
Protein Diversification & The SDGs

Food Solution for UN Goals



Nov 2023

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REPORT - CIWF International

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ABSTRACT

This Report proposes an overview, a definition and complete mapping of Protein Diversification in the UN-SDGs context. Based on the last available information, this report highlights the benefits of adopting Protein Diversification as a new approach in order to contribute to the general UN Goals towards Sustainable Agriculture, Climate Change mitigation, the reduction of Pollution and Biodiversity loss, human Health and One Health.

List of Acronyms

ASF: Animal Source Food

CBD: Convention on Biological Diversity

CIWF: Compassion in World Farming

EAA: Essential Amino Acids

EHS: Institute for Environment and Human Security

FAO: Food and Agriculture Organization

FSN: Food Security and Nutrition

GBF: Global Biodiversity Framework

GHGs: Greenhouse gases

NDCs: Noncommunicable diseases

IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC: Intergovernmental Panel on Climate Change

SDGs: Sustainable Development Goals

UNEP: UN Environment Programme

UNFCCC: United Nations Framework Convention on Climate Change

UNU: United Nations University

WFP: World Food Program

WHO: World Health Organization

WOAH: World Organization for Animal Health

“Whether we need to diversify our protein sources is no longer a question; it has become an urgent necessity.

With the multifaceted challenges of population growth, climate change, and the increasing burden on nature, we need to rethink the way we produce and consume protein, and innovation is a key part of the answer.”

Andy Zynga, [Protein diversification: a win for people and planet](#), NewFoodMagazine, 2023

INTRODUCTION

The UN Food Systems Summit in 2021 raised the **Need for *transformation* of our food systems globally.**

As pointed out by Philip Lymbery, CIWF CEO: "Most of the 2030 Sustainable Development Goals (SDGs) are offtrack or going backwards". In this sense: **“Getting the world back on track will take a radical overhaul of our food systems”.** (in [Felix Dodds blog](#), 2023)

The rising demand for food products of animal origin and the increasing pressure on natural resources have made **current food systems unsustainable.** The world’s population is projected to reach **10 billion in 2050 from 8 billion today.** Therefore, as stated by the FAO: "One of our greatest challenges will be to feed these extra people with adequate, safe, sustainable, and nutritious food that is produced, consumed and disposed of in a way that safeguards our precious natural ecosystems." ([Livestock’s long shadow, 2006](#))

To feed the world, the UN-FAO insists to **“Produce more with less”.**

“The alternative proteins market offers myriad opportunities for high value nutritional products potentially coming with a lower environmental footprint. It also responds to shifts in dietary patterns and **increasing demand from consumers for more ethically sourced products.”** ([FAO Guidance on Alternative Proteins](#))

The protein transition can be ensured in promoting protein diversification as a first step. Indeed, studies show that we produce enough food to feed 10 billion people, but that we need to shift our diets towards more plant-based and greener proteins. Our global food systems need to adopt more sustainable production and consumption patterns for the sake of humans, environment and animals.



“Global food systems are broken.

They are the result of choices we have made. There is more than enough food in the world to go around.”

[António Guterres Statement](#)

UNITED NATIONS
SECRETARY-GENERAL

Current Global Crisis:

Food Systems

Climate Change

Biodiversity Loss

Health issues...

UN Context: A Timely Momentum

Where do we stand? Food systems, Health, Environmental and Biodiversity protection, with Climate Change are closely intertwined. The momentum is growing at the UN. Facts are talking:

“A third of global food production will be at risk by the end of the century if greenhouse gas emissions continue to rise at their current rate”. [Third of global food production at risk from climate crisis](#), 2021

The FAO reports that the livestock sector is responsible for 14.5% of all anthropogenic GHG emissions (7.1 gigatonnes of Co2-equivalent per year), 6 with beef and dairy production being the main contributors. [...] The Global Livestock Environmental Assessment Model (GLEAM) estimates the mitigation potential for the sector to be around 33%, or about 2.5 gigatonnes CO2-eq.” [OECD-FAO Agricultural Outlook 2023-2032](#), 2023

From an environmental viewpoint, a protein transition based on legumes would first enable a better management of fertility at the territorial level, thereby reducing the agricultural sector’s climate footprint and its impact on biodiversity.

IPCC Report 2022

Impacts, Adaptation and Vulnerability



“Balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health.”

DEFINITION of Protein Diversification



DEFINITION OF PROTEINS

“Proteins are large molecules made of amino acids. Proteins are found in animal and plant foods. Proteins are the main structural constituents of the cells and tissues of the body. Muscles and organs are largely made of proteins. Proteins are necessary for growth and development of the body; for body maintenance and the repair and replacement of worn out or damaged tissues; to produce metabolic and digestive enzymes; and they are an essential constituent of certain hormones.” [FAO website](#)



FAIRR Definition of Protein Diversification

“Protein diversification refers to the transformation of existing and future portfolio composition by shifting away from an over-reliance on resource-intensive animal proteins towards lower impact protein ingredients and products.

These can include plant-based, cell-cultured, fungal-based and whole-plant alternatives to meat, dairy, seafood and other animal proteins. Such a transformation relies on the development of a cross-functional strategy involving research & development, marketing, and sustainable sourcing.”

PROPOSED DEFINITION - UN Goals Oriented

Protein diversification is an approach aimed at broadening protein sources and fostering green proteins, such as plant-based and alternative proteins, in order to reverse the trend of increasing reliance on animal proteins in human diets. It contributes to advance multiple interconnected goals in seeking to enhance food security, improve human health and nutrition, reduce environmental impacts, promote biodiversity conservation and climate change mitigation, while it encourages sustainable agriculture and food systems transformation.

Current & Future Protein Sources



Classical & New Protein Sources have their pros & cons :

ANIMAL PROTEIN

- **Pros** : Taste, diversity, complete protein source
- **Cons** : Unsustainable, unethical, major adverse impacts on animals, human health, and the planet

PLANT PROTEIN

- **Pros** : Green, sustainable, vegan, diverse, cheap
- **Cons** : Uncomplete proteins apart for some like Soy

MYCOPROTEIN

- **Pros** : Sustainable, high-protein, low fat, vegan
- **Cons** : Some people are allergic or don't like its taste

INSECTS

- **Pros** : Rich protein, low environmental footprint
- **Cons** : Cultural or ethical resistencies to eat insects

See: FAO Report, [Edible insects: Future prospects for food and feed security](#), 2013

CULTIVATED MEAT

- **Pros** : Taste meat, sustainable, low footprint
- **Cons** : Not natural (lab-grown) meat source

- See: Book by Lymbery & Vandenbosch, [Cultivated Meat to Secure Our Future: Hope for Animals, Food Security, and the Environment](#), 2023

MOLECULAR FARMING

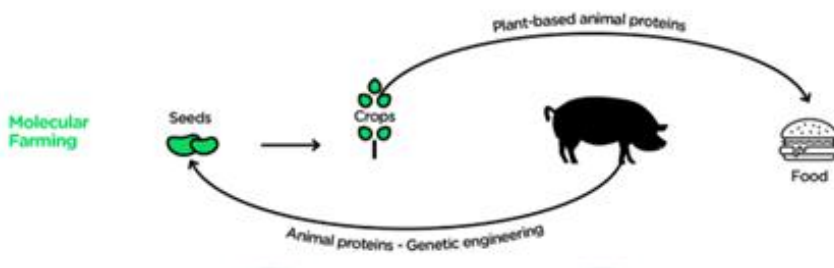
- **Pros** : Complete animal protein & taste in plants
- **Cons** : GMO technology, remaining uncertainties

- See: [Moolec website](#) and 'Producing animal protein from plants', [Future of protein production - Webinar](#), 2022

As the United Nations explores strategies for protein diversification to address global food security and sustainability challenges, molecular farming represents a promising technology innovation that merits further research and consideration in the context of a more diversified and sustainable protein supply for the future.

Moolec Science

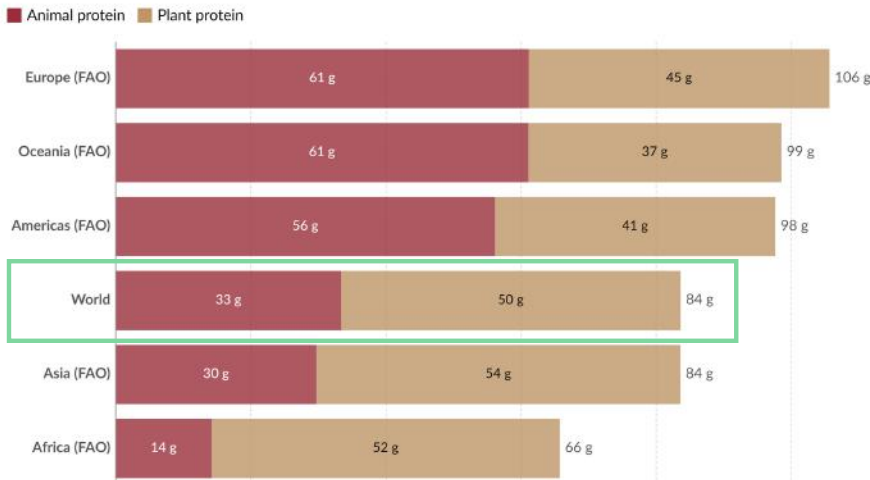
A science-based food ingredient company focused on the use of Molecular Farming technology.



World Reliance & Need for Proteins

Daily protein supply from animal and plant-based foods, 2020

Daily per capita protein supply is measured in grams per person per day. Protein of animal origin includes protein from all meat commodities, eggs and dairy products, and fish & seafood.



Data source: Food and Agriculture Organization of the United Nations

OurWorldInData.org/diet-compositions | CC BY

Region/Subregion	Fish, seafood	Meat	Milk, excluding butter	Vegetal products	TOTAL
(g/capita/day)					
World	5	15	9	50	82

Source: FAO. 2022. FAOSTAT

Despite the growing demand for animal products and the net disparity between some regions of the world, knowing that Europe and Oceania consume more animals than plant-based proteins, FAO stats clearly show that plant-based proteins are the most consumed overall.

The World Relies more on Plant-Based than on Animal Proteins.

As most people already rely more on plant-based proteins in their diets, the protein transition will be easier to achieve in this configuration. Obviously, this would be harder in the opposite case if the majority of people would rely more on animal proteins. **Still, there is an urgent need to reverse the global unsustainable trend for more animal products as the main source of protein.**

Soy Solution to Feed the World?

Soy is a complete protein source currently able to cover the basic EEAs needs of 10 billion people

Soy is one of the only vegetable foods that contain all 9 essential amino acids, making it a complete protein. It is also a good source of fibre, iron, calcium, zinc, and B vitamins. Eating soy protein in place of animal protein has been found to reduce bad cholesterol and triglycerides, which are linked to heart disease. It is currently produced in enough quantities to feed 10 billion people worldwide.

At least 85% of the world's soybean crop is used as animal feed and currently not eaten by humans. (WWF, [Growth of Soy: Impacts & Solutions](#), 2014)

As a simple indication providing a concrete example:

155 grams of dry soybeans contain 56 grams of proteins.

NB: It is generally advised to consider specific requirements and diversify the protein sources for a balanced healthy diet.

Age Group	Grams of Protein Needed Each Day
Children ages 1 - 3	13
Children ages 4 - 8	19
Children ages 9 - 13	34
Girls ages 14 - 18	46
Boys ages 14 - 18	52
Women ages 19 - 70+	46
Men ages 19 - 70+	56

Source: Centers for Disease Control and Prevention, [Nutrition for Everyone](#)

Can Plant proteins cover human needs in Essential Amino Acids? Yes, some can.

Essential amino acids (EAAs) are the 9 amino acids that are necessary to build proteins in the organism. Sources of complete EAAs are both animal and plant food.

This Table shows that the complete EAAs needed to cover the Recommended Dietary Allowances (RDAs) can be found not only in animal products, like chicken, and plant-based food like Soybeans or Spirulina.

Essential amino acids (EAAs)	Histidine	Isoleucine	Leucine	Lysine	Methionine + Cysteine	Phenylalanine+ Tyrosine	Threonine	Tryptophan	Valine	Total EAAs content
Recommended Dietary Allowances (RDAs)	700	1400	2730	2100	1050	1750	1050	280	1820	12880
Chicken, breast, raw*	839	1104	1861	2163	821	1718	1009	283	1165	10963
Soybeans, mature seeds, raw	1097	1971	3309	2706	1202	3661	1766	591	2029	18332
Seaweed, spirulina, dried	1080	3210	4950	3020	1812	5360	2970	929	3510	26841

*Chicken was chosen as it is the most eaten animal food and it has one of the highest amount of EAAs among animal-based foods.

Soybeans have the highest content of EAAs among all foods. Spirulina is a superior supplement containing the highest amount of EAAs. Another important factor is the composition of EAAs. A good indication is to calculate the food sample that meets the WHO's requirement of EAAs intake. The table below shows the smallest sample food required to provide all EAAs according to the RDA for each individual EAA.

Chicken	Soybeans	Cashew	Pumpkin seeds	Beans	Peas	Quinoa	Wheat	Rice	Tofu
156 g	90 g	226 g	172 g	173 g	224 g	325 g	693 g	893 g	766 g

Source: [Essential amino acids in plant food](#)

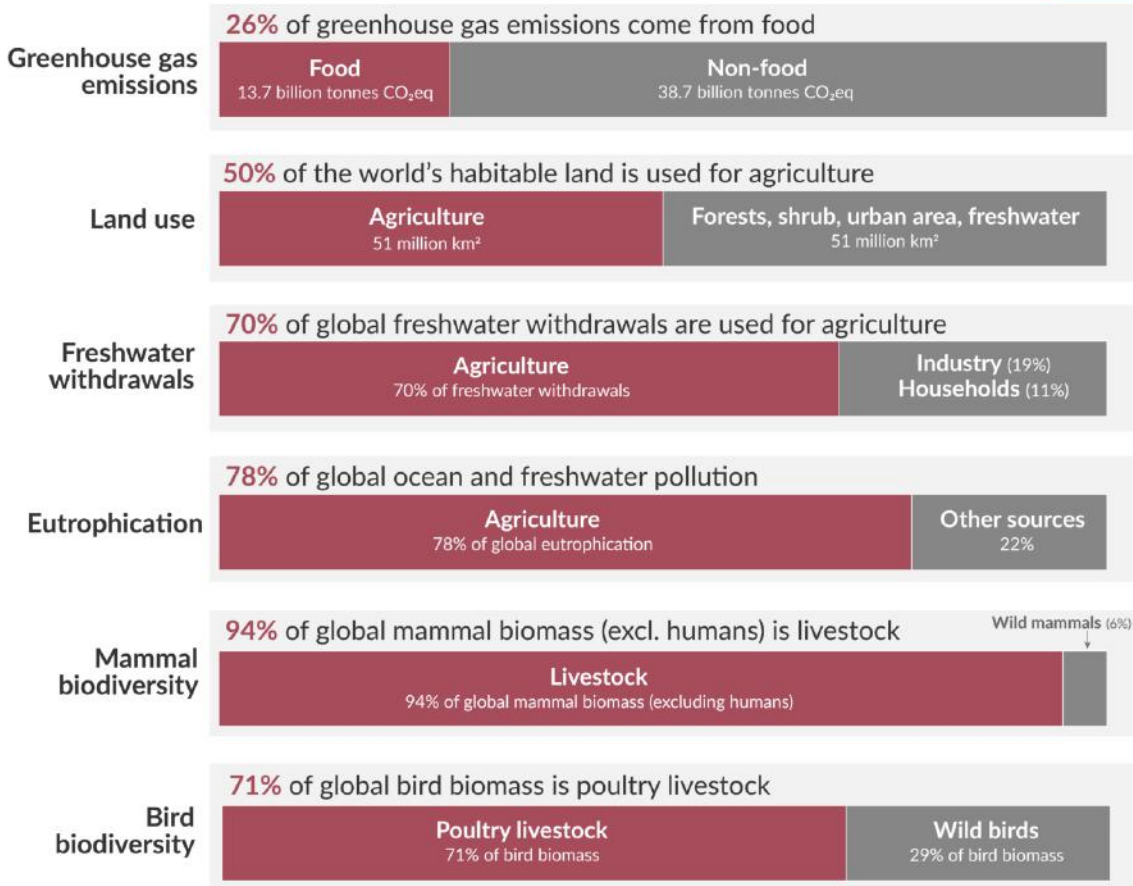
Humans need to create a balanced and varied combination to ensure they meet the protein needs while also getting a range of essential nutrients and amino-acids. It is possible to refer to a nutriment index like for instance the [Protein Content of Food Index](#).

From Animal to Plant proteins: A Diet shift needed

These graphics resulting from FAO stats clearly show why this food change is needed for GHGs, Land use, Water supply and biodiversity, and the continuous growing demand for meat products.

The environmental impacts of food and agriculture

Our World in Data

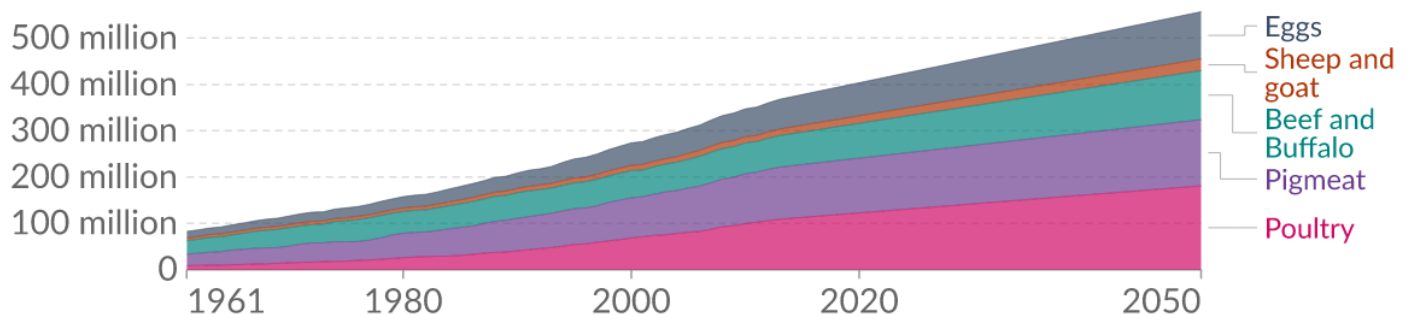


Source: UN FAO-UN AQUASTAT. [Our World in Data](#). Nov 2022

Global meat consumption, World, 1961 to 2050

Our World in Data

Expressed in tonnes of meat. Data from 1961-2013 is based on published FAO estimates; from 2013-2050 based on FAO projections. Projections are based on future population projections and the expected impacts of regional and national economic growth trends on meat consumption.



Data source: Food and Agriculture Organization of the United Nations
OurWorldInData.org/meat-production | CC BY

Source: UN FAO-UN AQUASTAT, [Our World in Data](#)

Protein Diversification: Which Benefits for the SDGs?

Protein Diversification Contributions to SDGs



▪ Graphical Abstract by BRELS, 2023

- What are the **direct** and **indirect** benefits of protein diversification for the SDGs?
 - Which SDGs Targets and Indicators do have links with protein diversification?
- This is what this report will explore in providing answers in the following pages.



Goal 1: End poverty in all its forms everywhere

Reducing Hunger,
Alleviating Poverty

Benefit: Diversified protein sources can provide income opportunities for local communities, especially in regions with resources suitable for alternative protein production.

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture



Nourishing
the World

Benefit: Protein diversification can contribute to ending hunger by enhancing food security and providing a wider range of protein sources, particularly in regions where access to traditional animal-based proteins is limited.

“ More than 780 million people are going hungry while nearly one-third of all food produced is lost or wasted. **More than three billion cannot afford healthy diets.** ”
[UN Secretary-General António Guterres, 24 July 2023](#)

- **Target 2.1:** “By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.”
→ **Indicator 2.1.1 Prevalence of undernourishment:** This indicator measures the percentage of the population that is undernourished, which is relevant to protein intake. Protein diversification can help ensure that people have access to a variety of protein sources, reducing the risk of protein deficiency and undernourishment.
- **Target 2.2:** “By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women.”
→ **Indicator 2.2.2 Prevalence of malnutrition - children under 5 years of age, by type (wasting and overweight):** Malnutrition can include both insufficient or excessive food and protein consumption. Diversifying protein sources can help combat malnutrition in facilitating the access to greener proteins and providing essential amino acids and nutrients for healthy growth and development, while reducing the risk of overnutrition.
- **Target 2.3:** “By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists, and fishers, including through secure and equal access to land, other productive resources and inputs [...].”
Protein diversification supports small-scale food producers by promoting diverse crops and using less land - usually used for feeding livestock- which can lead to increased agricultural productivity for these communities.
- **Target 2.4:** “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, maintain ecosystems, strengthen capacity for adaptation to climate change, extreme weather, drought, flooding, and other disasters, and progressively improve land and soil quality.”
Sustainable agricultural practices, including crop diversification and agroforestry, can promote a variety of crops, including those high in protein, enhancing the resilience and sustainability of food production systems.
→ **Indicator 2.4.1 Proportion of agricultural area under productive and sustainable agriculture:** Sustainable agricultural practices can promote the diversification of crops, including those high in protein.

Goal 3: Ensure healthy lives and promote well-being for all at all ages



Fueling Healthier Lives

Benefit: Diversifying protein sources can lead to improved nutrition and overall health by promoting diets that are lower in saturated fats and abundant in essential nutrients, contributing to the reduction of diet-related diseases and malnutrition. It can also decrease the risks of antibiotic resistances and of new disease outbreaks from zoonosis.

“ Protein diversification can be a catalyst for healthier diets.

Excessive consumption of red and processed meat, have been linked with increased risk of bowel cancer, and when not eaten as part of a balanced diet, consumption of meat products laden with unhealthy fats have been linked to chronic diseases such as heart disease and obesity. ”

Andy Zynga, [Protein diversification: a win for people and planet](#), 2023

“ - Excess consumption of red meat and processed meat is associated with increased risk of NCDs, including cancer, cardiovascular disease (CVD) and type 2 diabetes.

- Specifically in relation to cancer, the International Agency for Research on Cancer (IARC) has classified processed meat as “carcinogenic to humans” and red meat as “probably carcinogenic to humans”.

- Over a third of foodborne diseases are linked to animal-source foods – red meat in particular has been associated with increased risk of *Salmonella* and *Escherichia coli* infections and outbreaks – and some of the additives used in processed meats may add to food safety risks. ”

WHO Report, [Red and processed meat in the context of health and the environment](#), 10 July 2023

• Target 3.4: "By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being".

→ Indicator 3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes, or chronic respiratory disease. Cardiovascular disease, cancer and diabetes can be caused by a predominant meat and dairy consumption or animal-protein diet sources. Protein diversification can support healthier diets, weight management, and improved lifestyle factors, all of which can contribute to lowering the mortality rate attributed to cardiovascular disease, cancer, diabetes, and chronic respiratory disease (NCDs). By reducing the consumption of unhealthy diets highly relying on animal proteins and promoting a balanced, diversified diet, the risk of these NCDs can be mitigated.



Healthy Diets for Brighter Minds

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Benefit: Raising awareness about protein diversification and sustainable food choices supports education on responsible consumption.



Empowering Women in Agriculture

Goal 5: Achieve gender equality and empower all women and girls

Benefit: Empowering women in agriculture, including in the production of diverse protein sources, promotes gender equality.

6 CLEAN WATER AND SANITATION



Cleaner Agriculture, Cleaner Water

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Benefit: Reducing the environmental impact of protein production can lead to cleaner and more sustainable water use.

“Freshwater plays many important roles in daily life for example, agriculture is responsible for nearly 70% of that withdrawal volume, and it is therefore, the most water-intensive sector.”

Carlo Ingrao & al, [Water scarcity in agriculture](#), Science Direct, August 2023

Target 6.4: "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity".

→ **Indicator 6.4.1 Change in water-use efficiency over time.**

Diversifying protein sources away from water-intensive options like red meat can reduce overall water consumption in the food production sector. This can lead to improvements in water-use efficiency over time.

Many plant-based protein sources (e.g., legumes) require less water for cultivation compared to livestock farming. Shifting towards these options can contribute to improved water-use efficiency in agriculture.

Livestock farming can lead to water pollution due to runoff from manure and chemicals. Diversification can help lower pollution levels, indirectly improving water quality.

→ **Indicator 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.**

Protein diversification can alleviate water stress by reducing the demand for freshwater resources in agriculture.

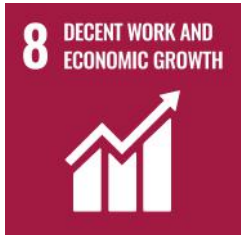
Plant-based proteins generally have a lower water footprint, contributing to a lower level of water stress. By promoting plant-based proteins and sustainable farming practices, water withdrawal can be better aligned with the available freshwater resources, leading to a reduced level of water stress. Diversification can reduce competition between different sectors (e.g., agriculture, industry, and households) for limited freshwater resources, thereby decreasing water stress and ensuring a sustainable supply of water.



Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Benefit: Sustainable agriculture and food production practices associated with protein diversification can reduce the energy intensity of the food system.

Cleaner Energy for greener Food



Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Benefit: The emerging alternative protein industry can create economic opportunities, particularly in research, development, and production of alternative protein sources, contributing to economic growth.

Economic opportunities
Decent Work



Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Benefit: Protein diversification promotes innovation in the food industry, with the development of alternative protein sources and sustainable production methods.

Innovation for Sustainable Food

“With the multifaceted challenges of population growth, climate change, and the increasing burden on nature, we need to rethink the way we produce and consume protein, and innovation is a key part of the answer.”

Andy Zynga, [Protein diversification: a win for people and planet](#), 2023

Innovations as cellular meat and molecular farming offer new alternative to animal food.



Goal 10: Reduce inequality within and among countries

Benefit: Protein diversification can promote equitable access to diverse and nutritious protein sources for all, reducing disparities in food access.

Nutrition Equity for All



Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Benefit: Encouraging urban communities to adopt protein diversification practices can reduce the environmental impact of food systems and land uses in cities.

Urban Sustainable Food Choices



Goal 12: Ensure sustainable consumption and production patterns

Benefit: Protein diversification encourages sustainable agriculture and consumption patterns, reducing the ecological footprint of food production with monoculture farming and overreliance on livestock production.

Responsible Food Choices

“Factory farming – the grain-feeding of confined animals – is the biggest single source of food loss, squandering enough grain to sustain 4 billion people. That’s half of humanity alive today.”

Philip Lymbery, [Fixing Our Broken Food System Will Take Urgent Action, Not Least In Ending Industrial Animal Agriculture, 2023](#)

• **Target 12.2:** "By 2030, achieve the sustainable management and efficient use of natural resources."

→ **Indicator 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.**

Protein diversification can help reduce the demand for resource-intensive animal agriculture, such as land, water, and feed for livestock. Shifting towards plant-based proteins or alternative protein sources often requires fewer natural resources, contributing to more efficient use of resources and reduced environmental impact.

• **Target 12.3:** "By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses."

→ **Indicator 12.3.1: (a) Food loss index and (b) food waste index.**

Protein diversification can lead to the utilisation of a wider variety of protein sources, including plant-based and alternative proteins, that are often less perishable and more resilient during storage and transport, resulting in reduced food loss and waste.

13 CLIMATE ACTION



Goal 13: Take urgent action to combat climate change and its impacts

Benefit: Diversifying protein sources can lower greenhouse gas emissions, decreasing land and water usage compared to traditional livestock farming, contributing to climate mitigation efforts.

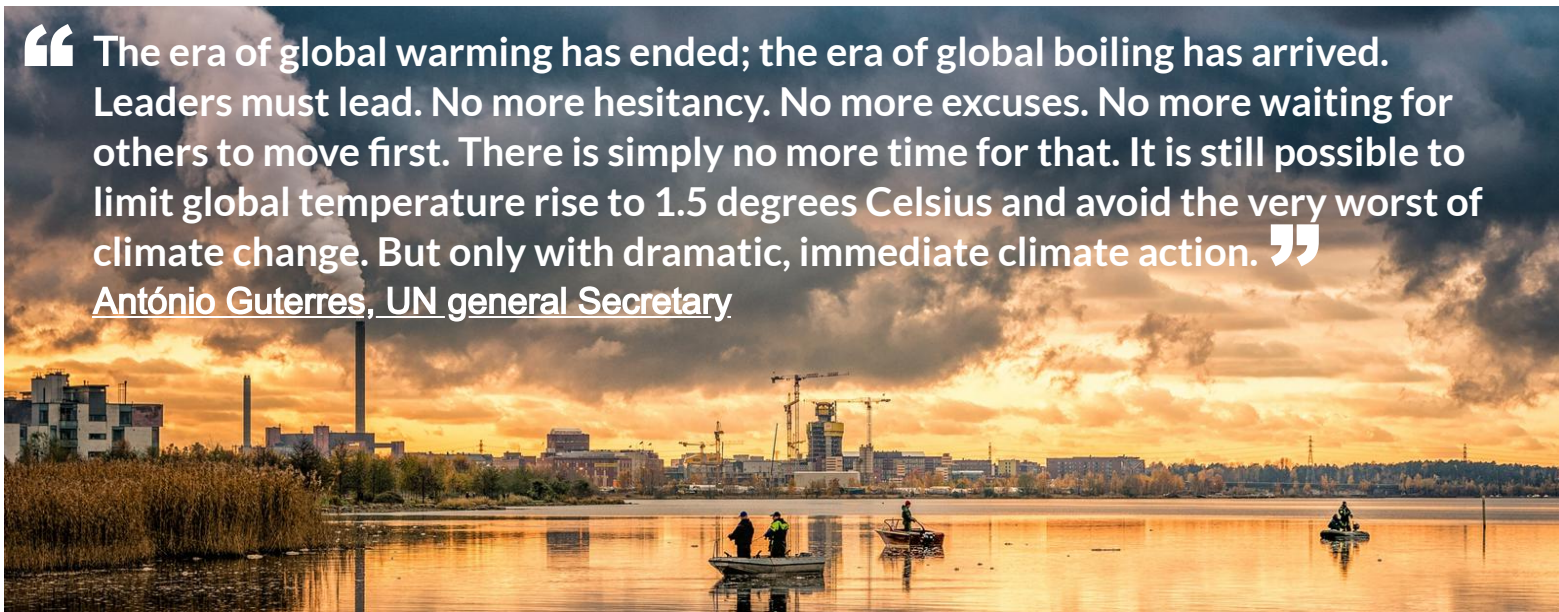
Climate-Friendly Diets

“ By 2050, dietary changes could free several million km² (*medium confidence*) of land and provide a technical mitigation potential of 0.7 to 8.0 GtCO₂ eq yr⁻¹, relative to business as usual projections (*high confidence*). ”

[IPCC, Special Report on climate change, 2022](#)

“ The era of global warming has ended; the era of global boiling has arrived. Leaders must lead. No more hesitancy. No more excuses. No more waiting for others to move first. There is simply no more time for that. It is still possible to limit global temperature rise to 1.5 degrees Celsius and avoid the very worst of climate change. But only with dramatic, immediate climate action. ”

António Guterres, UN general Secretary



• Target 13.2: Integrate climate change measures into national policies, strategies, and planning.

→ **Indicator 13.2.1 Integration of Climate Change Measures (Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change):** The production of animal-based proteins, particularly red meat, can have a significant carbon footprint. Shifting to alternative protein sources with a lower environmental impact, such as plant-based proteins or lab-grown meat, can contribute to the reduction of greenhouse gas emissions. Additionally, diversified protein sources often involve less land use and deforestation, which are important for mitigating climate change.

→ **Indicator 13.2.2 Total greenhouse gas emissions per year.**

Diversifying protein sources can help reduce greenhouse gas emissions from the food system in lowering emissions associated with the production of animal-based proteins, mitigating land use change and deforestation, lowering energy and water use, mitigating methane emissions, and promoting less energy-intensive food processing.



Less Pollution for Ocean Life

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Benefit: Reducing overfishing and the demand for marine resources in promoting plant-based and alternative proteins reduces the pressure on marine ecosystems and helps to protect ocean biodiversity and ecosystems.

Protein diversification, especially when it includes a shift towards plant-based proteins and sustainable aquaculture, can play a significant role in protecting marine ecosystems, reducing overfishing, minimizing bycatch, and ultimately preventing marine pollution, eutrophication and acidification.

(See for eg: [Eutrophication risk arising from intensive dairy cattle](#), Science Direct, 2018)

- **Target 14.1:** "By 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution."

→ **Indicator 14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density.**

Marine Pollution from Land-Based Activities: Diversifying protein sources, particularly by reducing the heavy reliance on marine fish for protein, can alleviate the pressure on marine ecosystems. A shift towards plant-based and alternative protein sources can help decrease overfishing, bycatch, and the need for resource-intensive fishing practices. This, in turn, reduces marine pollution from fishing activities.

- **Target 14.2:** "By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans."

→ **Indicator 14.2.1: Number of countries using ecosystem-based approaches to managing marine areas.**

Strengthening Resilience and Promoting Sustainability of Marine and Coastal Ecosystems: Protein diversification can reduce the pressure on marine resources, allowing fish stocks to recover and marine ecosystems to regenerate. This contributes to the overall health and resilience of marine and coastal ecosystems.

- **Target 14.3:** "Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels."

→ **Indicator 14.3.1: Average marine acidity (pH) measured at agreed suite of representative sampling stations.**

Enhanced Scientific Cooperation on Ocean Acidification: While the direct link between protein diversification and ocean acidification is less clear, the reduction in overfishing and the consequent recovery of marine ecosystems can contribute to healthier oceans, which are more resilient to the impacts of ocean acidification.

- **Target 14.4:** "By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics."

→ **Indicator 14.4.1 Proportion of fish stocks within biologically sustainable levels.** Diversifying protein sources can alleviate the pressure on fish stocks, helping to prevent overfishing and allowing stocks to recover to sustainable levels. It can also reduce the incentives for destructive fishing practices and illegal, unreported, and unregulated (IUU) fishing.



Using Less Land to Protect Life (1/2)

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Benefit: Diverse and sustainable protein sources, including plant-based options reduce the need for extensive land use for livestock farming. This helps to preserve terrestrial ecosystems, reduce deforestation and desertification, and protect biodiversity.

Protein diversification, especially when it includes plant-based proteins and sustainable agriculture, can alleviate the environmental pressures associated with traditional livestock farming, including deforestation, desertification, habitat destruction, and overharvesting. By reducing the environmental footprint of food production, it indirectly supports the conservation and sustainable use of terrestrial and freshwater ecosystems, the restoration of degraded land, and the protection of biodiversity. Regenerative agriculture is a solution. “Mega-farms are [...] exhausting our soil beyond repair. We can restore our planet for an animal-friendly and nature-friendly future.”
Philip Lymbery, *Sixty Harvests Left*, 2022

- **Livestock production already consumes 83% of global arable land** and consequently there is a clamour to reallocate forests into agricultural land. It's estimated that between 1991-2005, 70% of deforestation in the Amazon Basin could be attributed to the beef industry. Meanwhile, global forests, once a crucial carbon sink, have been cut down at such an alarming pace that they are now a net contributor to GHG emissions.
- **The earth loses about 18.7 million acres of forests per year** and the agricultural industry's demand for more land is a key driver.
 - **About 80% of the world's plants and animals live in forests and are losing their habitats** to deforestation. This is putting species under the threat of extinction.

Fairr, [Land environmental damage as a result of intensive farming](#), 2019

• **Target 15.1:** "By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements".

→ **Indicator 15.1.1 Forest area as a proportion of total land area.** Protein diversification, particularly by promoting alternative protein sources beyond traditional livestock farming, can help reduce the pressure on forests for grazing land and feed production. This can indirectly contribute to maintain or increase forested areas.

→ **Indicator 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type.** A diversified diet can reduce the demand for specific wildlife and fish species, thus helping to protect these species and their habitats.

• **Target 15.2:** "By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally."

→ **Indicator 15.2.1 Progress towards sustainable forest management.**

Promoting alternative protein sources can reduce the reliance on traditional livestock farming, which often leads to deforestation due to land clearing for grazing and feed production. Therefore, protein diversification can contribute to the sustainable management of forests.

“Desertification, land degradation and biodiversity loss share a similar primary driver: the conversion of land by humans for use in farming, raising livestock, settlements, extractive industries and infrastructure. Addressing desertification offers synergies with biodiversity conservation and climate action. All three challenges require enhanced international cooperation as well as concerted efforts to achieve internationally agreed-upon goals and targets.”

[Special Rapporteur on human rights and the environment, June 2023](#)

- **Target 15.3: "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world."**

→ **Indicator 15.3.1 Proportion of land that is degraded over total land area.**

Diversifying protein sources can help reduce the pressure on agricultural land. When done sustainably, it can alleviate the need for expanding agricultural areas into ecologically sensitive or marginal lands. This contributes to combating desertification and land degradation.

“Our global food system is the primary driver of biodiversity loss, with agriculture alone being the identified threat to 24,000 of the 28,000 (86%) species at risk of extinction. The global rate of species extinction today is higher than the average rate over the past 10 million years.” [UNEP Press Release, 3 Feb 2021](#)



- **Target 15.5: "Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species."**

→ **Indicator 15.5.1 Red List Index.**

Protein diversification can help reduce the demand for specific wildlife and fish species, which may be threatened by overharvesting. By reducing this demand, it can contribute to the protection and conservation of these species, ultimately improving the Red List Index.



Peaceful Ressource Practices

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Benefit: Sustainable and diversified protein production practices contribute to stronger food systems, reducing food-related conflicts and injustices.



Working together for a Sustainable Future

Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

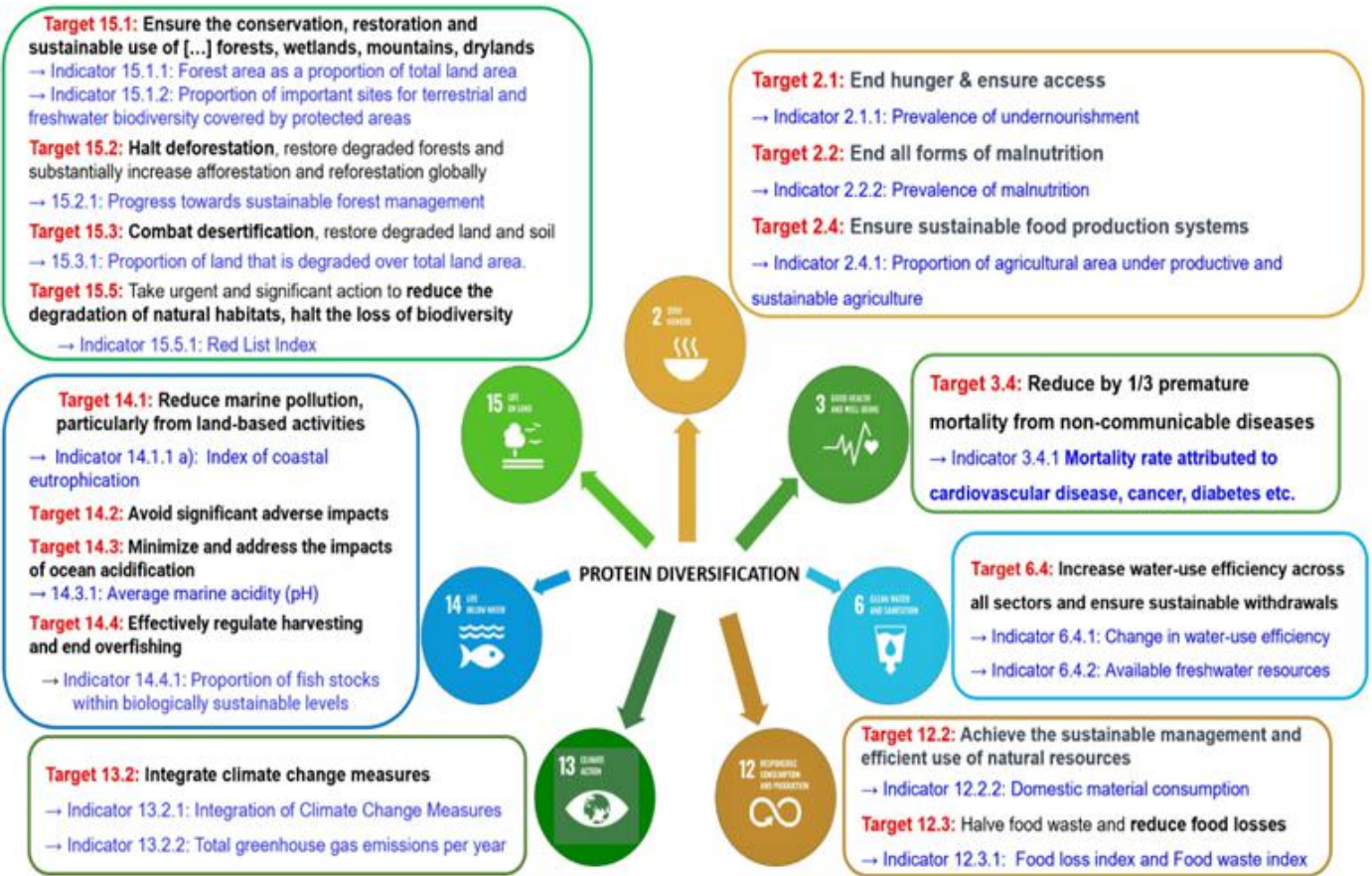
Benefit: Protein diversification often involves collaboration among governments, businesses, and civil society to develop and promote sustainable food systems, supporting the spirit of partnership and cooperation in achieving the SDGs.



▪ **PROPOSED New Goal 18 for Animals [Not Adopted]:**

A new SDG 18 on 'animal health, welfare and rights' has been first proposed by Ingrid J. Visseren-Hamakers in her paper: '[The 18th Sustainable Development Goal](#)', [Earth System Governance](#), 2020.

← The [Campaign of 'Beyond Cruelty'](#) for SDG18: Zero Animal Exploitation



Protein diversification stands as a powerful and interconnected solution, aligning with seven of the UN SDGs. Adopting this new approach would allow a triple win for humans, animals and the planet.

First and foremost, protein diversification supports SDG 2 "Zero Hunger", by improving human nutrition and food security. By introducing diverse protein sources like plant-based options, along with alternative and new protein sources, would promote healthier diets and reduce malnutrition.

Simultaneously, it advances SDG 3 "Good Health and Well-being." A diversified diet is essential for human health, and it can mitigate health problems associated with a rich animal-based diet.

Protein diversification also plays a pivotal role in addressing SDG 6 "Clean Water and Sanitation". The agriculture sector, especially livestock farming, is a major water consumer and pollutant. By diversifying protein sources, we reduce the water footprint of food production, thus supporting water conservation and ensuring access to clean and safe drinking water for all.

This approach encourages responsible food choices and contributes to overall well-being. Therefore, it aligns with SDG 12 "Responsible Consumption and Production".

Importantly, protein diversification contributes to SDG 13 "Climate Action" in reducing greenhouse gas emissions and offering a new opportunity to mitigate the harmful effects of industrial agriculture.

The SDG 14 "Life Below Water" benefits from protein diversification by reducing the pressure on marine ecosystems and aquatic resources. Overfishing and unsustainable fishing practices need to be addressed, and alternative protein sources encourage responsible aquatic resource management and marine life conservation.

Last but not least, in tackling deforestation, desertification and habitat destruction, it contributes SDG 15 "Life on Land" by alleviating the strain on natural resources and reducing the need for land and water. Therefore, this approach contributes to biodiversity conservation. Shifting towards more sustainable and humane protein sources reduces the environmental impact of conventional livestock farming.

In conclusion, the development of the SDGs and UN goals towards protein diversification represents a comprehensive and inspiring strategy. It advances SDGs 2, 3, 6, 12, 13, 14, and 15, promoting human health and nutrition, environmental sustainability, animal welfare, and water resource conservation.

Underpinned by responsible choices and a diverse protein supply chains, this interconnected approach fosters a more equitable and sustainable future for all.



Towards a New SDG Indicator on Protein Diversification?

→ Why a new SDG indicator on Protein Diversification?

A new SDG indicator focusing on Protein Diversification can play a pivotal role in addressing global challenges related to nutrition, food security, environmental sustainability, and public health. By tracking and promoting diverse protein sources in human diets, this indicator can significantly impact several key areas of UN concern.

- Firstly, it can help combat malnutrition and improve public health. Many regions face protein deficiencies due to overreliance on a few sources like meat. Such an indicator can encourage balanced diets, reducing malnutrition and related health issues.
- Secondly, it promotes environmental sustainability. Livestock agriculture, particularly beef production, contributes significantly to greenhouse gas emissions and deforestation. Encouraging diverse protein sources such as plant-based proteins or sustainably sourced seafood can reduce the environmental impact of food production.
- Thirdly, it supports food security. Dependency on a narrow range of protein sources can lead to vulnerabilities in the food supply chain. A diversified protein indicator fosters resilience by encouraging varied sources, making the food system less susceptible to shocks.
- Lastly, SDGs indicators should follow the following criteria of the 'Tier Classification.'

Tier Classification Criteria/Definitions

Tier 1: Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 percent of countries and of the population in every region where the indicator is relevant.

Tier 2: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries.

Tier 3: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested. (As of the 51st session of the United Nations Statistical Commission, the global indicator framework does not contain any Tier III indicators).

As of 30 November 2022: The updated tier classification contains 148 Tier I indicators, 77 Tier II indicators and 6 indicators that have multiple tiers (different components of the indicator are classified into different tiers).

→ Criteria needed for a new SDG indicator on protein diversification?

A new indicator on Protein Diversification would need the follow the main following criteria:

- 1. Relevance:** The indicator should directly link to the relevant SDGs, such as the 7 SDGs identified related to Nutrition (SDG 2), Health (SDG 2), Water (SDG 6), Responsible diets (SDG 12), Climate Action (SDG 13), Life below Water (SDG 14) and Life on Land (SDG 15).
- 2. Clarity:** The indicator should have a clear definition, specifying what protein diversification entails, and a transparent methodology for measuring it.
- 3. Feasibility:** Data for the indicator should be reasonably collectible, whether through dietary surveys, agricultural production data, or other relevant sources, and it should be feasible to monitor over time.
- 4. Global Applicability:** The concept of protein diversification should be adaptable to diverse countries and regions, recognizing different dietary patterns and protein sources worldwide.
- 5. Measurability:** The indicator should have quantifiable metrics, allowing for the measurement of changes in protein diversification over time, such as the percentage of protein derived from various sources in diets.
- 6. Time Sensitivity:** It should have a specific timeframe for monitoring progress, allowing for regular assessment of diversification efforts in diets.
- 7. Relevance to Policy:** The data generated by the indicator should inform policymakers about the importance of encouraging diverse protein sources in diets and its implications for health, nutrition, and sustainability.
- 8. Interlinkages:** Consideration of how protein diversification impacts other SDGs, such as reducing malnutrition and its positive effects on environmental sustainability, should be factored in.
- 9. Data Availability and Quality:** Reliable data sources on protein consumption and quality control mechanisms for data should be in place to ensure accurate measurement.
- 10. Stakeholder Involvement:** Engage a wide range of stakeholders, including governments, nutrition experts, environmental organizations, and the food industry, in the development and selection of this indicator.

By addressing these 10 main criteria, a Protein Diversification indicator can effectively measure progress toward promoting diverse and sustainable protein sources in diets, which in turn contributes to the SDGs related to nutrition, health and environmental sustainability.

→ WHEN and WHERE to include a new SDG indicator on protein diversification?

▪ **When?** What opportunities to propose this new indicator?

- **Short-Term Option:** [IAEG-SDGs- 2025 Comprehensive Review Process:](#)

“In accordance with GA Resolution 71/313, the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) conducted a Comprehensive Review of the global indicator framework throughout 2024 with the aim to submit its proposed refinements, revisions, replacements, additions and deletions to the 56th session of the United Nations Statistical Commission in March 2025 for its consideration.” (See the [Timeline for the 2025 Comprehensive Review](#)).

The timeline is short in consideration to the scientific assessment further needed to properly measure protein diversification aiming to sustainable food systems.

- **Mid-Term Option:** Keeping track on an eventual next SDGs review by 2030 to include this indicator.

- **Long-Term Option:** The Post-2030 Process

To date nobody knows well what the Post-2030 Agenda of the UN will look like. But we know that there is room for discussion to build what it should look like. Therefore, we can ensure that protein diversification has its place for the future. Indeed, Protein Diversification can play a key role in achieving a healthier, more environmentally sustainable, and food-secure world, contributing to multiple SDGs simultaneously.

▪ **Where?** Under which SDG would this indicator best fit?

The last mapping and assessment of the existing SDGs reveals that protein diversification aligns especially with 7 SDGs (2, 3, 6, 12, 13, 14, 15). A new related indicator has a particular place under SDG2 (Zero Hunger), Target 2.4:

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Target 2.4: “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, strengthen capacity for adaptation to climate change, extreme weather, drought, flooding, and other disasters, and progressively improve land and soil quality.”

The only indicator available for this target is the indicator 2.4.1 as follows:
Indicator 2.4.1: Proportion of agricultural area under productive and sustainable agriculture

2 ZERO HUNGER



Which New SDG Indicator on Protein Diversification?

The formulation of this new indicator can be based on the existing SDG indicators with 2 examples :

- 1- **Protein Diversification Index**,: In the same vein than, eg: the Indicator 12.3.1 a) Food loss index
- 2- **Sustainable Protein Production rate**: Idem, eg: Indicator 11.3.1 Ratio of land consumption rate.

1

PROTEIN DIVERSIFICATION INDEX

A "Protein Diversification Index" is a suitable and comprehensive approach to measure the benefits of diversifying protein sources in the context of human health, environmental sustainability, and animal conservation and welfare. This index could encompass a combination of the following indicators, along with others that specifically measure dietary patterns, food source diversity, environmental impact, animal welfare, and other relevant factors.

Key components of the Protein Diversification Index might include:

- Dietary Diversity Score**: Reflects the variety of protein sources in an individual's or population's diet, with a focus on plant-based and sustainable options.
- Sustainable Protein Consumption Rate**: Measures the proportion of protein intake coming from sustainable sources, including plant-based and ethically sourced animal products.
- Environmental Protein Footprint**: Evaluates the environmental impact of protein consumption, considering carbon emissions, water usage, and land utilization.
- Protein Quality Index (PQI)**: Rates the nutritional quality of protein sources to encourage healthier dietary choices.
- Animal Welfare Index**: Assesses the humane treatment of animals in protein production.
- Biodiversity Impact Score**: Quantifies the impact of protein production on local and global biodiversity, taking into account conservation efforts.
- Local Sourcing Percentage**: Reflects the reliance on local or regional protein sources, supporting sustainability and local economies.

By aggregating these component scores into a single index, this can provide a comprehensive view of the benefits of protein diversification. This index could serve as a valuable tool for policymakers, researchers, and consumers to monitor and promote dietary choices that align with the goals of health, sustainability, and animal welfare.

Developing and standardising such an index would require collaboration and consensus among relevant stakeholders.

This new indicator will have to be calculated based on the proteins consumed per capita, the ratio of animal and plants proteins consumed worldwide and the growing number of population to estimate the correct percentages that can be expected, depending on the transformation capacities of food systems providers and technology advances.

A "Sustainable Protein Production Rate" is a valuable concept and potential indicator to measure the sustainability of protein production. It can provide insights into how efficiently protein is produced in a manner that minimizes environmental impact and maximises resource utilization. This rate can be a crucial component of a broader evaluation of the sustainability of food systems.

The Sustainable Protein Production Rate can include similar parameters than the previous indicator proposal with some specificities:

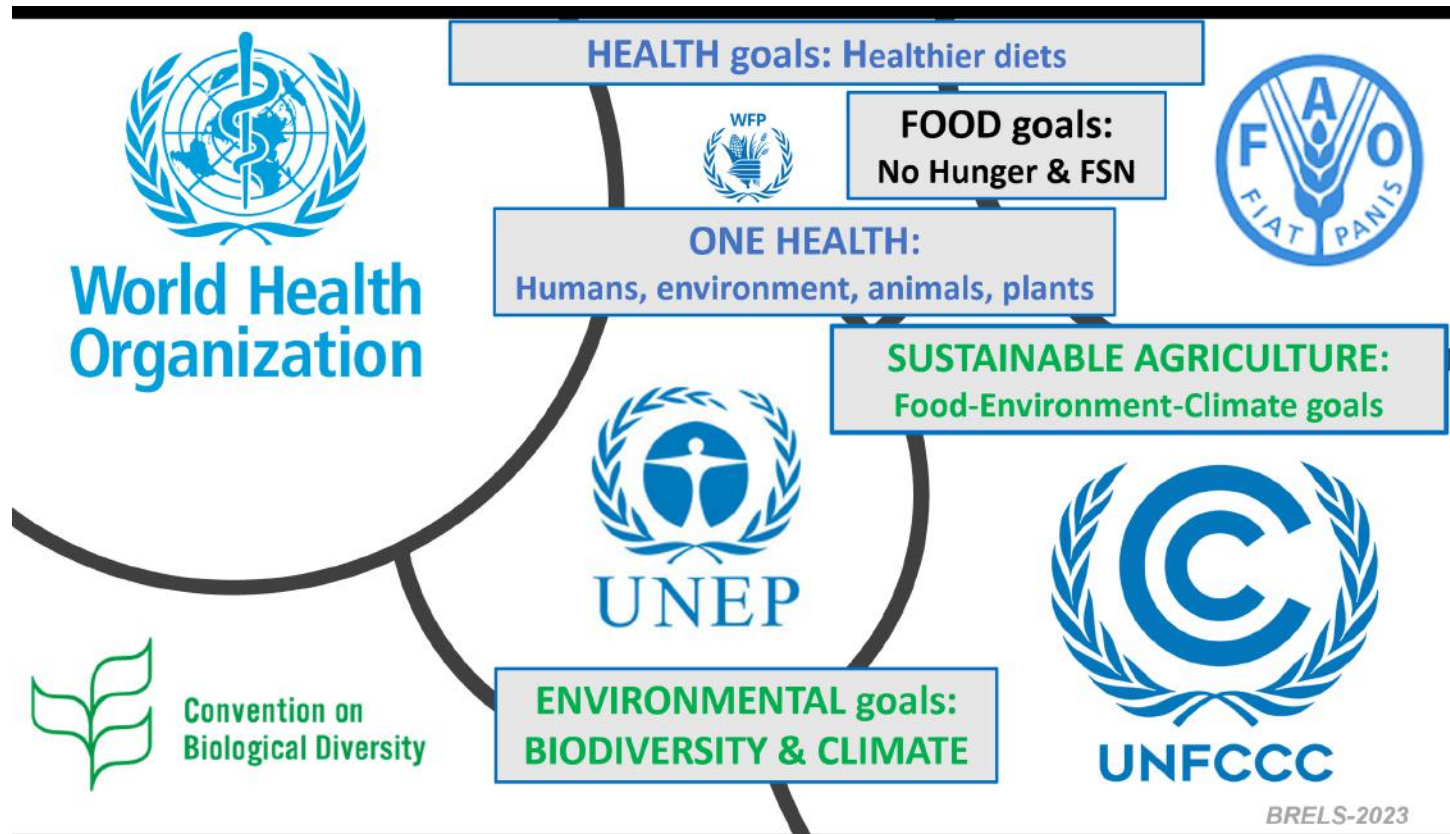
- **Resource Efficiency:** Assess the efficiency of resource use, such as land, water, and energy, in producing a unit of protein. This can help identify resource-intensive practices and promote more efficient ones.
- **Environmental Impact:** Measure the environmental footprint associated with protein production, including greenhouse gas emissions, water pollution, and habitat degradation. Lower rates indicate more environmentally friendly production.
- **Biodiversity Conservation:** Evaluate the impact of protein production on biodiversity, considering practices that protect or harm local ecosystems and species.
- **Animal Welfare:** Consider the ethical treatment of animals in protein production, giving higher rates to systems that prioritise animal welfare.
- **Food Security:** Assess the contribution of protein production to food security, especially in regions where protein deficiency is a concern.
- **Local Sourcing:** Encourage sourcing protein locally to reduce food miles and support local economies.

Developing a Sustainable Protein Production Rate would require the establishment of standardised measurement methods and data collection protocols, as well as collaboration among stakeholders in the food production industry, research institutions, and governmental bodies. Such a rate would provide valuable information for guiding policies and practices that promote sustainable protein production and, by extension, a more sustainable and diverse global food supply.

Proposed Formulation for a New indicator 2.4.2 on 'Protein Diversification'

"By [2030] (or later in the Post-2030 agenda?) reducing by [x%] (eg. 50%) the percentage of animal proteins produced by factory farming sources and increasing by [x%] (eg.80%) the percentage of plant-based proteins produced worldwide."

Protein Diversification: Benefits for general UN Goals



Beyond the SDGs, adopting a Protein Diversification approach would provide benefits for more general UN goals, related to Food security, Climate Change mitigation, Biodiversity Conservation and Health.

Concretely, this new Protein Diversification approach would contribute to the goals of several important UN Agencies (FAO, WHO, UNEP), Conventions-Frameworks-Agreements (UNFCCC, Paris Agreement, Convention on Biological Diversity and Global Biodiversity Framework) and related institutions like renowned scientific expert panels (Quadripartite on One Health, IPCC, IPBES).

The following pages will explore closer these links and advantages.

FOOD



Food and Agriculture Organization of the United Nations

- **The Food and Agriculture Organization of the United Nations (FAO)** is a specialized agency of the United Nations that focuses on issues related to agriculture, food security, and nutrition. The FAO regularly publishes reports and resources on sustainable agriculture and food production.

Despite some significant advances undertaken by the FAO for promoting farmed animal welfare, especially since the 2006 Report '[Livestock's Long Shadow](#)', we could recently observe an important backward in 2023 with the promotion of animal food, especially with the FAO Report on the '[Contribution of terrestrial animal source food to healthy diets for improved nutrition and health outcomes](#)', 2023.

The FAO is the UN-iversal reference on Food and Agriculture. Therefore, it would be important to have the FAO joining the efforts to promote protein diversification.



- **The World Food Program (WFP)** is the food aid agency of the UN and FAO intended to fight hunger. WFP is the largest humanitarian program distributing food assistance in emergencies and working with communities to improve their nutritional status and build resilience. The Last [World Food Forum and Committee on World Food Security](#) was held in Oct 2023.
- **The [Global Forum on Food Security and Nutrition \(FSN\)](#) Partnership:** Various partnerships, networks, and research organizations collaborate with the UN on food security and nutrition. These organizations often produce reports and studies related to sustainable and diversified diets.

HEALTH



World Health Organization

- **The World Health Organization (WHO) is another UN agency that addresses nutrition and health.** In 2015, the World Health Organization (WHO) released a [report](#) classifying red meat as a group 2A carcinogenic and processed meats as a group 1. This evidence was recalled and completed in the last **WHO Report, [Red and processed meat in the context of health and the environment](#)**, 10 July 2023:
- **Excess consumption of red meat and processed meat is associated with increased risk of NCDs, including cancer, cardiovascular disease (CVD) and type 2 diabetes.**
- **Specifically in relation to cancer, the International Agency for Research on Cancer (IARC) has classified processed meat as “carcinogenic to humans” and red meat as “probably carcinogenic to humans”.**
- **One Health Quadripartite (WHO-FAO-UNEP-WOAH)**

“Domesticated animals continue to be reservoirs of potentially deadly pathogens that could infect people. That is especially worrying in this era of the Covid-19 pandemic. Worse: the expansion of livestock husbandry has been leading to massive losses of biodiversity around much of the planet. A case in point is the continued decimation of the Amazon’s beleaguered forests in Brazil to make way for yet more grazing ground for cattle.” D.T. Cross, [Farming animals reduces biodiversity and threatens our health](#), 2020



“One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. ”

“Animal disease outbreaks remain the most significant risk in the meat sector. The meat sector faces several uncertainties in meeting the increasing demand for meat products while addressing concerns about animal disease, environmental sustainability, consumer preferences, animal welfare, public health and trade policies. The livestock and meat sector often face severe economic impacts due to disease outbreaks.” OECD-FAO, [Agricultural Outlook 2023-2032](#), 17 July 2023

CLIMATE



United Nations

Framework Convention on Climate Change

- **The United Nations Framework Convention on Climate Change (UNFCCC)** is the UN treaty to combat "dangerous human interference with the climate system", in part by stabilizing greenhouse gas concentrations in the atmosphere.
- **The Paris Agreement:** The Paris Agreement was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris in 2015 to limit global warming to less than 2 °C, and try to limit the increase to 1.5 °C.

"Our food systems are one of the key contributors to climate breakdown. Greenhouse gas emissions from farming and the land use change that often accompanies it, such as clearing forests and drying out wetlands to make room for crops and livestock, amount to more than a fifth of global carbon output, according to the Intergovernmental Panel on Climate Change."

Fiona Harvey, "[Impact of farming on climate crisis will be a key Cop topic – finally](#)",
The Guardian, 20 oct 2023

Ahead of the upcoming COP28 in the UAE Nov-Dec 2023: "COPs have, historically, significantly overlooked the role of farming, both as a major contributor to global climate change, as a potential solution to climate change. [...] If world leaders could come together to discuss commitments to looking at the link between food and climate, this would be historic."



- **The Intergovernmental Panel on Climate Change (IPCC)** is the United Nations body for assessing the science related to climate change. Reports from the IPCC may discuss the environmental impact of food production and the potential benefits of protein diversification in mitigating climate change.

"Balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health (*high confidence*). By 2050, dietary changes could free several million km² (*medium confidence*) of land and provide a technical mitigation potential of 0.7 to 8.0 GtCO₂ eq yr⁻¹, relative to business as usual projections (*high confidence*). Transitions towards low-GHG emission diets may be influenced by local production practices, technical and financial barriers and associated livelihoods and cultural habits (*high confidence*)."
[IPCC, Special Report on climate change and Land, 2022](#)

BIODIVERSITY



Convention on
Biological Diversity

- **The UN Convention on Biological Diversity (CBD)** was adopted in 1992 in Rio to preserve the biological diversity on earth and halt the loss of biodiversity as well as species extinction.
- **The Global Biodiversity Framework (GBF)** adopted in Dec 2022 in Montreal, includes 4 goals and 23 targets and commits the world to halting and reversing biodiversity loss by 2030.
- The key targets for 2030 of the GBF are: Effective conservation and management of at least 30% of the world's land, freshwater and oceans; Effective restoration on at least 30% of degraded terrestrial, inland waters, and coastal and marine ecosystems; Reduce the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, to near zero, while respecting the rights of Indigenous Peoples and local communities.
- Target 10 of the GBF specifically addresses agriculture as follow: “Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services.”

- **400+ vertebrate species extinct in the last 100 years**
- **32 million hectares of primary or recovering forest lost between 2010 and 2015**
- **1 million plant and animal species threatened with extinction (Source [here](#))**



Science and Policy for People and Nature

The Scientific platform in charge of biodiversity assessment reports

“Feeding humanity and enhancing the conservation and sustainable use of nature are complementary and closely interdependent goals that can be advanced through sustainable agriculture, aquaculture and livestock systems, the safeguarding of native species, varieties, breeds and habitats, and ecological restoration. Specific actions include promoting sustainable agricultural and agroecological practices, such as multifunctional landscape planning and cross-sectoral integrated management, that support the conservation of genetic diversity and the associated agricultural biodiversity. Further actions to simultaneously achieve food security, biodiversity protection and sustainable use are context-appropriate climate change mitigation and adaptation; incorporating knowledge from various systems, including the sciences and sustainable indigenous and local practices; avoiding food waste; empowering producers and consumers to transform supply chains; and facilitating sustainable and healthy dietary choices. As part of integrated landscape planning and management, prompt ecological restoration, emphasizing the use of native species, can offset the current degradation and save many endangered species, but is less effective if delayed.” [IPBES Assessment Report 2019](#)

SWOT on Protein Diversification at the UN

Strengths

- Supports SDGs achievement
- Tackles the main global crisis
- Food system transformation- “Produce more with less”
- Timely momentum for the 2030 and post-2030 Agenda

Weaknesses

- Short timing to add a new indicator in the [IAEG-SDGs 2025 Comprehensive Review Process](#)
- Notion not yet present in current UN language

Opportunities

- Supports the development and innovation for sustainable and healthy diets and protein supply
- Growing demand for vegan products in western countries
- Possibility of inclusion in the Post-2030 Agenda

Threats

- Recent FAO backwards in 2023, promoting animal food (eg. B12 supply).
- [FAO makes case for meat, eggs and milk as ‘essential source of nutrients’](#), 25 April 2023
- [‘The anti-livestock people are a pest’: how UN food body played down role of farming in climate change](#), 20 oct 2023
- [‘Declaration of scientists’ backing meat eating](#), 27 oct 2023

▪ Graphical Abstract by BRELS, 2023

How to address protein diversification in the existing UN language and SDGs processes?



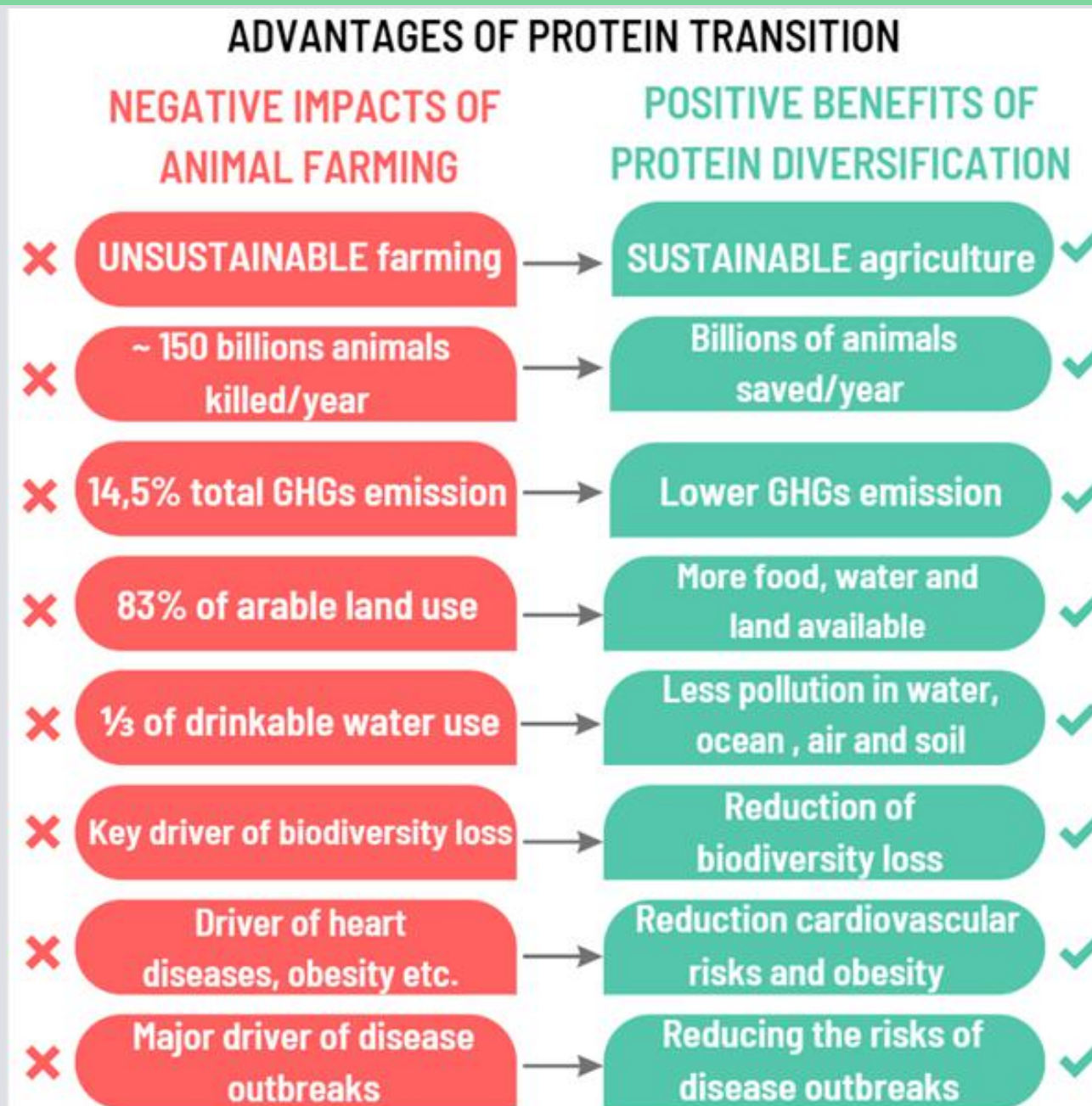
Approaching protein diversification within the existing UN language and SDG processes involves integrating sustainable and diverse protein sources into discussions and actions related to food security, nutrition, and environmental sustainability. Here are some elements of guidance to proceed:

- Raise awareness among stakeholders, policymakers, and the public about the importance of protein diversification for achieving the SDGs, especially the identified goals related to food, water, health, responsible choices, climate change and biodiversity.
- Advocate for the inclusion of protein diversification as a key component in discussions and resolutions related to food security and nutrition.
- Collaborate with relevant UN agencies and initiatives at FAO, WHO and UNEP to integrate protein diversification into their agendas.
- Encourage governments to incorporate protein diversification into their national policies and strategies, particularly those related to agriculture, health, and environment.
- Support and conduct research on diverse protein sources, their nutritional value, and environmental impact to provide data and evidence for policy decisions.
- Promote research and development of innovative technologies for protein diversification, such as plant-based and alternative protein sources.
- Include education on diverse protein sources and sustainable food systems in schools and training programs for farmers, food producers, and consumers.
- Educate consumers about the benefits of incorporating a variety of protein sources in their diets, including plant-based and alternative proteins.
- Encourage the private sector, including food producers and retailers, to invest in and promote diverse protein options.
- Ensure that protein diversification initiatives are inclusive, accessible, and equitable, addressing the needs of vulnerable and marginalised populations.
- Address food waste in protein production and consumption as part of broader efforts to achieve sustainable food systems.
- Establish monitoring and evaluation mechanisms to track progress in protein diversification and its contribution to the SDGs.
- Participate in UN forums, conferences, and events related to food security, nutrition, and sustainability to advocate for protein diversification.
- Reinforcing the collaboration with other NONGOs, research institutions, and advocacy groups working on sustainable food systems and nutrition to amplify efforts on protein diversification.
- Aligning efforts with the specific SDGs identified: SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 6 (Clean Water and Sanitation), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), SDG 15 (Life on Land) to demonstrate how protein diversification contributes to these goals.
- Share success stories and best practices in protein diversification within the context of the SDGs to inspire and guide other regions and nations.

By incorporating protein diversification into the existing UN language and SDG processes, we can contribute to more sustainable, nutritious, and environmentally responsible food systems, in line with the broader global development agenda.

Key Findings

- Protein diversification is serving the **UN objective towards Sustainable Food Systems**.
 - If some regions overrely on animal proteins, **the world mostly rely on plant proteins**.
 - With the **growing interest for non-animal proteins**, new technologies are developing.
 - **The global demand for animal products (eg: meat, fish, dairy, eggs) is still increasing**.
 - Certain complete plant and alternative proteins can cover human needs in EAAs.
 - Protein diversification benefits to the **SDGs, 7 in particular: SDGs 2, 3, 6, 12, 13, 14, 15**.
 - Therefore, this approach has a key role to play in the **SDGs and the Post-2030 Agenda**.
 - It generally benefits the **UN goals on Food, Health-One Health, Climate and Biodiversity**.
 - Protein diversification is a **solution for the UN** to endorse for Now & the Future.
- **Protein Diversification is a Triple Win for Humans, Animals and the Planet.**



The opportunity before us is to unite behind the momentum of the UN Food Systems Summit in helping deliver true transformation of food and farming. And to ensure that ending industrial animal agriculture is seen for what it is: fundamental to tackling hunger, climate change, pollution, and the collapse of nature. In this way, we can all play our part in setting a new course toward a just, equitable, humane, healthy, and nature-restorative food system, leaving no one behind. **Because all our futures depend on it.**"

Philip Lymbery, CIWF CEO

Concluding remarks

Current and future plant proteins and alternatives to animal products provide solutions for the urgent transformation needed of our food-systems, in order to answer the call to produce 'more with less'.

Protein diversification is answering the existing UN goals and SDGs related to food security and nutrition, and generally environmental protection in fostering sustainable agriculture, reducing pollution and GHGs, more land and freshwater, helping to achieve biodiversity targets etc. Less intensive animal farming will also considerably reduce health risks (eg: NDCs, antibioresistencies or diseases outbreaks).

Already having its place in the current SDGs goals and targets, protein diversification definitely has a key role to play in the Post-2030 Agenda. The next crucial stage for the shift towards sustainable proteins is the adoption of clear time-bound commitments or milestones, which are crucial for measuring progress and ensuring accountability of all the food actors.

Protein diversification is a triple win for humans, animals and the planet. We now need to ensure that it will lead the world to move away from unsustainable animal farming and deleterious production and consumptions patterns, towards a more sustainable and ethical way to eat proteins.

Recommendations for the Next Steps

1. Continuing the work towards a new SDG indicator on protein diversification, esp.:

- Making a scientific assessment of the percentage needed for protein diversification to ensure the transition to sustainable protein diets worldwide. The new measurable indicator should be based on solid scientific data to be provided.
- Realizing a Metadata document as existing for other indicators (eg: [Meta Data on Indicator on Food Waste](#)). This report contains elements for the Rationale with key data. Depending on the indicator chosen, these information have to be specified based on the scientific assessment.

2. Following the development of new related initiatives of particular interest, esp.:

- IAEA and FAO Development of a new and unique Protein Quality Database (Not yet online).
- Moolec Farming technology innovation consisting in 'Producing animal protein from plants' that can be a potential opportunity for change now and for the future.

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