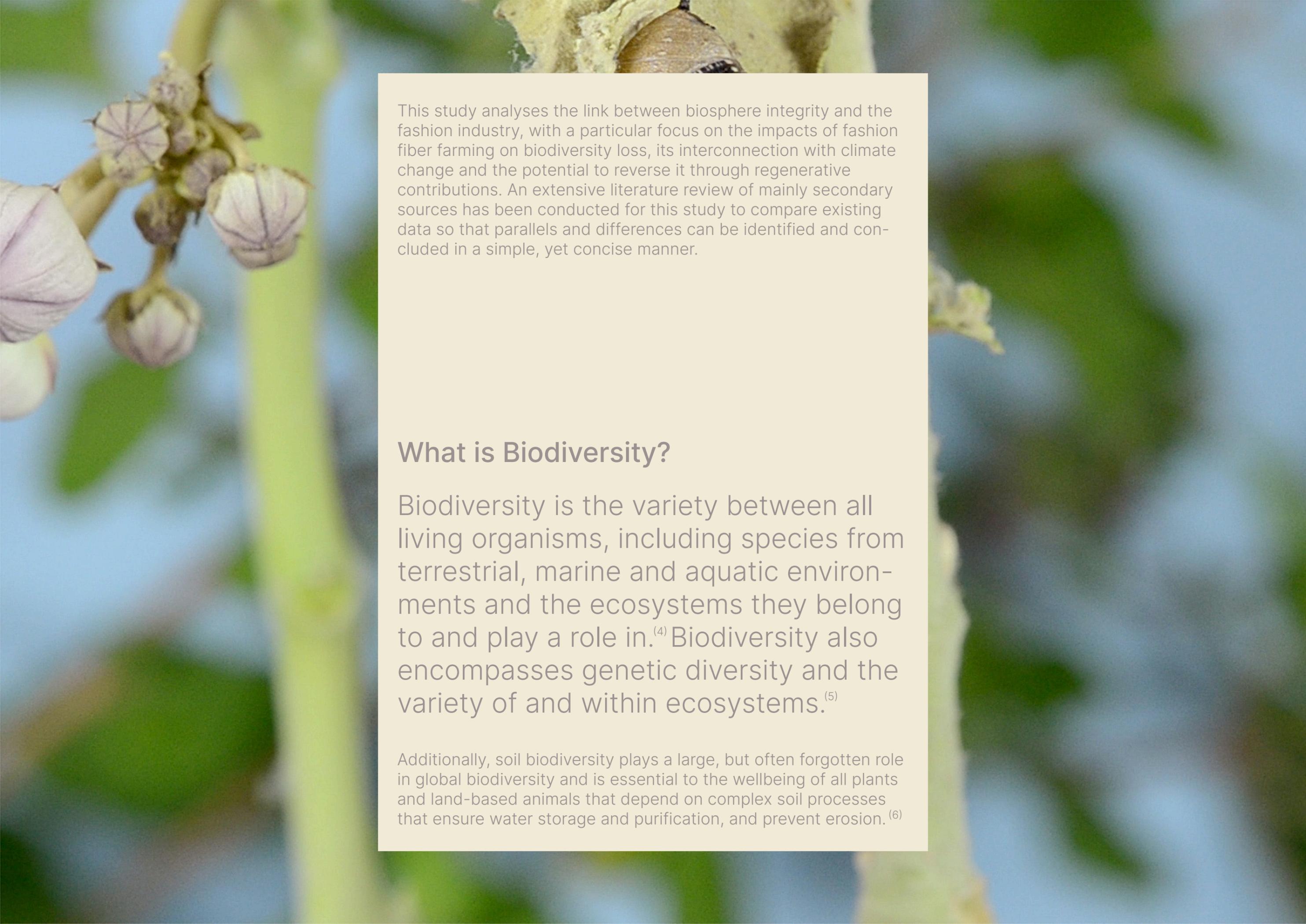


Biodiversity x Fashion Fiber Farming





This study analyses the link between biosphere integrity and the fashion industry, with a particular focus on the impacts of fashion fiber farming on biodiversity loss, its interconnection with climate change and the potential to reverse it through regenerative contributions. An extensive literature review of mainly secondary sources has been conducted for this study to compare existing data so that parallels and differences can be identified and concluded in a simple, yet concise manner.

What is Biodiversity?

Biodiversity is the variety between all living organisms, including species from terrestrial, marine and aquatic environments and the ecosystems they belong to and play a role in.⁽⁴⁾ Biodiversity also encompasses genetic diversity and the variety of and within ecosystems.⁽⁵⁾

Additionally, soil biodiversity plays a large, but often forgotten role in global biodiversity and is essential to the wellbeing of all plants and land-based animals that depend on complex soil processes that ensure water storage and purification, and prevent erosion.⁽⁶⁾

What are Biodiversity Loss indicators?

68%

"decline in populations of mammals, birds, amphibians, reptiles and fish between 1970 and 2016" (8)

75%

"of the Earth's land surface is significantly altered" (8)

56%

"of the Earth's capacity are (8) overused by human activities"

1M

"species are threatened with extinction as a result of ecosystem destruction"

"Many of these extinctions can be prevented if we actively conserve and restore nature" (8)

70%

"of the world's soil has been destroyed; if it continues at this rate, farmable soil is expected to be gone within 60 years." (10)

Which role does Fashion play?

While ecosystem services provide raw materials, nature's immaterial services, functioning as a source for inspiration and cultural heritage, are equally important for the foundations of fashion and its survival.⁽¹¹⁾

As one of the largest global consumer industries ⁽¹²⁾ generating €1.5 trillion annually, fashion significantly contributes to biodiversity loss in a variety of ways along its value chain; with the biggest negative impacts happening in the (1) raw-material production, (2) material preparation and processing, and (3) end of life phases.⁽⁹⁾

If the global population rises to 8.5 billion people by 2030 and overall apparel consumption will increase by 63% as expected,⁽¹²⁾ addressing and solving fashion's negative biodiversity impacts will become an ever more pressing issue.

The raw material stage, and specifically the agricultural process of fiber production offers an interesting angle in this context. Although agriculture is one out of the four main human activities "inextricably linked to fashion and biodiversity loss",⁽⁸⁾ it likewise has the potential to reverse fashion's negative impact on nature.⁽¹³⁾

How does Fiber Farming intersect?

Generally speaking, natural fibers have fewer negative impacts on the environment compared to synthetic materials. At the same time, the majority of fibers are cultivated under conventional farming methods which follow monocultural processes that include single cropping, GMO seeds, and heavy reliance on pesticides.⁽¹⁴⁾ These agricultural practices directly drive, (1) pollution, (2) land-use change and (3) climate change.⁽¹⁵⁾

Pesticide Usage

Conventional cotton production, for instance, whilst it only makes up 3% of the global agricultural land, accounts for 22.5% of the global pesticide consumption,⁽¹²⁾ leading to natural ecosystem loss through soil degradation, water contamination and pollinator extinction.⁽⁸⁾

Deforestation & Agricultural Practices

A large part of fashion's biodiversity impact results from land-system change for the agricultural production of wool, cotton, rubber, leather hides, viscose and other cellulosic fibers.⁽¹⁵⁾ Growing deforestation and overgrazed pasture land significantly impact soil degradation.⁽¹⁰⁾ This, in turn, reduces soil biodiversity and its ability to sequester carbon emissions from the air.⁽¹⁶⁾

Genetic Homogenization

Biodiversity loss can also be observed in the loss of genetic diversity within sheep and cotton species, caused by the homogenization of fibers through selective breeding. „Over one third of the estimated 1400 breeds of sheep that exist on earth are endangered of extinction”, underlining the need to move away from human influenced monoculture within fiber farming.⁽¹⁷⁾



What are Positive Solutions?

Regenerative Agriculture

Regenerative agriculture is a traditional indigenous farming system that prioritizes biodiversity and carbon sequestering whilst following a “holistic agroecosystem approach”.⁽¹⁷⁾ Pesticide usage and tilling methods are substituted with crop rotation, intercropping and/or inter-grazing, for little soil impact. Regenerative animal farming follows a similar approach, rotating livestock around the land for even grazing, which prevents overgrazing, degradation.⁽¹⁴⁾ All in all, it reduces issues such as land system change, pollution and carbon emission and can even function as a carbon reservoir.

Diversification & Forgotten Fibers

Reintroducing “forgotten” fiber varieties could help increase genetic biodiversity while enabling ecosystem and soil health. The revival of indigenous cotton under the ASSEFA project in India, for instance, shows that indigenous fibers reduce water impacts, pesticide usage and subsequently, soil degradation.⁽¹⁹⁾ Similarly, reintroducing “primitive” wool fiber animals could increase genetic diversity while driving the need for local, small-scale animal agriculture that moves away from massive monoculture livestock farming.⁽¹⁸⁾

Agro-Material Innovation

Mixing and diversifying raw material sources through fiber innovation could offer another solution. Turning agricultural by-products into fashion fibers could decrease the pressure on valuable arable land which currently, conventional agriculture of fiber-only crops is having. Moreover, by-product fibers significantly reduce CO₂ emissions which in turn is interlinked with biodiversity loss.⁽²⁰⁾

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