AZ Forest
Building climate and ecological resilience

Globally, around a quarter of Earth's land area has been degraded,[1] threatening the livelihoods, wellbeing, food, water and energy security of an estimated 3.2 billion people worldwide,[2] especially rural communities.

Land degradation increases vulnerability to climate change, and can reduce the effectiveness of climate adaptation options. Many drivers of land degradation are expected to be exacerbated by

climate change in the coming decades, and interventions are needed to secure livelihoods and mitigate the associated health impacts.

Forest restoration has been recognised as a key intervention to tackle climate change.[3] It also has a significant role to play in community resilience and climate adaptation, by protecting water and soil, helping to provide more resilient and diverse farming systems, cooling urban heat islands and reducing natural disaster risk.

Forests are vital for biodiversity – containing over 60,000 tree species and providing habitat for 80% of amphibian species, 75% of birds and 68% of mammal species.[4] Forest restoration can help to tackle the biodiversity crisis by providing and connecting habitats, increasing species diversity, whilst

securing ecosystem services such as the provision of clean water and soil stability.

WWF's Living Planet Report 2022[5] shows a 69% decline in the world's vertebrate populations since 1970. The report also notes that, if our planet passes 2°C of warming, climate change will be the dominant factor driving biodiversity loss. Action to tackle climate change is therefore key to protecting biodiversity, and land and forest restoration can protect and restore biodiversity whilst also removing carbon dioxide from the atmosphere.

AZ Forest programme

In 2020, AstraZeneca launched AZ Forest, a global initiative to plant and maintain 50 million trees worldwide by the end of 2025. This initiative aims to tackle climate change, restore and protect biodiversity, build resilient livelihoods and improve human health.

Whilst one of the primary aims of the AZ Forest programme is to help mitigate climate change by removing carbon dioxide from the atmosphere, **AZ Forest projects are designed to maximise the co-benefits reforestation can bring to the local context, for example:**

- **Focusing** on water resources where freshwater systems are degraded,
- **Restoring** habitat corridors where biodiversity strongholds are isolated, or
- **Investing** in regenerative agroforestry systems where land degradation threatens food security

In partnership with non-profit organisations and expert delivery partners focused on forest restoration, by the end of 2022 we had planted 10.5 million trees in Australia, Indonesia, Ghana, the US and the UK.

This paper gives a brief overview of AZ Forest's contribution to to local climate and ecological resilience.

Australia

In Australia, AstraZeneca aims to plant 25 million native and locally appropriate trees by the end of 2025, restoring 20,000 hectares of land in partnership with One Tree Planted and Greening Australia. Australia is the driest inhabited continent in the world, and is highly vulnerable to droughts, heatwaves and changes in rainfall.

AZ Forest Australia focuses on restoring degraded agricultural land, prioritising distressed areas of farmers' landholdings. Reforestation will help to make degraded areas more productive – greater tree cover is expected to improve soil health, and boost water quality and availability, alongside supporting broader ecosystem health. The trees will help to moderate local temperatures, and once established are expected to help restore the water cycle, mitigating wildfire risks.

The project aims to build connectivity between habitats and prioritises the planting of key species such as *Eucalyptus punctata* and *Eucalyptus melliodora* trees to increase access to food supply for the koala, regent honeyeater and other endemic species. She-oak trees will create an important food supply for the threatened glossy black cockatoo. Vital habitat will be created for dozens of additional endangered species such as the sandhill dunnart, malleefowl, honey possum and black-gloved wallaby.

Traditional Owners and rural communities will benefit from skills and economic opportunities for undertaking contracted works such as seed collection and planting. It is anticipated that the project could create 900 jobs across regional locations over the next five years, engaging up to 150 Indigenous and non-Indigenous business sub-contractors, seed suppliers and nurseries.

References
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4. FAO and UNEP, 2020. The State of the World's Forests 2020. Forests, biodiversity and people. Available at: https://doi.org/10.4060/ca8642en
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Indonesia

In the Citarum River Watershed in West Java, Indonesia, AstraZeneca aims to plant 10 million trees by the end of 2025, in partnership with One Tree Planted and Trees4Trees. The watershed is one of the most strategically important in the country – it serves nearly 27 million residents of the Jakarta-Bandung metro area with domestic water, irrigation for rice fields and hydroelectric power.

Degradation of forests in the watershed has caused widescale erosion and loss of topsoil, leading to landslides in the wet season and exacerbating droughts in the dry season. The resulting sedimentation in rivers and reservoirs threatens freshwater habitats, water supply, food security and power generation for an area that is home to 10% of the Indonesian population. As climate change is expected to increase the intensity of weather events, without a change in land use practices, these risks are likely to increase.

AZ Forest Indonesia will provide smallholder farmers with a high quality seedling mix of income-producing species, along with subsidies on specific crop seeds and ground plants for erosion control. Through the development of community-based agroforestry systems and training, the project aims to reduce deforestation and increase tree cover, rehabilitating the watershed while working with local farmers to transition to more sustainable livelihoods.

Ghana

In central Ghana, around 4 million trees will be grown and maintained through a community-led project combining natural forest restoration and sustainable agroforestry. In collaboration with the Circular Bioeconomy Alliance (CBA) and New Generation Plantation Technical Assistance (NGPTA), this unique partnership will focus on building community and ecological resilience and form part of a global network of 'Living Labs', helping to demonstrate how investing in nature and putting local communities at the heart of landscape restoration can benefit both biodiversity and local livelihoods.

The natural forest restoration element of the project focusses on restoring woodland cover which has been lost in recent decades. In addition to planting native species, this element will also focus on managing fires and other pressures, alongside species enrichment activities and encouraging natural regeneration, increasing the landscape's resilience in a rapidly changing climate.

The sustainable agroforestry programme combines fruit and nuts production, regenerative agriculture and wood production. It will give local communities access to a more diverse food system, whilst improving soil quality, as well as providing new sources of revenue. In addition, the timber trees will provide fuel for energy. Charcoal production is one of the leading drivers of forest degradation in the area, therefore access to fast growing and renewable timber will help to reduce pressure on natural forests, helping to protect carbon stocks and natural forest habitat.

Local level governance of the project in ensured via a multi-stakeholder platform which is facilitated by Ghanaian NGO Nature and Development Foundation. This helps to steer the project and ensure that community needs and concerns are at the heart of all decision making.

Community engagement and involvement in decision making is key to the long-term success of the project – **by ensuring it is valued by local people we can safeguard the trees and ensure they thrive over the coming decades**.

US

In the United States, in partnership with the National Fish and Wildlife Foundation (NFWF), AstraZeneca will plant and sustain one million trees by the end of 2025. To date, the reforestation effort has focused in the mid-Atlantic states, including the Delaware River watershed, where we have joined other sponsors in habitat restoration projects – AstraZeneca's funding helps to plant trees, restore forests, and promote the adoption of conservation practices to benefit water quality and sustain native wildlife species in the watershed.

Planting in riparian habitats will increase climate resilience of the ecosystems in two key ways. Firstly, the planting on river banks and in 'buffer areas' close to water will help stabilise river banks, and filter and infiltrate surface water runoff. Runoff and erosion are expected to increase as climate change causes rainfall events to become more extreme.

Secondly, riparian planting helps shade waterways, helping to reduce water temperatures. Surface water temperatures are expected to rise under climate change projections, which presents problems for many freshwater species adapted to cool waters, such as the brook trout.

These streamside forests can also act as key habitat corridors that connect otherwise fragmented forestland – reforesting riparian areas can help to ensure birds and wildlife can move through the landscape, giving them a greater chance of adapting to climatic and environmental changes.

UK

In the United Kingdom, in partnership with Forestry England, Borders Forest Trust and One Tree Planted, over one million trees will be grown and sustained by the end of 2025. The UK AZ Forest programme will support new reforestation and woodland creation projects, including near AstraZeneca sites in Cambridge and Macclesfield, as well as in Scotland.

The sites near Cambridge and Macclesfield aim to restore land previously covered by commercial plantations but degraded by tree pests and diseases. For example, in Thetford Forest, land used for larch plantation was cleared as the trees had succumbed to larch disease (*Phytophthora ramorum*). A diverse mix of tree species was selected to replace the larch: a variety of native species, alongside some non-native species which have high pest tolerance and are adapted to warmer temperatures. This approach will ensure the new woodland is resilient to the future impacts of climate change anticipated in the area.

AstraZeneca is supporting planting at a woodland creation site in Kent, an area vulnerable to climate-exacerbated environmental change and disease pressures. The woodland has been carefully planned to be as resilient as possible, building in species and structural diversity throughout the site design. Following detailed site surveys, a mix of 22 conifer, 19 broadleaf and 14 shrub species have been selected to support local biodiversity. Planting and ponds will create a network of corridors across the site supporting local wildlife such as dormice, great crested newts, migrant birds, invertebrates and reptiles. Lawton's principles of 'more, bigger, better and joined' are being adopted to create habitat and promote ecological connectivity.

High forest conifer and coppiced broadleaf mixtures, bordered by shrubs, will provide structural diversity whilst open areas adjacent to ancient woodland will encourage natural regeneration.

State of the art environmental DNA techniques will be used to measure soil and water biodiversity and analyse changes and fluctuations in the ecosystem of the woodland over time – this will provide a wealth of data and help steer the management of the site, ensuring maximum benefit for wildlife.