

# LIFE ON LAND

## The Role of Dietitian-Nutritionists in Contributing to the United Nations Sustainable Development Goals

### GOAL #15

Target: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (1)

## GLOBAL TARGETS

- ▶ 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
- ▶ 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
- ▶ 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

- ▶ 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.

With the human population rising, the pressure on our food system is increasing. With a growing population but a deteriorating food system, the prevalence of both under-nutrition and obesity are rising. This brief will explore how life on land impacts, and is impacted by, nutrition and food systems, and will identify opportunities for dietitian-nutritionists to improve such.

**4.2 billion people** rely directly on agriculture or forestry for their livelihoods (2)

**13 million hectares** of forest are lost each year (2)

The growing population will increase the demands for agriculture products by 50% by 2030, and without change, rates of food insecurity will rise. The number of malnourished children is expected to increase by 24 million by 2050 and the number of individuals suffering from hunger will increase by 200-600 million by 2080 (3). A change toward a sustainable food system is imperative to meet the demands of the growing population (4).



## How Does Life on Land Support Nutrition and Nutrition Support Life on Land?

4.2 billion people rely directly on agriculture or forestry for their livelihoods (2), and climate change, as discussed in sustainable development goal #13, is putting that at stake - severely impacting human nutrition and health. Natural and human activity is impacting the emission of greenhouse gases, stratospheric ozone depletion, and deforestation. The most notable changes in the climate are increasing global temperatures, variability in rainfall patterns, increase in rainfall in some areas, and more extreme weather events (5, 3, 4).

Climate change has negatively impacted the acidity of the ocean, disrupted global nitrogen, phosphorus, and sulphur cycles, depleted soil fertility, and impeded marine productivity (5). All such processes negatively impact life on land, including that which humans rely on for nutrition and health. Climate change is also impacting the supply and demand of the food system. Climate change has lowered the availability of food and crop productivity, household incomes, and the availability of clean drinking water (3, 4). Climate change has, and will continue to have, a more dramatic impact on populations vulnerable to food insecurity (4) including women, children, and marginal communities. These populations are at the greatest risk due to their high exposure to natural hazards, their dependence on climate sensitive resources, and their limited capacities to adapt to the impacts of climate change (3).

There are many impacts that life on land has had on the nutritional well-being and overall health of humans. For example children under the age of five in Ethiopia and Kenya that were born during a drought are 36% and 50% more likely to be malnourished (3). Similarly, children under the age of two in Niger are 72% more likely to be stunted if they were born during a drought (3).

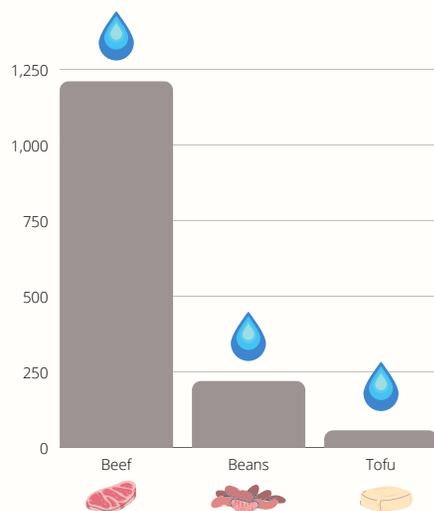
The current food system is dramatically impacting life on land, and vice versa. Some evidence of such includes:

- Livestock farming is generating 18% of total greenhouse gases (6)
- 70% of all agricultural land is directly or indirectly involved in livestock farming, contributing to land degradation and water pollution (6)
- Conventional tilling practices are increasing soil erosion and lowering soil organic carbon and total nitrogen, leading to higher atmospheric CO<sub>2</sub> (7)
- The increased use of fertilizers and pesticides is deteriorating soil health and productivity (7), impacting crop quantity and quality
- Crop fields have lower soil organic carbon, total phosphorus and total nitrogen than orchards and vegetable fields (7)

## SUSTAINABLE FISHERIES ACTION NETWORK<sup>(1,8)</sup>

Food production has been responsible for many environmentally damaging events including 80% of deforestation, up to 70% of freshwater use, and up to 30% of the greenhouse gas emissions created by humans. The worldwide consumption of meat has increased by 62% since 1963 due to the population growth and increasing wealth in developing countries. The production of animal proteins, both meat and dairy, have been shown to be more environmentally damaging and use more resources than plant food production. Evidence of such is provided in the following points.

- Animal protein production uses 11 times more fossil fuel energy than producing the same amount of plant-based proteins
- The production of 1000kcal of lamb or beef generates 10-14kg of greenhouse gas emissions while 1000kcal of lentils and tofu only generate 1-3kg
- Plant-based diets reduce greenhouse gas emissions and natural resource use because their production requires less land, water, and fossil fuels. For example, the production of one serving of beef requires 1211L of water while one serving of beans or tofu require 220L and 57L of water respectively



## Framework for Action

Sustainable agriculture is knowledge intensive but requires few external inputs. The implementation of sustainable agriculture requires carefully monitored practices and interactions between sectors (9). There are ample opportunities for dietitian-nutritionists to work on conserving and sustainably using the oceans, seas and marine resources.

## TOMALA IN WESTERN HONDURAS <sup>(12)</sup>

Tomala in Western Honduras has the highest rate of chronic child malnutrition in the country. To deeper understand the complexity of the factors contributing to such, Honduras has partnered with the United Nations to use groundbreaking methods of data collection to uncover the relationships between education, land degradation, infrastructure, housing, and job opportunities, and their impact on nutrition. Such data will help shape solutions into the future.

### Academic Level

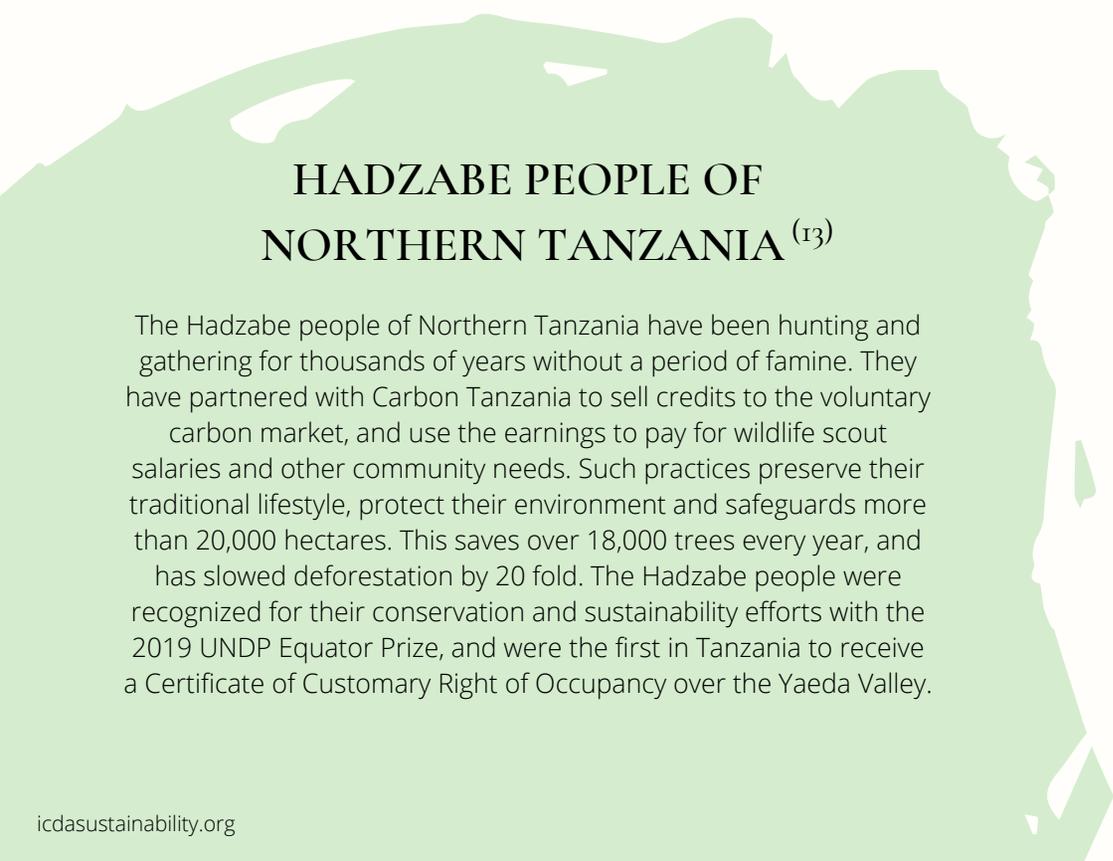
To conserve and sustainably use the oceans, seas and marine resources for sustainable development, people must be educated on such, and there are opportunities for improving dietitian-nutritionists' curriculum, that of small and large scale farmers, as well as children in the school system.

The cultivation and importance of the consumption of locally grown nutrient-dense foods should be more heavily emphasized in dietitian-nutritionists' education. Additionally, breeding programs for selected crops and livestock, and post-harvest management processes can be more heavily researched in the dietetic profession. There is also room for improvement in small and large scale farmers' education on the consequences of deforestation, residue burning, and cultivation of steep slopes (11). Dietitian-nutritionists can be key stakeholders in providing such education.

Educating children is important as well to build a foundation of understanding and interest in sustainable agriculture. School food gardens, school feeding programs, and sustainable information in the school curriculum have been successful in contributing to such, in schools where they are offered (3).

## Policy Level

Policies should be made to promote the availability and affordability of a diverse range of nutritious foods. They should account for gender sensitivity, including women and other vulnerable groups in the decision-making, planning, and implementation of programs. The legal rights and equal access for men and women to resources including land need to be strengthened (3) and certainly Indigenous and traditional knowledge of agriculture should be taken into consideration when developing such programs and policies (3).



## HADZABE PEOPLE OF NORTHERN TANZANIA <sup>(13)</sup>

The Hadzabe people of Northern Tanzania have been hunting and gathering for thousands of years without a period of famine. They have partnered with Carbon Tanzania to sell credits to the voluntary carbon market, and use the earnings to pay for wildlife scout salaries and other community needs. Such practices preserve their traditional lifestyle, protect their environment and safeguards more than 20,000 hectares. This saves over 18,000 trees every year, and has slowed deforestation by 20 fold. The Hadzabe people were recognized for their conservation and sustainability efforts with the 2019 UNDP Equator Prize, and were the first in Tanzania to receive a Certificate of Customary Right of Occupancy over the Yaeda Valley.

Dietitian-nutritionists can bring forth resources such as the [Systemic Solutions for Healthy Food Systems: A Guide to Government Action](#) to guide policy creation. This guide is a set of recommendations for national governments to build resilience and improve food security outcomes.

Cross-sectoral planning and partnership between communities, government, and public agencies are also integral to policy success (3).

## Health-Systems Level

Dietitian-nutritionists should encourage a plant-based diet to improve life on land and reduce diet-related chronic diseases, as well as help reduce food waste. They should play a key role by educating companies, agriculture producers, the general public, and food management employees on the impacts of food waste. For example, dietitian-nutritionists can develop and advocate for food waste donation programs. These may be such that farmers' markets, commercial companies, or grocery stores, donate overstocked nutritious food to food banks, hospitals, or soup kitchens, instead of disposing of them.

Dietitian-nutritionists can also implement food waste minimization programs in hospital foodservice facilities, and educate patients and clients on making sustainable choices such as purchasing local or reducing meat consumption.

## Community Level

Dietitian-nutritionists can play a role in sustainability at the community level through the twin track approach. The first component of the approach is direct and immediate nutrition intervention. This is to tackle the immediate need for food and nutrition in communities by offering food assistance and safety nets during emergencies, climate-related events or severe malnutrition. The direct interventions contribute to the vulnerability of the

communities but are “band aids” rather than long-term solutions (3). The second component of the approach involves long-term action that counters the drivers of malnutrition. Emphasis is placed on nutritious foods and diversity in agriculture for local consumption in communities and developing countries.

Dietitian-nutritionists can aid in the introduction of new crop species and cultivation techniques which can increase diversity and improve the sustainability of the food systems while maintaining traditional crops and techniques (11).

## KEY POINTS

- ▶ A change towards sustainable food systems is imperative to meet the demands of the growing population (4)
- ▶ The adoption of sustainable agriculture practices have improved the average crop and food availability by 79% and should be supported by dietitian-nutritionists (9)

## Key Roles for Dietitian-Nutritionists

- ▶ Encourage the consumption of sustainable land-based foods such as plant based proteins
- ▶ Implement programs such as community gardens and feeding programs that teach children, as well as farmers about sustainable land-based resources
- ▶ Collaborate with professionals to create policies that support sustainable land-based practices

## SHOULD I GO VEGAN?<sup>(1)</sup>

Reducing meat consumption and increasing plant-based products is beneficial for both human and planetary health. Plant-based diets can reduce premature mortality by 20%, lower greenhouse gas emissions, and decrease the use of land, water, and nitrogen/phosphorous applications. Eliminating meat products entirely may not be realistic or attainable for some, and so there are other sustainable dietary patterns that consumers can consider. One such example is the Mediterranean diet that includes little red meat, and ample fish.

Other sustainable dietary patterns are as follows.

- Flexitarian: Limited meat consumed.
- Pescatarian: Fish is the main source of protein. No red meat.
- Vegetarian: No meat. Animal products such as eggs and dairy are consumed.
- Vegan: No meat or animal products.



## INLE LAKE IN MYANAMAR <sup>(14)</sup>

In the Inle Lake in Myanmar, the diversity of birds and fish and the livelihood of many families are at risk, due to deforestation, pollution, and unsustainable agriculture. In 2012 a package of conservation initiatives in the watershed were launched, to showcase the ability to reverse the environmental degradation that had been taking place. The program involved organic farming, waste management, fishery control, and eco-friendly farming methods. Since seeing the potential, new laws are now being drafted to help reverse degradation.

## ECUADOREAN AMAZON <sup>(15)</sup>

Mountains in the Ecuadorean Amazon have been ideal sites for cocoa farming for generations, but are on the verge of collapse. The farming has been demanding, low paying, and is depleting forests to make way for more cocoa plants. To assist, "The Other Bar" was developed - the first blockchain chocolate bar. Customers scan a blockchain-powered token on their bar to buy a tree or discount a future purchase. Both options have increased farmers' profits and raised funds for efforts to combat climate change.

## Recommendations for Further Reading

Food and Climate Change- David Suzuki Foundation-  
[https://davidsuzuki.org/queen-of-green/food-climate-change/?gclid=EAlaIQobChMI6bzYg6O25wIVSz0MCh24eAEWEAAAYASAAEgKuefD\\_BwE](https://davidsuzuki.org/queen-of-green/food-climate-change/?gclid=EAlaIQobChMI6bzYg6O25wIVSz0MCh24eAEWEAAAYASAAEgKuefD_BwE)

Food Policy for Canada <https://www.canada.ca/en/agriculture-agri-food/news/2019/06/food-policy-for-canada--backgrounder.html>

Permaculture- Never Ending Food  
<http://www.neverendingfood.org/b-what-is-permaculture/permaculture-guilds/>

Sustainable Food Systems that Promote Healthy Diets: A proposed roadmap for Dietitians of Canada <https://www.pennutrition.com>

"Sustainable" - A documentary on the sustainable food and agriculture movement

*Text modified from original, which was created by Gillian Davidson, Acadia University.*



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