFAD under the coordination of Antonella Cordone. The Government of Canada is acknowledged for providing the funding.

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# Indigenous Peoples' Food Systems

For Indigenous Peoples, nature is sacred and living in balance with nature is a central value of IPFS.

Indigenous Peoples' food systems (IPFS) provide nourishment and healthy diets (1, 2). Understanding the underlying features of IPFS is crucial for developing locally and culturally appropriate food and nutrition interventions. Of particular importance is to take note of diverse food sources, and the cultural and social practices linked to food gathering and production, explained in the following section. For many Indigenous Peoples, food represents more than a source of nutrients; food is intrinsically connected to land, family, history and culture, as well as to social and spiritual wellbeing (3).

Studies of IPFS have provided a detailed understanding of the diversity and complexity of Indigenous Peoples' diets (1, 2, 3, 4). Some IPFS comprise hundreds of different food sources, including local crops and crop varieties, wild plants, and domestic and wild animals. Indigenous Peoples often combine food harvesting and food production, and rely on diverse food sources from a wider landscape

and territory. Accordingly, any nutrition interventions should be grounded in a more holistic understanding of IPFS (3).

1 Kuhnlein HV, Erasmus B, Spigelski D (2009) Indigenous peoples' food systems: the many dimensions of culture, diversity and environment for nutrition and health. Centre for Indigenous Peoples' Nutrition and Environment, McGill University and FAO, Rome.

2 Kuhnlein HV, Erasmus B, Spigelski D, Burlingame B (2013) Indigenous Peoples' Food Systems and Wellbeing: Interventions and Policies for Healthy Communities. Centre for Indigenous Peoples' Nutrition and Environment, McGill University and FAO, Rome.

3 Kuhnlein H, et al. (2006) Indigenous peoples' food systems for health: finding interventions that work. Public Health Nutrition 9 (8): 1013-1019.

4 Powell B, Thilsted SH, Ickowitz A, Termote C, Sunderland T, Herforth A (2015) Improving diets with wild and cultivated biodiversity from across the landscape. Food Security 7 (3): 535-554.

5 Berkes F, Colding J, Folke C (2000) Rediscovery of Traditional Ecological Knowledge as Adaptive Management. Ecological Applications 10 (5) :1251-1262.

## Key Features of Indigenous Peoples' Food Systems

<p><b>Management Practices</b></p> <p>Land, territories, and resources are managed collectively, within the family, clan, or the entire community. Customary governance systems are rooted in traditional knowledge and are intended to serve the common good of the community by regulating their rights and obligations to land, territories, resources, livelihoods, and food systems. Traditional land management and collective governance of IPFS are designed to generate food whilst preserving biodiversity. Examples include agroforestry gardens, integrated rice-fish paddy fields, shifting cultivation, and pasture management.</p>	<p><b>Knowledge and Innovation</b></p> <p>Indigenous Peoples' knowledge is different from science, in that it includes not only direct observation and interaction with plants, animals and ecosystems, but also a broad spectrum of cultural and spiritual knowledge and values that underpins human-environment relationships (5). This knowledge, unique to a given culture or society, emerges from the long history of interaction with their natural surroundings. Inter-generational transmission of knowledge amongst age groups and between elders sustains IPFS. Nonetheless, Indigenous Peoples' knowledge and practices are creative and experimental, and continuously innovate to meet new conditions.</p>
<p><b>Sustainability and Resilience</b></p> <p>The resilience of IPFS comes from the diversity of their foods, lands, and territories, their knowledge of sustainable management and the sociocultural values of caring, sharing, and reciprocity. Food and seed sharing, for example, is instrumental for resilience and is based on the value of solidarity and reciprocity. Traditionally, Indigenous Peoples' practices are based on the understanding and respect of ecosystem carrying capacity to ensure the replenishment of biodiversity (5). Indigenous Peoples' lands are also important areas for crop evolution and adaptation to climate change.</p>	<p><b>Culture and Spirituality</b></p> <p>IPFS comprise cultural relations to food and resources. Indigenous Peoples' knowledge about food is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, spirituality, and cosmogonies. The diverse spiritual-cultural practices highlight how these food systems are embedded within the cultural and political organisation of Indigenous Peoples. The sacred relationship with nature preserves the local environment.</p>

# Participatory Videos

The participatory videos that follow bring stories from the Matsigenka People from Amazonian rainforest in Peru, Maasai People in Great Rift Valley in Kenya, Khasi People from Himalayan foothills in North-East India, and Kubokota People from Solomon Islands in Oceania. The videos illustrate the importance of biodiversity for Indigenous Peoples' diets, and show how food production is combined with food harvesting (wild vegetables, seafood, wild fruits, freshwater fish, and medicinal plants). The videos show some of the ongoing changes in IPFS, including dietary transitions, and innovative strategies that are emerging in response to various challenges.

*Indigenous Peoples' food systems are critically important repositories of biodiversity and knowledge related to healthy and diverse diets.*

## **Matsigenka Food System**

Matsigenka People, Timpia, Cusco Region, Peru

Indigenous Matsigenka People live in the Amazon Basin in south-eastern Peru. Traditionally, the Matsigenka cultivate the land, fish in rivers and streams, gather fruit, and hunt in the forest. Manioc is a traditional crop and staple food, consumed along with many other wild and cultivated foods. Since 2004, when oil and gas exploitation started in the area, many families in the community have stopped cultivating the land and sought temporary jobs within these extractive industries. The oil and gas exploitation brought jobs but also resulted in less fresh

and healthy local foods. The availability of fish and animals decreased due to population increase, environmental pollution from oil spills, and increased motorboat traffic in the rivers. Since many families have stopped farming to work with the oil and gas companies or the municipality, there is less local food in the community and greater dependence on markets. During the COVID pandemic, many families were left without work and without income to buy food. This has led many to return to farming. They believe that they will not abandon it again; they may return to their jobs, but they will continue to cultivate land so as not to run out of food.

## **From the Forest and the Hills – The Khasi Food System**

Khasi People, Dewlieh community, East Khasi Hills; and Khweng community, Ribhoi District, Meghalaya, India

Dewlieh and Khweng are Khasi matrilineal communities that practice myriad ways of food production. Their focus is on traditional jhum cultivation (shifting cultivation), and they highly rely on forests for their food. While the Khweng community grows paddy rice, the Dewlieh community traditionally cultivates millets along with other crops. Despite the availability of diverse foods, dietary diversity of women was found to be low in both communities (1). The latest National Family Health Survey (NHFS-5) found that in Meghalaya, 53.8% of women (15-49 years) are anaemic and 46.5% of children (under 5 years old) are stunted (2). With the support of NESFAS, an Indigenous Peoples' non-profit organisation, the communities are working to increase the production and consumption of local micronutrient-rich and climate-resilient species. These efforts are combined with various other activities, including the establishment of community seed banks and community gardens, as well as the promotion of agroecological and resilience-strengthening practices.

## **Our Traditional Foods: Peoples Health and Life**

Kubokota People, Pienuna community,  
Ranongga Island, Western Province of  
Solomon Islands

*"Our ancestors lived in harmony with Nature and the forests and seas fed them with all its abundance."* Chief Derrick Ziru of Pienuna

The Pienuna community, which belongs to Kubokota People, relies on both the sea and forest for their food. They also cultivate a diversity of fruits and vegetables. In the video, community members discuss the health benefits of traditional foods such as different types of shells, Ngali nut (*Canarium indicum*), and wild yam. They also demonstrate cooking with hot stones - a traditional method of food preparation used for fish, Ngali nuts, and other foods. Logging, soil erosion, and shoreline sea erosion are some of the issues faced by the communities. In response to the depletion of the reef system, community conservation measures are being established to increase the availability of sea foods.

## **Survival in the Savannah: Maasai Indigenous Food System**

Maasai People, Olkiramatian, South Rift  
Valley, Kenya

The Maasai practice transhumance pastoralism as a strategy for utilizing the scarce resources of the Olkirantian landscape. In addition to livestock, Maasai consume wild fruits and use wild medicinal plants. For example, Maasai traditionally consume a special herbal tea known as Olkirowua, a decoction of various wild plants.

The traditional Maasai way of life depends on the maintenance of an optimal balance between wildlife, livestock, and people in a highly uncertain and variable environment. The area is also home to two community wildlife conservancies, namely Olkiramatian and Shompole, set aside by communities for the conservation of wildlife and the generation of income from tourism to complement income from livestock.

Today, the Maasai are complementing their high-protein diet with foods such as chapati, maize meal/ugali, potatoes, kale, cabbage, and rice. This is largely due to population growth and a reduced livestock herd due to climate change, land privatization, and land degradation. The transition from communal to private lands has brought degradation, disappearance of wild animals and plant species, reduced herds and yields, sale of land, and disintegration of communal decision making and reciprocity.

The main livestock breeds are the Maasai red sheep, the fat-tailed (black-headed) sheep, galla goats, and traditional zebu cattle. However, due to livestock diseases and climate change, the Maasai have started keeping Sahiwal and Boran cattle. The Maasai have also started growing maize, onion, sweet potatoes, cassava, millet, sorghum, tomatoes, beans, and vegetables (kales, amaranth, African nightshade, etc.). Other horticultural crops are also grown as small-scale cash crops.

1 NESFAS (2019) Report on Dietary Diversity Survey. NESFAS, Shillong.

2 Government of India (2021) National Family Health Survey (NHFS-5) 2019-21. Ministry of Health and Family Welfare, New Delhi.

# Improving Nutrition - Key Actions

Indigenous Peoples, and especially Indigenous women and children, are disproportionately affected by malnutrition and diet-related health problems (1). The underlying causes include the marginalization of Indigenous Peoples, resulting in higher levels of poverty and landlessness, and a lack of adequate health care (2). In addition to power and structural inequalities, climate change crisis, expansion of cash cropping, and environmental degradation are undermining the resource base of IPFS. The step by step process of design, implementation, and supervision of IFAD nutrition-sensitive projects is well described in *How to do note: Mainstreaming nutrition into COSOPs and investment projects*. This digital toolbox aims to highlight food biodiversity approaches, assessments, and other important aspects to consider when designing and implementing projects in the IPFS context.

The ongoing loss of biodiversity is changing Indigenous Peoples' diets. Decreasing diversity of crops, animals, and wild foods, in combination with increasing preference and availability of processed and ultra-processed foods, are resulting in malnutrition in all its forms (undernutrition, micronutrient deficiency, overweight and obesity, and diet-related non-communicable diseases). In addition, loss of traditional knowledge combined with discriminatory lack of access to education for Indigenous children and youths negatively impacts their nutrition, health, and quality of life. There is a need to combat traditional knowledge loss and increase access to intercultural education which will combine traditional and contemporary knowledge systems. Some of the most difficult human rights challenges for Indigenous Peoples stem from pressures on their lands, territories, and resources as a result of activities associated with the extraction of resources and the expansion of cash crops. Failure to recognize Indigenous Peoples' rights, including land rights and self-determination rights, limits the access to and use of traditional lands and food systems, which creates significant threats to Indigenous Peoples' food security and nutrition.

Enhancing food biodiversity provides opportunities to improve nutrition and health of Indigenous communities (3, 4, 5, 6) by strengthening IPFS including all its elements: knowledge, practices, and cultural elements (see Figure 1 for key actions). While nutrition projects may combine different types of activities (e.g., educational activities), it is important that projects focus on restoring biodiversity in IPFS. An important strategy to strengthen IPFS will be to scale out agroecology, nature-based solutions, and regenerative agricultural practices. Agroecology and regenerative agriculture are recognized as ways to sustainably increase food production and improve food security and nutrition outcomes in Indigenous and other local food systems (7, 8).

1 Lemke S, Delormier T (2017) Indigenous Peoples' food systems, nutrition, and gender: Conceptual and methodological considerations. *Maternal & Child Nutrition* 13 (S3): e12499.

2 Lemke S, Bellows AC (2016) Sustainable Food Systems, Gender, and Participation: Foregrounding Women in the Context of the Right to Adequate Food and Nutrition. In: Bellows AC, et al. (Eds.). *Gender, Nutrition, and the Human Right to Adequate Food*. Routledge, New York, pp. 254-340.

3 Kuhnlein HV, Erasmus B, Spigelski D, Burlingame B (2013) Indigenous Peoples' Food Systems and Wellbeing: Interventions and Policies for Healthy Communities. Centre for Indigenous Peoples' Nutrition and Environment, McGill University and FAO, Rome.

4 Kuhnlein HV (2015) Food system sustainability for health and well-being of Indigenous Peoples. *Public Health Nutrition* 18 (13): 2415-2424.

5 Kuhnlein HV, Erasmus B, Spigelski D (2009) Indigenous peoples' food systems: the many dimensions of culture, diversity and environment for nutrition and health. Centre for Indigenous Peoples' Nutrition and Environment, McGill University, and FAO, Rome.

6 Kuhnlein H, et al. (2006) Indigenous peoples' food systems for health: finding interventions that work. *Public Health Nutrition* 9 (8): 1013-1019.

7 FAO (2021) *The White/Wiphala Paper on Indigenous Peoples' food systems*. FAO, Rome.

8 Kerr RB, et al. (2021) Can agroecology improve food security and nutrition? A review. *Global Food Security* 29: 100540



**Figure 1.** Key actions to strengthen Indigenous Peoples' food systems

<p><b>RECOGNIZE</b></p> <ul style="list-style-type: none"><li>• Indigenous Peoples' rights to lands and territories</li><li>• Indigenous Peoples' sacred relationship with nature that preserves the local environment</li><li>• Indigenous Peoples' values of caring, sharing, and reciprocity</li></ul>
<p><b>ACKNOWLEDGE</b></p> <ul style="list-style-type: none"><li>• territorial management and collective governance, and how they generate food and preserve biodiversity</li><li>• conservation practices that are embedded in social, cultural, and spiritual systems</li></ul>
<p><b>PROMOTE</b></p> <ul style="list-style-type: none"><li>• community-based resource management techniques that restore forest, wetlands, mangroves, coral reefs and other wildlife habitats, wild edibles, and medicinal plants</li></ul>
<p><b>ENSURE</b></p> <ul style="list-style-type: none"><li>• revival and increased consumption of a diversity of nutritious crops, crop varieties, and wild foods, especially crops and animals that are resilient to climate change</li><li>• production of diverse nutritious local foods using best traditional practices, agroecology, and regenerative agriculture</li></ul>
<p><b>ENCOURAGE</b></p> <ul style="list-style-type: none"><li>• innovation or co-production of knowledge to improve sustainability of food production, gathering, and processing methods</li></ul>
<p><b>EMPOWER</b></p> <ul style="list-style-type: none"><li>• women, youth, and entire communities to raise awareness of and confidence in the nutritional and cultural value of local food biodiversity</li></ul>

# Improving Nutrition in Indigenous Peoples' Communities - Key Approaches

Projects aiming to improve Indigenous Peoples' nutrition need to be grounded in a participatory and intercultural approach to facilitate co-design with Indigenous communities. A special focus should be put on ensuring that all project development steps conducted with Indigenous Peoples' communities are carried out in local Indigenous languages. A gender-sensitive and transformative approach with a focus on Indigenous women as knowledge holders of food biodiversity is key. The respect of the Indigenous Peoples' rights to land, self-determination, and cultural and spiritual heritage, including the right to Free, Prior and Informed Consent (FPIC), should be an underlying principle of any project. IFAD's approach aims to ensure that the rights of Indigenous Peoples are fully respected in the design and development of IFAD-supported projects. See good practices in IFAD's engagement with Indigenous Peoples.

## Participatory and Intercultural Approach

Working with Indigenous Peoples must be grounded in an approach where Indigenous Peoples' knowledge, and associated ways of learning, creating, innovating and transmitting knowledge are given equal value and consideration as scientific or other types of knowledge. When collaborating and creating projects with people of different cultural backgrounds, participatory methods must apply an intercultural approach. Such an approach is based on an understanding of Indigenous Peoples' ways of learning, creating, and innovating, and on an appreciation of their

languages, worldviews, and cosmogonies. A focus on the intercultural principles of respect and openness to different worldviews facilitates a bridging of Indigenous and non-Indigenous approaches in projects and partnerships. The intercultural approach is increasingly recognized and applied in education and health sectors, particularly in improving health services for Indigenous Peoples (1).

A special focus should be put on creating safe spaces for discussion and ensuring that discussions take place in local language with adequate translation and interpretation. Language, as an integral part of culture, is a fundamental tool to understand and describe the world. Indigenous Peoples' languages and culture play an important role in protecting their rights, wellbeing, knowledge, and identity. Without Indigenous terminology, it is difficult to express Indigenous Peoples' philosophies, knowledge, and cultural practices and to convey them to future generations.

## Gender-sensitive and Transformative Approach

Indigenous women are knowledge-holders of food biodiversity and keystones of family nutrition. In the midst of IPFS disruption, they often bear the burden of malnutrition. Gender-sensitive nutrition programs that specifically target women, pregnant women, and adolescent girls can help to ensure that they have a better access to nutritious foods and healthy diets. Examples of gender-sensitive actions are recognizing the key roles that Indigenous women play as knowledge holders and food providers in IPFS, providing information relevant to health and nutrition, supporting women's livelihood and economic strategies, enhancing women's status and role in household and community decision making, collecting gender-disaggregated data, and building gender capacity and sensitivity of both local communities as well as project implementers.

While the levels of gender equality vary across Indigenous Peoples' societies, most are influenced by exogenous discriminatory social and economic institutions, policies, and laws. Indigenous women often experience multiple levels of discrimination. Women's empowerment calls for a gender-transformative approach that

emphasizes the need for structural transformation and addresses the underlying social norms, attitudes, and behaviours that perpetuate gender inequalities. This requires engaging both men and women, within and outside of the community, as agents of change to address the root causes of gender inequalities (2). See mainstreaming gender-transformative approaches at IFAD, and other resources.

## **Indigenous Peoples' Rights**

Indigenous Peoples' rights, including land rights, are the fundamental basis of their food systems, food security, nutrition, and culture. Land ownership ensures the continuation of their knowledge and practices. Violations of Indigenous Peoples' rights exacerbate the loss of food biodiversity. Many Indigenous Peoples continue to face a range of human rights issues. Some of the most difficult human rights challenges for Indigenous Peoples stem from pressures on their lands, territories, and resources as a result of activities associated with resource extraction and the expansion of cash crops.

The UN Declaration on the Rights of Indigenous Peoples (UNDRIP) is the most comprehensive global framework that addresses the unique human rights situation of Indigenous Peoples. The provisions of UNDRIP that are especially relevant to food systems are Right to Food, Self-Determination, Right to Land, Territories and Resources, and Intellectual Property Rights. They should be reviewed as essential additions to this toolbox.

## **Free, Prior and Informed Consent**

Free, Prior and Informed Consent (FPIC) is a principle that is linked to the right to self-determination, and it is upheld by the UNDRIP. The importance of FPIC is not merely supporting the right of Indigenous Peoples to say "yes or no" to externally initiated actions, or supporting Indigenous Peoples' authority to grant or withhold consent to a project or initiative that may affect them or their territories. Importantly, FPIC enables Indigenous Peoples to co-create projects and negotiate the conditions under which the project will be designed, implemented, monitored, and evaluated.

Following the FPIC process should be a key principle towards genuine respect of Indigenous Peoples' rights and should guarantee their involvement in decision-making processes. FPIC is a fundamental right of Indigenous Peoples that is recognized by IFAD in its policies and its Social, Environmental, and Climate Assessment Procedures. For more details on FPIC at IFAD see the v How to do: Seeking free, prior and informed consent (FPIC) in IFAD investment projects.

1 Pelcastre-Villafuerte BE, et al. (2020) Health needs of indigenous Mayan older adults in Mexico and health services available. *Health and Social Care* 28 (5): 1688-1697.

2 Lemke S, Bellows AC (2016) Sustainable Food Systems, Gender, and Participation: Foregrounding Women in the Context of the Right to Adequate Food and Nutrition. In: Bellows AC, et al. (Eds.). *Gender, Nutrition, and the Human Right to Adequate Food*. Routledge, New York, pp. 254-340.

# STEP 1 - Food Biodiversity Assessment

*Food biodiversity is the diversity of plants, animals, and other organisms used for food, both cultivated and wild.*

The first step of any assessment is to document food biodiversity in the local food system to understand the availability of foods, and their key characteristics. This is crucial to understanding the potential for biodiversity to improve the diets of Indigenous Peoples. Building on biodiversity of local foods will ensure that diets are improved sustainably while conserving traditional knowledge and food cultures. Food biodiversity data collection is carried out through a participatory focus group discussion. Food biodiversity data analysis helps to understand the availability of plants and animals across different food groups, the results of which shape project planning, as detailed in the following sections. In the IFAD project cycle, design phase, this step translates into an input to the project design report and to the Social, Environmental, and Climate Assessment Procedures (SECAP) that is prepared for each IFAD funded project.

## What is Food Biodiversity?

IPFS provide nutritionally diverse diets through the use of dozens and sometimes hundreds of species of edible plants and animals, including local varieties and breeds. Traditional foods derived from biodiverse plant and animal sources are high in protein, fibre, and micronutrients, and low in fat, sugar, and salt (1). Wild species of plants and animals, harvested in the wider landscape, present an important food source for balanced diets, nutrition, and health. Various studies have shown that efforts to improve nutrition should focus on a revival and more efficient use of locally available food biodiversity (1, 2, 3, 4, 5). Many traditional plant- and animal-based foods are rich sources of beneficial nutrients and bioactive compounds (6, 7, 8). The importance of local biodiversity, including wild food plants and animals, for food and nutrition is increasingly recognized and harnessed in nutrition-sensitive agriculture projects (9).

## 1.1 DATA COLLECTION

During data collection, a complete list of edible plants and animals occurring within the local food system should be generated through the free listing method with community members in a group discussion. The list should be comprehensive, involving plants and animals that are cultivated, purchased at market, and obtained in the wild. The list needs to capture neglected and underutilized species (NUS). While NUS may be neglected by research programmes and commercial enterprises, they often represent an important food source in IPFS. Additionally, the exercise should prompt for species that are no longer available (but could be revived). Data is collected in a table with local and common names and selected characteristics such as management, sources, seasonal availability, taste, and perceived resilience to climate change (Table 1). The plants and animals are listed according to local food groups (Box 1) or alternatively according to the management status (e.g., cultivated or wild), or source (e.g., home garden, rice field, fallow, forest, market).

Additional information of interest (such as key benefits/constraints) can be added as desired (examples of typical important criteria are taste, accessibility/availability, multiple uses, medicinal value, economic value, etc.). In this step, the listing focuses on local edible plants and animals; an overview of complex foods (e.g., soups, sauces, mixed dishes and food products) is obtained later during v STEP 2 – dietary assessment. A deeper understanding of the local food system, beyond food species, is always desirable. See complementary methods.

### Box 1. Grouping listed food biodiversity

Local food groups are folk categories of food biodiversity as perceived by the community. It is suggested to list plants and animals according to the local food groups and in local languages in order to enable easier listing for the community. An alternative approach would be to do listing according to the dietary diversity (MDD-W, see STEP 2 for a detailed explanation) food groups, but this approach is rooted in a "scientific" understanding of nutrition, and can be unfamiliar to local communities, thus resulting in a more time-consuming process.

**Table 1:** Sample table for listing food biodiversity (edible plants and animals) according to local food groups

Local food group	Local name	Common name (and Latin name)*	Management	Sources	Food seasonal availability	Taste+ (ranking)	Perceived resilience to climate+ (ranking)
Starchy staples	Nasi	Rice ( <i>Oryza sativa</i> )	Cultivated	Rice field, market	September (harvest)	3 (high)	2 (medium)
	Talas	Taro ( <i>Colocasia esculenta</i> )	Cultivated, wild	Fallow, swamp	Whole year	1 (low)	3 (high)
	Ubi jalar	Sweet potato ( <i>Ipomoea batatas</i> )	Cultivated	Home garden	October (harvest)	2 (medium)	3 (high)
Vegetables	Kangkung	Water spinach ( <i>Ipomoea aquatica</i> )	Cultivated	Home garden	Whole year	3 (high)	3 (high)
	Bayam	Leafy amaranth ( <i>Amaranthus</i> spp.)	Cultivated, wild	Home garden, fallow	Whole year	2 (medium)	3 (high)
Fruits	...						
Nuts/beans	...						
Meat, fish, seafood, dairy, eggs	...						
Any other local food group							
Meat, fish, seafood, dairy, eggs	...						
Any other local food group							

\* Latin names are desirable, but not necessary for completing the assessment

+ Participatory ranking on a scale from 1 to 3 (1=low score, 2=medium score, 3= high score)

## **Recommended Method for Generating the Food Biodiversity List: Free Listing and Ranking in a Focus Group Discussion**

### **How to organize and conduct a focus group discussion**

A focus group discussion (FGD) is a facilitated discussion with community participants and possibly other local stakeholders. An FGD serves not only to get needed information but also to stimulate knowledge sharing among the participants. Typically, between 10-15 knowledgeable and active participants participate in an FGD. They can consist of mixed-gender stakeholders, if culturally acceptable, but gender-specific groups are recommended when women and men may not feel comfortable speaking equally and freely in a mixed setting.

Typically, the information is noted on a large sheet of paper visible to all participants (Figure 2). An FGD is conducted by a team consisting of a facilitator, assistant, and note-taker. The facilitator manages the discussion and creates a comfortable environment for all participants. The assistant's and note-taker's roles are to support documenting the content of the discussion.

An FGD on food biodiversity in Indigenous Peoples' territories tends to take a long time (due to the high food biodiversity), therefore, it is important to organize the discussion with periodic breaks

for refreshments. In the case of very long lists, there can be two sub-groups discussing species in different food groups or two separate FGD sessions.

Free listing is a rapid way to generate a list of edible plants and animals (and possibly also varieties/breeds if required, as different varieties or breeds can have different traits and benefits) available in the local food system. Listing should be accompanied by a brief characterization of plants and animals and group ranking of important characteristics such as taste, resilience to climate, and any other criteria of interest. Typically, ranking is done on a scale from 1 to 3 (1=low value, 2=medium value, 3=high value), but a 1 to 4 or 5 scale is also common.

### **Complementary (or Alternative) Methods**

**Participatory food system mapping:** Before creating a food list, participatory mapping of the landscape and food system (drawing a participatory map) helps visualize the entire local food system. It allows participants to point out and discuss all food sources, access to and governance of lands, and most important food system activities (Figure 3). This participatory map could also be used later during follow-up community consultations to discuss any related and important issues during prioritization of project interventions (STEP 3). The participatory food system mapping exercise is best done through a community workshop or transect walk.



**Figure 2.** FGD facilitator filling in the table on food biodiversity in West Sumatra, Indonesia

**Literature review:** The existing information on local food biodiversity can sometimes be found in various literature sources such as research articles, reports, theses, databases, grey literature, etc. However, in the context of Indigenous Peoples' food systems, the available information might be rather limited. Examples of relevant resources that include reference to Indigenous Peoples' food biodiversity are v FAO and Alliance of Bioersivity International and CIAT (2021) (10); and Kuhnlein et al. (2009) (1). And for an example of a regional food database, see the CINE and Environment at McGill University website (11).

**Key informants' interview:** Conducting individual interviews with knowledgeable community representatives (e.g., traditional knowledge holders, custodian farmers, heads of women's groups, cultural leaders) can be used to collect information on food biodiversity. Individual interviews are easier to organize than FGDs, but data analysis may be more time-consuming.

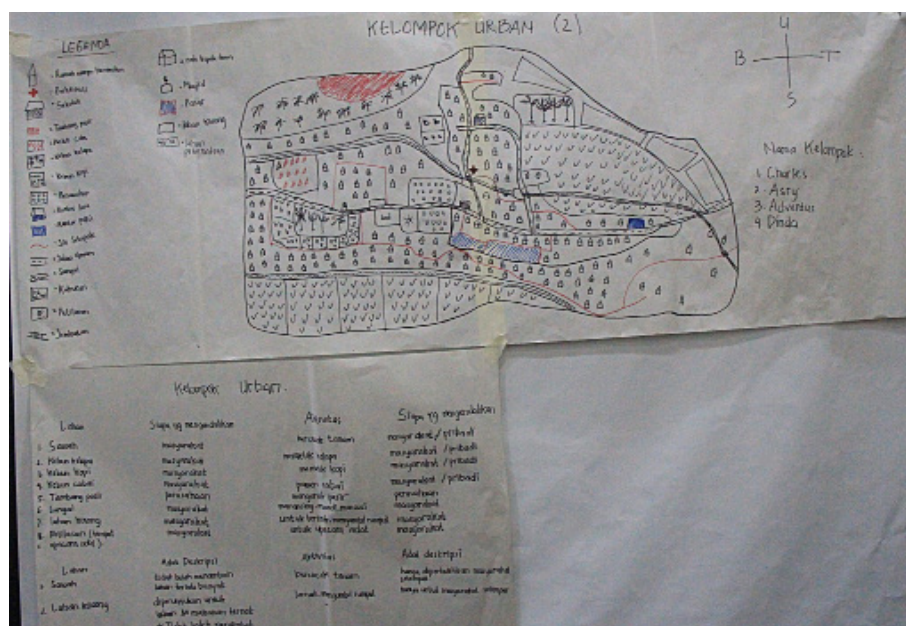
**Household surveys:** If a larger survey with multiple households is conducted, the inventory of food biodiversity can be collected at the household level and then merged and analysed.

**Transect and agrobiodiversity walks:** Observations involving local participants are a useful way to learn and document local food biodiversity across the landscape. Ideally, all local land-uses should

be visited and both cultivated and wild food biodiversity documented. But due to seasonality, not all resources may be available in the given period. Therefore, the walks should be repeated in different seasons, or participants should be asked to recall food biodiversity available in other agro-climatic seasons.

**Market surveys:** Local markets are places with a high concentration of food biodiversity. Therefore, observation and survey of markets can generate a comprehensive list of foods available in the given season. Prices of foods can also be easily collected at this time. Like transect and agrobiodiversity walks, market surveys should also be repeated in different seasons or complemented by interviews to capture seasonal variation.

For more details about how to use these additional methods, consult PAR (2017) (12), Kuhnlein et al. (2006) (13), IFAD and Bioersivity International (2021) (14), or ethnobotany manuals (15). Mijatovic et al. (2019) (16) provide a more detailed participatory assessment to leverage agrobiodiversity for climate change resilience and adaptation. The information on seasonality can reveal plants and animals with longer availability across the year (and thus providing a greater opportunity for consumption). See Lochetti et al. (2020) (17) for guidance on seasonal food calendars for nutrition.



**Figure 3.** An example of a participatory food system map. The map includes key components of the village (houses, school, road, markets etc.), and surrounding land-uses such as rice fields, vegetable plots, agroforestry gardens, and rivers. The legends on the left side explain the features on the map, and the notes below the map list the main land-uses, who accesses and governs them, and what are the most important agricultural and food system activities.

For more thorough assessments, also consider photo-documentation and taxonomical identification of local species (15). Photos can be handy for later communication materials, while taxonomical identification would help to identify particular species and to check their management, conservation status, or food composition in the literature. Additional relevant manuals are available in the Resources section of the toolbox.

## **1.2 DATA ANALYSIS AND INTERPRETATION**

### **1.2.1 General Data Analysis Following the Local Food Groups**

General data analysis using the local food group categories is recommended but optional.

In general data analysis, the collected data should be transcribed into a spreadsheet. This information can be used to calculate:

- the total number of edible plants and animals;
- their number/proportion in particular food groups;
- number/proportion of wild, cultivated, and purchased food items;
- plants and animals with the highest ranks for taste and perceived resilience to climate change (and/or other criteria of interest).

However, it is important to categorize and analyse local food biodiversity following the Minimum Dietary Diversity for Women (MDD-W) food groups (see 1.1.2 below).

### **1.2.2 Categorization and Analysis of Food Biodiversity Following the Minimum Dietary Diversity for Women (MDD-W) food groups**

All documented plants and animals should be categorized into the ten food groups defined by the Minimum Dietary Diversity for Women (MDD-W) (18, 19), in order to understand how local food biodiversity can contribute to a diverse diet and improved nutrition.

Similarly, general biodiversity and preferred plants and animals can be determined by calculating:

- the number/proportion of identified foods across MDD-W food groups;
- the highest-ranked plants and animals (sum of ranks of taste and climate resilience in the presented case) within particular food groups.

Box 2 provides an example of key findings from a food biodiversity assessment from the Solomon Islands.

#### **Box 2. Example of key findings from the assessment of food biodiversity in the food system of Indigenous Solomon Islanders in Baniata village, Rendova Island.**

A study by Vogliano et al. (2021) (20) documented 221 species and varieties of cultivated and wild foods in one rural village in the Solomon Islands. The most diverse groups were Meat, poultry and fish (69 species and varieties); followed by Grain, white roots and tubers, and plantains (47); Other fruits (46); Dark green leafy vegetables (26); Nuts and seeds (15); Other vegetables (14); Eggs (8); Other vitamin-A rich fruits and vegetables (5); Pulses (1); and Milk and milk products (0). (The study followed a different categorization, hence the numbers presented here are after re-grouping foods into MDD-W categorizations). See also the study-related video capturing food biodiversity and its potential to mitigate malnutrition and climate change.



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# STEP 2 - Dietary Diversity Assessment

The next step in the process is to assess dietary diversity and identify food groups that are under-consumed. Dietary diversity data collection is conducted through survey interviews with individual women (24-hour food recalls). In data analysis, MDD-W is used to calculate the proportion of women consuming a diverse diet (at least five out of ten defined food groups), and to identify under-consumed food groups – the dietary gap – that can be addressed by the food biodiversity identified in STEP 1. MDD-W is one of the outcome indicators adopted by IFAD in measuring nutrition sensitive agricultural projects, but alternative methods of assessing diets and nutrition, such as expert interviews or secondary data reviews, are also briefly explained.

## Healthy Diets and Dietary Diversity

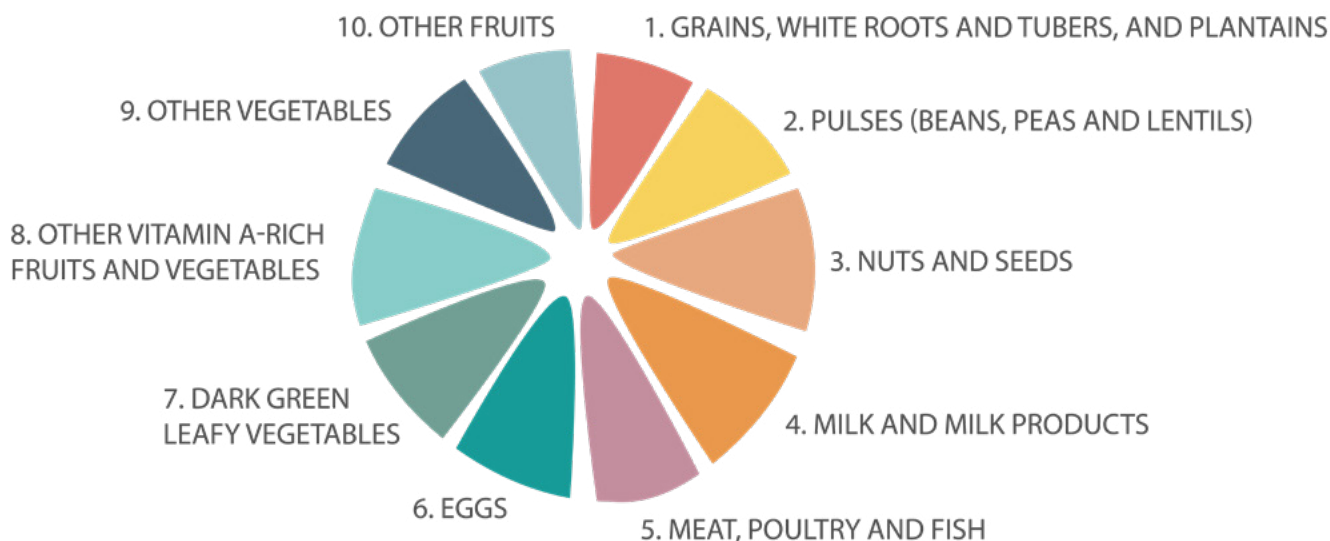
A healthy diet is one that provides sufficient and diverse foods, adequate to satisfy the energy and nutritional needs essential for growth and an active life. Consuming a diverse and balanced diet helps to protect against malnutrition (including undernutrition and micronutrient deficiencies) and obesity, and to lower the risk of diet-related non-communicable diseases. No single food contains a full spectrum of needed nutrients (except breast

milk for infants), and therefore a balanced diet based on a variety of food is required to cover a person's macronutrient and micronutrient needs.

In this guideline, dietary assessment is conducted using a dietary diversity approach (1) that has been validated as a proxy of nutrient adequacy (the higher dietary diversity, the higher micronutrient adequacy), and is in line with IFAD-adopted indicators (2). Dietary diversity is measured using the MDD-W indicator that measures the variety of foods in the diet by using ten defined food groups (Figure 4). The MDD-W indicator is used to determine whether women's diets are sufficiently diverse by assessing the number of food groups consumed by women of reproductive age (15-49 years of age) in one day (24 hours). According to MDD-W, women who consume at least five out of ten food groups are considered to have a diverse diet. Women of reproductive age are one of the key target groups for nutritional interventions as they are vulnerable to malnutrition due to high physiological demands, especially during pregnancy and lactation.

The full MDD-W survey should ideally be conducted with a representative sample of the population early in project implementation as part of a baseline Community of Inquiry (COI) survey. For the purposes of project design, conducting the dietary diversity assessment on a smaller sample of individual women would be sufficient to inform project design.

**Figure 4:** Ten standard food groups of Minimum Dietary Diversity for Women (MDD-W)



## 2.1 DATA COLLECTION - 24-HOUR FOOD RECALL

Dietary diversity is measured by a qualitative 24-hour food recall, which is conducted in a survey with the community members in project target areas (FAO, 2021) (3). If resources and time are available, additional data can be collected and other indicators may be consulted. A deeper understanding of local food systems beyond dietary diversity is always recommended, and especially important when assessing diets of communities with specific dietary patterns such as animal-dependent communities (Box 1).

Qualitative 24-hour food recall consists of asking individual respondents to recall all foods and beverages consumed during the previous day and night (Table 2). Food recall should not be conducted during times of ceremonies or fasting to avoid recording unusual consumption. The 24-hour food recall can be done by open recall (asking and probing for all foods and beverages consumed), or by a list-based method where the enumerator reads a prepared, locally relevant, list of foods and beverages or food groups, and respondent responds only “Yes” or “No”. The open recall is more informative and has a smaller error, while the list-based method is easier and faster (1, 3). Open recall is the preferred method for documenting dietary diversity with Indigenous communities. This will also provide more information on the consumption of specific food items, which is useful to understand overall diversity in the diets (e.g., species level) and assess the impact and changes in consumption of particular foods and species.

### Conducting 24-hour Food Recall (Open Recall)

Start the interview by explaining the purpose of the survey and the interview process to each respondent (who should be women aged 15 to 49 years). Always seek free, prior and informed consent. Create a friendly and relaxed atmosphere. Begin the interview questionnaire (Table 2) as follows: *“I would like to ask you to recall everything you ate or drank yesterday from the morning until the night. Please mention all foods and beverages you consumed either at home or outside of the home. Please include all foods and beverages, not only main meals but also any snacks, fruits or small meals.”*

To make the recall easier, supporting questions can be asked: *“What did you eat or drink when you woke up yesterday?”* After a response, probe *“Anything else?”*. And continue with the same question for midmorning snack, lunch, afternoon snack, dinner, and evening snack.

Always probe to make sure the respondent has not forgotten anything. Indigenous Peoples often consume wild foods (for example a wild fruit consumed while in the field), so probing in this context is particularly important. If the respondent recalls a mixed meal such as soup, porridge, or any other mixed dish, ask to specify all the specific ingredients. Table 2 shows a structured table to collect the 24-hour food recall data.

## 2.2 ANALYSING DIETARY DIVERSITY USING MDD-W

### Analysis at the Individual Level

The key step to analysing dietary diversity through the MDD-W indicator is to categorize all the consumed foods into ten standard food groups for each individual. Consumption of at least one food item from any food group counts as one score for that group; then the number of food groups identified is summed. Thus, the MDD-W indicator can range from a score of one to ten. Any ingredient used in quantities smaller than 15 grams (which is roughly one full tablespoon), such as chili pepper or spices, is considered a condiment/seasoning, and thus is not counted as a food group.

Considering the example of the food recall provided in Table 2, the woman consumed five food groups and thus her dietary diversity score is five. Therefore, the woman reached the MDD-W dietary diversity threshold (at least five food groups consumed).

### Population-level Indicator

The population-level indicator is the proportion of women reaching MDD-W (% of women who consume at least five food groups). For example, if 40 out of 100 interviewed women consumed at least five food groups, the proportion of women reaching MDD-W is 40%. The mean dietary diversity can also be counted, but the proportion of women reaching MDD-W is a more accurate measure. It is

**Table 2:** Example of a structured table for 24-hour food recall (for a Khasi respondent in Meghalaya, North-East India, who consumed five food groups)

Time	Food	Ingredients	Additional information (i.e., food sources)*	MDD-W food group+
Breakfast	Banana	Banana	Home garden	Other fruits (1)
Snack	Tea and chana masala	Tea (tea with sugar) Chana masala (chickpea, onion, tomato, garlic)	Food stall	Pulses (2)
Lunch	Rice with fried fish and vegetable	Rice, fried tilapia fish, cucumber, water	Local market (rice, fish) Home garden (cucumber) Well (water)	Grains, white roots and tubers, and plantains (3); Other vegetables (4)
Snack	Tea and biscuit	Tea (tea with sugar), Chocolate biscuit	Local shop (tea, sugar, biscuit)	No food group
Dinner	Rice with boiled beef and green beans	Rice, beef, onion, salt, ginger, green beans, water	Local market (beef, onion, salt) Home garden (ginger, green beans)	Grains, white roots and tubers, and plantains; Meat, poultry and fish (5) Other vegetables
Snack	Tea only	Tea (tea with sugar)	Local shop (tea, sugar)	No food group

\* This or any additional information is optional

+ MDD-W food group is identified later, during the data analysis. Numbers in brackets indicate and sum the MDD-W food groups

also strategic to analyse the proportion of women consuming particular food groups.

Interventions which increase the consumption of under-consumed food groups as identified by the MDD-W would have the highest potential of increasing dietary diversity. However, the local context and food culture need to be at the centre of any intervention, and sensitivity should be exercised in project implementation, as consumption of certain food groups may not be culturally acceptable or feasible (especially among animal-dependent communities, see Box 4). In this scenario, increasing diversity, consumption frequency, or portion sizes of nutritious foods from already consumed food groups might be more suitable. In this way, diets can be improved even if the dietary diversity indicator does not increase. Dietary diversity findings need to be shared and discussed during the community and stakeholder consultations in STEP 3, where the barriers to and reasons for low consumption of certain food groups can be identified and strategies can be developed.

Lastly, if there are expected significant socioeconomic differences within the community, it is suggested to also collect basic socio-demographic data and compare the dietary diversity findings across different clusters, for example, between women with different livelihood

strategies, land-use systems, age, education level, or household wealth. The list of possible socioeconomic and livelihood indicators is available in STEP 4.

### Complementary (or Alternative) Methods

**Literature review:** Existing information on dietary diversity (or additional nutritional indicators) can sometimes be found in literature sources such as research articles, reports, country technical notes, theses, etc. However, in the context of Indigenous Peoples, the available information might be rather limited.

**Expert interview:** Interviewing relevant experts, such as local nutritionists or community health specialists, can provide information on the diets and nutrition of the community. However, such qualitative information is difficult to use for project monitoring (unless there is existing monitoring and data that local experts can provide).

**Focus group discussion (FGD):** The typical diet, foods, and consumption patterns can also be discussed during community FGDs. FGDs can provide very useful information and raise awareness, but this qualitative information should not be quantified and used for dietary monitoring. It could be sufficient for project design.

**Note:** At the project design phase, alternative methods such as expert interviews, FGDs, or secondary data reviews might be particularly useful for rapid assessments of diets and nutrition in case there are limited time or resources for an MDD-W survey during the design mission.

### **Additional Options and Considerations**

It is recommended to consider alternative indicators where MDD-W does not apply due to the limited diversity of foods consumed. IFAD also adopts as a core outcome level indicator the Knowledge, Attitude and Practice (KAP) nutrition indicator. Additional indicators are suggested at the end of this chapter. It should also be noted, that in addition to the IFAD core indicators, at the project level, there is the possibility and flexibility to integrate other relevant indicators, as long as they can be adequately managed in the logical framework.

### **Other Data Collection Methods**

Although not explained here, with available resources and time, it is possible to collect additional data and look into other indicators based on quantitative food intake, repeated 24-h food recalls to capture seasonal differences, anthropometric surveys, or biochemical markers. See for example FAO (2018) (6), or Cambridge Biomedical Research Centre (n.d.) (7). A deeper understanding beyond dietary diversity would be helpful, particularly for assessing diets of communities with specific diets such as animal-dependent communities (Box 4).

Whenever possible, besides categorizing foods into food groups, an additional important step would be to review the actual composition of local foods in food composition tables, or determine

the nutrient content of these foods by laboratory analysis. This would help to identify and promote the most nutrient-dense species and foods.

**Barrier analysis:** Barrier analysis is a formative survey that is used to identify what is preventing the target group from practising a desired behaviour, as well as what are the enablers of that behaviour (8). Barrier analysis allows groups to look beyond preconceptions and identify the real barriers and their determinants in order to design an effective behaviour change strategy. For example, barrier analysis with Pnar (subgroup of Khasi Indigenous Peoples in North-East India) women and adolescent girls found that significant barriers to the consumption of diverse local foods were crop pests and diseases damaging food production, the influence of friends on dietary choices, and lack of awareness on the linkages between diet and health (9). See Kittle (2013) (8) for guidance on conducting barrier analysis. Due to feasibility matters, key barriers can be discussed alternatively during stakeholder consultations (see Table 4 in STEP 3).

**Dietary species richness:** Data collected in STEP 2 can be analysed using an indicator called Dietary Species Richness (10). This indicator, which counts the number of different species consumed per day, is also positively associated with dietary adequacy. It can be a suitable measure of food biodiversity in the diets of Indigenous Peoples. The main challenge is the additional need to distinguish and count all different species consumed by the respondents. In the example of the food recall given above, the respondent consumed 12 species, and thus the dietary species richness is 12 (tea, sugar, and salt are not counted, but condiments and spices are considered).

### **Box 3. Example of key results of dietary diversity assessment with Khasi and Garo women in Meghalaya, North-East India.**

A survey by NESFAS assessed dietary diversity of 276 Khasi and Garo Indigenous women (15-49 years) and found that 37% of women reached MDD-W (4). The mean dietary diversity was 4.2. The most widely consumed food groups were Grain, white roots and tubers, and plantains (consumed by 100% of women); Other vegetables (89%); and Meat, poultry and fish (79%). The under-consumed food groups were Dark green leafy vegetables (45%); Other vitamin A-rich fruits and vegetables (35%); Pulses (26%); Other fruits (22%); Eggs (17%); Nuts and seeds (7%); and Milk and milk products (1%). The food biodiversity assessment (see STEP 1) helped to prioritize preferred food biodiversity in the under-consumed foods groups, which were then targeted by food, nutritional, and agroecological interventions.

Consumption of ultra-processed foods: A further analysis tool that can be integrated in the MDD-W template is to calculate the proportion of ultra-processed foods in the diet. Consumption of ultra-processed foods is linked with increased non-communicable diseases, overweight, obesity, and mortality (11). The overall dietary advice should guide consumers to eat a diverse, healthy diet dominated by minimally processed foods and avoidant of ultra-processed foods. This pattern strongly corresponds with traditional diets based on local foods. But traditional diets are changing rapidly, and monitoring consumption of ultra-processed foods could help to capture the extent of dietary transition and inform communities, programs, and policies.

To calculate the proportion of ultra-processed foods in the diet, the first step is to categorize the consumed foods into food groups using the NOVA classification system (12). These are: 1) Unprocessed or minimally processed foods; 2) Processed ingredients; 3) Processed foods; and 4) Ultra-processed foods. All the food items are

given the same weight, and the share of ultra-processed foods in diets is counted (the number of consumed ultra-processed food items is multiplied by 100 and divided by the total number of food items consumed). Considering the example of the food recall in Table 2, the woman consumed a total of 23 items and one item was ultra-processed (chocolate biscuit). Therefore,  $1 \times 100 / 23 = 4.3$ . This means that the share of ultra-processed food items in the woman's diet is only 4.3%, and the share of non-ultra-processed food items is 95.7%.

List of foods and ingredients consumed: Since the open recall method of 24-hour food recall provides information on various food items and complex foods consumed, it is possible to create a list of local dishes, including their ingredients. This can help to highlight how diverse the foods are, what biodiverse foods could be promoted, or how the recipes could be adjusted and diversified.

#### **Box 4. Special attention in assessing and interpreting diets of animal-dependent communities:**

Although MDD-W is a generic indicator that can be used in different settings, it should be interpreted cautiously in the case of communities with specific dietary patterns such as pastoralists, certain hunters or Arctic people who are all largely dependent on animal-sourced foods. Despite the likelihood that the number of food groups consumed will be lower among these groups, there can be high diversity within animal-based food groups in terms of species and different parts of animals consumed. Different animal parts (e.g., organ meats, blood) tend to be rich in micronutrients that are important for nutrient adequacy. With this in mind, dietary diversity results should be interpreted with cultural sensitivity. A possible adjustment of food groups could be considered, or a deeper assessment of diets and existing food biodiversity could be conducted.

**The Maasai Food System:** The video on the food system of Maasai People in Olkiramatian Group Ranch demonstrates the cultural and dietary importance of livestock for Maasai People, yet it also shows an integration of cultivated crops and foods from market. In this context, a standard dietary diversity assessment should work well. In addition, the video shows that even in traditionally animal-dependent communities where one would assume that diets are based only on meat, blood, and milk, there is "hidden" food biodiversity such as herbs and wild fruits that are diversifying diets. These natural foods are often overlooked in mainstream nutrition programs. Some of these local plants have been identified as nutritionally or medicinally significant (5).

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# STEP 3 - Community Consultation and Intervention Prioritization

This step consists of consultations with the Indigenous Peoples' communities and other relevant stakeholders in the project area. The consultations allow the team to share and discuss the findings of the food biodiversity assessment (STEP 1) and dietary diversity assessment (STEP 2). The aim of the community consultations is to identify foods that can be promoted to improve nutrition and generate ideas for how to strengthen local food systems. Multi-stakeholder consultations are conducted to understand a wider set of opportunities and barriers to harnessing food biodiversity and improving diets and nutrition. Project ideas from both community and stakeholder consultations are then compiled and prioritized. The consultation processes enable a better understanding of nutrition-related issues and facilitate the co-design of project interventions.

## **In-depth Consultations with Indigenous Peoples' Communities and Stakeholders**

STEP 3 seeks to involve the community members and other stakeholders in the process of project design or in the early phases of implementation. Consultations are held to create a space for sharing, discussion, and decision making that involves local communities and other stakeholders. Consultations are carried out in participatory FGDs or workshops in a local language that all community members can understand. The consultations should follow the principles of intercultural learning to ensure that Indigenous Peoples' knowledge, experiences, and needs are embedded into the project design, and that the solutions for nutrition problems are found within the community.

## **3.1 COMMUNITY FOOD PRIORITIZATION AND CONSULTATION**

Community food prioritization and consultations are conducted in an FGD with community members of mixed age and gender if culturally appropriate. Community consultations are organized with only the community members in order to give them an opportunity to freely discuss the results of STEPS 1 and 2, and identify possible interventions. The aims of the community species prioritization and consultations are to share and validate the results of STEPS 1 and 2, identify food groups and plants or animals that can be promoted to improve nutrition, and discuss any other issues that are important for the revitalization of IPFS. An FGD on prioritization and consultation can be structured as follows:

**1. Presentation and discussion of the key findings** of the food biodiversity assessment (STEP 1) and dietary diversity assessment (STEP 2). Provide community members with time to reflect on the results of the STEP 1 and STEP 2;

**2. Identification of nutritionally important foods** (Table 3);

- Create a table of under-consumed food groups based on the results from STEP 2 (first column in Table 3) on a large piece of paper (e.g., Dark green leafy vegetables);
- For each under-consumed food group, identify plants and animals that could be promoted (based on local preferences captured by ranking exercise from STEP 1);
- Validate the results of the ranking exercise with community members and finalize the prioritization of food biodiversity. Using an open and flexible approach, participants should discuss characteristics, advantages, and disadvantages of shortlisted plants and animals. Availability and sustainable use of shortlisted foods should be also considered.

A more detailed process of prioritizing crops (and varieties) is available from IFAD and Bioversity International (2021) (1).



**3. After the identification of nutritionally and culturally important plants and animals, discuss a broader set of issues that affect local food systems and identify measures to increase food biodiversity and its consumption.** Possible discussion topics include:

- Loss of traditional knowledge
- Loss of seeds
- Access to/availability of food biodiversity
- Sustainable use of food biodiversity
- Ecosystem degradation
- Livelihood and wellbeing
- Nutrition transition
- Nutrition information and awareness
- Health issues in the community
- Climate change

**4. Generate ideas for local solutions and interventions from the community members on how to increase resiliency of local food systems and improve nutrition through greater use of biodiversity.**

### 3.2 MULTI-STAKEHOLDER CONSULTATION

Multi-stakeholder consultations are organized separately and after the community consultation. The multi-stakeholder consultations consist of an FGD or workshop with community members, local experts, and other possible project actors.

It is important to bring together not only key target groups, such as women and youth, but also community leaders and local food system actors from different sectors such as traditional herbalists and other knowledge holders, farmers, wild food gatherers, fisherfolk, traders, teachers, local authorities, extension workers, nutrition and health experts, development experts, women's groups, village leaders, and religious or cultural leaders.

During the multi-stakeholder consultations, after presenting the results of STEPS 1 and 2, and the results of the community consultations (STEP 3.1), the discussion is organized around key factors that affect nutrition and health (see first column in Table 4): According to the local setting, these might be adjusted and any other relevant factors added.

The consultation is organized around the key factors affecting diet and nutrition; and for each factor, the following topics are discussed (Table 4):

- relation to diet and nutrition (and its estimated impact level);
- key issues or barriers;
- key needs and opportunities;
- ideas for actions and interventions; and
- stakeholders that may be involved.

This information can help to build cross-sectoral action that could result in a higher impact of

**Table 3:** An example of leafy vegetables prioritization from ranking exercise (based on the assessment from STEP 1): water spinach (6 points) was prioritized by the community over leafy amaranth (5 points). However, this finding should be shared with the community, discussed and validated.

MDD-W food group	Local name	Common name (Latin name)*	Management	Sources	Food seasonal availability	PARTICIPATORY RANKING+		
						Taste	Perceived resilience to climate	Overall score
Dark Green Leafy Vegetables	Kangkung	Water spinach (Ipomoea aquatica)	Cultivated	Home garden	Whole year	3 (high)	3 (high)	6
	Bayam	Leafy amaranth (Amaranthus spp.)	Cultivated, wild	Home garden, fallow	Whole year	2 (medium)	3 (high)	5

\* Latin names are desirable but not necessary for completing the assessment

+ Ranking on a scale from 1 to 3 (1=low value, 2=medium value, 3= high value)

project activities on nutrition outcomes. A multi-sectoral approach that integrates nutrition with other priorities is a commitment adopted by IFAD to mainstream nutrition in all projects (2019) (2). In addition to increasing food biodiversity and its consumption, the consultations might reveal other nutrition-related issues which could be addressed by the intervention. During the consultation, the facilitator should stimulate an open and inclusive discussion. Ideally, consensus that takes into account the voices of all stakeholders should be reached.

positive impact on diets and nutrition. Due to the increasing impacts of climate change on the local communities, prioritized interventions should also increase resilience to climate change and mitigate risks. Developing a checklist of prioritization criteria will help facilitate the selection process. Any intervention will include trade-offs and risk, which should be considered, discussed, and addressed through mitigation measures. For more details see IFAD (2019) (2) and de la Peña and Garret (2018) (5).

### **3.3 COMPILE AND PRIORITIZE INTERVENTION OPTIONS**

Based on the community and multi-stakeholder consultations, a list of culturally acceptable interventions can be compiled (see Table 5 for an example of possible intervention ideas).

From this list, a set of interventions are then prioritized to be developed into project activities. Prioritized interventions should be cost-effective, well-perceived or put forth by the community, empower women, and have a high probability of

#### **Box 5. Pathways for improving nutrition typical for IFAD investments and projects (IFAD, 2019) (2) may overlook the importance of local food biodiversity and the specific features of IPFS:**

Typically, in an IFAD funded project, opportunities to improve nutrition may be found at various points: a) the production level, by increasing households' production of and access to nutrient-rich and nutritious foods; b) the processing level, by promoting post-harvest practices aimed to preserve and enhance nutrient quality of the food produced, and by increasing year round availability through safe processing and storage; c) the commercial level, by improving safe and healthy transport; d) the consumption level, by encouraging consumers to make healthier food choices through targeted nutrition education; e) women and/or youth engagement; and (f) water sanitation and hygiene.

Pathways for improving nutrition typical for IFAD investments and projects (2) may overlook the importance of local food biodiversity and the specific features of IPFS. See Kuhnlein 2006 (3) 2013 (4) for pathways that are appropriate for improving nutrition in Indigenous communities.

**Table 4:** Example of a structured table of interrelated factors affecting diets and nutrition.

<b>FACTORS AFFECTING DIETS AND NUTRITION</b>	<b>Relation to diets and nutrition (and impact level)*</b>	<b>Key issues or barriers</b>	<b>Key needs and opportunities</b>	<b>Ideas for actions and interventions</b>	<b>Key stakeholders to be involved</b>
FOOD BIODIVERSITY	Biodiversity of local crops and livestock is crucial for diverse diets (HIGH)	Production of food biodiversity is decreasing due to agricultural intensification	Conserve and revive community production of local crops and livestock	Provide technical support and incentivize the community to maintain diverse food production and to produce nutritious foods	Smallholder producers, women's groups, technical agencies, traders, extension agents
INDIGENOUS WOMEN'S KNOWLEDGE AND EMPOWERMENT	Knowledge, skills and time of women are important for cooking and diets (HIGH)	Women are discouraged or not able to produce or prepare nutritious foods	Increase knowledge of women and ensure they have more time for cooking	Organize cooking sessions and trainings; improve food processing technologies for time-saving	Women, women's groups, adolescent girls, chefs, nutritionists, food processing experts
LIVELIHOOD	Livelihood secures the income for purchases of foods and other needs (HIGH)	Limited livelihood opportunities and low income from agriculture and fishing	Secure fair income and increase livelihood opportunities	Increase agricultural income through local product certification and adding value by processing	Smallholder producers, certification and value chain experts, small-sized enterprises, women's groups, food processing experts
FOOD ENVIRONMENT AND MARKETS	Food environment and markets are important for accessing food sources (HIGH)	Nutritious foods are costly, and local markets are irregular	Make nutritious foods affordable, and increase the frequency of markets	Lower the costs of nutritious foods and facilitate more frequent local markets	Government, traders, technical agencies, market facilitation experts
LAND, WATER, RESOURCES, AND ECOSYSTEMS	Local ecosystems and rivers are important sources of water and wild foods (MEDIUM)	Agricultural intensification through monocultures is damaging ecosystems and biodiversity	Traditional landscape management and access to commons should be ensured	Support traditional land uses, community resource management, and access to land and water	Community leaders, government, smallholder producers and fishers, companies, landscape managers
HOUSEHOLD FACILITIES AND SANITATION	Home facilities and sanitation are important for hygiene and food safety (MEDIUM)	The remote and poorer households have limited facilities	Facilities and sanitation should be improved	Build facilities and knowledge related to water, sanitation, and food safety	Community leaders, government, vulnerable households, water and sanitation experts, engineers
FOOD PROCESSING AND TECHNOLOGIES	Processing and storage of foods increases the availability of seasonal foods and their value (HIGH)	Households and small-sized enterprises have a limited capacity to process local foods	An opportunity to improve food processing to increase its value and availability	Improve capacity and technologies to process local food in a nutrition-sensitive way.	Producer groups, women's groups, small-sized enterprises, food processing experts, marketing experts
EDUCATION AND MEDIA	Education has a strong impact on food perception and food choice (HIGH)	Communities and children are not aware of the nutritional and health value of local foods	Provide information and education about nutrition problems, diets, and foods	Integrate local and Indigenous knowledge on local foods into education and media	Knowledge holders, cultural leaders, teachers, educators, school children, government, media

HEALTH AND EXTENSION SERVICES	Community health workers and agriculture extension agents provide new knowledge on food and health (MEDIUM)	Lack of health and extension services	Improve knowledge and reach of health workers and extension agents	Provide training to health workers and agricultural extension agents on diets and importance of local foods	Community health workers, agriculture extension agents, government, technical experts, remote households
CLIMATE CHANGE AND RESILIENCE	Changes in climate make it difficult to plan, produce and harvest and ultimately to sell and consume (MEDIUM)	Lack of knowledge on how to adapt to climate change effectively	Raise the capacity on increasing resilience and adaptation of agriculture and livelihood to changing climate	Educate the community and food producers on climate-resilient species and resilient landscapes	Climate change and resilience experts, extension agents, community leaders, women groups, smallholder producers
ADD ANY OTHER KEY ELEMENT					

\* Latin names are desirable but not necessary for completing the assessment  
+ Ranking on a scale from 1 to 3 (1=low value, 2=medium value, 3= high value)

**Table 5:** *Examples of intervention options*

<p><b>Strengthening Indigenous Peoples' food systems:</b></p> <ul style="list-style-type: none"> <li>- restore, revitalize, and promote local food biodiversity and food systems</li> <li>- document Indigenous Peoples' knowledge about the management and use of local food resources</li> <li>- re-learn Indigenous Peoples' methods of growing, collecting, processing, and harvesting</li> </ul>
<p><b>Food biodiversity production:</b></p> <ul style="list-style-type: none"> <li>- diversify food production with a focus on micro-nutrient rich species from under-consumed food groups</li> <li>- promote the use of micronutrient-rich species and foods, including those with medicinal value (food medicine)</li> <li>- strengthen local seed systems of nutrient-rich crops</li> <li>- support livestock keeping with a focus on local breeds and climate-resilient species</li> <li>- promote agroecological diversification of farming systems (e.g., intercropping, crop rotations, agroforestry, edible fences, integrated farming systems)</li> <li>- promote home gardens and kitchen gardens</li> <li>- support sustainable use of safe and nutritious wild foods (unthreatened wild edible plants, mushrooms, wild fish and seafood, etc.)</li> </ul>
<p><b>Land, water, and ecosystems:</b></p> <ul style="list-style-type: none"> <li>- restore mosaic landscapes with diverse land-uses and ecosystems</li> <li>- reduce pollution by agrochemical inputs and plastic</li> <li>- strengthen the circular use of resources for healthy soil and sustainability</li> <li>- ensure community-based sustainable natural resource management and access to commons</li> <li>- ensure safe access to water and clean water sources</li> </ul>
<p><b>Women's empowerment:</b></p> <ul style="list-style-type: none"> <li>- increase women's awareness of the importance of traditional foods for nutrition and health</li> <li>- advocate for changes of potentially harmful sociocultural norms</li> <li>- ensure economic empowerment of women and young people</li> <li>- implement locally suitable technologies to reduce women's workload</li> <li>- strengthen women's voices in decision-making at the household and community level</li> <li>- apply an overall gender-sensitive (gender transformative) approach into interventions</li> </ul>
<p><b>Education, knowledge, and media:</b></p> <ul style="list-style-type: none"> <li>- acknowledge and promote traditional knowledge transfer</li> <li>- integrate Indigenous Peoples' foods into education</li> <li>- work with knowledge holders, elders, community leaders, and youth to influence the community and drive knowledge transfer and behaviour change</li> <li>- support school gardens and locally-procured school feeding programs</li> <li>- increase knowledge on maternal nutrition and young child feeding practices</li> <li>- communicate the value of Indigenous Peoples' foods in wide social networks and public media</li> <li>- document, innovate, and disseminate recipes for preparing nutritious meals</li> <li>- promote a physically active life</li> </ul>

<b>Food preparation, processing, and technologies:</b>
<ul style="list-style-type: none"> <li>- promote traditional and innovative processing, preservation, and storage of nutritious foods</li> <li>- maximize the efficient use of food resources, including all parts of animals and plants</li> <li>- innovate recipes and cooking methods of local foods</li> <li>- establish suitable technologies or transportation options that preserve nutritional value</li> </ul>
<b>Livelihood:</b>
<ul style="list-style-type: none"> <li>- implement agroecology and regenerative agriculture for increased productivity of nutritious crops</li> <li>- raise rural employment and incomes for higher purchasing power of nutritious foods</li> <li>- develop biodiversity-based local livelihoods (e.g., local cafes, value-added products, social enterprise and branding, geographical indication of traditional products, etc.)</li> <li>- manage the balance between sale and consumption of nutritious foods</li> </ul>
<b>Climate change:</b>
<ul style="list-style-type: none"> <li>- promote the use of climate-resilient species and varieties</li> <li>- diversify food and land-use systems for adaptation and resilience</li> <li>- strengthen social security system and solidarity mechanisms</li> </ul>
<b>Food environment and markets:</b>
<ul style="list-style-type: none"> <li>- promote and bring Indigenous Peoples' foods into local markets, food stalls, and cafes</li> <li>- ensure a safe and hygienic market environment</li> <li>- secure affordable prices of nutritious local foods in the markets</li> <li>- facilitate local, regional, or mobile markets in areas with limited access to diverse foods</li> <li>- encourage conscious consumer choices and purchases of nutritious foods</li> <li>- regulate marketing of ultra-processed foods and foods with a high content of unhealthy ingredients (e.g., chemicals, aflatoxin, salt, sugar, or partially hydrogenated oils, etc.)</li> </ul>
<b>Household facilities and sanitation:</b>
<ul style="list-style-type: none"> <li>- ensure safe and hygienic kitchen and home spaces</li> <li>- promote hand washing and the use and consumption of clean and safe water</li> <li>- ensure safe water, sanitation, and hygiene (WASH) to prevent disease and eliminate pollution</li> </ul>
<b>Health and agricultural extension services:</b>
<ul style="list-style-type: none"> <li>- integrate nutrition and gender into health counselling and increase the capacity of community health workers and extension services</li> <li>- integrate nutrition into food and agricultural extension services</li> <li>- increase access to appropriate and affordable health care</li> </ul>
<b>Other project-specific elements can be added</b>

1. IFAD and Bioersivity International (2021) How to do note: Crop selection for diet quality and resilience. Nutrition-sensitive agriculture - Note no. 1. IFAD, Rome.

2. IFAD (2019) How to do note: Mainstreaming nutrition into COSOPs and investment projects. IFAD, Rome.

3. Kuhnlein H, et al. (2006) Indigenous peoples' food systems for health: finding interventions that work. Public health nutrition 9 (8): 1013-1019.

4. Kuhnlein HV, Erasmus B, Spigelski D, Burlingame B (2013) Indigenous Peoples' Food Systems and Wellbeing: Interventions and Policies for Healthy Communities. Centre for Indigenous Peoples' Nutrition and Environment, McGill University and FAO, Rome.

5. de la Peña I, Garret J (2018) Nutrition-sensitive value chains. A guide for project design. Volume I. IFAD, Rome.

# STEP 4 - Project Design

The final step involves developing a project design based on the outcomes of the food biodiversity assessment (STEP 1), dietary diversity assessment (STEP 2), and consultations with Indigenous Peoples' communities and other stakeholders (STEP 3). STEP 1 ensures that the project is designed to leverage local biodiversity to tackle women's and household nutritional gaps as identified in STEP 2. Importantly, STEP 3 facilitates the inclusion of the local communities into decision making about project activities. Nonetheless, the project design and implementation processes must follow a policy of ethical engagement with Indigenous Peoples. Adhering to an intercultural approach throughout project implementation ensures that the project genuinely addresses Indigenous Peoples' views, knowledge, experiences, and aspirations.

## Specific Considerations in Designing Projects with Indigenous Peoples

IFAD funded projects follow the theory of change, logical framework, and associated considerations essential in IFAD's project cycle, however there are several specific processes that must be considered in project development for IPFS.

First, in alignment with IFAD's Policy on Engagement with Indigenous Peoples, Indigenous Peoples impacted by the project must be involved at all stages of the project cycle after seeking the Free, Prior and Informed Consent (FPIC) of the participating communities. To ensure long term, meaningful success, Indigenous Peoples' representatives, and especially women as stewards of local food systems, need to participate in the project design and throughout the project's lifetime.

Second, the project design, implementation, and evaluation processes must take into account the inherent rights of Indigenous Peoples which they derive from their lands and territories, cultures, traditions, histories, and socio-economic and livelihood activities as enshrined in the UN Declaration on the Rights of Indigenous Peoples, 2007.

Third, engagement, collaboration, and communication need to happen in a culturally appropriate form and in a language that the communities will fully understand, following participatory and intercultural approaches.

Fourth, the sociocultural values of Indigenous Peoples and the nurturing role of women as custodians of food and lands must be fully understood and taken into account to promote a gender-sensitive, inter-generational, and transformative approach. The egalitarian values of equality, caring, and sharing in matriarchal societies (such as Khasi, Minangkabau, Karen, Mosuo, Akan, Hopi, and Mohawk communities, among others) should be revived and integrated (1, 2, 3).

Fifth, besides the overarching goal to improve diets and nutrition, a project should take a more holistic understanding of IPFS and seek to strengthen them through a commitment to recognize and promote the rights, values, and cosmogonies of Indigenous Peoples (see Figure 1).

For a perspective on IFAD's principles of engagement, procedures, resources, and lessons learned, see IFAD's Policy on Engagement with Indigenous Peoples. This policy provides nine guiding principles reinforcing IFAD's objective to ensure that Indigenous Peoples in rural areas are empowered through self-driven development toward improved wellbeing, income generation, and food security. In addition, another IFAD publication shares examples of good practices for engagement with Indigenous Peoples in IFAD's investment projects as well as in the smaller projects supported by the Indigenous Peoples' Assistance Facility (IPAF). For applications of FPIC see How to do note: Seeking, free, prior and informed consent in IFAD investment projects. And to learn how to mainstream nutrition in projects, see the How to do note: Mainstreaming nutrition into COSOPs and investment projects.

## Development and Piloting of the Methodology

The methodology presented in this toolbox was applied and validated by North East SOW Food and Agrobiodiversity Society (NESFAS) in a project aiming to improve the nutrition and wellbeing of Khasi Peoples in North-East India (see Box 6). The project was developed based on the results of a food biodiversity assessment and dietary

diversity assessment, which were discussed with the local communities to identify project action plans. The project has been conferred with the 2021-IFAD Indigenous Peoples Award, and the project narrative can be seen in the short film, 'Sacred Futures - The NESFAS Story'.

## **Recommended Process of Overall Project Design**

The information collected in STEPS 1, 2, and 3 should provide information needed to design a full project document. See Figure 5 for how the results of different steps are used in defining the different parts of the project development process.

### **1. Define the Overall Goal of the Project**

An overarching project goal should aim to improve nutrition of Indigenous Peoples by strengthening the local IPFS and increasing its resilience through the restoration of local food biodiversity.

### **2. Specify the Project Objectives**

Project objectives should be derived from the results of STEP 1, 2, and 3. They should include specific local foods (identified in STEP 1 and prioritized in STEP 3) that can be promoted to address nutritional gaps identified in STEP 2. They should also reflect the main issues and ideas identified through the consultations in STEP 3.

Examples of project objectives from the IPFS project implemented by NESFAS in North-East India:

- Objective 1: To diversify diets of Indigenous women by improved preservation, cooking, and consumption of nutritious local foods, especially millets and wild leafy green vegetables;

- Objective 2: To improve Indigenous women's knowledge and awareness of the benefits of local food biodiversity and diverse diets for nutrition and health;

- Objective 3: To increase the production of nutritious and climate-resilient food biodiversity through culturally-appropriate agroecological and regenerative practices;

- Objective 4: To increase availability and added value of nutritious local foods (millets, local nuts and seeds, and seasonal fruits and vegetables) by enhanced processing and storage.

### **3. Develop the Theory of Change (TOC)**

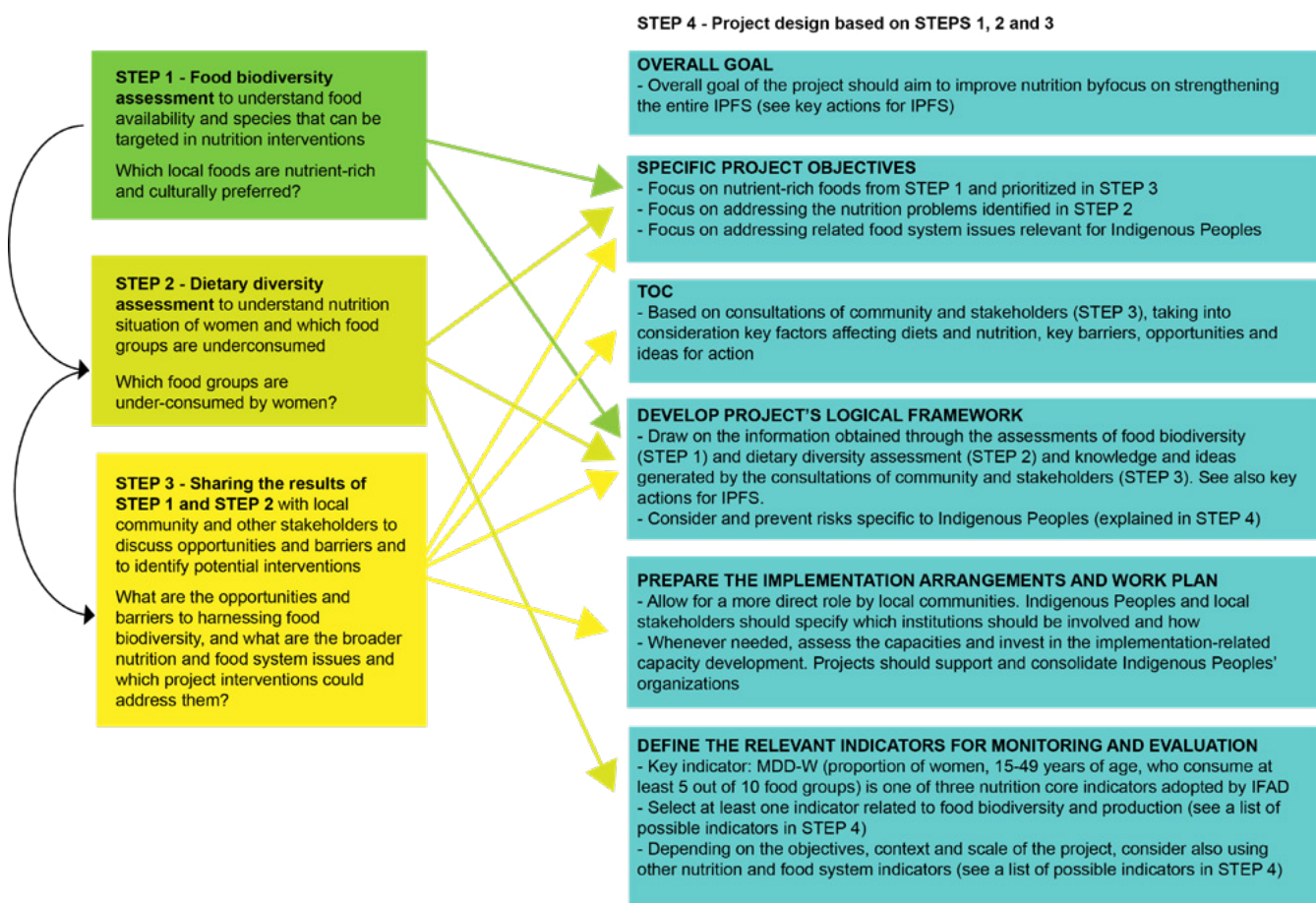
The Theory of Change (TOC) is a useful tool in identifying limiting factors in a project plan and making adjustments to eliminate them. TOC should build upon or reflect the information gathered in consultations with the local communities and stakeholders (STEP 3). The generated information on the factors affecting diets and nutrition, key barriers, opportunities, and action steps (Table 5), provide a solid base for the development of TOC and a logical framework. The development of TOC should also reflect on the main theme of the investment (e.g., agroecology, food systems, value chains, rural development, etc.).

#### **Box 6. Project example - Improving nutrition (and wellbeing) of Khasi Indigenous Peoples in North-East India**

North East Slow Food and Agrobiodiversity Society (NESFAS), an Indigenous Peoples' NGO based in North-East India, implemented a project called, "No One Shall Be Left Behind: Biodiversity for Food, Nutrition and Energy Security for 3000 Households in Meghalaya and Nagaland", with the aim to improve livelihoods in 130 villages by strengthening IPFS. Project activities commenced only after thorough consultations were completed with community members of the 130 villages and a FPIC agreement was signed with each participating village. Mapping of food biodiversity and associated local knowledge was conducted to document and prioritize preferred foods. This was followed by the dietary diversity assessment, which helped to identify consumed and under-consumed food groups. The results of these two assessments, along with key food system issues, were discussed with the local communities, and action plans were co-created. These assessments and consultations were used to inform and adjust the project interventions such as cooking demonstrations; food festivals; nutrition and WASH and campaigns; midday meals and school gardens; agrobiodiversity walks; agroecological production; and seed sharing initiatives.



**Figure 5.** Process of using results of STEPS 1, 2, and 3 to inform the overall project design



#### 4. Develop Project's Logical Framework

Development of a logical framework (or logframe) for projects improving diets and nutrition through IPFS should draw on the information obtained through assessments of food biodiversity (STEP 1) and dietary diversity (STEP 2) and knowledge and ideas generated by the consultations of community and stakeholders (STEP 3).

Developing a logframe typically includes indicators with quantifiable targets and suggested means of verification for monitoring and evaluation. It also pushes designers to reflect on assumptions and possible risks. Indigenous Peoples have worldviews, rights, local resources, as well as risks and challenges that are different from non-Indigenous societies. Therefore, when working in Indigenous Peoples' territories, it is crucial to consider and prevent specific risks. Examples of assumptions specific to Indigenous Peoples that can lead to risk are as follows:

- Indigenous Peoples' collective rights to their lands and territories are respected, and

communities are eager to promote the biological and cultural diversity of their food systems;

- Households have secure land tenure and enough land to produce selected foods. The biodiversity of the local landscape/food system is adequate for provisioning nutritious foods;
- There is enough interest to take part in activities that combine traditional and contemporary knowledge to make the best use of local nutritious foods;
- Producers are willing to combine their traditional practices with new agroecological methods. Trainers have sufficient knowledge and skills on intercultural approaches for weaving traditional and contemporary knowledge and practices;
- Indigenous women do not face significant constraints and barriers to producing, cooking, and consuming local nutritious foods;
- Communities are open to learning and adapting improved food processing and storage technologies, and are prepared to benefit equitably from increased availability and added value of foods and food products;

- The project team has the capacity to communicate in a way and language that Indigenous Peoples' communities fully understand;
- The project delivers locally suitable and feasible technologies that the communities can sustain beyond the project, without breaking transmission of existing traditional knowledge and methods.

IFAD's Social, Environmental and Climate Assessment Procedures (SECAP), which lays out a framework for managing risks and impacts, and aims to achieve better development outcomes in IFAD investments, provides relevant guidelines valuable during the early stages of the design process. The SECAP Standard 1 on Biodiversity Conservation recognizes that biodiversity is about people and the need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment, and that diversity in agroecological systems builds resilience of rural families and their farming systems. Standard 4 on Indigenous Peoples emphasizes that projects must examine the potential risks to Indigenous Peoples, including their rights, lands, territories, resources, and livelihoods, as an integral part of assessing the project's full range of potential adverse social and environmental impacts.

More details and general guidance on project design, theory of change, logical framework, and monitoring is available elsewhere (4,5), or in other relevant manuals.

## **5. Prepare the Implementation Arrangements and Work Plan**

The implementation arrangements and work plan should allow for a more direct and defined role by local communities. Indigenous Peoples and local stakeholders should specify which institutions should be involved and how.

While certain interventions can be largely community-based, some complex interventions requiring transdisciplinary and multi-sectoral actions will need to build partnerships and collaborations with various experts and stakeholder groups such as local health workers, governmental extension agents, farmer/women's groups, teachers/students/schools, religious and cultural bodies, NGOs and CSOs, development organisations, and others. This can be clarified during the implementation arrangements and work plan development.

If there is uncertainty about stakeholders' capacity for implementation, then an assessment of their technical, labour, and financial capacity should be conducted. It is important that the project team has the capacity to implement, backstop, monitor, report, and troubleshoot. Whenever needed, capacity development should be planned and delivered. Projects should support and consolidate Indigenous Peoples' organisations at local and territorial levels (6).

Inclusive partnerships that strengthen Indigenous Peoples' agency and local stakeholders' capacity can help to ensure that improvements will continue even when the project has finished. This could be an approach for the project exit strategy to improve sustainability. Whenever possible, existing projects and programs should be reviewed, and synergies that maximize nutritional outcomes through sustainable food systems prioritized. Finally, costing will depend on the type, complexity, and scale of the intervention. Context-specific information will need to be collected and considered. In general, costing should consider all the inputs required for each activity and costs per unit.

## **6. Define the Relevant Indicators for Monitoring and Evaluation**

Monitoring should be done at different stages (baseline, midline, endline) of the intervention to capture the intermediate results and to navigate the right impact pathway. Appropriate key indicators, such as the proportion of women reaching MDD-W, can be used to regularly monitor progress on the impact on diets in the target population. MDD-W is one of three nutrition core indicators adopted by IFAD (7); the other two are the percentage of the targeted population who have improved Knowledge, Attitudes and Practices (KAP) of food, feeding, caring, and hygiene; and the output indicator (the number of households provided with support to improve their nutrition).

Below is a list of recommended indicators and possible metrics related to diet, nutrition, and nutrition-related knowledge, but also to other areas as food systems have multiple interrelated components and outcomes. Many of these indicators (especially related to nutrition, socio-economy, and wellbeing) should be disaggregated by gender and age to control for intra-household variations. Note that some of the listed indicators would require additional methods beyond those explained in this toolbox.

While the list below provides diverse options of possible indicators, each project should choose, adjust, or further specify the indicators (including output and outcome levels) and targets according to the project goal and objectives. More comprehensive monitoring would provide a better understanding of the intervention's impact on both social and ecological outcomes. Whenever possible, more holistic monitoring employing mixed-methodologies (quantitative and qualitative) that give space for participatory assessment, qualitative interviews, and observations should be conducted.

Resources with a more detailed description of indicators and with additional food system-related indicators are available (8, 9, 10, 11, 12, 13). For general indicators used by IFAD, see Core Outcome Indicators measurement guidelines (COI) – online training. IFAD staff additionally can refer to the Core Indications Manual (14). Several of IFAD's core indicators include multipliers to disaggregate data by Indigenous Peoples. There is no specific compendium of indicators for IPFS, but related older sets of indicators are available (15, 16). TEBTEBBA published A Resource Book on Indicators Relevant for Indigenous Peoples. And the Indigenous Navigator provides tools, data, and indicators that can be used for monitoring the level of recognition of Indigenous Peoples' rights. The Indigenous World reports by IWGIA do not provide a guide on indicators, but they are a comprehensive resource on the situation of Indigenous Peoples' rights worldwide. In the future, the development of specific metrics and indices for IPFS is recommended.

Importantly, participatory engagement of the community during the monitoring and evaluation process can also empower community members and strengthen the sustainability of the project. This is in alignment with SECAP, which stresses that Indigenous Peoples and knowledge experts should jointly monitor implementation throughout the full duration of the project cycle.

Lastly, monitoring and evaluation should generate valuable information and lessons that must be returned to local communities and stakeholders. The findings will also generate evidence that can be used for advocacy and policy work at the local, regional, national, and global levels.

## **PROPOSED INDICATORS RELATED TO DIET, NUTRITION, AND NUTRITION-RELATED KNOWLEDGE**

- proportion of women (15-49 years of age) who consume at least five out of ten food groups (MDD-W)
- proportion of children (6-23 months of age) who consume at least five out of eight food groups
- mean dietary diversity score (average number of food groups consumed by a population)
- proportion/number of consumers with increased consumption of target food groups
- proportion/number of women consuming iron-rich foods
- proportion/number of consumers with increased number of fruit and vegetable servings
- proportion/number of adult consumers who eat at least five servings of fruits and/or vegetables per day
- proportion/number of consumers with increased dietary species richness
- proportion/number of consumers with decreased share of ultra-processed foods in diets
- proportion/number of children and youths accessing and consuming school meals made from local food biodiversity
- proportion/number of households with increased share of income spent on non-starchy staples
- proportion/number of persons with reduced incidence of foodborne diseases
- proportion/number of persons with reduced incidence of diet-related non-communicable diseases
- proportion of persons with improved Knowledge, Attitudes and Practices (KAP) of food, feeding, caring, and hygiene

## **PROPOSED INDICATORS RELATED TO FOOD BIODIVERSITY AND PRODUCTION**

- proportion/number of households with increased diversity of crops and livestock produced
- proportion/number of households maintaining traditional crop varieties and animal breeds
- proportion/number of persons with increased knowledge and use of wild edible plants and animals

- proportion/number of persons with improved access to food biodiversity
- proportion/number of households with increased production/productivity of local nutritious and climate-resilient foods (prioritized food groups or target foods)
- proportion/number of households with improved agroecological and regenerative practices
- number of established community seed banks keeping autochthon seed varieties
- number of persons served by the established seed banks keeping autochthon seed varieties

### **PROPOSED INDICATORS RELATED TO SOCIO-ECONOMY AND WELLBEING**

- proportion/number of persons/communities with recognized rights over land and natural resources
- proportion/number of persons with reduced/no experience of discrimination as prohibited in international human rights law
- proportion/number of persons/households with improved livelihood or increased income derived from local biodiversity, food systems, and territories
- proportion/number of groups/enterprises with improved food processing skills and sustainable technologies
- proportion/number of persons with increased level of local knowledge and languages
- proportion/number of women with increased control of income and ownership of assets
- proportion/number of women with increased power in decision-making
- proportion/number of women empowered in agriculture (women's empowerment in agriculture index - WEAI)
- proportion/number of children, youths, and adolescents with improved access to education
- proportion/number of youths, adolescents, and young adults with enhanced knowledge, skills, and experiences for decent employment and entrepreneurship
- number of schools and educational programs integrating and passing traditional knowledge
- proportion/number of households with improved access to safe water supply
- proportion/number of households with improved access to healthcare and insurance
- proportion/number of households with improved access to markets and supply chains
- proportion/number of households with reduced food insecurity (food insecurity experience scale - FIES; or household food

- insecurity experience scale - HFIES)
- proportion/number of households with increased access to food (months of adequate household food provisioning - MAHFP)
- proportion/number of households with increased household dietary diversity (household dietary diversity score - HDDS)
- proportion/number of persons with improved other wellbeing indicators (wellbeing indicators defined locally in a participatory way - capabilities approach)
- number of Indigenous Peoples' communities consulted that provided free, prior and informed consent to the proposed project
- number of Indigenous Peoples' representatives involved in project management/district units
- number of Indigenous Peoples' representatives involved in project supervision and evaluation missions

### **PROPOSED INDICATORS RELATED TO ENVIRONMENT AND CLIMATE RESILIENCE**

- status of biodiversity of wild plants and animals
- enhanced vegetation index or ecosystem integrity
- landscape area under sustainable management
- coverage of areas under traditional governance
- coverage of restored or rehabilitated land
- coverage/proportion of land resilient to natural hazards and climate impacts
- status of water quality of ecosystems
- quality and health of the soil
- pollution levels in agro-ecosystems
- resilience to climate change (IFAD's how to do note – Measuring climate resilience)
- proportion/number of households using multiple land-use systems for agriculture and food acquisition (resilience in the diversity of land-uses)
- number of active traditional solidarity mechanisms in place (e.g., mutual and communal work, barter, food sharing and donations, free food, and care for the vulnerable)
- proportion/number of communities with increased resilience of socio-ecological production landscapes and seascapes (indicators of resilience in socio-ecological production landscapes and seascapes - SEPLS)

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