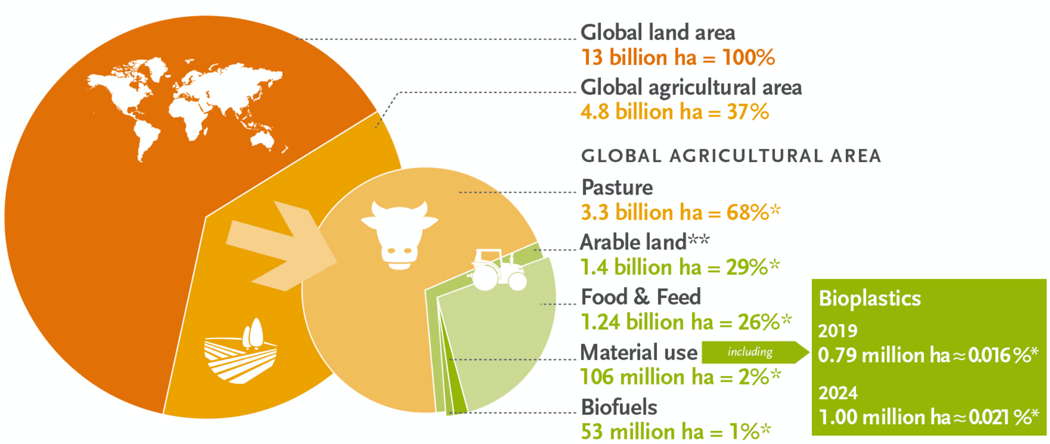
BFA Fact Sheet – Land Use

As the world's population continues to rise, so too does the demand on our natural resources. Current projections estimate that the world's population will reach 9.7 billion people by 2050 [1]. While our population continues to grow, our resources remain finite, and there is concern that we will not have enough arable land to meet everyone's needs. In order to meet increasing demand for food, water, fuel, and materials, we need to make thoughtful choices about how and where we source these goods.

Currently, bioplastics are not a significant user of land, and they are not predicted to become so. However, the impacts of land use must still be accounted for, as any industry that uses land must be held accountable for its contribution to global land use change, no matter how small.

According to research conducted by European Bioplastics, with data from The Food and Agriculture Organization of the United Nations, Institute for Bioplastics and Biocomposites, and nova-Institute, the global agricultural area is approximately 4.8 billion hectares. Of that, 1.4 billion hectares is arable land (as opposed to pasture). Material production requires 106 million hectares of arable land. Only .79 million hectares, or .016% of total global agricultural area was estimated to be used for bioplastic production in 2019. This is projected to grow to 1 million hectares, or .021% of total global agricultural area by 2024 [2]. See the figure below for a visual breakdown of this data.

Land use estimation for bioplastics 2019 and 2024



Source: European Bioplastics (2019), FAO Stats (2017), nova-Institute (2019), and Institute for Bioplastics and Biocomposites (2019). More information: ***www.european-bioplastics.org***

* In relation to global agricultural area
** Including approx. 1% fallow land

Analyzing the land use of bioplastics will remain important as new technologies, applications, and biocomposites are developed, and total bioplastic production increases. While bioplastics only represent about 1% of all plastic produced annually currently, the capacity of global bioplastics production is projected to increase from 2.11 million tonnes in 2019 to approximately 2.43 million tonnes in 2024 [3]. If responsibly sourced bioplastics are to play a role in the transition to a circular economy (replacing the remaining fossil-based plastic after all unnecessary plastic has been phased out), their land use impacts must be continuously reassessed.

Land use change refers to the direct or indirect destruction of ecosystems to make room for a new purpose, for example, agriculture. *Direct land use change* (DLUC) occurs when existing ecosystems are replaced by a new land use. *Indirect land use change* (ILUC) occurs when existing crops are used for a new purpose (for example, biofuel or bioplastic) and this triggers ecosystem destruction elsewhere to make new room for agriculture [4]. Land use change can lead to habitat loss and fragmentation, biodiversity loss, and the disruption of ecosystem services such as climate regulation, pollination, water cycling, and soil formation.

Fortunately, tools and certifying bodies exist to evaluate and minimize the impacts of bioplastic feedstocks and their impacts on land use. Sustainable biomass certifications can ensure environmental and social damage are avoided and detrimental land use change (for example, deforestation or grassland conversion) does not occur. Examples of credible certifications according to WWF include Roundtable on Sustainable Biomaterials, Bonsucro, Roundtable on Sustainable Palm Oil, Roundtable on Sustainable Soy, and Forest Stewardship Council.

BFA's Methodology for the Assessment of Bioplastic Feedstocks provides guidance on measuring and assessing land use change, both direct and indirect. Specific guidance includes the recommendation to grow bioplastic feedstocks on underutilized agricultural lands that are currently not being used for any agricultural activity and are suitable for the feedstock crop in question, provided those lands do not hold substantial potential value for resilience benefits for biodiversity and ecosystems. Wastes and residues may also have significantly lower land use impacts compared to other feedstocks as they are, by definition, by-products of existing production. In using waste and residues there must be strong assurance that these materials are truly waste and not being displaced from other uses, for example, to be left on the field to prevent erosion and reduce nutrient loss.

Carefully assessing the potential land use change impacts can help limit or negate issues of food displacement both locally and globally, reduce pressure on existing natural habitats, minimize biodiversity loss, and achieve positive carbon sequestration. For more information and questions to guide decision-making, see the *Land Use Change Indicator* in the Survey Level Screening portion of the methodology.

Although there is no globally agreed on method for measuring and assessing ILUC, nor a single method that is technically sophisticated enough to take all variables into account, BFA believes that ILUC must be at a minimum, qualitatively assessed. Guidance exists in the *Land Use Change Indicator* in the Survey Level Screening portion of the BFA methodology and, in addition, BFA recommends the use of the Low Impact Indirect Biofuels Methodology, developed by WWF International, Ecole Polytechnique Fédérale de Lausanne, and Ecofys [5]. The method is intended for identifying biofuel feedstocks with a low risk of causing indirect impacts but it is equally applicable to feedstocks for biomaterials. The methodology helps users explore potential indirect land use change impacts, and ensure that feedstock cultivation does not displace other agricultural commodities.

Building on this methodology, Roundtable on Sustainable Biomaterials developed a certification addition called RSB Low iLUC Risk Biomass to enable producers to demonstrate low indirect land use change risk. While intended for alternative fuel producers, this addition to a certification can be pursued by non-fuel producers using the Advanced Products Standard as well [6].

As we advance towards a future of increased demand on our resources, the land use impacts of all industries must be carefully considered. We must make careful decisions around land use, regardless of scale, to maximize social, environmental, and economic benefits and ensure the needs of every person can be met. Proactive research and careful decision-making can lead us towards a future that supports the needs of a growing population. BFA continues to work towards a future of responsible sourcing of bioplastic feedstocks by convening a forum for discussion, advancing science-based research, and providing a voice for conservation.

References

[1] United Nations, “UN projects world population to reach 8.5 billion by 2030, driven by growth in developing countries,” *United Nations Sustainable Development Goals*. https://www.un.org/sustainabledevelopment/blog/2015/07/un-projects-world-population-to-reach-8-5-billion-by-2030-driven-by-growth-in-developing-countries/ (accessed Jul. 27, 2020).

[2] “Renewable Feedstock,” *European Bioplastics*. https://www.european-bioplastics.org/bioplastics/feedstock/ (accessed Jul. 27, 2020).

[3] European Bioplastics, “Bioplastics Market Data,” *European Bioplastics e.V.* https://www.european-bioplastics.org/market/ (accessed Jul. 27, 2020).

[4] J. Beard and R. Grillo, “Airlines’ biofuel ambitions must not increase emissions | Blog Posts | WWF,” *World Wildlife Fund*, May 01, 2015. https://www.worldwildlife.org/blogs/sustainability-works/posts/airlines-biofuel-ambitions-must-not-increase-emissions (accessed Jul. 27, 2020).

[5] “About: The Low Indirect Impact Biofuels -LIIB- Methodology,” Apr. 13, 2005. http://content.ccrasa.com/library_1/30048%20-%20The%20Low%20Indirect%20Impact%20Biofuels%20-LIIB-%20Methodology.pdf (accessed Jul. 27, 2020).

[6] “RSB Low iLUC Risk Biomass Criteria and Compliance Indicators.” Roundtable on Sustainable Biomaterials, Jun. 01, 2015, Accessed: Jul. 27, 2020. [Online]. Available: https://rsb.org/wp-content/uploads/2018/05/RSB-STD-04-001-ver-0.3-RSB-Low-iLUC-Criteria-Indicators.pdf.