

# BIODIVERSITY AND NUTRITION SYNERGIES:

EVALUATING NATIONAL  
BIODIVERSITY STRATEGIES  
AND ACTIONS PLANS FOR  
INTEGRATION



**gain**  
Global Alliance for  
Improved Nutrition

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## Executive Summary

The Initiative on Climate Action and Nutrition (I-CAN) was launched at the 27th Conference of the Parties (COP27) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2022 by the Government of Egypt. I-CAN is co-chaired by the Global Alliance for Improved Nutrition (GAIN) and the Government of Egypt and is comprised of a working group of members including the Food and Agriculture Organization (FAO), the World Health Organization (WHO), and the Scaling Up Nutrition (SUN) Movement. I-CAN aims to foster collaboration to accelerate transformative action addressing the critical nexus of climate change and nutrition.

Part of I-CAN's focus is to research and assess existing policies to explore the climate-nutrition nexus. The I-CAN report, 'Accelerating Action and Opening Opportunities: A Closer Integration of Climate and Nutrition', led by GAIN, provided a baseline assessment to assess current levels of climate and nutrition integration to identify weaknesses, strengths, and opportunities within climate and nutrition policies.

Recognising that climate and nutrition are generally not well connected and that biodiversity loss is deeply connected to the causes and consequences of the climate crisis, this report takes the baseline assessment a step further to analyse nutrition-biodiversity linkages in National Biodiversity Strategies and Action Plans (NBSAPs).

Biodiversity is deeply interlinked with nutrition action and food security. Diverse diets, sourced from a rich variety of plants and animals, offer a wide range of nutrient-rich foods, including essential vitamins, minerals, and other micronutrients necessary for nutritional support in human health. Biodiversity also supports soil health, affecting the



nutrient composition of crops, pollination, and pest control, all of which are critical for sustainable food systems. Furthermore, traditional and local knowledge systems (which are often connected to biodiversity conservation) preserve sustainable and nutritious food practices, fostering resilience against environmental and socio-economic challenges and enhancing the nutritional value of crops and livestock. This report does not seek to add to the global body of evidence on links between biodiversity, food systems, and nutrition outcomes<sup>1</sup>, but rather to provide an analysis on the extent to which nutrition sensitivity is integrated into biodiversity strategies.

NBSAPs provide strategic direction at the national level for the management of biodiversity, outlining specific actions, targets, and policies to help conserve and sustainably use biological resources. Governments are required to submit these documents to the Convention on Biological Diversity (CBD) and align them with globally agreed goals on biodiversity. Since the launch of the CBD's Kunming-Montreal Global Biodiversity Framework (GBF) in 2022, Parties to the Convention (i.e., governments) are encouraged to update their NBSAPs in line with the GBF by COP16 in October 2024.

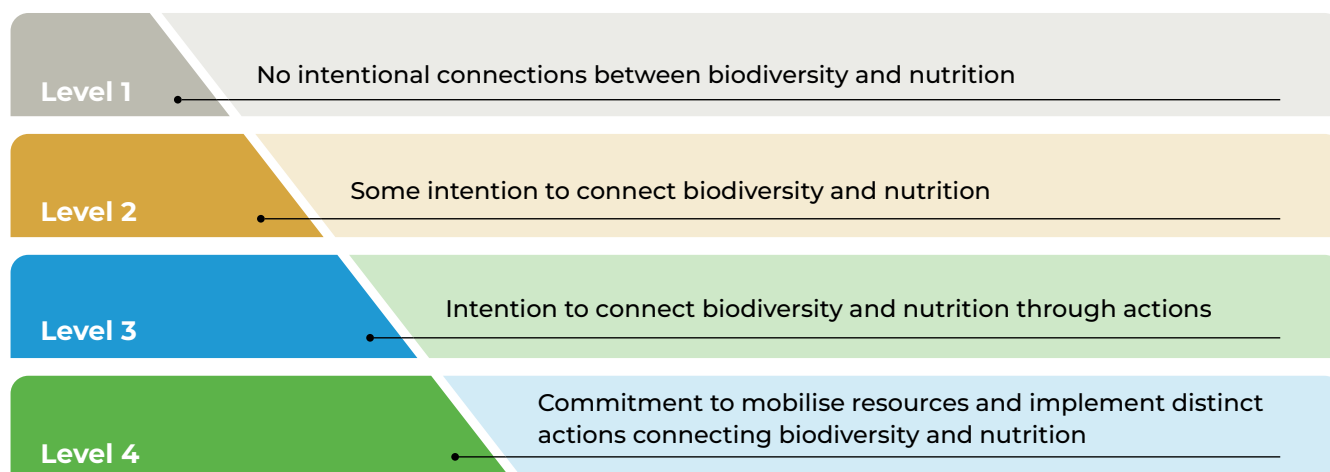
NBSAPs are important avenues for mainstreaming intersectoral collaboration to improve biodiversity management, making the renewal period a key

1 | FAO, 2021

opportunity for nutrition action to be integrated within biodiversity management. To understand how well nutrition is currently integrated in NBSAPs (and therefore how this can be strengthened in future NBSAPs), this analysis reviews 192 NBSAPs for their

integration of nutrition-biodiversity linkages. Each NBSAP is categorised by its level of integration of biodiversity and nutrition, ranging from no integration (Level 1) to strong integration (Level 4) (see **Figure 1**).

**Figure 1: Levels of Integration between Biodiversity and Nutrition**



From this analysis, the key findings of the report illustrate that:

- The majority of NBSAPs need to integrate biodiversity-nutrition linkages:
  - ❑ 62% of NBSAPs make no intentional connections between biodiversity and nutrition
  - ❑ Only 4% of NBSAPs have concrete plans to mobilise resources and take action to address nutrition
- Countries in Latin America and the Caribbean, Sub-Saharan Africa, South Asia, and East Asia and the Pacific are more likely to integrate nutrition-biodiversity linkages, but most regions on average have no integration (see **Figure 2**);
- Low-income economies had the highest proportion of strong integration with biodiversity and nutrition (8%) compared to 0% of high-income countries – meaning they are more likely to better integration nutrition-biodiversity linkages relative to other income groups;
- NBSAPs that were published more recently are more likely to better integrate nutrition-biodiversity linkages. The set of NBSAPs that were updated within the last five years (2018-2024) have a smaller proportion of no integration – Level 1 NBSAPs (49%) – and a higher proportion of strong integration – Level 4 NBSAPs (5%);
- The majority of NBSAPs mention food security (74%), indigenous knowledge (73%), and genetic diversity of crops (65%) yet did not link these concepts to nutrition. This presents a foundation and opportunity for future NBSAPs to develop these linkages;
- Indigenous knowledge is frequently included in NBSAPs in relation to conserving and restoring biodiversity and supporting agricultural production.

Ultimately, this report aims to encourage policymakers and officials participating in revisions of their country's NBSAP to think about how to better integrate nutrition in their NBSAPs in impactful and actionable ways, recognising that nutrition and biodiversity are interlinked.

This report also presents two case studies of NBSAPs from Malawi and Brazil, with information supplemented through interviews with individuals from local organisations that are familiar with the NBSAP process. The two case studies serve as exemplars of how to integrate nutrition-biodiversity linkages in NBSAPs.

Based on the analysis and case studies, the report concludes with the following recommendations for integrating nutrition in NBSAPs:

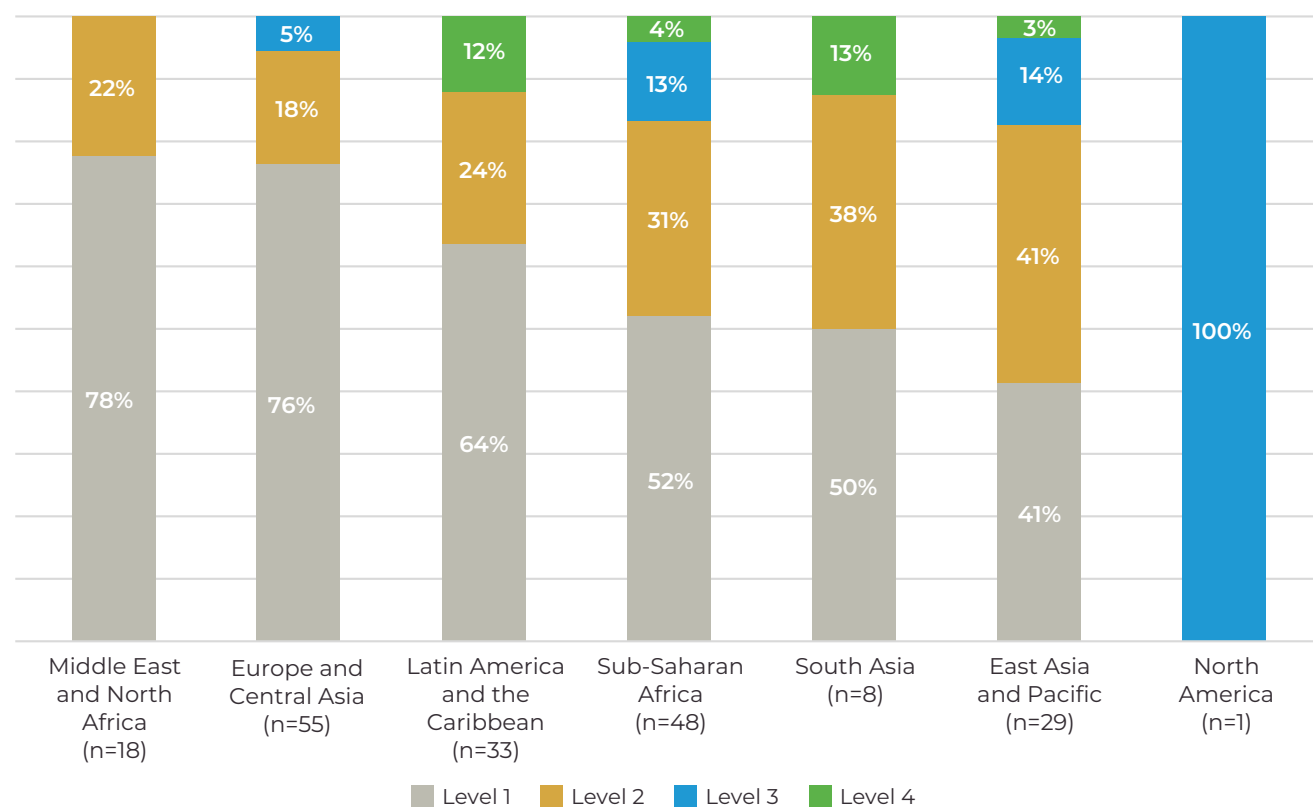
- Build on existing themes within the NBSAPs that are related to nutrition to improve the analysis of nutrition-biodiversity linkages (e.g., where traditional knowledge is mentioned, this can be linked to the symbiotic relationship with nutrition);
- Increase the awareness of biodiversity-nutrition linkages with stakeholders (e.g., ministries, civil society organisations, private

sector, women and youth groups, local communities, and Indigenous Peoples) that are involved (or should be consulted) in the NBSAP process;

- Improve capacity-building for biodiversity-nutrition integration within the monitoring and evaluation framework of NBSAPs;
- Develop multi-sectoral, participatory forums for the NBSAP development and implementation process, and emphasise the need for nutrition-biodiversity linkages within these forums;
- Prioritise the involvement of women, youth, Indigenous Peoples, and local communities within the NBSAP development process to integrate their experience with agriculture and nutrition.

## Summary of All Results

**Figure 2:** Proportion of Levels of Integration by Region (N=192)<sup>2</sup>



<sup>2</sup> The total percentage for East Asia and Pacific does not equal 100% due to rounding.

# Introduction

Biodiversity encompasses genetic, species, and ecosystem diversity. At each level, biodiversity is fundamental to global nutritional security.<sup>3</sup> Improving biodiversity in food production can positively impact dietary variety, which can help improve diet-related health outcomes.<sup>4</sup> Diversifying agricultural production may improve the nutritional value of diets, especially for subsistence farmers, and also promotes sustainable agricultural practices and ecosystem resilience, both of which improve access to nutritional diets.<sup>5</sup>

The loss of global biodiversity is happening at an alarming rate. Currently, one million animal and plant species are threatened with extinction, with many facing extinction within decades.<sup>6</sup> This is the highest number of species at risk in human history. At the same time, nearly one in three people suffer from one or more forms of malnutrition. The crisis of biodiversity is tied to the issue of malnutrition.<sup>7</sup> The ongoing loss of biodiversity in the global food system poses a significant and increasing threat to the availability of and access to healthy diets. These impacts disproportionately affect vulnerable populations, including women, children, Indigenous Peoples, and people living in poverty.

## About NBSAPs

NBSAPs are a critical policy instrument for reversing the biodiversity loss crisis. They provide strategic direction at the national level for the management of biodiversity, outlining specific actions, targets, and policies to help conserve and sustainably use biological resources. Governments are required to develop and submit NBSAPs to the CBD and align

them with globally agreed goals on biodiversity. Since the launch of the GBF in 2022, Parties to the Convention (i.e., governments) are encouraged to renew their NBSAPs in line with the GBF by COP16 in October 2024.

Each country has a different process in developing their NBSAP according to their institutional, legal, and administrative context, all of which will affect who should participate. That said, the COP to the CBD recommends that NBSAPs are developed through engagement with five major stakeholder groups for a participatory approach, including: government ministries (including from different levels of government, sectoral ministries, and ministries responsible for education and social affairs), the scientific community, Non-Government Organisations (NGOs), the private sector, Indigenous Peoples, and local communities.

NBSAPs are important avenues for mainstreaming intersectoral collaboration to improve biodiversity management, making the renewal period a key opportunity for nutrition action to be integrated with biodiversity management. To understand how well nutrition is currently integrated in NBSAPs (and therefore understand how this can be strengthened in future NBSAPs), this analysis reviews 192 NBSAPs for their integration of nutrition-biodiversity linkages. Each NBSAP is categorised on its level of integration of biodiversity and nutrition, ranging from no integration (Level 1) to strong integration (Level 4).

3 Genetic diversity refers to the variability of genes within a species. Species diversity is the number of different species and their abundances in a specific area, while ecosystem diversity refers to the variety and abundance of ecosystems on Earth.

4 World Health Organisation, 2020

5 World Health Organisation, 2024

6 IPBES, 2019

7 WHO, 2024

## About I-CAN

This report builds upon a previous baseline report published under the I-CAN in 2023 mapping the state of integration between climate change and nutrition across a range of indicators.



I-CAN was launched at UNFCCC COP27 in 2022 by the Government of Egypt. I-CAN is co-chaired by GAIN and the Government of Egypt and is comprised of a working group of members including FAO, the WHO, and the SUN Movement. I-CAN aims to foster collaboration to accelerate transformative action addressing the critical nexus of climate change and nutrition.

The outcomes of I-CAN are organised around four pillars:

- (1) implementation, action, and support;
- (2) capacity building, data, and knowledge transfer;
- (3) policy and strategy; and
- (4) investments.

I-CAN focuses on advocating and advising on how to better integrate climate thinking, planning, action, and finance with nutrition action, with the aim of improving outcomes for both nutrition for climate improvement.

In the two years since its inauguration, I-CAN has developed assessments and research to bridge policy gaps in the climate-nutrition nexus. The first I-CAN paper 'Accelerating Action and Opening Opportunities: A Closer Integration of Climate and Nutrition', led by GAIN, provided a baseline assessment to assess current levels of climate and nutrition integration and opportunities. The assessment focused on identifying the strengths and weaknesses of integration within climate and nutrition policies, to ultimately strengthen their inclusion in future policy developments. Recognising that climate and nutrition are generally not well connected and that biodiversity loss is deeply interlinked with the causes and consequences of the climate crisis, this report takes the baseline assessment a step further to analyse nutrition-biodiversity linkages in NBSAPs.

For the I-CAN baseline assessment, researchers developed a methodology by reviewing and adapting existing methodologies that gauged nutrition-sensitivity and climate-smart characteristics (both mitigation and adaptation). The final methodology involved categorising the level of integration of climate-nutrition linkages, ranging from no integration (Level 1) to strong integration (Level 4). This report adopts the I-CAN methodology to evaluate published NBSAPs for the extent to which they integrate nutrition-biodiversity linkages (see appendix for methodology).





## Key Findings and Themes

**Countries in Latin America and the Caribbean, Sub-Saharan Africa, South Asia, and East Asia and the Pacific are more likely to better integrate nutrition-biodiversity linkages (Level 4), but most regions on average have zero integration (Level 1)**

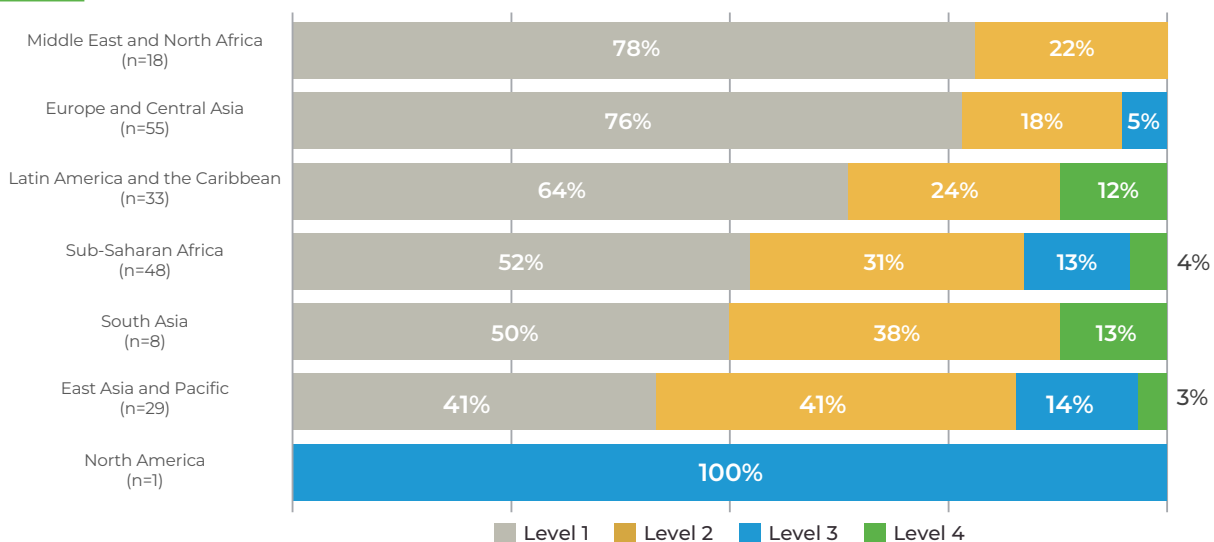
The majority of NBSAPs assessed demonstrated a need to integrate biodiversity-nutrition linkages. NBSAPs were classified ranging from level 1 at no integration with nutrition, to level 4 at strong integration with nutrition (details as shown in figure 1). Out of all NBSAPs assessed, 62% are Level 1 NBSAPs, 27% are Level 2 NBSAPs, 7% are Level 3 NBSAPs, and only 4% are Level 4 NBSAPs. To review the geographic distribution of the NBSAP levels, this analysis assessed the strength of nutrition-biodiversity integration in two ways, both of which show countries in Latin America and the Caribbean, Sub-Saharan Africa, South Asia, and East Asia and the Pacific are more likely to better integrate nutrition-biodiversity linkages. First, in terms of the proportion of Level 4 NBSAPs (shown in green in **Figure 3**), South Asia ranked the highest (13%), followed by Latin America and the Caribbean (12%),

Sub-Saharan Africa (4%), and East Asia and the Pacific (3%). In contrast, the Middle East and North Africa (MENA) region and Europe and Central Asia had zero NBSAPs classified at Level 4.

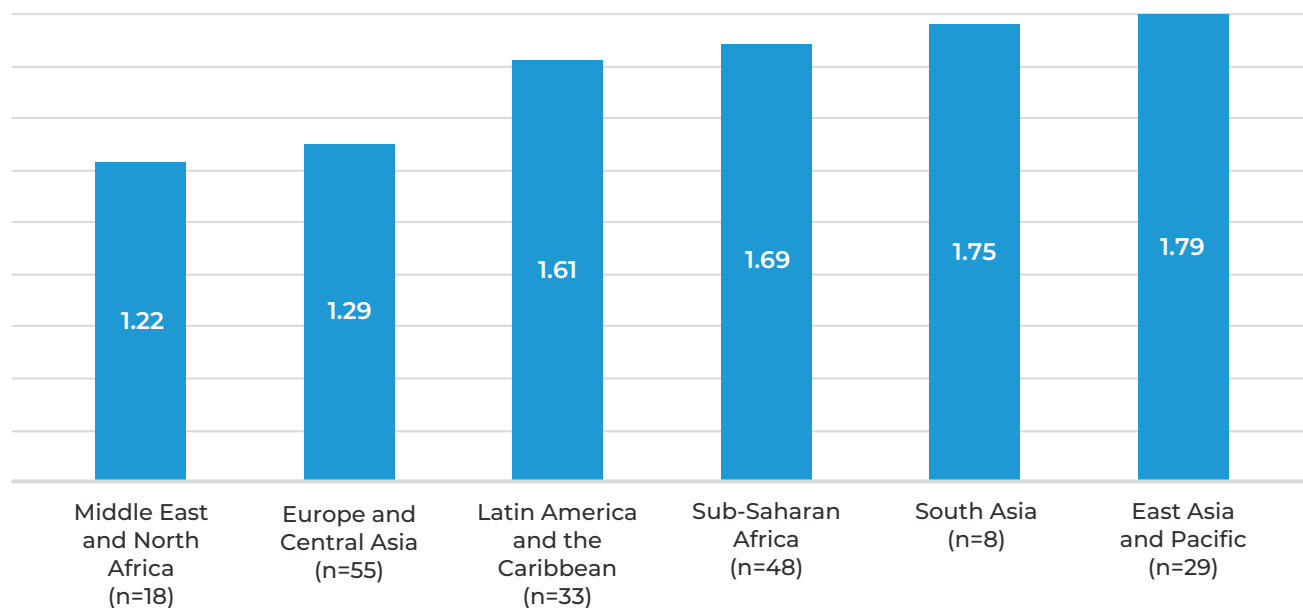
Second, the weighted average was analysed, which provided slightly different results. According to this metric, countries in Latin America and the Caribbean, Sub-Saharan Africa, South Asia, and East Asia and the Pacific still lead on nutrition-biodiversity integration. However, instead of only capturing the proportion of NBSAPs with the highest integration, the weighted average examines the overall distribution of NBSAPs across different levels.

The result is a number between (and inclusive of) 1 and 4. As shown in **Figure 4**, by region, the strongest to weakest integration determined by weighted average is East Asia and Pacific (1.79), South Asia (1.75), Sub-Saharan Africa (1.69), Latin America and the Caribbean (1.61), Europe and Central Asia (1.29), and MENA (1.22). It should be noted that this result excludes North America, which has a sample set of only one (Canada) ranked at Level 3, giving it a weighted average of 3.

**Figure 3: Proportion of Levels of Integration by Region (N=192)<sup>8</sup>**



<sup>8</sup> The total percentage for East Asia and Pacific does not equal 100% due to rounding.

**Figure 4:** Weighted Average of the Levels of Integration by Region (N=192)

The general regional trend of low- and middle-income countries leading in higher levels of integration generally aligns with the locations of biodiversity hotspots. Of the 36 identified biodiversity hotspots in the world, only 7 are located within Canada, MENA, Europe and Central Asia.<sup>9,10,11</sup> The most biodiverse regions (Latin America and the Caribbean, Sub-Saharan Africa, South Asia, and East Asia and the Pacific) are, conversely, developing deeper linkages between biodiversity and nutrition within their NBSAPs. One reason this trend exists could be that biodiversity loss acutely threatens biodiverse regions' native vegetation, affecting the availability of nutrient-rich foods for their populations.



As seen in **Figure 3**, across all regions, NBSAPs were most likely to be classified as Level 1 (i.e., compared to other classifications, Level 1 NBSAPs had a higher percentage distribution as shown in grey). The exception to this was Canada and East Asia and the Pacific.<sup>12</sup> Besides these exceptions, in all regions, the majority ( $\geq 50\%$ ) of NBSAPs were classified as Level 1. Corresponding with their lack of Level 4 NBSAPs, Europe and Central Asia had a high proportion (76%) of Level 1 NBSAPs, with MENA having the highest proportion (78%) of Level 1 NBSAPs.

**Low-income economies are more likely to better integrate nutrition-biodiversity linkages compared to other country income groups**

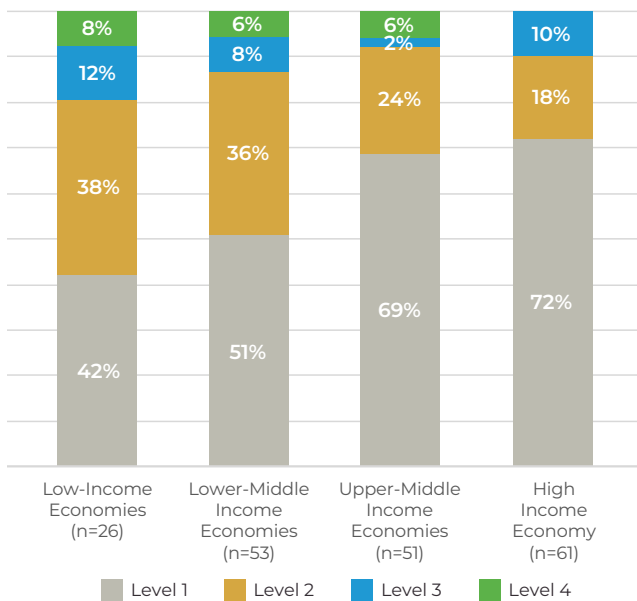
The analysis of integration by income groupings follows the results by regional groupings but provides slightly different insights. As seen in **Figure 5**, low-income countries demonstrated the strongest nutrition-biodiversity linkages relative to other income groupings, as they had the smallest proportion of Level 1 NBSAPs (42%) and the highest proportion of Level 4 NBSAPs (8%). In contrast, high-income countries have the highest proportion of Level 1 NBSAPs (72%) and zero Level 4 NBSAPs.

9 To qualify as a biodiversity hotspot, an area must meet two strict criteria: Contain at least 1,500 species of vascular plants found nowhere else on Earth (known as "endemic" species); and have lost at least 70 percent of its primary native vegetation.

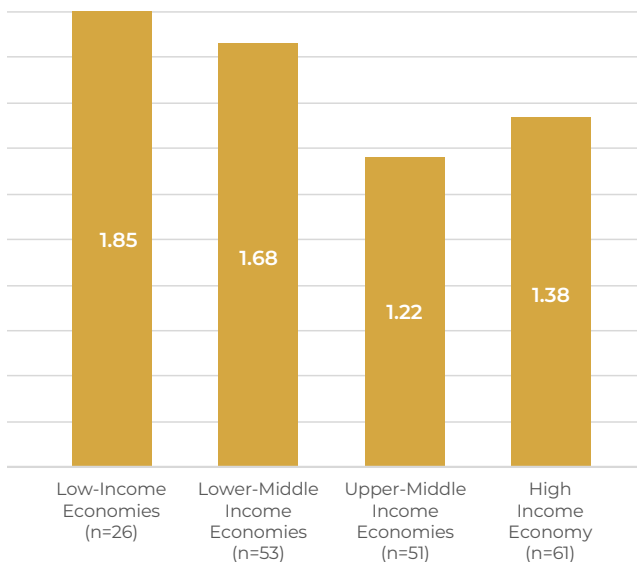
10 These regions are California Floristic Province, Madrean pine-oak woodlands, North American Coastal Plain, Mediterranean Basin, Mountains of Central Asia, Caucasus, and Irano-Anatolian.

11 Hoffman et al., (2016).

12 Venezuela is not included in these samples as it is categorised by the World Bank as *Temporarily Unclassified*.

**Figure 5: Proportion of Levels of Integration by Income Groupings (N=192)**

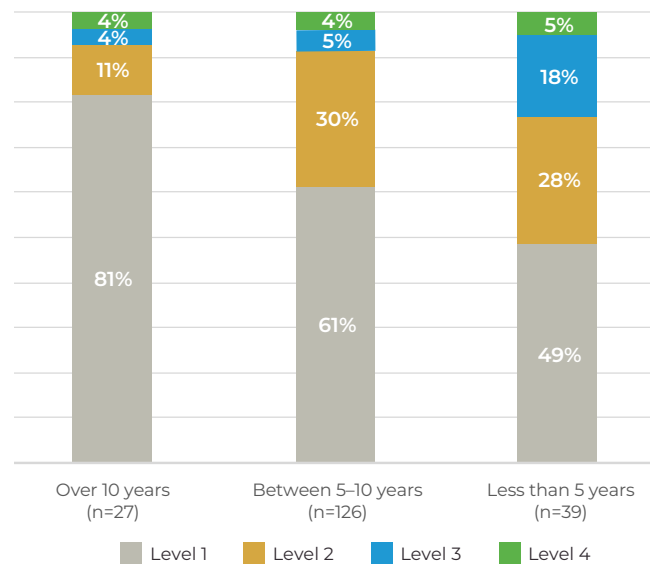
When examining the weighted average (**Figure 6**), the results resemble a U-shape, with upper middle-income economies showing the least integration.

**Figure 6: Weighted Average of the Levels of Integration by Income Groupings (N=192)**

**NBSAPs that were published more recently are more likely to better integrate nutrition-biodiversity linkages**

The timing of NBSAP revisions may have an impact on the level of nutrition-biodiversity integration, with more recently published NBSAPs demonstrating stronger nutrition-biodiversity linkages. As shown in **Figure 7**, the set of NBSAPs that were updated

within the last five years (2018-2024) have a smaller proportion of Level 1 NBSAPs (49%) and a higher proportion of Level 4 NBSAPs (5%). This corresponds to a weighted average of 1.8. Meanwhile, the set of NBSAPs that were updated over ten years ago had a higher proportion of Level 1 NBSAPs (81%) and a smaller proportion of Level 4 NBSAPs (4%). This corresponds to a weighted average of 1.3.

**Figure 7: Proportion of Levels of Integration by NBSAPs' Publication Year (N=192)**

**Figure 7** suggests that, over time, countries may better understand the linkages between nutrition and biodiversity, and this is reflected in their NBSAPs. Only 20% of NBSAPs were updated between 2018-2024. Decision 15/6 at COP15 requested countries revise and update their NBSAPs before COP16 in October 2024. Therefore, there is a possibility that the revised NBSAPs will better integrate nutrition-biodiversity linkages.

**Nearly one-third of Level 1 NBSAPs mention nutrition but do not provide the deeper analysis needed for a Level 2 classification**

Many level 1 NBSAPs mention nutrition superficially. This indicates that many NBSAPs recognise biodiversity-nutrition linkages but need a deeper analysis of the interconnections between nutrition and biodiversity to be classified as Level 2 or above. Illustrating that result (**Figure 8** on the following page), 29% of Level 1 NBSAPs mention nutrition but failed to provide the deeper analysis required for classification as a Level 2.

Many NBSAPs mention the ecosystem services provided by biodiversity (and list nutrition as one such ecosystem service), but they often fail to draw the conceptual link between nutrition and biodiversity. For example, the Marshall Islands' NBSAP states "biodiversity and biological resources are fundamental to so many aspects of our lives – for example, health and medicine, food and nutrition, energy." Given there is no explicit description of the pathways or the conceptual link between biodiversity and nutrition, the NBSAP was classified as Level 1.

**A majority of NBSAPs mention food security while failing to address nutrition or nutrition linkages to biodiversity**

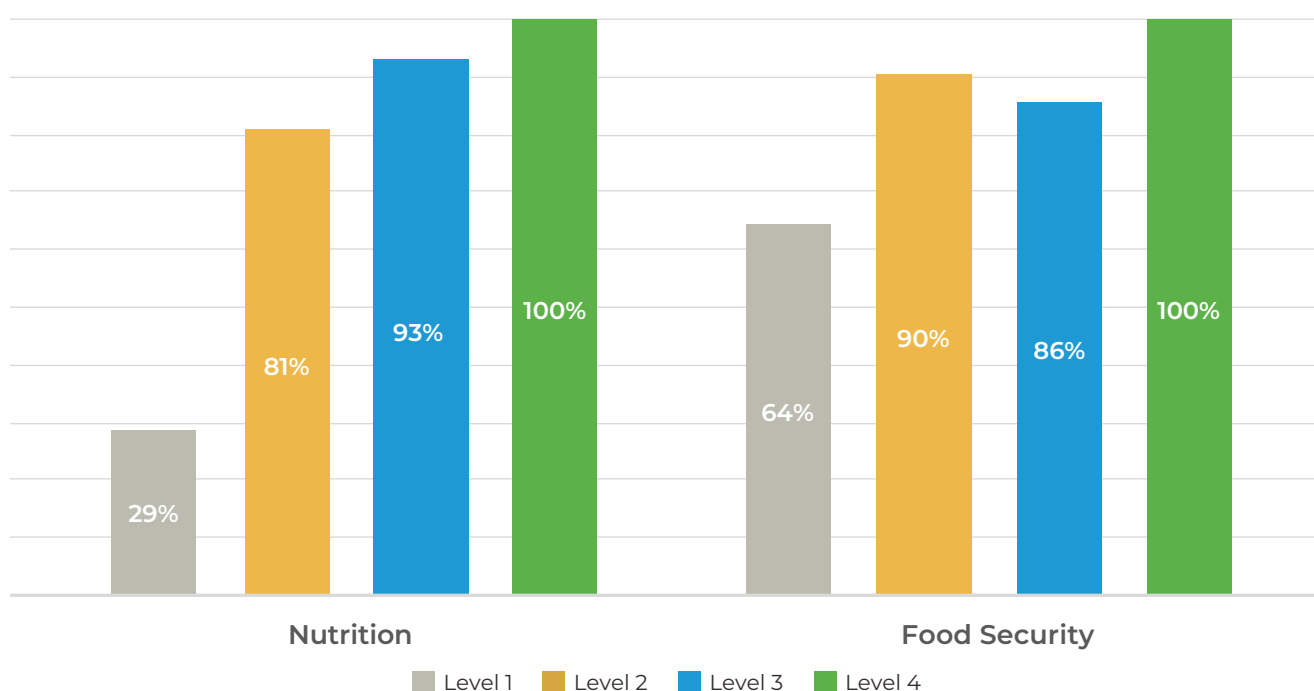
The I-CAN baseline assessment defines food security as the availability, access to, utilisation of, and stability of food supplies.<sup>13</sup> While some definitions of food security include reference to nutrition, I-CAN recognises that nutrition is distinct from food security. Nutrition is about the quality and diversity of food necessary for good human health and wellbeing. It extends beyond calorie-based food consumption, emphasising the intake of a well-balanced diet containing essential macro- and micro-nutrients.

**Figure 8** indicates that 64% of Level 1 NBSAPs mention food security, but most NBSAPs fail to simultaneously mention nutrition (only 29% mention nutrition). These results suggest that as countries consider food and its relation to biodiversity, they should consider biodiversity's impact on nutrition concurrently. The chart also indicates that 100% of Level 4 NBSAPs mentioned food security, demonstrating that the integration of nutrition often goes hand-in-hand with references to food security.

**When analysing other themes in NBSAPs related to nutrition and biodiversity, genetic diversity in the context of agriculture and food was most frequently mentioned**

The keyword searches not only analysed references to nutrition and food security across the NBSAPs, but also investigated mentions of keywords related to traditional and indigenous knowledge/food systems, human diets, and genetic diversity in the context of agriculture or food. This additional keyword analysis was conducted so that the researchers could understand whether there are underutilised opportunities for integrating nutrition by referencing other common themes that could relate to both nutrition and biodiversity.

**Figure 8:** Proportion of NBSAPs that mention Food Security and Nutrition by Levels of Integration (N=192)



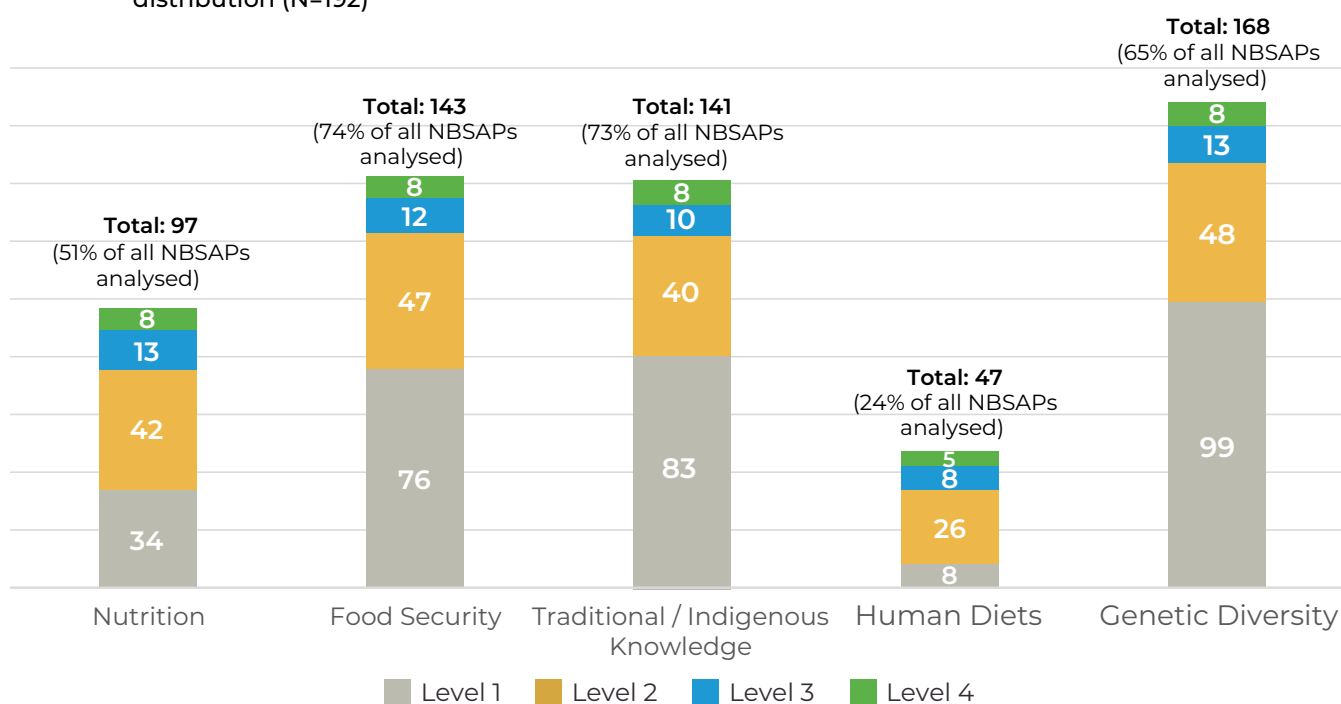
**Figure 9** demonstrates that among the keywords, genetic diversity related to agriculture and food is the most frequently mentioned. In contrast, keywords associated with human diets are the least frequent. Overall, NBSAPs that strongly integrate nutrition-biodiversity linkages (Level 4) are most likely to include the above keywords, compared to other NBSAP classification levels.

The significance of genetic diversity (referring to varieties of sub-species within a particular species, as opposed to variety of species in an ecosystem) in NBSAPs can be understood in the context of the significant loss of genetic diversity associated with food and agriculture. An estimated 75% of crop diversity was lost between 1900 and 2000, as local varieties were replaced by modern ones.<sup>14</sup> This loss is particularly pronounced in high-income countries, where high-output crops have become dominant in agriculture.<sup>15</sup> Correspondingly, 100% of high-income countries stress the importance of conserving and restoring or improving genetic diversity related to agriculture and food, compared to 88% of low-income countries.



Only 47% of NBSAPs examine both genetic diversity and nutrition (though not necessarily drawing linkages between the two). This indicates that there is an opportunity for nutrition to be integrated in NBSAPs if nutrition is connected to genetic diversity of plants and agriculture. An example of one such linkage that could be included in NBSAPs is around how greater genetic diversity contributes to greater resilience to pests and diseases, which could stabilise food and nutrition security in the case of infestations or the spread of disease. It may also contribute to more beneficial nutrients and other bioactive compounds in human diets, improving nutritional outcomes.

**Figure 9:** Overview of the number of NBSAPs that mentions key themes and the levels of integration distribution (N=192)



14 FAO, 2000.

15 Ibid.

**In many cases, NBSAPs include themes that could have been linked to nutrition**

Across all NBSAPs, 25% mention both food security and traditional knowledge but do not mention nutrition. 28% mention both genetic diversity and food security. 31% mention food security but do not mention nutrition. This demonstrates that there are opportunities to integrate nutrition with other related themes like genetic diversity, food security, and traditional foods. However, many NBSAPs frequently fail to do so, even when mentioning themes related to nutrition.

Another theme present in some NBSAPs was the connection of the decline in genetic diversity of food crops to the introduction of cash crops and monoculture, which can undermine traditional farming and food systems. Some NBSAPs, particularly in formerly colonised countries, highlight the impact of cash crops on genetic diversity and other forms of biodiversity. They stress the importance of preserving traditional knowledge related to food and the genetic diversity of food crops. Antigua and Barbuda's NBSAP, for example, points to the loss of its forests due to the policy of monoculture for sugar cane and sea-island cotton during the colonial era. Its NBSAP emphasises the push to diversify the agriculture sector under the government's sustainable development initiatives to enhance food security. However, all the NBSAPs that referenced colonial era agricultural policies did not connect monoculture to the decline in nutritional security and the possibility that diversifying agricultural systems and protecting traditional knowledge could improve nutritional outcomes. This can be an important connection but is not always a straightforward one. Monoculture and modern agriculture can affect crop diversity through the prioritisation of staple crops, which in some cases can be calorie-dense and nutrient-poor, and the depletion of soil nutrients. Although, they can

also have positive impacts on food availability and affordability through the increase of global trade, making diverse foods available to more people across seasons at cheaper costs.

**Indigenous and traditional knowledge is mentioned in the majority of NBSAPs and presents an opportunity for nutrition linkages**

Around 3 in 4 NBSAPs (73%) mention the importance of traditional knowledge in conserving and restoring biodiversity, which can relate to food and agriculture. Many NBSAPs refer to the importance of indigenous knowledge and stewardship for biodiversity management – which is indeed critical given that Indigenous Peoples conserve 80% of the world's remaining biodiversity.<sup>16</sup>

In Latin America and the Caribbean, 97% of NBSAPs mention traditional/indigenous knowledge in relation to biodiversity, which is the highest out of all regions. Indigenous Peoples represent almost 10% of the population of Latin America and the Caribbean.<sup>17</sup> Bolivia and Guatemala have the 2nd and 3rd largest demographic shares in the world, respectively, of Indigenous Peoples.<sup>18</sup>

Indigenous Peoples hold valuable ancestral knowledge and expertise in using native species and preserving genetic diversity of local species. This knowledge plays a vital role in promoting healthier diets and mitigating the impacts of climate change, contributing to more resilient food systems.<sup>19,20</sup> With both traditional knowledge and genetic diversity being frequently mentioned in NBSAPs, nutrition can easily be included in future NBSAPs, if bridged with these two themes. For example, Indigenous Peoples and local communities often utilise their traditional knowledge to preserve the genetic diversity of crops, thereby improving the diversity of local diets, which improves nutrition and contributes to a balanced diet.

<sup>16</sup> Sobrevila, 2008.

<sup>17</sup> IADB, 2010.

<sup>18</sup> This amounts to 48% of the population being Indigenous in Bolivia and 43.8% of the population in Guatemala.

<sup>19</sup> Hiemstra, 2024.

<sup>20</sup> Fassil et al., 2000.

## BEST PRACTICE

## BEST PRACTICE (LEVEL 4 NBSAP) CASE STUDY: BRAZIL

**NBSAP Publication Year: 2016**

**NBSAP Implementation Year: 2016 - 2020**

Brazil is a megadiverse country, with estimates indicating it is home to 20% of the planet's biodiversity. Brazilian biomes include the Amazon, Cerrado, Atlantic Forest, Caatinga, Pantanal, and Pampas. In 2023, the value added of Brazil's agriculture, forestry and fishing economy was 135,667 million USD (6.2% of the country's GDP, which is higher than the global average of 4.1% of GDP).<sup>21</sup>



### Key Themes

"Since 2006, the Brazilian government has advanced its policies and actions concerning food and nutrition. It has shifted from solely addressing hunger and malnutrition to considering preventive measures to combat obesity and other diet-related diseases. This shift is reflected in its NBSAP."

#### Nutrition Key Theme 1: Data collection on the nutritional value of biodiversity

- Brazil's NBSAP does not explicitly include nutrition as one of its five strategic objectives, but it does include the nutritional value of Brazilian biodiversity in the complementary indicators used to measure the achievement of these objectives. The NBSAP indicates that the nutritional value of Brazilian biodiversity is measured by the number of native species, with information on their nutritional value included in the Database on the Nutrition Composition of Biodiversity.

#### Nutrition Key Theme 2: Knowledge and promotion of nutrition

- Brazil includes nutrition in its Action Plan under Target 1, Action 4 and 47, which aims to raise awareness among Brazilian people about the values of biodiversity and steps they can take to conserve and use it sustainably. Action 4 involves the promotion of knowledge and sustainable use of biodiversity species, as well as the implementation of the Plants for the Future Initiative and Biodiversity for Food and Nutrition Project. Action 47 involves managing the valuation of food plants. The main objectives are to link local knowledge with scientific knowledge and promote good practices in handling food. The action provides an example of preparing flours and preserves to enhance nutritional value. It also includes distributing a recipe book and tailored booklets to the communities participating in the program.

#### Nutrition Key Theme 3: Genetic biodiversity

- Brazil's NBSAP emphasises the importance of conserving genetic resources and associated traditional knowledge. Target 13 aims to maintain genetic diversity of microorganisms, cultivated plants, and animals, including socio-economically and culturally valuable species by developing and implementing strategies to minimise the loss of genetic diversity by 2020. Action 2 under this target involves integrating biodiversity into food and nutritional safety policies. The NBSAP specifically highlights the Global Environmental Facility Project for the Conservation and Sustainable Use of Biodiversity for the Improvement of Human Nutrition and Well-being. This project aims to demonstrate the nutritional value of agrobiodiversity and its role in promoting healthy diets and strengthening livelihoods. The NBSAP highlights Brazil's objective of influencing policies, programmes, and markets that support the conservation and sustainable use of agrobiodiversity of nutritional value and distributing tools, knowledge, and best practices for the intensified use of biodiversity for food and nutrition.

### Gender-related Themes

- In the NBSAP, there is an understanding of the role of women in the conservation and sustainable use of biodiversity and of the differing needs of women compared to other members of the population. National Target 14 states that by 2020, ecosystems that provide essential services are restored and safeguarded, taking into account the explicit needs of women among other vulnerable groups. Brazil's NBSAP also emphasises that “the contribution of women's practices and knowledge must be recognized and valued in the processes for proposing, planning, constructing, decision-making and implementing policies, programmes and actions aiming at the conservation of biodiversity.” However, there is no analysis linking nutrition and gender in the NBSAP.

### Enabling Factors

#### Participatory process enabling Brazil to integrate nutrition and other key themes:

- The development of the Brazilian NBSAP for 2011-2020 involved many forums for representative participation, including Dialogues on Biodiversity, the Multi-sectoral Inputs to the Governmental Action Plan for the Conservation and Sustainable Use of Biodiversity, and the creation of the Brazilian Panel on Biodiversity (Painel Brasileiro de Biodiversidade – PainelBio). Dialogues on Biodiversity initiative, for example, brought together various sectors of society, including government, academia, corporations, civil society, representatives of Indigenous Peoples, and traditional communities to develop national targets. Over 200 institutions and programs were invited to engage in the process to develop the NBSAP.



#### Existing national policies that prioritised nutrition:

- Since 2006, the Brazilian government has advanced its policies and actions concerning food and nutrition. It has shifted from solely addressing hunger and malnutrition to adopting a more comprehensive approach that includes preventive measures to combat obesity and other diet-related diseases. One of the major initiatives is the National Food and Nutrition Policy (PNAN), which aims to enhance the overall food, nutrition, and health conditions of the populace. This is achieved through the promotion of healthy eating habits, food and nutrition monitoring, and the prevention and comprehensive management of health issues associated with food and nutrition. The PNAN has likely laid a strong foundation for integrating nutrition in the NBSAP. Increased awareness and deeper understanding of the relationship between food and disease prevention: The Brazilian government has been taking steps to improve the understanding of the connection between food and disease prevention. Food and nutritional security have become important aspects of Brazilian policy, with various measures implemented to guarantee access, distribution, conservation, and storage of food.

#### Platforms for institutional data sharing and knowledge sharing that enabled different sectors to inform the development of national targets and actions:

- The creation of the Brazil NBSAP involved the Brazilian Panel on Biodiversity (PainelBio), a multi-sectoral collaborative platform for institutional data sharing and knowledge sharing that enabled different sectors to inform the development of national targets and actions through seeking to promote synergy among institutions and fields of knowledge. PainelBio was invited to provide feedback on the strategy and specifically promoted the need to integrate gender issues in the NBSAP. PainelBio also created the complementary indicators used to measure the achievement of these objectives (see Key Theme 1) and included nutrition as a necessary indicator.



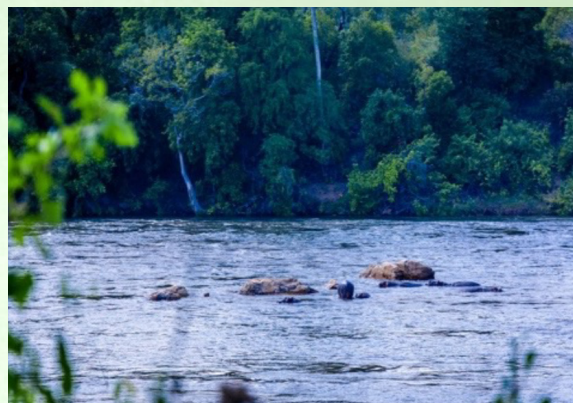
## BEST PRACTICE

## BEST PRACTICE (LEVEL 4) CASE STUDY: MALAWI

**NBSAP Publication Year: 2016**

**NBSAP Implementation Year: 2015 – 2025**

Terrestrial ecosystems in Malawi include forests, mountains and grasslands. Aquatic ecosystems cover about 20% of the total surface area of Malawi and are habitats to a diversity of fish and other aquatic fauna and flora. In 2023, the value added of Malawi's agriculture, forestry and fishing economy was 3,109.54 million USD (22.1% of the country's GDP).<sup>22</sup>



### Key Themes

“ The fact that in Malawi, their biodiversity is under threat because most of the communities are overdependent of the natural resources. Lake Malawi provides a lot of fish as a protein for the masses and other plant species that they overdepend on. The threat that is there for the resources and our nutrition should be one of the first key reasons for why one of the issues of nutrition stands out [in relation to biodiversity in NBSAPs]. ”

#### Nutrition Key Theme 1: Genetic diversity, nutrition, and agriculture

- In describing the status and trends of biodiversity in Malawi, the NBSAP covers flora species diversity. Here, the NBSAP lists 14 species (e.g., *Dioscorea bulbifera* or yam, *Curcubita maxima* or squash, and others) that have a high nutritive value but are declining in production due to being out competed by major crops. The NBSAP also considers the contribution of different sectors to the country's total protein supply. (Page 5, 7)

#### Nutrition Key Theme 2: Committing resources to actions that will improve gender-related outcomes

- The NBSAP outlines the required actions to enhance the participation of women in biodiversity management, including the development of gender-sensitive policy frameworks, collaborative management programmes, and alternative income-generating activities. The plan commits specific institutions responsible for these actions, including the National Herbarium and Botanic Gardens of Malawi (NHBM), Ministry of Gender and Disability, Ministry of Natural Resources, Energy and Mining (MoNREM), Ministry of Agriculture, Irrigation and Water Development (MoAIWD), and the Ministry of Local Government and Rural Development (MoLGRD) as well as possible funding sources such as the United States Agency for International Development (USAID) and United Nations Development Programme (UNDP). (Page 34-35, 59-60)

#### Nutrition Key Theme 3: Food and medicine

- The NBSAP outlines how 131 plant species can be used medicinally, some of which can even double as food. For instance, the Baobab fruit (*Adansonia digitata*) is an important nutraceutical because of its high antioxidant levels, but it is also a food ingredient and has industrial applications in juices, cereals, ice creams, dairy products, and confectioneries. (Page 5)

## Enabling Factors

### Urgency of tackling malnutrition:

- Malawi faces some of the highest rates of malnutrition in the world. Gender disparities in access to land and low investments in agricultural research are some of the reasons for limited crop diversification in Malawi, in turn causing low dietary diversity and thus nutrition insecurity (FAO, EU, & CIRAD, 2023). Due to this, malnutrition is considered an urgent priority, which may be why it is covered relatively strongly in this NBSAP.



### Support from various stakeholders to tackle malnutrition

- As a result of the urgency to address malnutrition, Malawi receives support from international partners in addressing nutrition and food security. For instance, The New Alliance for Food Security and Nutrition – Malawi Cooperation Framework was established so that the Government of Malawi, private sector and the G8 members could commit to collaboration to achieve food and nutrition security in Malawi (New Alliance for Food Security and Nutrition, 2013). Such support may boost Malawi's capacity to implement nutrition-related improvements, as reflected in the implementation plan included in the NBSAP regarding nutrition.

### Action Plans: Committing resources to monitoring nutrition-related outcomes

- The NBSAP's monitoring and evaluation plan describes how Malawi will annually monitor the number of collections with nutritive potential established, with the overall aim of maintaining and safeguarding the genetic diversity of flora and fauna. The plan includes a baseline of 13 collections (2015) and a goal of 25 collections (2025). The plan commits specific actors including the Environmental Affairs Department (EAD), NHBGM, Department of Agricultural Research Services (DARS), Forestry Research Institute of Malawi (FRIM), and University of Malawi (UNIMA) to be responsible for annual data collection through conducting research studies. (Page 33, 73)

## Looking ahead to Malawi's next NBSAP

“ Nutrition is a very important element; as you look at maintaining biodiversity, it is not just for nature but also for people to have the right nutrition. Enabling the sustainable use of resources also enables the sustainable development for biodiversity and people. The NBSAP becomes a document that is for everyone and it's the stakeholders themselves that have appointed the issues that should be prioritised. ”

### Malawi's current NBSAP expires in 2025

- As a result, their renewal process is currently under way. In an interview with a member of the coordinating team for this process, he outlined the following approach that the government is taking to ensure a collaborative approach with a number of stakeholders (particularly women, youth, and indigenous groups) to strengthen its incorporation of nutrition and realigns the current NBSAPs with that of national stakeholders' priorities and the GBF.

### Ensuring the involvement of women, youth and Indigenous groups

- In their consultations, many women, youth, and Indigenous Peoples revealed that they have felt disengaged and as if they were viewed solely as end users of the activities within the decision-making process. As such, the NBSAP coordination teams have ensured that these groups are engaged throughout the entire process and that there is a monitoring and evaluating framework in place for their engagement. For future NBSAPs, the team aims for the inclusion of women, youth, and indigenous groups to be systematic to ensure their knowledge and experience are consistently and substantively included.

### Steps that Malawi has taken for their NBSAP renewal process:

1. **Stakeholder mapping:** Conducted a thorough stakeholder mapping by reviewing the targets that are currently in place and the proposed actions to determine the key stakeholders that should be included in the NBSAP development process.
2. **Gap analysis:** Reviewed the current NBSAP and mapped it to the GBF to understand how the revised national targets could improve on the previous NBSAP in terms of addressing all elements of the GBF.
3. **Data Collection Exercise:** Leveraged an existing National Ecosystem Assessment to include questions related to the NBSAP that researchers consulting with local communities can include. Researchers also developed a questionnaire that was circulated to government institutions, academic, NGOs, and women groups to check how aware the stakeholders are of biodiversity management and what they think are the missing elements that they would not want them to miss as they revise the NBSAP.
4. **Stakeholder meetings:** Took advantage of pre-planned meetings to consult with various stakeholders. NBSAP coordinators conducted workshops with youth, interviews with indigenous groups and consultations with women during the National Ecosystem Assessment to understand more about their priorities for the next NBSAP, including on nutrition.
5. **Multi-sectoral Approach:** To ensure that various perspectives are heard and involved, the coordinators have scheduled workshops and online meetings to encourage knowledge exchanges between stakeholders, both within the government and civil society, to draft the NBSAP.



## Opportunities for Biodiversity-nutrition Advancement in NBSAPS

Despite NBSAPs having an overall low level of integration with nutrition, there are many opportunities for closer integration that are achievable with a clear strategy for actions and targets. Below are some recommendations which would streamline climate-nutrition-biodiversity integration.

**Increase the awareness of biodiversity-nutrition linkages with stakeholders involved in developing NBSAPs**

- **Include nutrition in revised or new NBSAPs and emphasise nutrition in implementation plans.** COP16 will focus on operationalising NBSAPs and the resources necessary to achieve this. To achieve deeper nutrition-biodiversity integration (i.e., beyond Level 2), NBSAPs should be committed to improving nutrition with clear implementation plans, including specific targets, specific responsible actors, and timeframes. NBSAPs can, for instance, incorporate projects with a nutrition focus to understand for where nutrition can be incorporated within national and sub-national policies and interventions.
- **Include indicators that measure nutrition-related improvements.** NBSAPs could, as an example, include indicators linked with genetic or dietary diversity, and include timeframes for action and indication of responsible actors. Improving genetic diversity is broadly beneficial for a range of human development indicators, including nutrition, and can increase the likelihood of uptake of the recommendation.
- **Build awareness of the links between nutrition and biodiversity.** Educating policymakers involved with NBSAP development on the links between biodiversity and nutrition and enabling intersectoral collaboration in the creation of the NBSAP could improve both nutrition and biodiversity outcomes. Areas of focus for education and dialogue could include nutritional deficiencies and health outcomes; healthy diets and quality of food for consumption; food as preventative healthcare, rather than as reactionary care for medicinal purposes; and self-sufficiency, food security, and preservation of agrobiodiversity.

**Build on existing themes within the NBSAPs to improve the analysis of the nutrition-biodiversity linkages**

- **Consider various ways food can contribute to human health, particularly in ways that demonstrate how biodiversity can improve nutrition.** Plants that can provide both food and medicine are typically considered nutritious. By highlighting the importance of medicinal and nutritious plants (as in the example of the Baobab fruit in the Malawi case study), NBSAPs can draw attention to the diverse ways that edible plants benefit human health, facilitating their production and conservation.
- **Identify native species that contribute to improving nutrition outcomes.** In the Malawi case study, the NBSAP identified specific plants that are highly nutritious but currently underutilised. Other countries should also name nutrient-rich plants for improved production. This will help highlight to other stakeholders what crops they should diversify to improve nutrition outcomes.
- **Expand on the importance of genetic diversity of crops and its contributions to healthy diets and nutrition.** Given that 65% of analysed NBSAPs mention genetic diversity, the foundation already exists within the majority of NBSAPs to develop an analysis about the benefits of genetic diversity to healthy diets. This can include nutritional variety and environmental resilience to support production and consumption of nutritious crops.

- **Integrate Indigenous knowledge as it is critical to understanding and mitigating the effects of adverse climate patterns.** that affect agrobiodiversity and genetic diversity of plants, and to understanding the nutritional benefits of native foods.

- **Incorporate Gender Equality and Social Inclusion analyses into NBSAPs.** Countries can identify specific gaps and opportunities by conducting a gender and social inclusion analysis of the proposed nutrition and biodiversity programs in the NBSAP, to ensure that strategies are sensitive to the unique nutritional needs and vulnerabilities of different genders and population groups.

**Develop multi-sectoral, participatory forums for the NBSAP development and implementation process, and emphasise the need for nutrition-biodiversity linkages within these forums**

- **Ensure diverse perspectives within multi-sectoral, participatory forums that are created as part of the NBSAP development process.** Women, youth, Indigenous Peoples, and local communities are key stakeholders that must be involved in the NBSAP renewal process, with a particular emphasis on those with an interest in health and nutrition. This includes developing mechanisms to facilitate their participation in the NBSAP process, including through workshops, feedback sessions, consultations, and appointing representatives in the drafting process. They can also promote training and raise awareness about the importance of gender mainstreaming among NBSAP policymakers, implementers, and local communities.
- **Conduct a stakeholder analysis to identify the stakeholders that should be consulted in the NBSAP creation process.** A stakeholder mapping (supplemented by stakeholder consultations) is necessary to identify and to understand the different government actors, civil society organisations, associations, and additional groups that need to be involved in the NBSAP development process to ensure that no

voices are left out. Consultations can include workshops, surveys, and interviews. These consultations can help inform the stakeholder mapping and the areas to prioritise within the NBSAP, and should work across sectors to ensure the participation of actors in health, food, nutrition, and agriculture.

- **Ensure there is a communication mechanism and distribution of ownership amongst a variety of stakeholders throughout the NBSAP process.** It is critical to develop a systematic approach to knowledge-sharing amongst the stakeholders involved in the NBSAP process, to ensure that each stakeholder group understands the others' perspectives and that this is in turn reflected within the NBSAP. Furthermore, the NBSAP creation process should be multi-sectoral, and as such, a coordination team with representatives from various government agencies (i.e., environmental, health, food, trade etc.), civil society organisations, private actors, and other stakeholders should be steering the coordination process.
- **Increase the integration of NBSAP targets and activities into existing policies and programmes and activities.** The NBSAP development and implementation process can be integrated into existing policy and programme infrastructures, such as Malawi had done with stakeholder consultations in their NBSAP renewal process. Planned or current projects can be aligned with the NBSAPs, to increase the feasibility of achieving its targets and to encourage cross-sectoral and multi-stakeholder partnerships.

## Conclusion

This research demonstrates the significant opportunity for strengthening nutrition-biodiversity linkages in NBSAPs. Most NBSAPs show no nutrition-biodiversity integration (i.e., they were classified as Level 1). The opportunity for nutrition-biodiversity integration in the post-GBF NBSAPs is particularly time sensitive, given that the implementation periods of many NBSAPs have expired and 2024 is the deadline for countries to publish revised NBSAPs.

Within these updates, action plans should be strengthened by incorporating nutrition-related interventions and indicators, including within monitoring and evaluation frameworks. These plans should also foster cross-sectoral collaboration to facilitate better ecological and human development outcomes in tandem.

Throughout this analysis, several key themes emerged as areas to link biodiversity and nutrition within the NBSAPs, including food security, indigenous and traditional knowledge, human diets, and genetic diversity of crops. Yet in most NBSAPs, the connections of these themes to nutrition were not considered. As a next step, it would be critical to educate policymakers and all stakeholders involved or consulted throughout the NBSAP creation process about the different synergies between the above topics and nutrition.

It is integral to have a concerted effort to substantively include women, youth, local communities, and Indigenous Peoples in the NBSAP development and implementation process. Their knowledge of local biodiversity and agriculture is critical to developing achievable targets to mitigate biodiversity loss and improve nutritional outcomes.

Linking biodiversity conservation and restoration with nutrition strengthens and supports a diverse ecosystem and sustainable food system. Integrated

action on biodiversity and nutrition offers a holistic approach to environmental and public health challenges, and aligns across several Sustainable Development Goals (SDGs):

- **SDG 2 – Zero Hunger:** Biodiversity conservation linkages create a sustainable food system by supporting crop diversity and agricultural conservation, both of which contribute to the ability to utilise and consume nutrient-rich diets.
- **SDG 3 – Good Health and Wellbeing:** Biodiverse environments contribute to the availability of a variety of foods, the quality of diets and food security, all of which facilitates food to be used as a preventative measure against Non-Communicable Diseases (NCDs)
- **SDG 13 – Climate Action:** Taking initiative to preserve the biodiversity of ecosystems and build the resilience of agricultural systems helps fight against climate change.
- **SDG 15 – Life on Land:** Promoting the use of indigenous and traditional crops and knowledge in agri-food systems supports the consumption of nutritious foods, mitigates adverse climate events against food crops, and preserves cultural heritage.

With 2030 rapidly approaching, the urgency to achieve the SDGs is greater than ever. Integrated approaches through cross-cutting thematic lens are critical. Nutrition and biodiversity linkages can strengthen and promote the resilience of livelihoods and ecosystems around the world. The NBSAP renewals are an opportune moment to facilitate collective action for the implementation of concrete interventions that support global goals on biodiversity and nutrition.

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# Appendix

## Methodology

The following methodology was employed:

1. A manual keyword search was conducted for each NBSAP to identify nutrition related content. Please see the nutrition keyword section for the full list.
2. If keywords are present, the section is read for context to ensure that nutrition-biodiversity linkages are present, and to determine the degree of integration. In order to conduct keyword search analyses for nutrition-related keywords, the full section where the keyword was included was reviewed. This was necessary to gain a comprehensive understanding of the context. NBSAPs were not considered to have relevant integration with nutrition if it did not explicitly recognise the links between nutrition and biodiversity.
3. After keyword searches have been exhausted and relevant sections are analysed, a classification level (1-4) is assigned for the overall document. An NBSAP can only be considered above Level 1 if the links between biodiversity and nutrition are explicitly articulated.
4. The review process is repeated by a second reviewer without knowledge of the first reviewer's classification level. If the first and second reviewer did not align, a third reviewer would repeat the analysis and determine the final level. All NBSAPs were analysed by a minimum of two reviewers.
5. Final classification levels are assigned, and all data is aggregated to create data visualisations such as charts and graphs.

All documents used for the NBSAP analysis were sourced from the CBD online database. In some cases, NBSAPs were unable to be found or the most recent had not yet been uploaded onto the CBD database and in this case required an external web engine search. Some states' NBSAPs were not found. Please see limitations sections for further information.

### Nutrition Keywords

#### Group 1: General Nutrition

Nutrition; Nutritional; Nutrient(s); Malnutrition; Undernutrition; Overnutrition; Nutritious; Nutritious Foods; Food Systems

#### Group 2: Diet-related

Diet(s); Balanced Diet; Healthy Diet; Unhealthy Diet; Affordable Diet; Accessible Diet; Available Diet; Diet Diversity; Plant-Based; Vegan; Vegetarian

#### Group 3: NCDs and Human Health

Obesity; Overweight; Underweight; Weight Loss, Weight Gain; Anaemia; Anaemia; Diabetes; Blood Pressure; Hypertension; Blood Sugar; Cholesterol; Cardiovascular Disease; Blood; Iron; Stunting; Wasting; Breast feed(ing)

#### Group 4: Food Safety

Food Label; Food Safety; Food Control; Food Quality

#### Group 5: Food Groups and Types

Vegetable(s); Fruit(s); Meat; Red Meat; White Meat; Fish; Starch; Dairy; Protein; Fat; Fats; Oil; Oils

#### Group 6: Nutritional Content

Vitamin; Micronutrient(s); Mineral; Fiber; Fibre; Calcium; Gluten; Calorie; Caloric; Carbohydrate; Sodium; Salt; Sugar; MSG; Iron; Zinc; Fortified; Biofortified; Fortification; Biofortification.



## NBSAP Classification

The NBSAPs are classified into one of four levels, ranging from no integration (level 1) to strong integration with concrete plans for action (level 4) (see **Table 1**).

These four levels are designed to reflect a commitment to action towards the higher levels of integration. At Levels 1 and 2, the understanding of biodiversity-nutrition linkages (if any) was assessed. At Levels 3 and 4, the core focus is on measuring the level of action on addressing biodiversity-nutrition issues through policy commitments and strategy development. The main difference between Levels 3 and 4 is in resource mobilisation. While there is intention to act to improve nutrition in NBSAP at Level 3, there is commitment to act at Level 4, made evident by concrete plans addressing biodiversity and nutrition targets, including financial, policy, staffing, and other resource commitments.

## NBSAP Classification

**Table 1:** Indicator and level distributions for the analysis.

Indicator	Level 1	Level 2	Level 3	Level 4
<b>Number of NBSAPs</b>	No mention of relevant nutrition keywords/concepts in the NBSAPs  OR Mention keyword with no explicit analysis of the links between biodiversity and nutrition	Mention of relevant nutrition keywords/concepts in the NBSAPs  AND some analysis conducted of the linkages between nutrition and biodiversity	Level 2 is met, with deeper analysis on linkages between biodiversity and Nutrition, and vice versa  AND improved nutrition is an objective within the NBSAPs with some initial plans on measures to be taken to achieve this	Level 3 is met, with in-depth analysis on linkages between biodiversity and nutrition and vice versa  AND improved nutrition is targeted within the NBSAPs with clear actions outlined and distinct plans on policy/ program design  e.g., timeline, funding, regions, baselines and targets, lead agencies etc

## Trends Analysis

The NBSAPs were also reviewed for themes related to nutrition. An inductive approach was taken, determining key themes as the NBSAPs were initially reviewed for nutrition/ nutrition-related keywords. The following themes were present in many of the NBSAPs, varying by region and income status:

The NBSAPs were organised by region using World Bank regional classifications. Likewise, the NBSAPs were also organised by income classification as determined by the World Bank as of 2023.<sup>23</sup>

## Language

The keyword search for the NBSAPs were completed in English. When the NBSAP was not available in English, the language translation software, DeepL was used to translate the documents into English to ensure uniformity in the keyword search. There were some limitations to DeepL. DeepL is unable to translate Arabic. Kuwait, Syria, and United Arab Emirates' NBSAPs were therefore reviewed and classified by an Arabic speaker. This meant that for this report, Kuwait, Syria, and United Arab Emirates' NBSAPs were not corroborated with a second review. Some NBSAP files could not be reviewed by DeepL, specifically, Guatemala, Mexico, Paraguay, and Andorra due to the size of the file or the file corruption. Two Spanish-speakers reviewed and classified these NBSAPs.

- Food security (note that food security focuses on access to the necessary number of calories rather than nutritional value);
- Traditional food systems and/or indigenous knowledge.
- Human diets;
- Genetic diversity in relation to agriculture and food.

We then conducted a manual keyword search of the following keywords related to each theme to determine the significance of the trend. We selected the keywords based on the word or synonyms associated with the theme.

### Thematic Keywords

Food security; Traditional Food Systems; Indigenous Knowledge; Diet; Genetic Diversity (in relation to agriculture or food)

### Case Study Selection

This report contains two case studies of Level 4 NBSAPs. The case studies provide a more in-depth look into how the selected NBSAPs integrates nutrition, the key themes found in the NBSAP, some of the factors that could have enabled the country to integrate nutrition, and insights into how the NBSAPs are being improved in the renewal process. The research involved in these case studies involved a comprehensive review of the NBSAP and a semi-structured interview with individuals from organisations involved in developing the respective NBSAP. Semi-structured interviews consist of a predetermined set of open questions, while also allowing the interviewer to ask follow-up questions and explore particular themes or responses further. The interviews were intended to provide insight into the process of developing the NBSAP. Our criteria for case study selection were the following:

- **Level 4 ranking**, ensuring that the NBSAP integrated analysis of the links between biodiversity and nutrition and included concrete actions to improve nutrition;
- **Published within the last ten years**, ensuring the case studies are more likely to be applicable to the current global context;
- **LMIC**, recognising LMICs' food and nutrition security tends to be more significantly impacted by biodiversity loss;
- **The country's involvement in the Alliance for Transformative Action on Climate and Health (ATACH)** – recognising that I-CAN is a working group under the ATACH.
- **Gender considerations**, recognising that there are gendered aspects of nutrition and that I-CAN consider gender as a key focus area.

From these criteria, two NBSAPs were selected: Brazil and Malawi.

### Limitations

It is important to note that there are limitations to this methodology. The classification of levels is susceptible to a certain degree of subjectivity. Where possible, the analysis underwent review by multiple reviewers to minimise personal bias to the best extent possible. Reviewers tended to agree for NBSAPs categorised as Level 1 and 2. However, Levels 3 and 4 tended to have more discrepancy in the results which required judgement regarding the commitment to actions taken to address biodiversity and nutrition goals. A third reviewer sought to overcome these discrepancies.

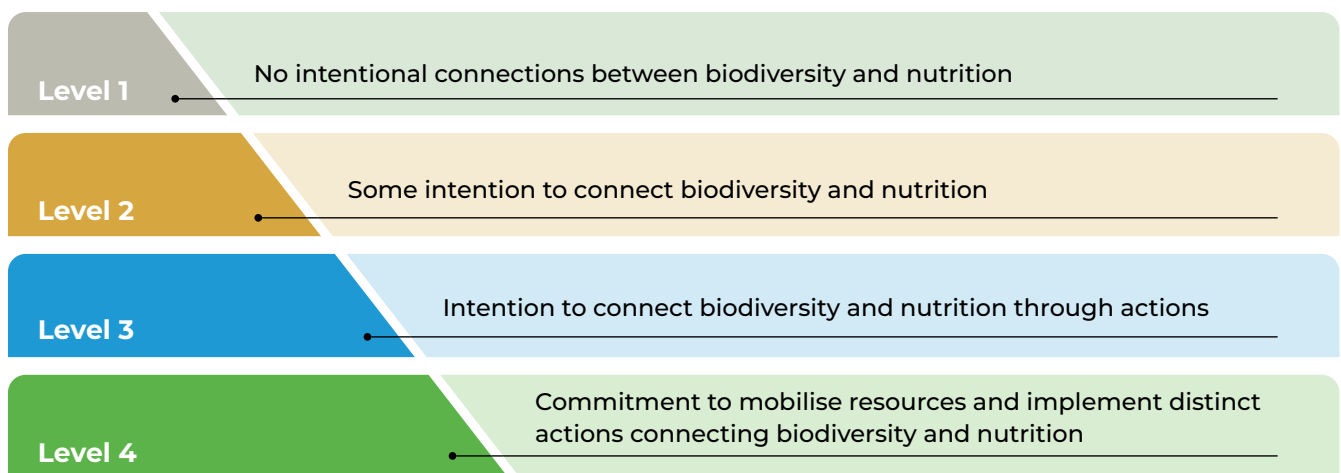
The availability of NBSAPs was also a research limitation. Ultimately 192 out of 199 NBSAPs were reviewed with only Aruba, Iceland, Libya, Palestine, United States of America, Uzbekistan, and Vatican City not included due to unavailability on the CBD website or technical issues.

Another limitation was that the language translating software DeepL is unable to translate Arabic and in this case a native Arabic reviewer conducted the analysis, however the classification, at the time of this report, was not verified through a repeat review.

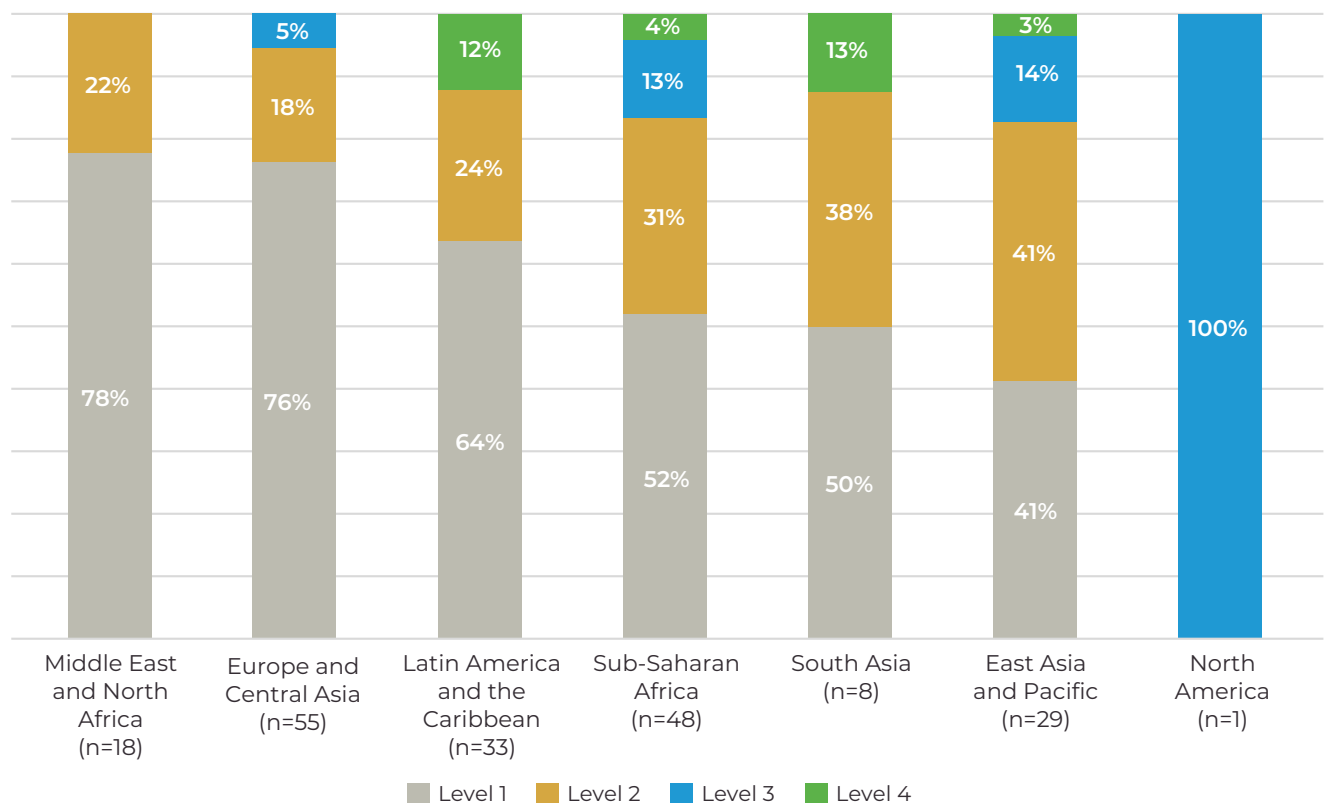
It should be also noted that many of the NBSAPs were developed eight or more years ago. The CBD have requested countries revise and submit new NBSAPs aligned with the GBF and its goals and targets by COP 16. As a result, this analysis may require updating once countries submit their new NBSAPs.

## Figures and Tables:

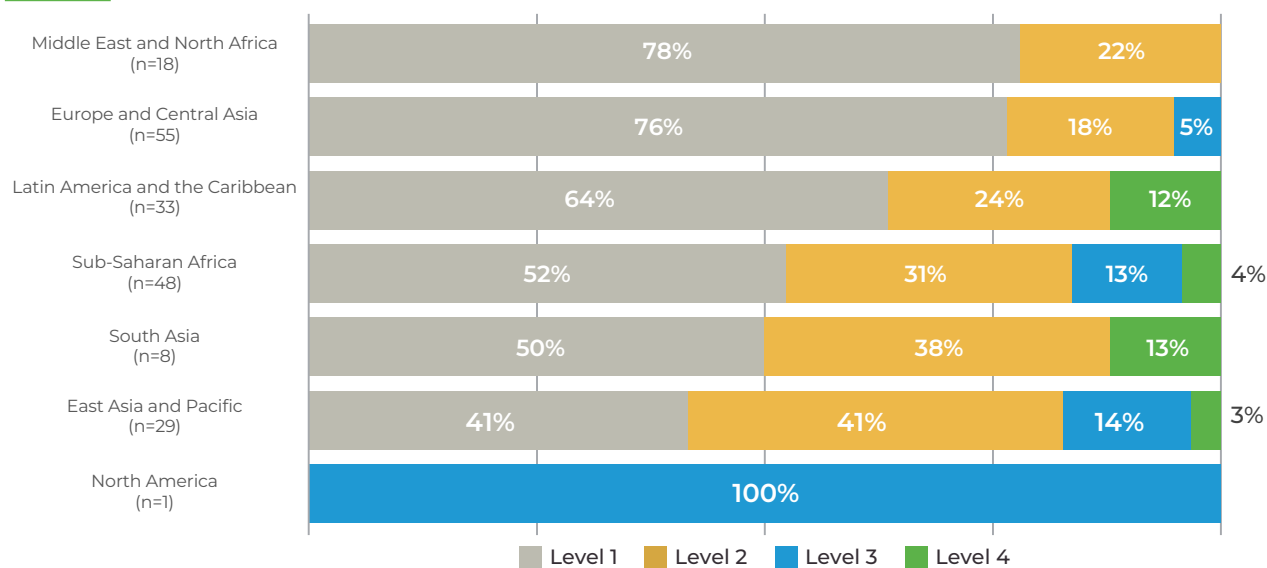
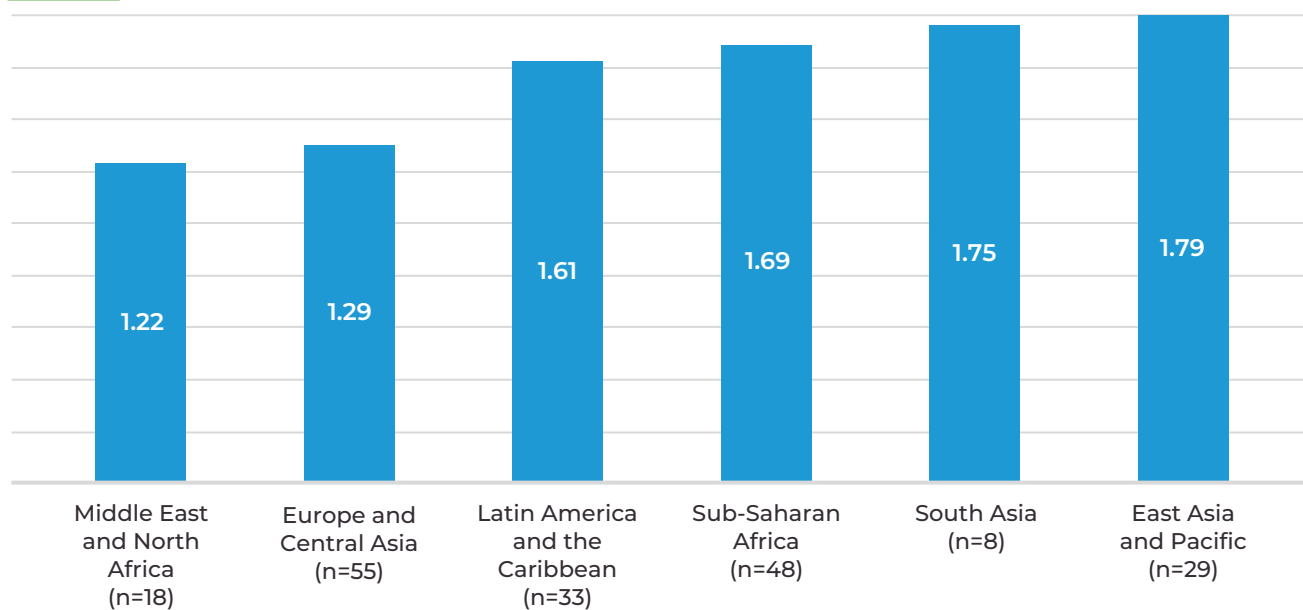
**Figure 1:** Levels of Integration between Biodiversity and Nutrition



**Figure 2:** Proportion of Levels of Integration by Region (N=192)<sup>24</sup>

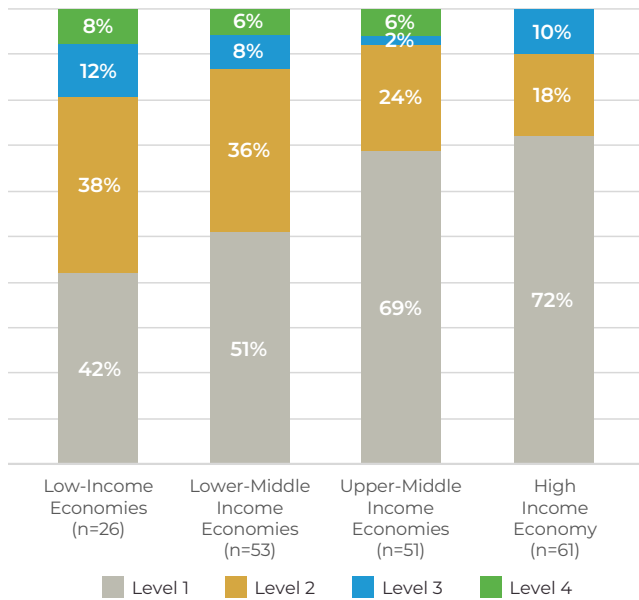


<sup>24</sup> The total percentage for East Asia and Pacific does not equal 100% due to rounding.

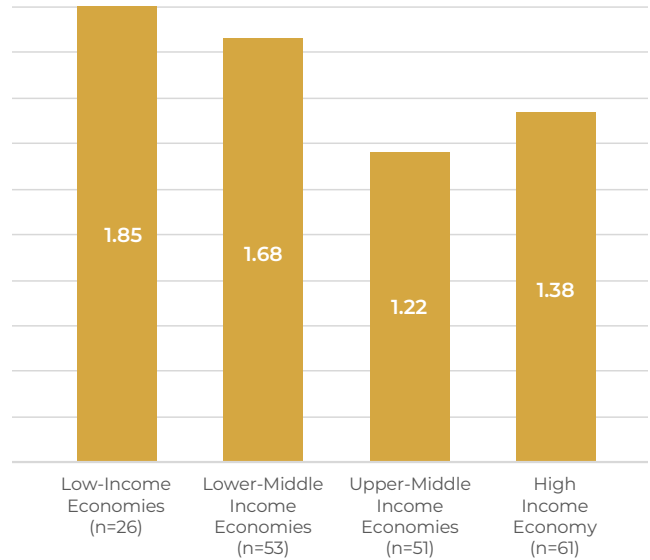
**Figure 3: Proportion of Levels of Integration by Region (N=192)<sup>25</sup>****Figure 4: Weighted Average of the Levels of Integration by Region (N=192)**

<sup>25</sup> The total percentage for East Asia and Pacific does not equal 100% due to rounding.

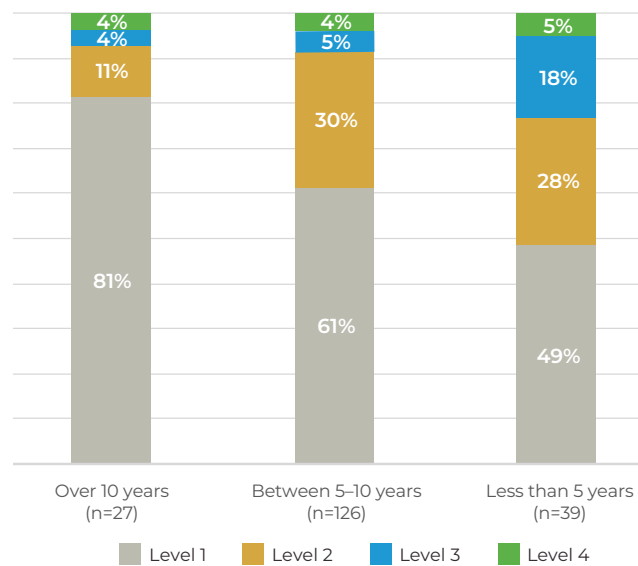
**Figure 5: Proportion of Levels of Integration by Income Groupings (N=192)**



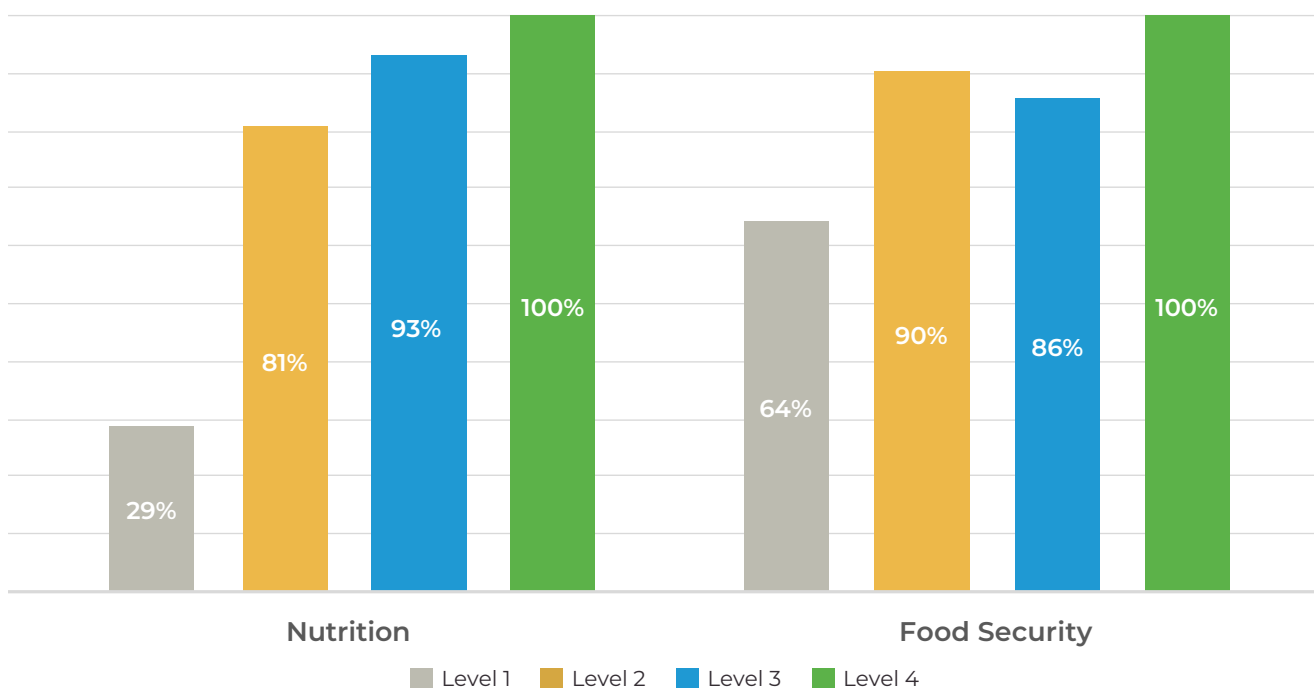
**Figure 6: Weighted Average of the Levels of Integration by Income Groupings (N=192)**



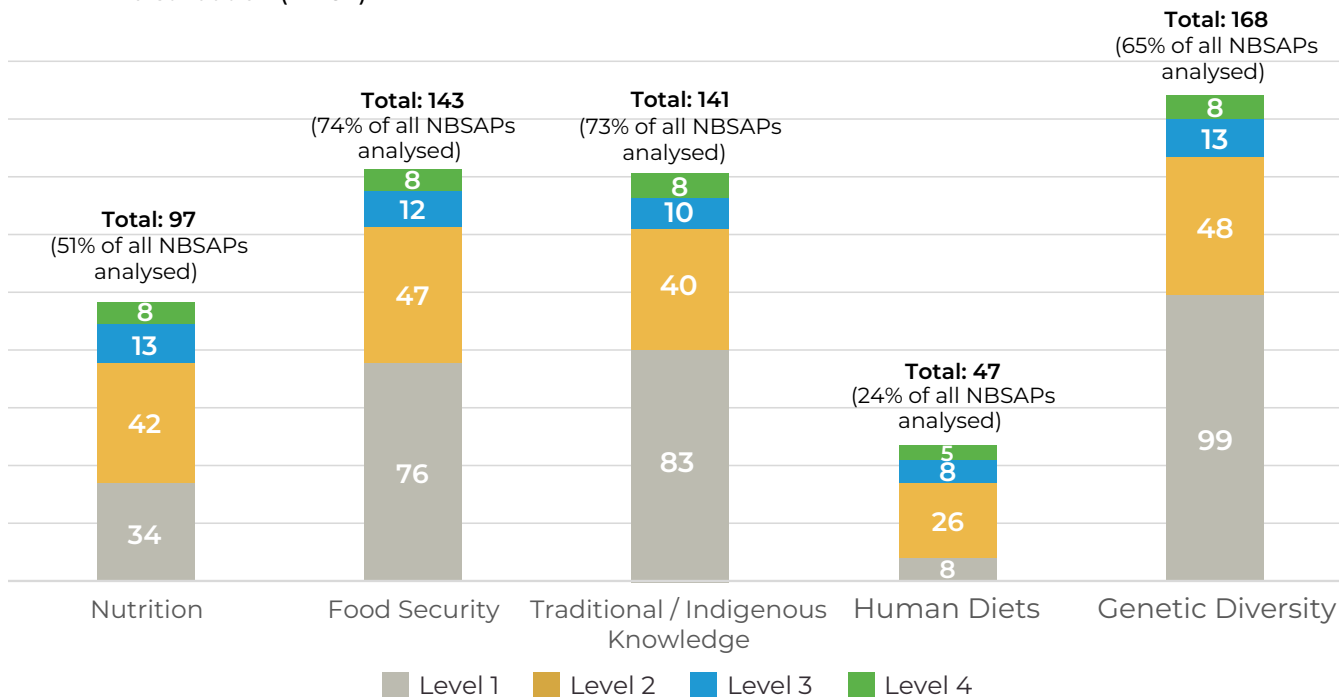
**Figure 7: Proportion of Levels of Integration by NBSAPs' Publication Year (N=192)**



**Figure 8:** Proportion of NBSAPs that mention Food Security and Nutrition by Levels of Integration (N=192)



**Figure 9:** Overview of the number of NBSAPs that mentions key themes and the levels of integration distribution (N=192)



## Stakeholder Engagement:

### Analysis on National Biodiversity Strategies and Action Plans (NBSAPs) under the Initiative for Climate Action and Nutrition (I-CAN) Interview Consent Form

**Information and Purpose:** This interview will be part of a project led by the Global Alliance for Improved Nutrition (GAIN), and conducted by Shared Planet, a contracted consultancy, under the Initiative for Climate Action and Nutrition (I-CAN). The Initiative on Climate Action and Nutrition (I-CAN) is a multi-stakeholder, multi-sectoral flagship initiative launched at COP27 co-chaired by the Government of Egypt and GAIN, alongside core partners WHO, FAO and the Scaling Up Nutrition (SUN) movement. It aims to catalyse climate actions for nutrition improvement, and vice versa. For more information on the work I-CAN is doing please see the I-CAN [baseline report](#) or [pathways paper](#).

This project involves analysing each country's NBSAP on the CBD NBSAP database to identify to what extent the NBSAP integrates nutrition. The objective of this work is to provide a snapshot into the depth of nutrition considerations within NBSAPs. Brazil and Malawi were selected for a more in-depth analysis because their NBSAPs showed strong biodiversity-nutrition linkages. As part of this deeper dive, we are conducting interviews to get a better understanding of the process of developing Brazil and Malawi's NBSAP. These interviews will inform a short report which will present our findings of the NBSAP analysis and general recommendations for integrating nutrition in future NBSAPs.

**How your data and information will be used and retained:** Personal data will only be used by GAIN and Shared Planet and will be in compliance with UK GDPR.

**Your Participation:** Your participation in this project will consist of a written interview answering the questions found below. Please note you are not required to answer any question(s) and can choose not to respond to any question(s) for any reason(s). You may stop your participation in the project at any time and you have the right to withdraw your consent for this interview and request that your data be deleted at any time.

**Confidentiality:** Your name and identifying information will not be associated with any part of the written deliverables.

If you have any questions or concerns, please contact x.

By signing below, I acknowledge that I have read and understand the above information and consent to the following (please tick as appropriate):

If you have any questions or concerns, please contact x.

By signing below, I acknowledge that I have read and understand the above information and consent to the following (please tick as appropriate):

- I agree to participate in an interview.
- I agree that the information I provide as part of this interview may be used in the final report. This information will be presented anonymously so that I will not be personally identified.
- I agree that my organisation's name can be identified in the final report.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name (Print): \_\_\_\_\_

**Thank you for taking the time to read the consent sheet and for your valuable contribution to the project.**

## Interview Questions

### Introductory Question

1. Our understanding is the IPE institute contributed to the “Dialogues on Biodiversity” process which built a set of National Targets in line with the CBD Vision for 2050. Is this correct? How does IPE contribute to developing Brazil's NBSAPs?

### Nutrition Links

2. Brazil links nutrition in the NBSAP in its indicators for monitoring the achievement of the National Biodiversity Targets 2011-2020. Indicator 39 includes Nutrition Value of Brazilian Biodiversity, linking to National Target 13 (p.82). Brazil also references activities focused on improving human nutrition in its action plan, for example the Biodiversity for Food and Nutrition Project (p.124) and the integration of biodiversity into food and nutritional safety policies in the Global Environment Facility Project “Conservation and sustainable use of biodiversity for the improvement of human nutrition and well-being” (p. 204). What factors do you believe have enabled Brazil to prioritise nutrition within their NBSAP?
3. Our analysis demonstrated that Malawi strongly integrates nutrition-biodiversity linkages in their National Biodiversity Strategy and Action Plan (NBSAP). For instance, the NBSAP lists species with high nutritive value that are declining in production (p. 5) and outlines an action plan on monitoring the number of collections with nutritive potential (p. 33, 73). What do you think are the factors that enabled Malawi to have a strong nutrition focus within their NBSAP?
4. We considered some of the following factors as enablers of a focus on nutrition: (1) the urgency of tackling malnutrition, given that Malawi faces high rates of malnutrition, and (2) the support that Malawi receives from international partners in addressing nutrition and food security, e.g. the New Alliance for Food Security and Nutrition – Malawi Cooperation Framework. What do you think of the factors that we have outlined?
5. Do you think that (1) improving nutritional security and (2) protecting and restoring biodiversity and nature are naturally complementary objectives? If so, can you expand on the key reasons why?


### Gender

6. Gender is also a key focus area for I-CAN. Our analysis demonstrated that gender is highlighted within the NBSAP but not explored alongside nutrition. I-CAN recognises gendered considerations to nutritional security. How can the gender-nutrition nexus be strengthened in NBSAPs? What are the current barriers to integration?

### Operation and Implementation

7. We would like to develop recommendations for policymakers developing future NBSAPS to integrate nutrition and include specific activities for improving nutrition.
  - a. What is the process for prioritising key themes in the NBSAP?
  - b. What are some recommendations for ensuring nutrition is prioritised?
  - c. Who are the key stakeholders / ministries that should be included in the NBSAP process to ensure nutrition is integrated? How do Non-governmental Organisations (NGO), Civil Society Organisations (CSOs) and other Non-state Actors (NSAs) influence the drafting process?





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