

Green Technology Book 2022

Solutions for Climate Change Adaptation



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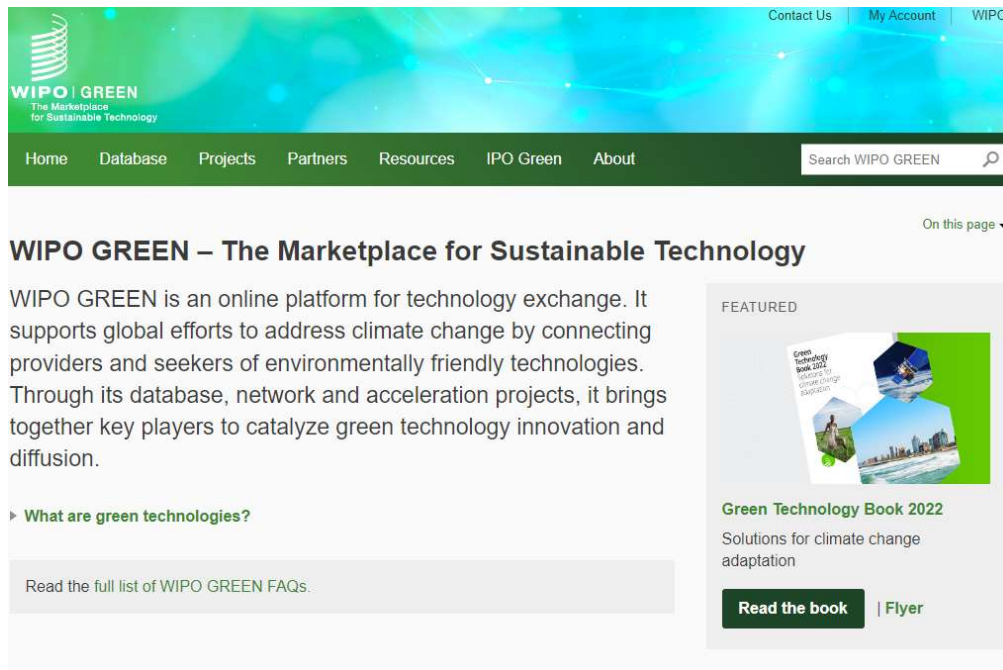
Global Challenges Division
World Intellectual Property Organization (WIPO)



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WIPO GREEN Platform



The screenshot shows the WIPO GREEN website homepage. At the top, there is a navigation bar with links for 'Contact Us', 'My Account', and 'WIPO'. Below this is a dark green header with the WIPO GREEN logo and the tagline 'The Marketplace for Sustainable Technology'. A secondary navigation bar includes links for 'Home', 'Database', 'Projects', 'Partners', 'Resources', 'IPO Green', and 'About', along with a search bar labeled 'Search WIPO GREEN'. The main content area features a heading 'WIPO GREEN – The Marketplace for Sustainable Technology' followed by a paragraph describing the platform's mission. A 'FEATURED' section highlights the 'Green Technology Book 2022' with a 'Read the book' button and a 'Flyer' link. A sidebar on the left contains a link for 'What are green technologies?' and a button to 'Read the full list of WIPO GREEN FAQs.'.

- WIPO GREEN platform, major visible implementation
- Combines all assets
 - Database
 - Projects
 - Partners
 - Resources / knowledge material

WIPO Green Technology Book 2022

Solutions for Climate Change Adaptation



CLIMATE TECHNOLOGY CENTRE & NETWORK

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Problems – Solutions



- When you encounter a problem, you look for solutions
- Impacts from climate change are increasingly a problem
- We point to solutions
- Adaptation is complex and highly varied
- Technology can provide some of the solutions - and is available
- But uptake is too slow and we need adaptation action now





“The human capacity to innovate
will enable us to survive”

Jamaica Tourism Minister, COP27, BBC 8Nov2022

The Green Technology Book shows solutions - a digital first publication



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Publications / Green Technology Book

Green Technology Book 2022 Solutions for climate change adaptation

Table of contents
Download
Database

The Green Technology Book takes a look at the state of play of green technologies responding to some of the most critical challenges of climate change.

In the 2022 report, we present the technology trends and practical solutions to combat climate-change impact on agriculture and forestry, the water sector and cities.

How can innovative technologies and the intellectual property system help us adapt to climate change?

The Green Technology Book illustrates how healthy innovation ecosystems are generating a wealth of green technology solutions.

Drawing on a rich database of technologies - whether proven, frontier or still on the horizon - the report offers practical and inspiring examples of green technologies that can help people adapt to the reality of climate change.

Executive summary

We should take encouragement - and inspiration - from the sheer range of transformational tools to help communities adapt to climate change.

Daren Tang
WIPO Director General

Climate-change adaptation, technology and innovation



Green technology solutions to our changing environment



The future of climate-change adaptation



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3 Technology areas: Agriculture & Forestry Water and Coastal Regions, Cities



Chapter 3

Agriculture and forestry

Climate change is leading to multi-billion dollar losses in crop yield and affecting the health of forest ecosystems. Technology can help farmers and forest managers monitor crop and forest health, adapt their practices, use resources more efficiently and manage climate risk.



This chapter presents solutions within agriculture and forestry that respond to climate change impact on food security. It explores proven, frontier and horizon technologies ranging from local and indigenous techniques to urban farming, hydroponics and high-tech digital solutions. Sections take a look at technologies for climate-resilient plants, healthy soils, irrigation, livestock and forest protection. Because the right information at the right time can be vital, the chapter also looks at early warning systems and solutions for monitoring and forecasting climate change impact.

Explore technologies



16 Technology sections

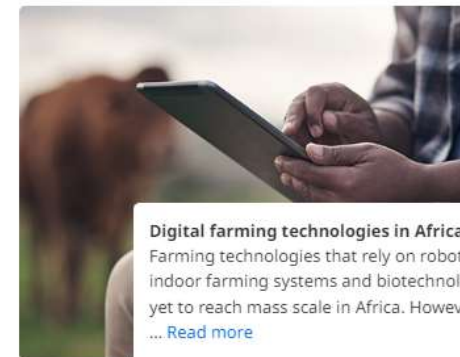
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[Publications](#) / [Green Technology Book](#) / [3. Agriculture and forestry](#) / Farming technologies

Chapter 3. Agriculture and forestry

Farming technologies

Since the Green Revolution of the 1960s, technological change has played a key role in maintaining agricultural productivity and resilience. Faced by an increasingly complex climate landscape, innovations such as vertical farming and precision farming are attracting interest. The world is now in expectation of what is likened to a fourth agricultural revolution.



Proven technologies ▾

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Examples and Proven, Frontier & Horizon groups



- Table of contents
- Download
- Database



Floating gardens of Bangladesh
Around a quarter of Bangladesh is flooded for several months of the year. This causes soil salinity and disruption to agriculture. Floating ... [Read more](#)



Digital farming technologies in Africa
Farming technologies that rely on robotic indoor farming systems and biotechnology yet to reach mass scale in Africa. However ... [Read more](#)

Proven technologies ^



data, such as
can support
and harvesting to



Precision agriculture through IoT technology and sensors
Libelium provides a wireless sensor network platform whose many uses includes precision agriculture. The technology uses internet of things (IoT) ... [Read more](#)



Robotic farming technologies for precision agriculture
Autonomous robotic farming technology developed by SwarmFarm Robotics enable precision application of nutrient and crop protection inputs. The ... [Read more](#)

Frontier technologies v

Horizon technologies v



200+ Individual solutions



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3. Agriculture and forestry / Irrigation / Proven technologies

Smartphone control of alternative energy powered irrigation system

TECH-INNOV NIGER



The founder of the Tech-Innov company, Abdou Maman, has developed a remote-controlled irrigation system adapted to the semi-arid conditions of Niger in West Africa. It introduces the concepts of digital farms and tele-irrigation in support of agricultural development in the country. The company provides farmers with tools enabling them to move away from manual watering and reduce water waste. The system uses mobile devices so farmers can manage irrigation remotely and efficiently. It also integrates hydraulic and meteorological data so farmers can optimize water usage.

- Contracting type: For sale
- Technology level: Medium
- Country of origin: Niger
- Availability: Niger

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4. Water and coastal regions / Marine ecosystems / Proven technologies

Artificial reefs

Reefmaker



Reefmaker's patented process for artificial reefs uses Florida limestone. This soft rock matches the pH levels of the ecosystems targeted and provides a good substrate for marine life, allowing it to grow naturally. The limestone is attached to a concrete structure in a sloping design to ensure durability while increasing surface area for reef. A special deployment vessel equipped with cranes has been designed for accurate placement of the artificial reefs out to sea. In addition to coral reef restoration, the limestone reefs can also be used for oyster reef restoration, wave attenuation and erosion control. Structures can be designed to fit along the length of permanently fitted vertical poles attached to the sea bed. The aim is to keep the concrete proud of the marine floor and firmly retain the artificial reefs during extreme events like hurricanes. More than 50,000 reefs have been deployed along the US coast.

- Contracting type: For sale
- Technology level: Medium
- Country of origin: United States
- Availability: United States

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5. Cities / Infrastructure and services / Proven technologies

Decentralized water treatment and storage systems

Fluence Corporation



Resiliency in water infrastructure can be enhanced through decentralized water treatment and storage systems. Treating water at point of use can make water treatment more fit for purpose and effective compared to treating all water to a potable standard. Also decentralized water storage could be used for river flow management, irrigation or in emergency situations. Fluence is a company that provides modular, decentralized water and wastewater treatment solutions for remote locations. Water treatment systems are built into steel shipping containers. Transportation and site preparation is easy and installation quick. The technology has been developed for use in resorts and recreation sites. But similar solutions could potentially be used in emergency situations. For example, storms and hurricanes where central water supplies may be damaged or contaminated.

- Contracting type: For sale
- Technology level: Medium
- Country of origin: United States
- Availability: Worldwide

Direct link to the WIPO GREEN Database



WIPO GREEN
The Marketplace for Sustainable Technology

Home Database Projects Partners Resources IPO Green About us

Smartphone control of alternative energy powered irrigation system

FARMING & FORESTRY > IRRIGATION



Description Benefits Other Information

[Log in for access to additional information and attachments](#)

ID	147519
Owner	TECH-INNOV NIGER
Uploaded by	WIPO GREEN Admin
Type	Technology
Source	User uploads
Published	Oct 13, 2022
Updated	Oct 29, 2022

Remote-controlled irrigation system to manage irrigation remotely and efficiently.

The founder of the Tech-Innov company, Abdou Maman, has developed a remote-controlled irrigation system adapted to the semi-arid conditions of Niger in West Africa. It introduces the concepts of digital farms and tele-irrigation in support of agricultural development in the country. The company provides farmers with tools enabling them to move away from manual watering and reduce water waste. The system uses mobile devices so farmers can manage irrigation remotely and efficiently. It also integrates hydraulic and meteorological data so farmers can optimize water usage.

 EMAIL OWNER  VISIT WEBSITE

TECH-INNOV NIGER

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WIPO GREEN Database a central tool

- Free UN-based public database
- Major repository of innovative green technologies and needs
- Automatic matchmaking
- AI-based search functions
- “Patent2Solution” search
- 127.000 articles
- 3000 user uploads
- Simple registration and upload

Collections

Collections group needs and technologies from WIPO GREEN Acceleration Projects and other activities. WIPO GREEN Acceleration Projects actively identify pertinent needs within specific climate change, food security, and environmental issues in a country or region as well as potential innovative green solutions.

LAC Climate Smart Agriculture

Our Latin America Project focusing on zero-till in Brazil, sustainable agriculture and forestry in Argentina and Peru, and wine producers in Chile



POME Indonesia

Acceleration project in Indonesia on technology solutions for treating Palm Oil Mill Effluent (POME)



China Cities

Acceleration project in China seeking solutions to environmental needs in cities



Feeding 9bn

Ideas for how innovation can help feed the more than 9 billion people forecast to inhabit earth by 2050



GreenBook

Technologies for Climate Change Adaptation. Workplaces for the new WIPO flagship report



...heating and cooling using natural humidity fluctuations

The company has developed a construction element to be integrated into buildings, that reduces or even eliminates the need for heating, cooling or humidity balancing. This...

Mar 10, 2022

Tubular RO/NF membrane module for wastewater treatment

Tubular membranes have traditionally been used in various water treatment fields. In recent years, awareness of environmental conservation has increased worldwide, and...

[More...](#)

FEATURED ARTICLES

Jun 22, 2021
SEPURAN® GREEN

Evonik has developed a biogas upgrading process that makes the best use of the membranes' separation properties: Through the skillful connection of SEPURAN® Green...

Jun 14, 2021

Continuous fertigation with treated municipal wastewater as a sustainable wastewater reuse strategy in paddy rice cultivation

To promote resource recovery from municipal wastewater treatment plants (MWWTPs), we developed innovative rice irrigation systems known as continuous irrigation with treated...

Conclusions drawn from the work

- Adaptation solutions are available and they are varied
- Nature-based and no-regret solutions gaining attention
- Many solutions are both adaptation and mitigation
- Local adoption and customization often required
- High-tech also relevant in less-developed regions
- Adaptation still well behind mitigation but funding increasing
- Make solutions good business



WIPO Green Technology Book 2022

Solutions for Climate Change Adaptation



<https://www.wipo.int/en/green-technology-book/>

Short Impact & Adaptation Survey:



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