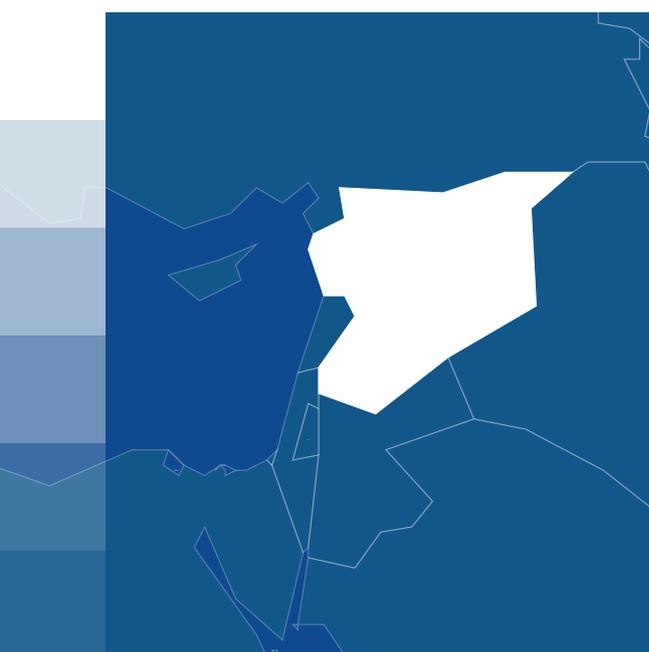


# Syria

## Country profile



# Key messages

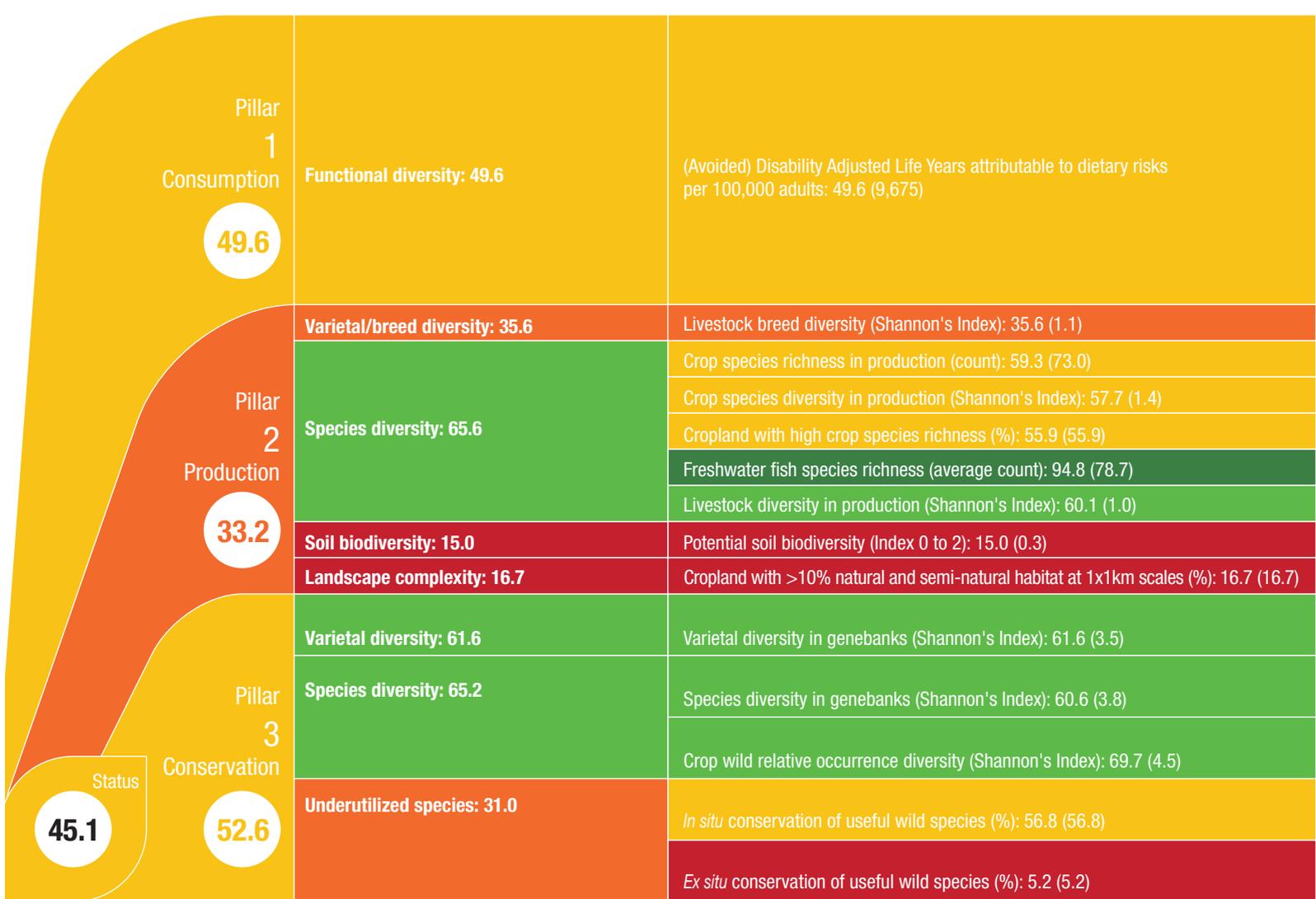
- Syria has an Agrobiodiversity index score of 45.1, reflecting a moderate integration of agrobiodiversity into the food system. There are significant gaps in data on levels and management of agrobiodiversity meaning that the assessment is less comprehensive than for most other Mediterranean countries.
- In consumption, food diversity could be better utilized for healthier, more balanced diets. Syria is currently not on course to meet targets for maternal, infant, and young child nutrition.
- The Syrian production system is characterized by high livestock diversity and freshwater fish richness, moderate crop species richness and diversity, and low livestock breed diversity, compared to other countries around the world. Soil biodiversity is very low. Syria has low levels of landscape complexity, and natural vegetation could be better integrated in and around croplands.
- Although a considerable number of Syria’s plant species and crop varieties are conserved in genebanks compared to other Mediterranean countries, its crop wild relatives and other useful wild species are poorly represented in genebanks.

**Pillar 1: Agrobiodiversity in consumption for healthy diets**  
**Pillar 2: Agrobiodiversity in production for sustainable agriculture**  
**Pillar 3: Agrobiodiversity in conservation for future use options**

Score	41-60
0-20	61-80
21-40	81-100

All raw scores are scaled from 0 to 100. See Annex 2 for details.

SUB-INDICATOR (raw scores)	INDICATOR	PILLAR
Overall agrobiodiversity: 0 (0)	Commitments supporting agrobiodiversity: 6.7	Pillar 1 Consumption 34.2 6.7 Commitment
Varietal/breed diversity: 0 (0)		
Species diversity: 0 (0)		
Functional diversity: 0 (0)		
Underutilized species: 33.3 (1)		
Overall agrobiodiversity: 66.7 (2)	Commitments supporting agrobiodiversity: 29.2	Pillar 2 Production 29.2
Varietal/breed diversity: 66.7 (2)		
Species diversity: 33.3 (1)		
Functional diversity: 0 (0)		
Underutilized species: 0 (0)		
Pollinator diversity: 0 (0)	Commitments supporting agrobiodiversity: 66.7	Pillar 3 Conservation 66.7
Soil biodiversity: 0 (0)		
Landscape complexity: 66.7 (2)		
Overall agrobiodiversity: 66.7 (2)		
Varietal/breed diversity: 66.7 (2)		
Species diversity: 66.7 (2)		
Functional diversity: 66.7 (2)		
Underutilized species: 66.7 (2)		



PILLAR	INDICATOR	SUB-INDICATOR (raw scores)
Pillar 1 Consumption 10.7 Action 0.0	Management practices supporting agrobiodiversity: 0.0	Published diet guidelines (Yes/No): 0.0 (0.0)
		Published food composition tables (Yes/No): 0.0 (0.0)
Pillar 2 Production 32.2	Diversity-based practices: 25.2	Crop-livestock integration (% agricultural land with cropland and pasture): 25.2 (25.2)
	Management practices supporting agrobiodiversity: 39.1	Nitrogen use efficiency (kg N output per kg N input): 72.5 (0.8)
		(Inverted) Sustainable Nitrogen Management Index (Index 0 to infinity): 53.6 (36.8)
		Organic agriculture (%): 0.1 (0.1)
		Tree cover on agricultural land (%): 8.2 (2.5)
		(Avoided) pesticide use (kg per ha): 99.3 (0.3)
Conservation agriculture (%): 0.6 (0.6)		
Pillar 3 Conservation 0.0	Management practices supporting agrobiodiversity: 0.0	Indicators reported to the World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (%): 0.0 (0.0)

## Context

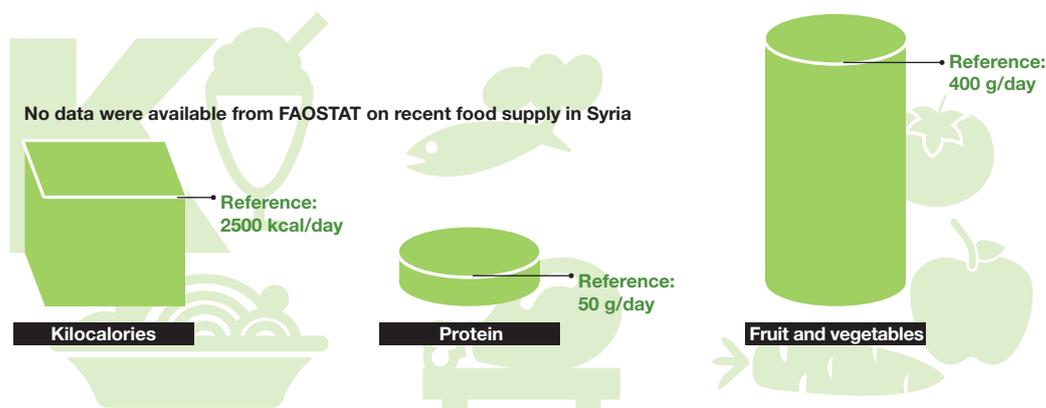
The Syrian Arab Republic is a low-income country. The last estimates of its annual GDP and GDP per capita date to 2007, when they were valued at US\$40.4 billion and US\$2,033 respectively.<sup>1</sup> Syria covers a land area of about 185,180 km<sup>2</sup>,<sup>2</sup> and had an estimated population of about 17 million inhabitants in 2019<sup>3</sup> with a population density in 2018 of 92 people per km<sup>2</sup>.<sup>4</sup> Fifty-five percent of the Syrian population live in urban areas.<sup>5</sup> Syria has been drastically affected by civil war since 2011. The poverty level in Syria was last estimated in 2004, before the conflict, and represented 1.7% of the population.<sup>6</sup> In 2018, Syria's multidimensional poverty index was 0.029.<sup>7,8</sup>

## Consumption for healthy diets

The Syrian diet typically comprises cereals, often as processed white flour. The most consumed dairy products are yoghurt and cheese, and vegetables, such as zucchini (courgettes), potato, eggplant (aubergine), and cabbage, are frequently consumed. Chicken forms a common part of the diet, in addition to beef, lamb, and cured meats. Fresh and dried dates and nuts form key components of the diet, and coffee is the most widely consumed beverage (Figure 1).<sup>9</sup>

In Syria, the average life expectancy of a healthy person reaches 72 years.<sup>10</sup> No data were available regarding the level of undernourishment in the Syrian population<sup>11</sup> nor on the prevalence of severe or moderate to severe food insecurity.<sup>12</sup> The prevalence of stunting and wasting in children under five reported in 2010 were 27.9% and 11.5% respectively.<sup>13</sup> In 2016, 34% of women between 15 and 49 suffered from anemia<sup>14</sup> and in 2019, almost 13.5% of the population between 20 and 79 were diabetic.<sup>15</sup> An estimated 34.8% of adult women (aged 18 years and over) and 20.9% of adult men are living with obesity.<sup>16</sup>

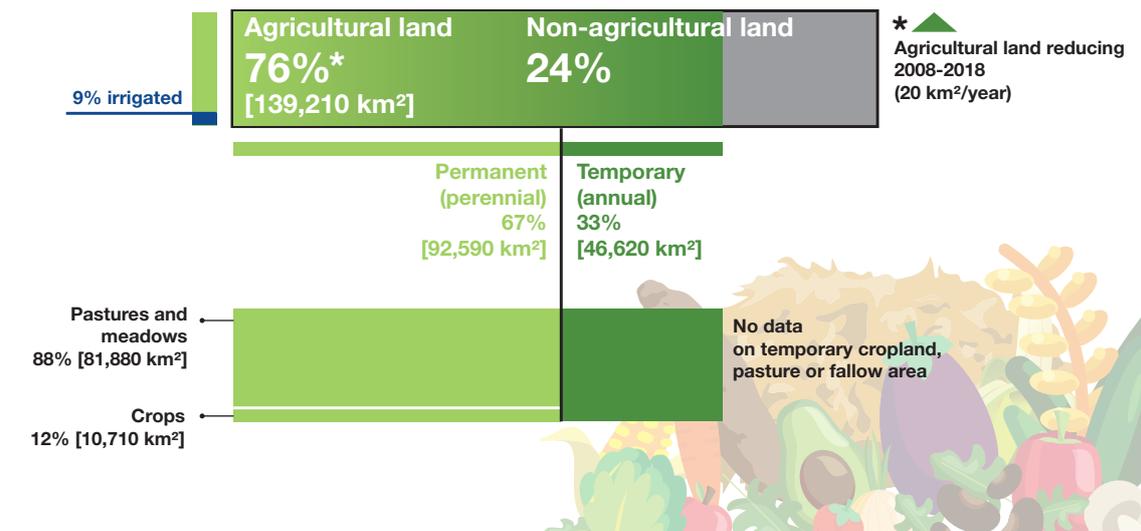
**Figure 1: Kilocalorie, protein, fruit and vegetable supply**



## Production for sustainable agriculture

In Syria, 75.8% of land area (139,210 km<sup>2</sup>) is devoted to agriculture, with 33.5% accounting for arable land<sup>17</sup> (Figure 2). In 2007, agriculture, forestry, and fishing contributed 19.5% of Syrian GDP.<sup>18</sup> Latest estimates from 2020 report that 10% of the Syrian population is employed in the agricultural sector, of whom 8% are women.<sup>19</sup> In 2016, fish capture production was estimated at 4,500 tonnes and the estimated aquaculture production was 2,500 tonnes.<sup>20</sup> Eggs, milk, and meat (sheep) are the three main animal-sourced foods produced in Syria, with an annual livestock production of above 5.7 million tonnes.<sup>21</sup>

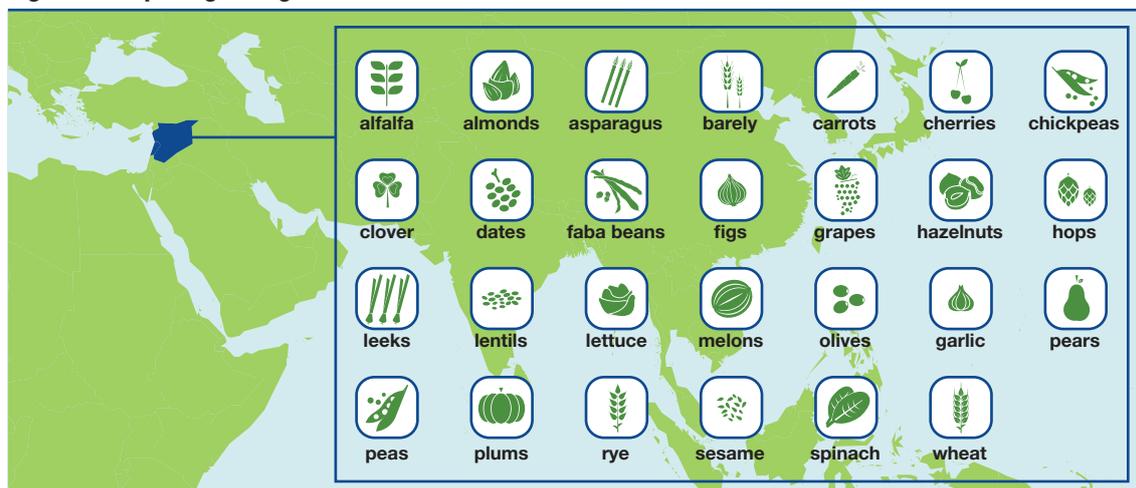
Figure 2: Land used for agriculture



## Conservation for future use options

In Syria, 1,293 km<sup>2</sup> of the total land area and over 10,204 km<sup>2</sup> of the marine area are protected.<sup>22</sup> Nearly 3% of the land area (4,910 km<sup>2</sup>) is forested. Net tree cover loss from 2001 to 2019 was 207 km<sup>2</sup>, showing a decrease of 20% in tree cover since 2000.<sup>23</sup> An estimated 370 plant species and 1,110 animal species have been assessed by the International Union for the Conservation of Nature’s ‘Red List’, which assesses the risk of extinction.<sup>1</sup> It found that 32 plants, 15 mammals and 17 birds are threatened.<sup>24</sup> Syria is part of the fertile crescent and is an important centre of the origin of crop species especially wheat and barley<sup>25</sup> (Figure 3).

Figure 3: Crops originating from West Asia



## Agrobiodiversity Index score

Syria has an Agrobiodiversity Index status score of 45.1, putting it among the least agrobiodiverse Mediterranean countries. The assessment is more limited than for most other countries because of missing or incomplete data on several dimensions of agrobiodiversity, which is unsurprising given the country has suffered more than a decade of conflict.

## Status: What's driving the Agrobiodiversity Index score?

For Syria, we see that scores are highest in conservation (52.6), followed by consumption (49.6), and production (33.2). This indicates that agrobiodiversity is relatively effectively used in consumption for healthy diets and conserved for current and future use options, while there is potential for much better use of agrobiodiversity in production for sustainable agriculture. We can take a closer look at the indicator scores to understand what underlies the differences in status of agrobiodiversity across the pillars of Syria's food system.

## Consumption

**Functional diversity:** The functional diversity score of 49.6 is relatively low and reflects a moderate number of avoided Disability Adjusted Life Years attributable to dietary risk factors.<sup>26</sup> Syria is 'off course' to meet all targets for maternal, infant, and young child nutrition. Limited information is currently available about the composition of food consumption patterns.

There were no data available on varietal diversity, species diversity, underutilized species, or local species in consumption.

## Production

**Varietal diversity:** The diversity of livestock breeds maintained in production in Syria is low relative to other countries in the world and below average for the ten Mediterranean countries. Syria has two breeds each of cattle, goat, horse, and sheep in production and one breed each of other livestock including the Arab Camel and Ghab buffalo. We note that other species and breeds may be in production in Syria but not registered in the database used for the analysis (FAO DADIS), as the last population counts for all breeds are from 2006. Keeping multiple breeds in production should help farmers maintain livelihoods in times of pest and disease outbreaks or other production challenges, because different breeds have different resistance to pests and diseases.

**Species diversity:** With 73 distinct commodities in production, crop species richness is moderate relative to the global maximum of 123 species (in China) and in line with the average across the ten Mediterranean countries. The top ten crops by harvested area are barley, olives, wheat, seed cotton, lentils, almonds, pistachios, apples, anise (grouped together with badian, fennel, coriander), and grapes. The area coverage of different crops in production per 10x10 km is moderately evenly distributed, meaning cropped landscapes have a moderate diversity relative to other countries in the world and compared to other Mediterranean countries. A moderate percentage (56%) of agricultural land contains a high diversity of crop species at 10x10 km scales. This indicates that crop diversity is not being used to its maximum potential, and increasing crop diversity at field, farm, and landscape levels is recommended to enhance natural pest and disease control, yield stability, biodiversity, and other ecosystem services.<sup>27</sup> With 79 recorded freshwater fish species, fish richness is very high relative to other countries in the world and compared to the nine other Mediterranean countries. Livestock species diversity in production is high compared to other countries in the world and compared to the nine other Mediterranean countries. Actions to maintain and increase livestock richness in areas of the country where these are low would help ensure farmers in all regions rely on a wide species base, helping shield them against pests and diseases and other production challenges.

**Soil biodiversity:** Soil biodiversity is very low for most of the country, averaging 0.3 on scale of 0.11 to 1.35 (representing the minimum and maximum global extremes). Integrated plant nutrient management can help maintain and restore soil health, such as through increasing the use of cover crops, application of mulch and animal manure, and intercropping with legumes.

**Landscape complexity:** 17% of Syria's cropped landscapes have at least 100ha natural vegetation at 1x1 km scales, which is well below the 100% recommended, and below average compared to the nine other Mediterranean countries. Maintaining natural vegetation in and around cropland helps maintain habitat connectivity and ecosystem functioning to sustain nature's contributions to agriculture, including reducing the risk of pest and disease outbreaks, maintaining pollinators, and safeguarding crop wild relatives. Establishing at least 10% natural habitat at local (1x1 km) and landscape (10x10 km) scales could be achieved on farm through practices such as planting live fences (trees, hedgerows), woodlots, flower strips and set aside, and off farm by safeguarding portions of natural or semi-natural forests, wetlands, and grasslands around cultivated areas.

There were no data on functional diversity, underutilized species, or pollinator diversity in production.

## Conservation

**Varietal diversity:** Syria has a high score for varietal diversity (61.6), meaning that the number of samples of Syrian crop varieties conserved in genebanks is high relative to the number of crop varieties relative to other countries conserved in the world, but below average relative to other Mediterranean countries.

**Species diversity:** The species diversity score (65.2) indicates that a moderate diversity of cultivated and wild species native to Syria are conserved in genebanks, and a moderate number of crop wild relatives have been identified in country, relative to other countries in the world.

**Underutilized species:** Syria has a low score (31) for conservation of underutilized species (useful wild species). The score reflects that while 56.8% of known useful wild species are conserved *in situ*, their representativeness in *ex situ* repositories is very low (5.2%).

There were no data on functional diversity of genetic resources in conservation.



Credit: ©IFAD/Nadia Cappiello

## Actions: What actions are being taken to maintain and increase agrobiodiversity?

**Consumption:** Syria has no published food-based dietary guidelines or food composition tables to support dietary diversity.

**Production:** Action scores are low (32.2) for agrobiodiversity in production. This score reflects low adoption of diversity-based practices together with low adoption of agrobiodiversity-supportive management practices.

- **Diversity-based practices:** Available data indicate that there is low potential for integrated farming in Syria, with only 25% of agricultural landscapes (10x10 km areas) containing both cropland and pasture, thus facilitating crop–livestock integration. This is well below the average for Mediterranean countries (48%).
- **Production management practices supporting agrobiodiversity:** The environmental efficiency of production in Syria is moderate relative to other countries in the world, based on the Sustainable Nitrogen Management Index (SNMI) score. Given that nitrogen use efficiency is relatively high, the moderate SNMI score suggests that there is potential to improve land use efficiency (yields) to reduce environmental impacts of production. Syria has very low levels of pesticide use relative to other countries in the world, estimated at 0.3kg per hectare, which is far below the highest global user (28.0kg per hectare in Mauritius) and below the Mediterranean average. The avoided use of pesticides will be having a positive impact on soil biodiversity, pollinators, and natural enemies of pests, with benefits for agriculture and biodiversity. Trees are integrated into 2.5% of agricultural land in Syria, which is extremely low relative to other countries in the world and likely reflects the difficulty in sustaining plants that need a lot of water, such as trees, in extreme arid climates. Setting aside small areas of farmland for planting functionally and nutritionally diverse trees can provide multiple benefits for farmers in arid climates.<sup>28</sup> Drought-resistant and native tree varieties could be prioritized to minimize water consumption while providing other benefits to farmers. Organic agriculture is practiced on 0.1% of agricultural land and conservation agriculture on 0.6% of arable land, which is very low relative to other countries globally and in the Mediterranean. However, the very low use of pesticides indicates organic agriculture may be more widespread than suggested by official records.



**Conservation:** It has not been possible to properly evaluate the level of conservation action in Syria, given that the country has not reported its progress towards the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture of the UN Food and Agriculture Organization through the online monitoring framework.

## Commitments: How supportive of agrobiodiversity are national policies?

The commitments analysis for Syria was based on their *National Biodiversity Strategy and Action Plan for 2002*.<sup>29</sup>

**Consumption:** We were unable to find any commitments to use of agrobiodiversity for healthier diets.

**Production:** In production, Syria is committed to industrial farming. Its national planning strategy states it will work towards the ‘realization of the agricultural revolution and the use of modern methods in agriculture’. There are very few policies that support diversification of farms or landscapes for more sustainable agriculture, and policies to promote cotton cultivation are likely to reduce on-farm varietal diversity. For example, Syria heavily regulates cotton production, including specifying which varieties are authorized for production in each region. Farmers are not permitted to independently produce agricultural cotton seeds locally. Syria has, however, made strong commitments to afforestation and natural habitat restoration on abandoned agricultural land and degraded lands. These commitments will help increase landscape complexity, supporting a wider range of animal and plant species including pollinators and natural enemies that support agriculture.

**Conservation:** Syria is committed to *in situ* conservation, setting several targets to increase the area of protected lands. It has a national genebank for the *ex situ* conservation of plant genetic resources.



# Recommendations

This section suggests concrete actions that can be taken to improve the use and conservation of agrobiodiversity for more sustainable food systems (Table 1). The list of actions is by no means exhaustive or prescriptive. It is intended for review, discussion, and improvement by in-country policy specialists.

**Table 1: Recommended actions to enhance agrobiodiversity in the national food system**

Food system pillar in the Agrobiodiversity Index	Recommendations	Contributing to:	
		Risk and resilience	Global policy
Consumption for healthy diets	<p>Support increasing diversity in food supply and consumption.</p> <p>Find ways to avoid losing the rich diversity of traditional diets.</p> <p>Develop food-based dietary guidelines and related food composition tables.</p>		<p>SDG2 Zero Hunger</p> <p>SDG12 Responsible Production and Consumption</p> <p>WHO Decade of nutrition – reducing overweight, obesity and anemia</p>
Production for sustainable agriculture	<p>Introduce policies to support the production of diverse crops and livestock, favoring native and locally adapted varieties and breeds.</p> <p>Maintain and implement commitments to afforestation and natural habitat restoration to increase agricultural landscape complexity.</p> <p>Incentivize integrated plant nutrient management and integrated crop–livestock systems and best agroecological farm management practices to improve soil health and yields.</p>		<p>Post-2020 CBD Goal 1<sup>ii</sup> No Net Loss</p> <p>SDG 2 Zero Hunger</p>
Conservation for future use options	<p>Take action to report on progress made in implementing the Second Global Plan of Action on Plant Genetic Resources for Food and Agriculture (PGRFA), through the online reporting format established by the UN Food and Agriculture Organization for this purpose.</p> <p>Make a comprehensive assessment of existing agrobiodiversity and establish a national strategy for rebuilding the plant genetic resources program post conflict.</p>		<p>Post-2020 CBD Goal 3 Genetic Diversity</p> <p>Post-2020 CBD Goal 4 Nature’s Benefits</p> <p>SDG 15 Life on Land</p> <p>FAO second Global Plan of Action on PGRFA<sup>31</sup></p>

## Agrobiodiversity highlight

### *Saving Syria's unique seed diversity*

When war broke out in Syria in 2011, the future of one of the world's most important seed collections was put at risk. What followed was an internationally coordinated rescue to ensure the preservation of this priceless heritage.

Syria's International Center for Agricultural Research in the Dry Areas (ICARDA) housed the largest collection of crop diversity from the Fertile Crescent, including barley, durum wheat, faba bean, chickpea, and lentils. In 2008, ICARDA was among the first genebanks to deposit safety duplicates of its seeds at the opening of the Svalbard Global Seed Vault. Carved into a mountain on the isolated island of Spitsbergen in the Svalbard Archipelago, Norway, the Seed Vault provides a disaster-proof place for institutes to store their precious seed collections in case something goes wrong with their own genebanks.

When the war broke out, ICARDA had successfully backed up almost 80% of its seed samples, and so it only lost 1,657 samples to the war. However, genebanks are not museums to safeguard seeds for eternity, but also act as a place where researchers and breeders can access the materials they need. That is why in 2015 ICARDA became the first depositor so far to organize a withdrawal from Svalbard to start regenerating their unique genetic diversity in their facilities in Lebanon and Morocco. Starting with only 300 precious seeds, each year since 2016, more than 30,000 samples have been regenerated, that is, grown out to provide enough seed to conserve and meet the needs of researchers and breeders.

Sources: <sup>30</sup>



Credit: ©IFAD/Nadia Cappiello

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## End notes

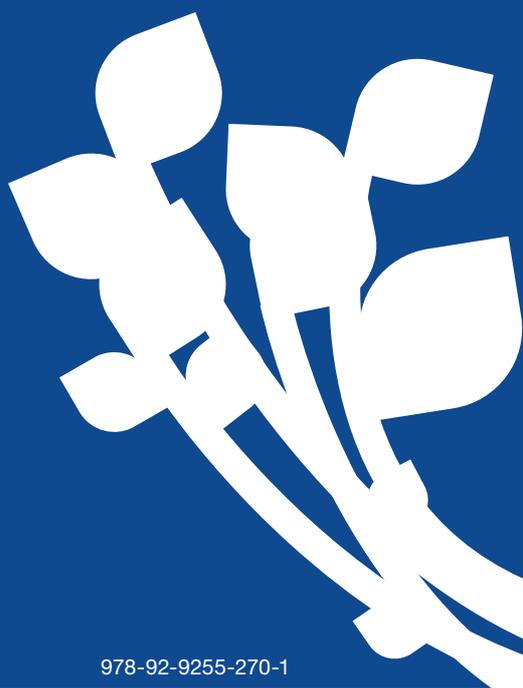
- I. The International Union for the Conservation of Nature (IUCN) ranks species according to how threatened they are. Rankings range from 'extinct', through 'critically endangered', 'endangered' and 'vulnerable', to 'near threatened' and 'least concern'.
- II. The Convention on Biological Diversity is an international treaty for the sustainable use and conservation of biological diversity. In 2010 it launched a strategic plan, running from 2011 to 2020, with 20 ambitious targets known as the Aichi Targets from the city in which they were signed. The international community has developed new targets, but their signature has been delayed due to the COVID-19 crisis.



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THIS COUNTRY PROFILE IS A CHAPTER OF THE "AGROBIODIVERSITY INDEX REPORT 2021: ASSESSING MEDITERRANEAN FOOD SYSTEMS", DOWNLOADABLE HERE: <https://cgspace.cgiar.org/handle/10568/118471>

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