

## OPPORTUNITY #4

CAN WE MAKE DESERTS FERTILE?

# GREEN IS THE NEW BROWN

Growing plants and algae in deserts tackle issues from food security to land degradation and increase the liveable area of Earth



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up more than

**40%**

of Earth's land surface

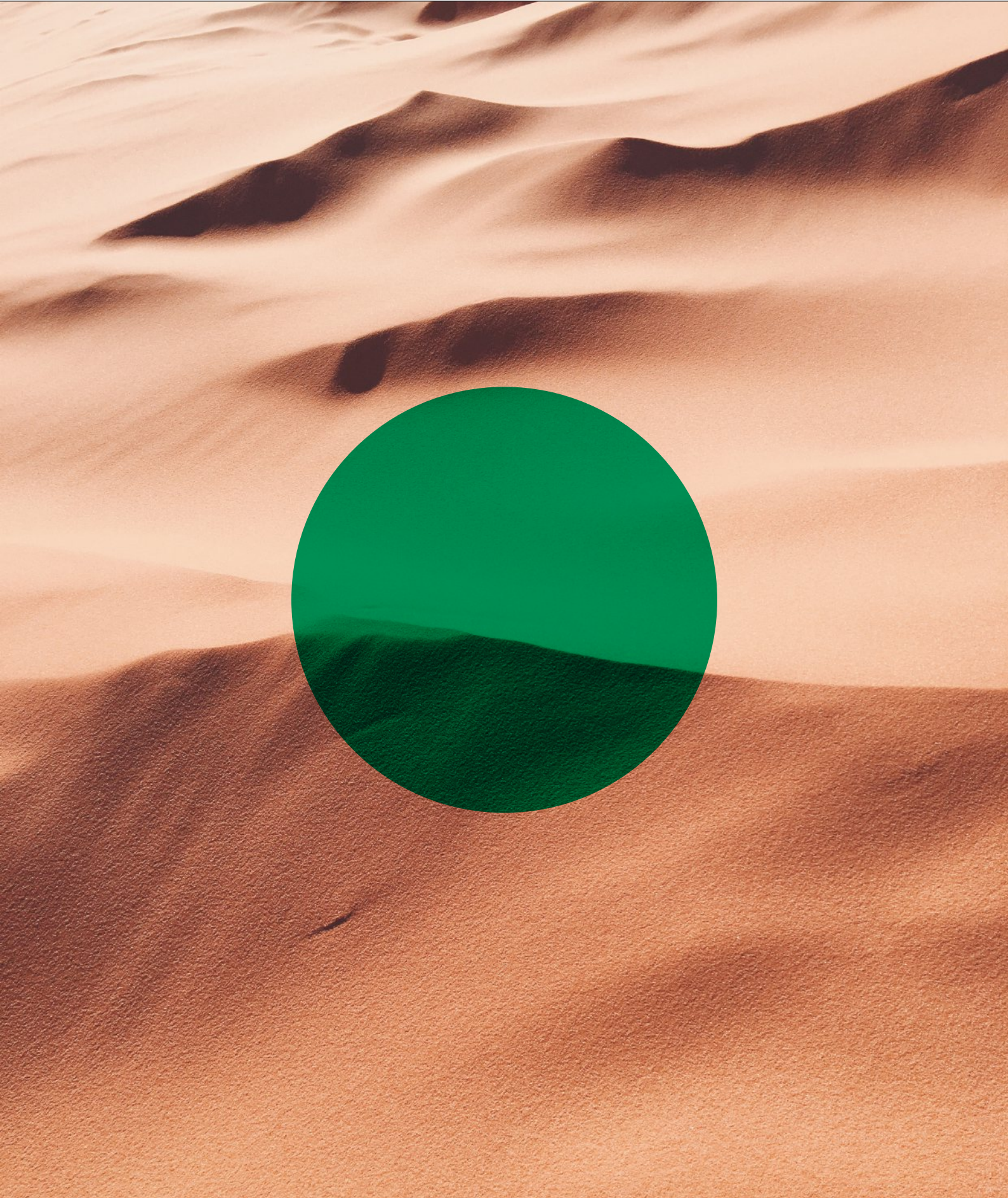
### WHY IT MATTERS TODAY

Drylands make up more than 40% of Earth's land surface.<sup>22</sup> Around 2.1 billion people live in such areas,<sup>23</sup> with a population growth rate of 18.5% between 2010 and 2020.<sup>24</sup> With global temperatures on the rise, as much as a third of the world's population could be living in desert-like conditions by 2070.<sup>25</sup> Two of the largest deserts are the Arabian Desert, covering an area of 900,000 square miles (2,330,989 square km),<sup>26</sup> and the Sahara, covering an area of around 3,320,000 square miles (8,598,760 square km).<sup>27</sup>

While some deserts are vibrant ecosystems, they are largely unliveable for humans and animals alike. In 2019, desertification and other land degradation was calculated to have cost the world economy more than \$85 trillion,<sup>28</sup> according to the World Bank. The rate of land degradation has accelerated to 30 to 35 times the historical rate, according to the UN.<sup>29</sup>

### SECTORS

AGRICULTURE & FOOD · ADVANCED MATERIALS & BIOTECHNOLOGY · INFRASTRUCTURE & CONSTRUCTION · REAL ESTATE · UTILITIES





## THE OPPORTUNITY TOMORROW

Green infrastructure offers greater economic, environmental and social value than deserts. It attracts economic growth and investment. Greening land increases land and property values, employment, productivity and tourism. The effort can also alleviate the effects of climate change and pollution, improve public health and well-being, and promote biodiversity.<sup>30</sup>

Advances in geoengineering and biotechnology are making it possible to transform deserts into fertile land with green infrastructure. There are many different approaches to this push to green the desert which include: changing the properties of desert sand<sup>31</sup> to increase nutrients; using natural water condensation processes powered by renewable energy to harvest water from the air;<sup>32</sup> or using treated wastewater<sup>33</sup> and cloud-seeding<sup>34</sup> to increase rainfall. Such advances need to be supported by investment and international agreements on the safe use of these technologies.

This greatly expands the scope for vegetation to grow and for the production of specialised crops such as algae for foodstuffs or novel biomaterials that may be used in sustainable textiles, among other applications.

Projects that aim to reverse the degradation or restore the degraded land are already in operation. Dubbed 'Great Green Walls', they are situated in the Gobi Desert in China (4,500km)<sup>35</sup> and the Sahara Desert in Africa (8,000km).<sup>36</sup>



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#### BENEFITS

Making deserts fertile provides new livelihoods and improves the quality of life for hundreds of millions of people. Plants and other biomass grown in former desert areas create natural carbon sinks and contribute to reversing the impact that climate change has had on increasing desertification. It would safeguard communities and reduce the need for migration.

#### RISKS

Risks include damage to indigenous flora and fauna, increased land prices and other unintended consequences of imposing human-centric, large-scale manipulation of a climate.