

Royal Botanic Gardens KEW

**Unlocking why plants
and fungi matter**

Royal Botanic Gardens, Kew strategy to 2020/21

Contents

4 Foreword

5 Unlocking why plants and fungi matter

8 Looking to the future

11 Our objectives

14 Delivering our objectives

14 Collections for the benefit of humankind

17 Science that helps solve the critical challenges facing humanity today

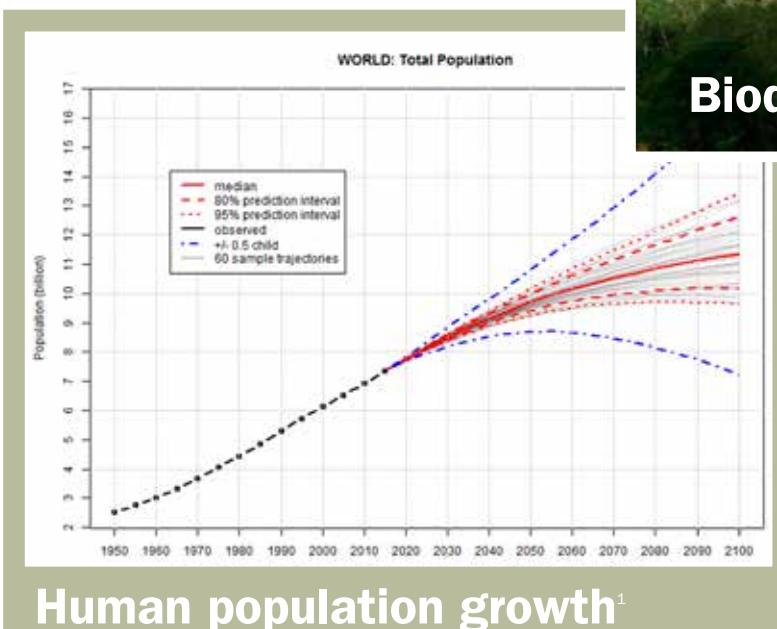
19 Creating the world's leading botanic gardens

21 Sharing our knowledge through education

23 A sustainable and dynamic organisation

26 Achieving impact

Critical challenges facing humanity



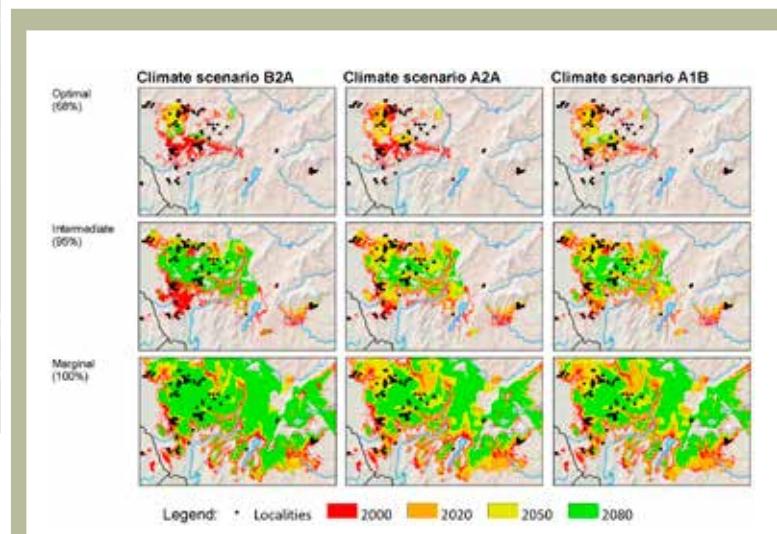
Biodiversity loss

Human population growth¹



Plant diseases

Food security



Climate change²

¹ United Nations Department of Economic and Social Affairs: <http://esa.un.org/unpd/wpp/Graphs/Probabilistic/POP/TOT>

² Davis et al. 2012, PLoS ONE 7(11)





Foreword

Unlocking Why Plants and Fungi Matter is our vision for how a better understanding of plants and fungi will contribute to solving some of the most critical challenges facing humanity today.

Royal Botanic Gardens, Kew is already a world famous centre for botanical and mycological knowledge. Our two inspiring gardens enchant our visitors with the wonder of the world's plant diversity; and we reach beyond our garden walls to excite and educate individuals and communities. Delivering this strategy will build on these successes as we aim to be the global resource for plant and fungal knowledge, building an understanding of the world's plants and fungi upon which all our lives depend.

Our goal is that every person who interacts with RBG Kew will discover something amazing about the world of plants and fungi, the importance of their diversity, and how all our lives can be improved through appreciating and understanding that diversity better. From showcasing the beauty of plant diversity in the Great Broad Walk Borders at Kew Gardens to digitising our scientific collections and releasing the data for others to use, we will be unlocking why plants and fungi matter.

This is an exciting time in RBG Kew's history. We are stewards of this organisation and the accumulated knowledge of our collections, data and people. By delivering this strategy successfully, our organisation will be stronger, we will reach and inspire more people, and contribute to solutions to our planet's most serious contemporary challenges.



Marcus Agius
Chairman



Richard Deverell
Director

Unlocking why plants and fungi matter

Royal Botanic Gardens, Kew's mission is to be the global resource for plant and fungal knowledge, building an understanding of the world's plants and fungi upon which all our lives depend.

We use the power of our science and the rich diversity of our gardens and collections to provide knowledge, inspiration and understanding of why plants and fungi matter to everyone.

We want a world where plants and fungi are understood, valued and conserved – because all our lives depend on them.







Looking to the future



The world needs RBG Kew now more than ever, and RBG Kew has more to offer the world in response. This document sets out our ambitions, our contemporary relevance, and the key activities that will be our focus over the next five years.

RBG Kew has constantly evolved in response to the demands and needs of society over the 250 years since Kew Gardens was established by Princess Augusta.

From its earliest days, the success of RBG Kew has been interwoven with the economic success of the United Kingdom and the wellbeing of people across the globe.

This strategy builds on the successes of the past, allowing RBG Kew to fully use the strengths of our heritage and the accumulated collections, knowledge and data we hold, while focusing on the urgent needs of society today.

Loss of biodiversity, climate change, rapidly-spreading pests and diseases, human population growth, and the associated challenges of food security are causing unprecedented stress on human societies around the world. Plants and fungi hold the key to help solve these challenges through the fundamental life-giving processes they drive, the properties they contain, and the materials and food they provide.

Through increasing understanding of why plants and fungi matter, RBG Kew unlocks their potential. This is an urgent task. We face unprecedented losses of biodiversity and rapid environmental change, and risk losing the precious secrets that plants and fungi can give us before we discover them. If we are successful in achieving our strategy, ecosystems and human societies across the globe will be more resilient.

RBG Kew staff are authentic and passionate experts who share their knowledge, stimulating curiosity and debate. Our many visitors love the beauty and diversity of our gardens and our activities beyond the garden walls inspire millions more. We will use the unique combination of our data-rich collections, our science and our gardens to become the global voice for unlocking why plants and fungi matter. If we are successful



in achieving our strategy, people all around the world will have a greater understanding of why plants and fungi matter.

RBG Kew's work ultimately benefits every human being on the planet today and in the future. We have a profound responsibility, our strategy is ambitious and it builds on the purpose and work of RBG Kew through its history.

We have set ourselves five strategic objectives to move RBG Kew forward successfully into the next decade.



Our objectives







BRAZIL
GOIAS
CYPERACEAE
Cyperus sp.
Fazenda Santa Fé, Rio Preto de Goiás, above
town, 2000' elevation, 27°30' S 47°30' W Altitude 2000m
Camps 1990-1991
Exsiccatum by Walter R. Rohrbach
Ley C. Mello, W. Rodriguez, R. da G. Mello
2000 - 2002



Delivering our objectives

Collections for the benefit of humankind

The size and diversity of RBG Kew's collections are unique. They are a huge database for plant and fungal diversity knowledge: one of the largest and most diverse global herbariums of dried, pressed plant specimens and the largest fungarium in the world; the largest living plant collection of any botanic garden and the world's largest wild plant DNA and tissue bank, and the only global wild plant seed bank.

These collections are at the heart of our future success. We will curate them to excellent standards, ensuring we are responsible stewards for these invaluable assets. We will continue to develop our collections, ensuring they remain of contemporary relevance. We will open up our collections, including the valuable data they hold, ensuring they are widely used for active scientific purposes that benefit humankind.

More than **seven million** herbarium sheets, including **330,000** type specimens that were used to describe new species

1.25 million dried fungal specimens,
the largest such collection in the world

Nearly **180,000** individual plants from over **30,000** taxa, including **1,300** threatened species in our gardens

50,000 samples of DNA from over **35,000** species of plants in our DNA bank

More than **2 billion** seeds, from **36,000** species of plants in the Millennium Seed Bank in Wakehurst





RBG Kew is a collections-based organisation, but many people are not aware of the incredible assets that we hold and care for.

We aim to digitise our collections, to complement the physical collections. We will explore opportunities to join forces with other botanic gardens and herbaria across the UK to create a National Digital Herbarium, pooling the resources of the UK's plant collections to ensure our nation builds its reputation as the global leader in plant taxonomy.

We will release digitised data as Open Data, providing an invaluable resource for scientists and innovators liberating the world's

largest database of plant diversity for the world. Through portals such as Plants of the World Online and the Useful Plants & Fungi Portal, we will bring together data, information and insight on the diversity of the plant and fungal kingdoms and their uses.

The Millennium Seed Bank Partnership is the world's largest ex-situ plant conservation programme, aiming to bank seeds from 25% of the world's plant species by 2020. Through partnerships in more than 80 countries, we focus on banking endangered, endemic and economically valuable species including the wild relatives of

crops. They can be used for research, innovation and as the ultimate insurance against species extinction.

Through our combined actions on banking endangered seeds and our horticultural expertise, we are saving species from extinction. Our living collection holds around 1,300 species of conservation interest¹, including 13 species that are extinct in the wild. Our horticultural teams are experts in growing plants that have never been propagated, working with other botanical gardens around the world to ensure their continued survival.

¹ Defined by IUCN Red List criteria of 'Extinct in the Wild', 'Critically Endangered', 'Endangered' and 'Vulnerable'





Science that helps solve the critical challenges facing humanity today

We published our Science Strategy in February 2015, setting our vision to document and understand global plant and fungal diversity, and its uses, bringing authoritative expertise to bear on the critical challenges facing humanity.

Food security, ecosystem resilience, and human populations that rely on a healthy environment are all in danger as a result of climate change, and the loss of habitat and biodiversity. Our scientific research into plant resources such as coffee

in Ethiopia or yams in Madagascar, diseases and pests such as fungal pathogens, and chemical traits and properties of plants and fungi used in traditional medicinal remedies, will help us find solutions to the critical challenges we face.

We will release an annual State of the World's Plants report, providing an overview of the status of the plant kingdom. Our scientists will combine their extensive knowledge and expertise in an authoritative evaluation of the status of plants.

The report will provide new evidence and perspectives on a range of key issues, and act as an important horizon-scan to identify strategic research and policy priorities for the UK and overseas.

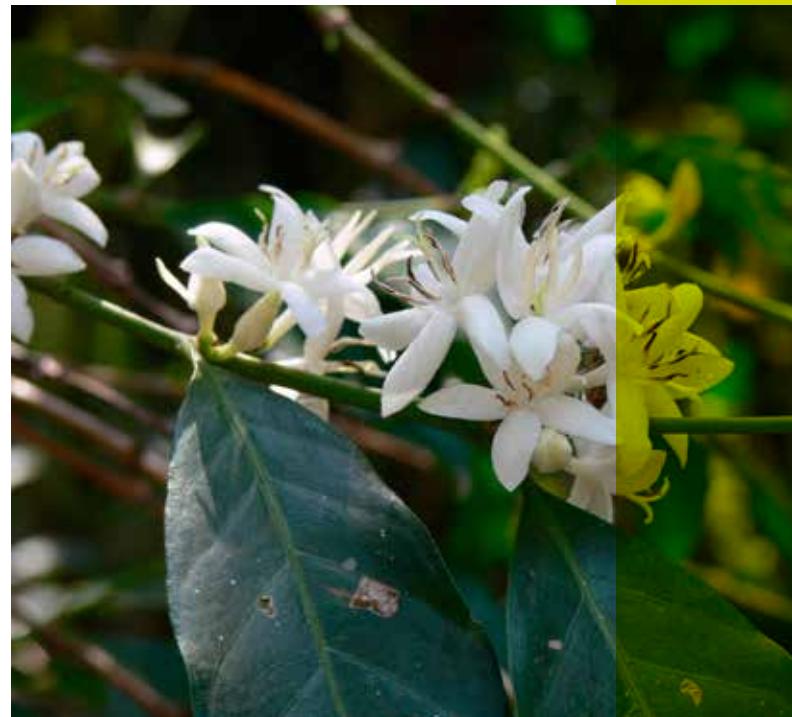
One in five of the world's plants is threatened with extinction. Many of these occur in the tropics where extinction continues through humanity's destruction of habitats. The Tropical Important Plant Areas initiative will assess the highest priority areas for plant conservation,



providing mapping tools for use across seven countries by 2020 to assist conservation action by our partners.

Our understanding of the diversity of plant and fungal life is constantly growing. To better understand how the world's plants and fungi are related to each other, and how they evolved, we will complete the Plant and Fungal Trees of Life. This comprehensive investigation of evolutionary relationships will provide a unifying framework for

comparative plant and fungal research. This will accelerate the discovery of new taxa, particularly in less well-known groups, as well as facilitating the exploration of previously undiscovered properties and uses.





Creating the world's leading botanic gardens

Our two botanic gardens, at Kew Gardens in west London and Wakehurst in the Sussex countryside, display the diversity of plant life from around the world within spectacular landscapes. Kew Gardens is a UNESCO World Heritage Site, recognising the historical and contemporary interaction of the natural and built landscapes with the botanical science conducted within them.

We aspire to take every visitor on an exciting journey through the diversity of the plant and fungal kingdoms, inspiring them with the importance of plants and fungi in their lives. We connect with visitors through their love for the beauty of plants. We will achieve this through continually improving the gardens, bringing our collections and science to life.



We will create distinctive, high quality experiences in our gardens, to attract a broader audience from across the UK and worldwide. We want our botanic gardens to be a reason for people to visit the UK and for British residents to make the journey across the country. We want our visitors to be representative of society and will positively act to ensure there are opportunities for a greater diversity of people to be drawn into our gardens.



We are developing a series of new experiences to engage children with plants and fungi. A new children's garden at Kew Gardens will be created, providing a natural and exciting area for playing and learning. Our annual Family Science Festival will uncover the amazing hidden secrets of the plant and fungal kingdoms through games and activities. Engaging the next generation is crucial to achieving our mission.

At Wakehurst we will open up more of our country estate to visitors, focusing on wild plants from wild places. Through outreach projects we will enlist millions of people across the world to join with us in unlocking why plants and fungi matter. We will also engage a global audience through the latest online opportunities, sharing our passion for plants and fungi in our 'virtual garden'.



Sharing our knowledge through education





RBG Kew holds the accumulated knowledge and expertise from 250 years of world-leading mycological and botanical science, conservation and horticulture. We have learned much and want to share that learning by providing high quality public education programmes for school groups, apprentices, higher and further education students, professionals, and keen amateurs alike.

Our structured schools programmes bring the curriculum to life for school students, and our teacher training programmes enable the wonders of the plant and fungal kingdoms to inspire students in school classrooms across the country. We host around 90,000 students per year, and have

ambitious plans to expand and deepen our engagement.

RBG Kew's School of Horticulture provides world class vocational training for botanical horticulture skills. Through an active apprenticeship programme, the world famous Kew Diploma in Horticulture, and new modular courses in horticulture, we aim to be the global leader in botanical horticulture education.

In 2015 we introduced the Masters in Science course in Plant and Fungal Taxonomy, Diversity and Conservation. This course addresses skills gaps in taxonomy and systematics. We will train a new generation of taxonomists in cross-disciplinary skills with

applications for academia, government, industry and consultancy. Complementing this Masters course, we will continue to provide opportunities for PhD students to partner with us, and provide a series of specialist botany courses for scientists from around the world.

We will not just educate professionals, and we are creating a series of courses aimed at the keen amateur and enthusiast. Horticultural and scientific skills enrich the lives of everyone who learns them, enabling everyone to unlock why plants and fungi matter for them.





A sustainable and dynamic organisation

RBG Kew will only be able to achieve the positive global impact it aspires to if it is a sustainable and dynamic organisation. This requires us to ensure that we have talented and motivated people, 21st century built and technological infrastructure, an organisational culture that supports successful delivery, and a positive reputation that underpins our ability to forge productive partnerships with organisations around the world. Financial health will be the foundation for all of this.

Our staff and volunteers will be supported and cared for. We want to recruit and retain the most talented individuals, and will find ways to provide reward and recognition for their work. Without them, none of our ambitions will be delivered.

RBG Kew acts in a distinctive way that makes the most of our strengths. We care deeply about the future of the planet, the plant and fungal kingdoms and all people around the world who rely on a healthy environment. We are authentic and passionate experts, collaborating and sharing our knowledge to stimulate curiosity and debate, celebrating beauty and encouraging a life-long love of plants. We cherish the diversity of our collections, and value the diversity of our people and everyone we work with. We are ambitious and bold, with a strong desire to innovate and improve.

We will work internationally, across the UK and with our local communities around Kew Gardens and Wakehurst to achieve our

strategy. We will seek partnerships with individuals, businesses, governments, universities, other charities and public sector bodies who share our ambitions. Through partnership and collaboration we will create a world where plants and fungi are understood, valued and conserved.

Securing our long-term financial health underpins all our ambitions. We will achieve this through our positive relationships with government, building our charitable supporter base and growing our self-generated income, as well as operating as efficiently as possible. We deliver public value, achieve our charitable purpose and provide enjoyable and inspiring services to our direct customers. All these elements are mutually supportive.



Our expertise will influence the development of policies in the UK and around the world. RBG Kew has been directed by Parliament to deliver six general functions set out in the National Heritage Act, 1983¹. We directly support the Department of Environment, Food and Rural Affairs in achieving their priorities for improving the environment and safeguarding plant health. RBG Kew also supports wider UK government objectives, through our international collaborations, contributions to wellbeing and development across the globe, in educating and inspiring the next generation of scientists, and in promoting the UK as a destination for scientists and tourists.

Kew Foundation is a charity that supports RBG Kew. It is a crucial partner in raising funds for our activities and for helping us build a network of financial supporters in the UK and across the globe.

RBG Kew operates in a competitive marketplace for visitors and so we remain acutely tuned to the needs of our existing and potential future customers. This attention to our customers stimulates innovation and drives us to develop inspiring products that underpin our mission and positively contribute to our financial health.

¹ www.legislation.gov.uk/ukpga/1983/47/section/24



Achieving impact



We are embarking on an ambitious period in our history. To ensure we keep on track, we will focus on eight priority initiatives:

1. Delivering the Science Strategy and curating the collections
2. Maximising the potential of the gardens
3. Growing commercial income
4. Creating outstanding learning and outreach propositions
5. Engaging the public and key stakeholders in RBG Kew's importance and impact
6. Growing philanthropic support and Friends income
7. Achieving success through our people
8. Improving the built and technological infrastructure

To track our success, we will monitor our progress against the following measures:

- Number of new plant, fungal and seed accessions to our collections
- Number of visits to RBG Kew's digital collections and database resources
- Number of scientific publications
- Number of citations from RBG Kew's scientific publications
- Total science income drawn down in-year
- Number of IUCN threatened species in the MSB and Living collections
- Total visits to Kew Gardens and Wakehurst
- Percentage of total day-time visitors who feel that they have learned something as a result of their visit
- Self-generated income
- Number of apprentices, Diploma and Masters students moving onto further education and employment in a relevant discipline
- Number of school pupil visits to Kew Gardens and Wakehurst
- Positive brand recognition score
- Fundraising income received by RBG Kew
- Total number of Friends of Kew Gardens and Wakehurst
- Staff engagement score
- Floor area of useable building space not in operational use
- Reduction in greenhouse gas emissions



Photographs and maps displayed in this document were kindly provided by:

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kew.org/strategy