

Agrobiodiversity Index

Frequently Asked Questions



General questions

1. Why does the Agrobiodiversity Index report two values?

Differently from what the Agrobiodiversity Index Methodology Report v.1.0 explains, the Agrobiodiversity Index report 2019: Risk and resilience reports two values: 1) the Status score, which shows the existing level of agrobiodiversity in markets and consumption for healthy diets, in production systems for sustainable agriculture, and in genetic resource management for current and future options; and 2) the Progress score, which combines measurements of a country's commitments and actions in support of agrobiodiversity. The reason behind aggregating Commitment and Action scores is that they both have the same nature, in the sense that they refer to the level of efforts that countries (or other food systems actors) are putting in sustainably using and conserving agrobiodiversity.

Why not a single number? Aggregating Status and Progress scores would not be scientifically robust because these scores measure very different things. Status scores can be thought of as measuring 'stocks' of agrobiodiversity, whereas Commitment and Action measure variables that impact on agrobiodiversity over time (similar to 'flows' in economics). Governments have little control over the Status scores in the short run, but can make Commitments and take Actions that will impact on the Status score in the medium/long term. Merging Status, Commitment and Action scores would prevent understanding whether a country is on the right track (or not) to improve the Status of agrobiodiversity through its Actions and Commitments.

2. How accurately are the Agrobiodiversity Index scores representing a country?

The Agrobiodiversity Index Status and Actions scores are estimated from globally available, peer-reviewed data repositories, such as FAOSTAT. Although data sources have a margin of error and different accuracy levels, the Agrobiodiversity Index team seeks to ensure that the data used are from the most reliable and best available sources to measure agrobiodiversity. This means that the Index will be periodically updated to incorporate new information and datasets as these become available.

Commitments are scored based on national policies and strategies, assessed by text mining countries' national legal documents, retrieved from the FAO's legislation and policies database, FAOLEX, and the World Health Organizations' Global database on the Implementation of Nutrition Action, GINA. The team is currently assessing the robustness of the text mining analysis and the accuracy of using global repositories rather than official national webpages. We found that the retrieval of commitment-related information can be performed with high effectiveness by using UN-based organization databases such as FAOLEX and GINA as opposed to individual countries' ministries webpages. However, the commitment scores still depend, to a large extent, on individual countries' efforts to report their policies/ regulations/ legislations to FAO and WHO platforms.

3. What can the Agrobiodiversity Index tell us about local knowledge on agrobiodiversity and other uses beyond consumption?

The Agrobiodiversity Index is currently focusing on capturing agrobiodiversity in healthy diets, production systems, and genetic resources at the national level using globally or nationally available datasets. This means that locally specific uses of cultivated crops (and livestock, fish, pollinators, or whole agro-ecosystems) are not explicitly captured in the Agrobiodiversity Index.

While we recognise the importance of safeguarding local knowledge on agrobiodiversity, e.g. to capture non-food uses such as medicinal or spiritual ones, lack of data and context-specificity of local knowledge on agrobiodiversity is likely to continue to be a limitation for integrating information on these aspects.

4. What can the Agrobiodiversity Index tell us about the role of foods that cannot be found in markets?

The Agrobiodiversity Index captures countries' Commitment to promoting food diversity in markets and diets, through a set of keywords linked to "Diversified markets" and "Diversified diets." It also captures the Status of the nutritional diversity of food available for consumption using national food supply data. However, we have not found a data source for capturing non-marketed foods in diets, e.g. subsistence foods, wild foods, food traded among neighboring farmers, and other foods that are not documented in national databases.

5. What can the Agrobiodiversity Index tell us about keystone species, crop wild relatives, or landraces in specific ecosystems?

The Agrobiodiversity Index Commitment score captures countries' policies to protect or promote landraces (synonyms: varietal diversity, traditional varieties, heirloom varieties, local varieties), and crop wild relatives, by searching policies, regulations, and legislation for these keywords, and scoring the level of commitment where these occur. The Agrobiodiversity Index also includes Status measurements of crop wild relative and varietal diversity using data from GBIF and neglected and underutilized species diversity in markets based on the proportion of non-cereal and non-starch crops in supply (FAO). It does not, however, capture the Status of – or Actions related to – landraces in consumption or production because there is currently no cross-national data available for this. In the future, the Agrobiodiversity Index may incorporate crop varietal production and consumption data from agricultural household surveys where these have collated data from a sufficiently representative number of households, agroclimates, and socio-economic contexts across a country.

6. What can the Agrobiodiversity Index tell us about the seed systems and seed banks?

The Agrobiodiversity Index Commitment score incorporates policies related to seeds by searching for the keywords associated with "seed diversity", including diversity in seed banks and seed system. See Annex 1 of the Agrobiodiversity Index Methodology Report v.1.0 for the complete list of keywords related to 'seed diversity' used in the Commitment analysis. The Index also monitors the Status of species, varietal and genetic diversity in national gene banks based on Genesys records. At the moment, the Agrobiodiversity Index does not capture the Status of – or Actions related to – diversity in seed supply, use, or in sub-national, e.g. community-level seed banks, due to data gaps. See the Access to Seeds Index for a very comprehensive assessment of seed access for farmers provided by specific countries and companies.

7. What can the Agrobiodiversity Index tell us about wild foods?

Wild foods from natural habitats work as a “food bank” where subsistence farming is exposed to crop failures due to droughts, floods, pest outbreaks, and other threats. While the Agrobiodiversity Index team recognizes the importance of these wild foods for healthy diets, the Index scores are calculated based on globally available datasets, which currently only include data on foods coming from cultivated areas.

8. What can the Agrobiodiversity Index tell us about food consumption based on traditional knowledge or preferences?

Information about local knowledge on agrobiodiversity is highly context-dependent. Traditional uses and values for certain foods is not well captured in the Agrobiodiversity Index, since information on this is not readily available at global or even national scales. However, the Index considers the “Share of dietary energy supply derived from sources other than cereals, roots, and tubers (kcal/capita/day)”, which is used as a proxy for the Status of neglected and underutilized species in markets and consumption. Comparing this indicator across countries reveals variation in use of neglected and underutilised species due to local preferences as well as market access and other factors.

The Agrobiodiversity Index also measures levels of commitment to conserve and promote traditional and local foods. For example, in Pillar 3 (Genetic resource conservation) to assess the level of genetic diversity, search terms include “traditional varieties,” “hierloom variety”, “indigenous variety” and “local varieties”. In Pillar 1 (Healthy diets), search terms to assess market diversity include “diverse local foods.” Occurrences of these terms are scored to indicate a country’s level of commitment to safeguarding traditional and local varieties.

Check Annex 1 of the Agrobiodiversity Index Methodology Report v.1.0 for the complete list of keywords used in the Commitment analysis.

9. What can the Agrobiodiversity Index tell us about varietal diversity in diets, production, and genetic resources?

Measuring varietal diversity in diets, production, and genetic resources is still a challenge due to a big data gap that remains unfilled. In fact, information is commonly reported at the species rather than the varietal level. While data on varietal diversity in Actions are missing, the Index manages to capture varietal diversity in Status under Pillar 3 as “Varietal diversity in gene bank accessions.” Likewise, the Index searches a wide range of keywords linked to “varietal diversity” in policies, regulations, and legislation, to measure countries’ Commitment to protect and use diversity at the variety level, across the three pillars.

Check Annex 1 of the Agrobiodiversity Index Methodology Report v.1.0 for the complete list of keywords used in the Commitment analysis.

10. What can the Agrobiodiversity Index tell us about climate change or disasters?

Agrobiodiversity helps to manage climate-related risks to agriculture, for example by ensuring that breeders and producers have access to a wider range of plant species and varieties resistant to climate shifts. Agrobiodiversity also helps farmers mitigate or recover from the impacts of natural and economic disasters, such as pest outbreaks, desertification, and market price spikes or dips.

The contributions that agrobiodiversity makes to mitigating and recovering from climate change impacts and disasters are captured in the Agrobiodiversity Index risk assessment framework (see the Methodology Report V1.0). The framework is designed to help governments and other food systems actors to understand to what extent they are exposed to additional risks when agrobiodiversity is low in food supplies, primary exports, or within a landscape, for six areas: malnutrition, poverty traps, climate-related food losses, land degradation, pests and diseases, and biodiversity loss.

Risk levels are currently determined by inverting the average score of all indicators that can reduce a given risk (according to the risk assessment framework), so that the overall level of risk, e.g. for climate-related food losses, is represented on a scale of 0 (no additional risk) to 100 (maximum additional risk). This is a first attempt to demonstrate the effects of agrobiodiversity on climate-related and other risks.

However, we recognise it considers the linkages between agrobiodiversity and each risk to be the same everywhere, while in reality some risks will be greater in some contexts more than others. For example, the reduced risk of climate-related food losses from diversification of agriculture is particularly relevant in areas where dry spells within the rainy season are expected to increase in length. We leave it to the user to decide on the relevance of each risk depending on where the Index is being applied.

In addition, the Index captures whether or not a country has specific Commitments to fostering the use of agrobiodiversity for mitigating or adapting to climate change through “climate smart agriculture.” The team is currently exploring the potential of utilizing metadata analysis and global spatial data to identify geographic areas associated with risks and resilience in the six areas at the country level.

11. What can the Agrobiodiversity Index tell us about the negative spillover effects of agriculture?

The Agrobiodiversity Index does not measure the negative spillover effects of agriculture but it does measure Actions taken to mitigate or reduce them. Some of the Actions considered in the Index include integrated plant nutrient management, low external input agriculture, avoided over-use of artificial fertilizers or external inputs, and avoided over-use of chemical control mechanism. Likewise, the Index captures any Commitment towards reducing the negative impacts of agriculture by looking at whether policies, regulations, and legislations are promoting or not biological control, organic fertilizer, sustainable agricultural practices, to name a few.

Check Annex 3 of the Agrobiodiversity Index Methodology Report v.1.0 for the complete list of measurements used in the Action analysis.

12. What can the Agrobiodiversity Index tell us about superfoods, probiotics/microbes, biofortification, or other types of food targeted to fight malnutrition?

Nothing specific. The Index focuses on how food diversity can help secure healthy diets, rather than on specific diets or strategies to fight malnutrition.

13. What happened with the Pillar on Diversity-supplying seeds systems in the “Mainstreaming Agrobiodiversity in Sustainable Food Systems: Scientific Foundations for an Agrobiodiversity Index”?

The technical team of the Agrobiodiversity Index decided to rename and merge the “Diversity-supplying seeds systems” into the Genetic Resources for Future Use Options (Pillar 3). Seed diversity is a core component considered in Pillar 3.

14. What can the Agrobiodiversity Index tell us about ecosystem services?

Nothing specific. The Agrobiodiversity Index does not measure ecosystem services directly, but it does include some sub-indicators that could be used to quantify ecosystem services provision.

For example, the Action sub-indicator on “Percentage of agricultural land under agroforestry” is included in the Index as a measure of “Production management practices supporting the use and conservation of agrobiodiversity.” This sub-indicator could be combined with ancillary data to estimate carbon sequestration or other ecosystem services provided by the agroforestry areas. However, currently we do not attempt to compute ecosystem services associated with different types of agrobiodiversity.

We direct readers to other tools well suited to ecosystem service assessments, such as Natural Capital Project’s InVEST and MESH models, and PolicySupport’s WaterWorld and Co\$tingNature models.

15. What can the Agrobiodiversity Index tell you about sustainability?

Sustainability is such a broad concept, the Agrobiodiversity Index cannot “measure” it. The Agrobiodiversity Index focuses on the conservation and management of agrobiodiversity for more sustainable food systems. Therefore in simple terms, higher Agrobiodiversity Index scores indicate more sustainable food systems. The Agrobiodiversity Index integrates a ‘Risk’ and ‘Resilience’ framework that can help track sustainability. Higher risk and/or lower resilience indicates that current Status, Actions and Commitments are insufficient and the current consumption, production or genetic resource management context not sustainable.

However, overall food system sustainability depends on many other factors beyond agrobiodiversity. There are other sustainability indicators like the SAFA (Sustainability Assessment of Food and Agriculture Systems) that may provide alternative measures of overall sustainability and could be used in tandem with the Agrobiodiversity Index to provide a holistic picture.

16. How does the Agrobiodiversity Index capture consumption and diets?

Currently, the Index captures consumption in the Status component through FAO food balance sheets and disability-adjusted life years; Actions using information in dietary guidelines and food composition tables; and Commitments by searching for terms related to diversified diets, diversified markets, functional diversity, species diversity and varietal diversity. The team is exploring the option of using the Global Dietary Database.

About the methodology

1. How does the Agrobiodiversity Index select between two (or more) available data sources for each sub-indicator?

The Index prioritizes data sources that are globally available and published in scientific journals. When there is more than one suitable data source, we select based on which data source is a better reflection of the indicator that it will be used to measure. For example, it currently integrates two sources for crop species distribution from which we calculate crop species diversity metrics.

2. Does the Agrobiodiversity Index include national delimited agrobiodiversity hotspots or agro-ecological zones?

Not so far, but we are currently working on this. Based on feedback from country-level users, we are testing options to run the Agrobiodiversity Index for each distinct agro-climate zones within a country using the Global Yield Gap Atlas (GYGA) Climate Zones (<http://www.yieldgap.org/web/guest/cz-ted>). The GYGA zones identify areas with similar agronomic conditions based on growing degree days, temperature seasonality and annual aridity. However, some datasets used in the Agrobiodiversity Index are only available at the national level and cannot be separated using other boundaries.

Agrobiodiversity hotspots within a country can be easily identified based on spatially explicit data. Country profiles include maps that show spatial information, such as the “number of harvested crops per pixel” or “agricultural landscapes embedding “>10% natural vegetation”, which is critical to make informed decisions. Besides, we are exploring the robustness of combining multiple spatial agrobiodiversity data to provide an overall agrobiodiversity hot and coldspot map per country.

3. What can the Agrobiodiversity Index tell you about sub-national or state level?

The Agrobiodiversity Index can be applied at sub-national level using global datasets, but the quality of results improves when using local data. We have run the Index over specific sub-national regions in collaboration with local partners, e.g. in central Peru and in west Spain. In the near future we will work with local partners (e.g. ICAR, CAAS) to run the Agrobiodiversity Index for specific states in India and districts across China.

4. What are the main challenges of downscaling the Agrobiodiversity Index?

Obtaining data at the sub-national level can be challenging because these data are often not readily available in global (or even national) online data repositories. Multiple departments and ministries are involved in using and safeguarding agrobiodiversity for healthy diets, sustainable agriculture, and current and future use options, and data storage across these groups is often not centralised. The Index can work as a bridge among these teams by integrating information available and helping foster discussion and collaboration among ministries.

5. How does the Agrobiodiversity Index handle data gaps?

This is handled by standardizing scores for each sub-indicator to 0 to 100, and then averaging values across all sub-indicators under a specific indicator, ignoring no data values. This means that a country with poor data availability is not penalized for this, but that where more data are available this can be used to improve the calculation.

6. How does the Agrobiodiversity Index integrate the different data sources with varying levels (e.g., year, pixel, state, country) and data types (e.g., point, pixel, country)?

Data collected at different levels (e.g. hectares, calories, percentages) are standardised to 0 to 100, to allow integration (averaging, summing) of different data across sources. Data are sourced based on the latest year available. We try to make this consistent across countries, although some discrepancies will remain, e.g. where pesticide use data is available for 2015 for most countries but only 2013 for others.

See the Agrobiodiversity Index Methodology Report v.1.0 Section 3 for more detailed information.

7. How does the Agrobiodiversity Index weigh each sub-indicator and indicator for calculating the final score?

The Index team conducted a local and global sensitivity analysis with the indicators and data used to assess 20 countries for status and action, 7 for commitments, using the Agrobiodiversity Index in June 2018. After testing different weights, the results of the global and local sensitivity analysis showed that applying weights does not substantially change the overall index score. Hence, the calculated scores in the first version of the Index uses equal weights for all indicators.

See the Agrobiodiversity Index Methodology Report v.1.0 Annex 5 for more details.

www.agrobiodiversityindex.org
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