



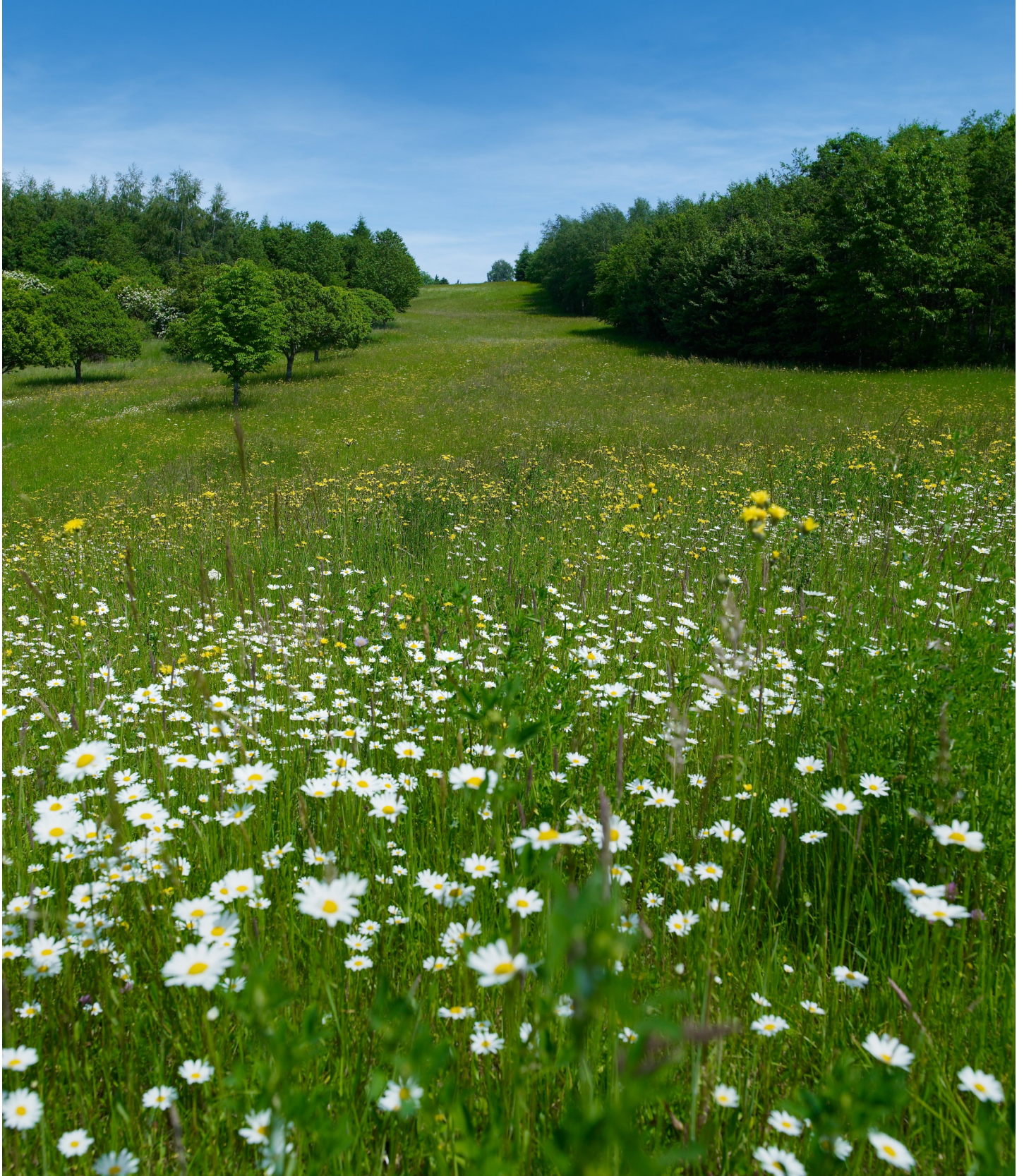
Nestlé

Creating Shared Value

Nutrition | Water | Rural Development

Natural Capital

- Biodiversity -



Nestlé's mission is to respond to the needs and preferences of consumers by offering safe, nutritious and healthy foods and beverages.

As the world's leading Nutrition, Health and Wellness company we purchase nearly 1% of the world's agricultural production. Along with other companies in the agri-food sector, we build on functioning ecosystems and a healthy environment.

Biodiversity is the cornerstone of balanced ecosystems and human well-being. It provides a large number of assets that sustain our lives and inspires the industry to develop goods for everyday life needs, be it food, pharmaceuticals, cosmetics and many others.



Promoting silvopastoral grazing systems amongst Nestlé dairy suppliers in Colombia.

Yet over the last century, human activities (e.g. urbanization, agriculture) and population growth have reduced biodiversity beyond the planetary boundaries (safe limit). Therefore, as a food company, we have a responsibility in protecting and enhancing biodiversity through our operations.

Biodiversity

Biodiversity is the biological diversity, the variability among living organisms at ecosystems, species and genetic levels.¹ It comprises of aquatic and terrestrial ecosystems including forests and soils and provides a large number of services that can broadly be grouped as non-material (cultural), material (provisioning) and regulating ecosystem services (Figure 1).

Agrobiodiversity includes all

elements of biological diversity that constitute the agro-ecosystem. It consists of three components such as (i) diversity within landscapes (e.g. species of plants, animals, insects and microbes), (ii) diversity of and within agricultural crops and animals (e.g. breeds of cattle, crop rotation) and (iii) diversity within species (genetic variability).²

Besides providing food and raw materials, agrobiodiversity delivers services such as benefiting pollination, improving soil health and water quality, sustaining rural people's livelihoods and enhancing the resilience of agro-ecosystems.

Eroding biodiversity

The world's biodiversity erosion is accelerating at a dramatic pace. As a matter of fact, on 58% of the world's land surface - where more than 70% of human population lives - the Biodiversity Intactness Index has moved beyond the planetary boundaries.³

Due to human activities, up to 30% of mammal, bird and amphibian species are threatened with extinction.⁴ Indeed, increased agricultural land-use and the development of input-intensive monocultures with excessive use of

fertilizers and pesticides strongly affected the biological diversity of farmlands.⁵

The Food and Agriculture Organization (FAO) has estimated that during the last century, 75% of crop genetic diversity has been lost, a phenomenon referred to as genetic erosion. Another 30% of livestock breeds are at risk of extinction; in fact, six breeds are lost each month.⁶

Biodiversity and Nutrition

Through simplification and standardization within the agri-food sector the number of varieties grown and processed has continuously decreased (Figure 2). Although more than 80% of the human diet is provided by plants, only five cereal crops provide two third of energy intake.⁶

Furthermore, even within a particular type of cereal the source of nutrients is limited to a small number of varieties. For illustration, Thailand had 16,000 rice varieties in the past, today only 37 are grown. About 50% of their cultivated area uses only two rice varieties.⁷

For long, the main focus of agri-food systems and development policies was on providing enough calories,

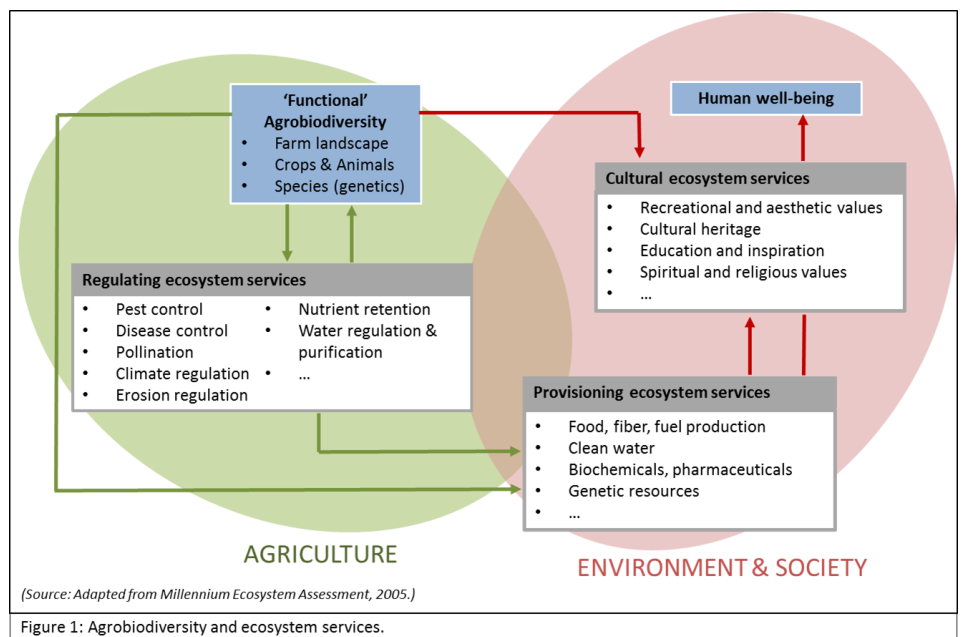


Figure 1: Agrobiodiversity and ecosystem services.

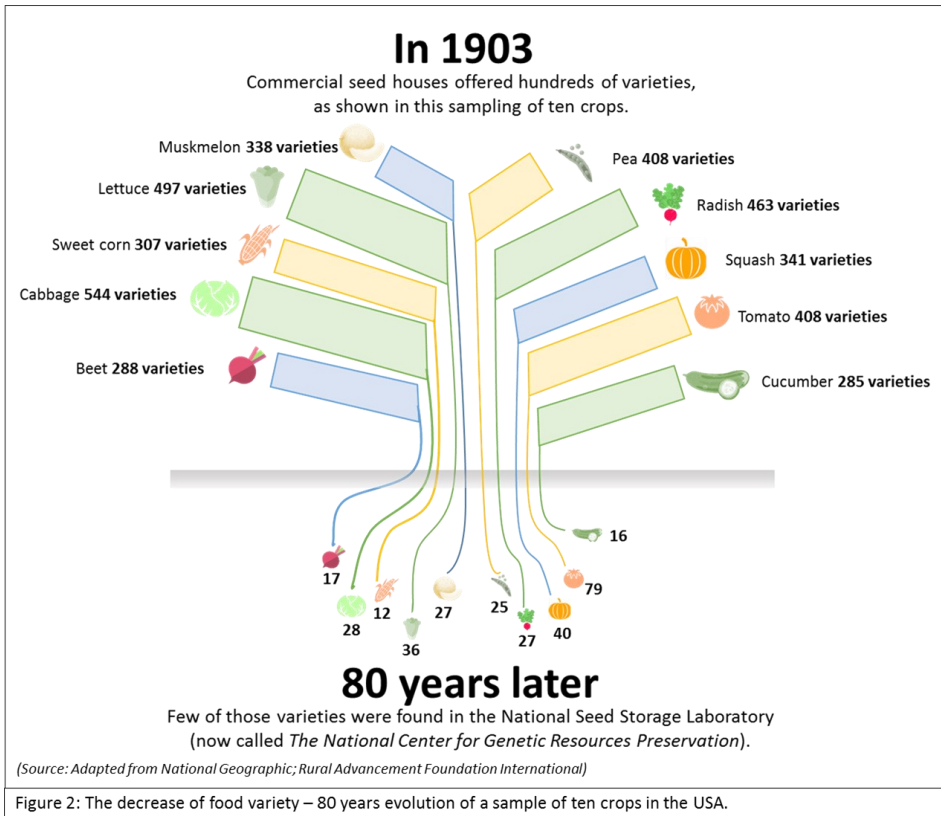


Figure 2: The decrease of food variety – 80 years evolution of a sample of ten crops in the USA.

neglecting the importance of a balanced diet and nutritional quality of the food.

Changing lifestyles coupled with high energy diets, low in variety, contributed over time to an increase of public health issues (e.g. obesity, cardio-vascular diseases and micro-nutrient deficiencies).

However, biodiversity can play a key role in ensuring dietary diversity because nutrient composition among varieties can differ considerably.

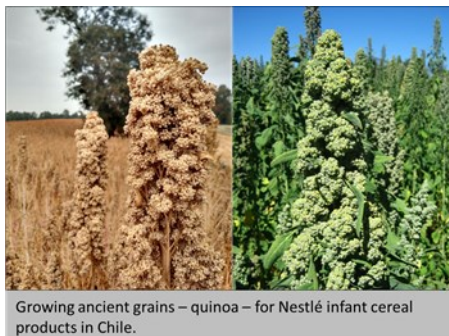
According to FAO⁷, some sweet potato cultivars can vary in carotenoid content by a factor of 200 or more. In cassava, nutrient composition ranges strongly among varieties, too. Indeed, per 100 g of edible portions, protein content can vary from 0.7 to 6.4 g and beta-carotene content from <5 to 790 mcg (micrograms).

Iron and zinc content in rice might differ by a factor of 2.5 and 1.5 respectively. Hence, the varieties with higher nutritional content usually are traditional varieties, whereas

those with lower values tend to be the high-yielding high-bred ones.

Fortunately, society is increasingly acknowledging the potential role that agricultural biodiversity can play in moderating nutritional problems. In addition, there is clearly a need for increased availability of vegetables, fruits and legumes in diets.

But is it possible to halt agrobiodiversity erosion by simply enhancing biodiversity across landscapes or increasing the number of crops and animal species disregarding their functionality in the agro-ecosystem?



Functional agrobiodiversity

Given that maximizing biodiversity does not necessarily increase the agro-ecosystem functioning, the concept of “functional agrobiodiversity”² is advisable. It refers to those functional elements of biodiversity at different management level (e.g. plants, agricultural fields or landscapes) that are intrinsically linked with each other and could support a more sustainable agricultural production. Ultimately, it can deliver benefits to the regional and global environment and to the public at large.⁸

Effectively, as not all species have the same level of influence on the functioning of the agro-ecosystem, elements of agrobiodiversity are clustered considering their interconnections with particular ecosystem services. Good practices can then be defined to support desired services.



Promoting intercropping models for Nescafé Plan coffee farmers in Vietnam – coffee with pepper and durian.

There are several examples of practices that allow to make functional agrobiodiversity tangible. Most of them will foster the resilience of agro-ecosystems and many have a positive impact on farm resources management (e.g. pesticides, fertilizers, water, energy use).

Functional agrobiodiversity-based practices can include:

- Managing crop-genetic diversity (crop rotations, intercropping, leguminous and traditional crops varieties, agroforestry).
- Adopting sustainable soil management practices (reduced

tillage, diversified crop rotation, residue management, mulching).

- Promoting mixed farming systems (including crop and livestock).
- Enhancing species diversity (provide respective habitats for sensitive animal species, plant or conserve native plants and trees).
- Managing landscape diversity (re-vegetate farm edges and conserve ecological corridors, farm ponds and streamlets).



Planting trees to improve biodiversity, water availability and soil recovery in Nestlé dairy farms in Ecuador.

How to best achieve functional agrobiodiversity at different management levels?

Biodiversity stewardship

A governance structure is needed for a holistic management of biodiversity, along with tools and methods to measure and value it.

The concept of biodiversity stewardship promises a way forward. We define it as a stakeholder inclusive process to manage biodiversity at landscape level. Stakeholders include, but are not limited to, farmers, landowners, governmental agencies, communities, industry and food companies and civil society organizations.

Biodiversity stewards understand that individual measures may influence biodiversity of neighbors and the landscape. They act accordingly and contribute to the development of management plans fostering functional agrobiodiversity.

Awareness must be created among society for local and regional biodiversity stewardship such as it has been done for water and climate change. Appropriate policies should then frame and incentivize functional biodiversity practices.

So far, agricultural models driven by biodiversity found limited application at large scale. Given the risk associated with biodiversity loss and ensuring supply of agricultural raw materials, the agri-food sector must include biodiversity stewardship in its operations. Furthermore, as consumers' interest and consciousness grow continuously, biodiversity-inclusiveness becomes a significant competitive advantage.

Nestlé's actions

In 2001, Nestlé initiated the Sustainable Agriculture Initiative Nestlé (SAIN). As a corporate wide action-oriented initiative, SAIN contributes to the production and supply of safe, high quality raw materials for Nestlé brands. SAIN promotes more sustainable agricultural practices through education and training aiming to reduce environmental impacts and favoring the development of lean and efficient supply chains.

Biodiversity issues are addressed through SAIN, in programs such as Farmer Connect, the Nescafé Plan, the Cocoa Plan, the Dairy Sourcing Plan, the Nespresso AAA Program, and are interlinked with Responsible Sourcing and other direct sourcing operations.



Establishing a butterfly meadow at a Nestlé factory to assist and improve the butterfly population.

Already back in 2001, our engagement and acknowledgment for a well-functioning environment has led us to issue the first Environmental Progress report. To further strengthen our commitment, we published our Policy on Environmental Sustainability in 2014 and we update on progress in our Nestlé in society report.

We have also been deploying RISE (Response Inducing Sustainability Evaluation) since 15 years, to assess farm sustainability. Agrobiodiversity is an integral part of RISE. The tool has been used in more than 800 farms around the world providing us with valuable insights on biodiversity.

Nestlé continues to advocate for effective policies and stewardship through the Sustainable Agriculture Initiative (SAI) Platform and supports activities of the World Business Council for Sustainable Development (WBCSD). We have established collaborations with local organizations, universities and government agencies in Nestlé markets which help us make a difference on the ground at local scale.

More information, including previous publications on Nestlé's Commitment to Natural Capital such as 'Soil & Soil Health' and 'Water in Agriculture' are available at:

www.nestle.com/csv

2016, Vevey, Switzerland

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