



What are the importance of innovation and technology for sustainable agriculture and WIPO GREEN's work to support it?

Webinar: The Role of IP in providing Sustainable Agriculture and Food Systems in the context of Climate Change

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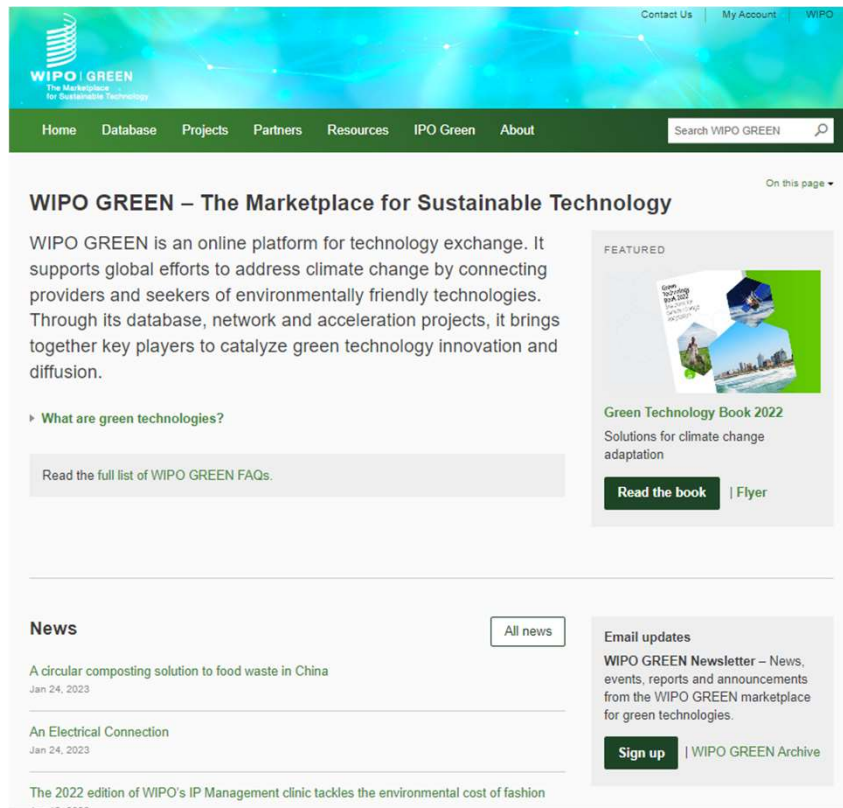




IP and Green Technologies

- Green technology not really different from other technologies
- Except possibly more frontline
- IP a cornerstone of the innovation ecosystem
- Innovation ecosystem is generating innovation and the capacity to adopt and adapt existing technologies
- IP an important factor in technology transfer
- Patent system generates vast amount of technological information
- Large public databases makes this widely available

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 a search bar. The main content area features a title 'WIPO GREEN – The Marketplace for Sustainable Technology' and a brief description of the platform. A 'FEATURED' section highlights the 'Green Technology Book 2022' with a 'Read the book' button. A 'News' section lists recent articles, and an 'Email updates' section offers a 'Sign up' button for the WIPO GREEN Newsletter.

- Green technology matchmaking initiative
- Increase understanding of innovative potential
- Deploy innovation in the field
- WIPO GREEN platform, visible implementation
- Combines all assets
 - Database
 - Projects
 - Partners
 - Resources / knowledge material

WIPO GREEN Database a central tool

- Free UN-based public database
- Major repository of innovative green technologies and needs
- Automatic matchmaking
- 129.000 articles
- 3900 user uploads
- Simple registration and upload
- No fees
- Integrated experts database
- No fees
- Search “WIPO GREEN” and go to the database

The screenshot displays the WIPO GREEN Database website. At the top, there is a navigation bar with links for Projects, Partners, Resources, IPO Green, About us, and Register. A search bar is prominently featured, with a search button and a 'Full Text Search' option. Below the search bar, a 'Register' button is visible. The main heading reads 'WIPO GREEN Database of Innovative Technologies and Needs'. A descriptive paragraph explains that the database is a free, solutions-oriented global innovation catalogue. Below this, there are seven category icons: ENERGY, WATER, FARMING FORESTRY, POLLUTION WASTE, TRANSPORTATION, PRODUCTS MATERIALS PROCESSES, and BUILDING CONSTRUCTION. The 'Collections' section lists various groups of needs and technologies, including 'Green Technology Book', 'Feeding 9bn', 'POME Indonesia', 'LAC Climate Smart Agriculture', and 'China Cities'. The 'Experts' section is partially visible at the bottom. On the right side, there are sections for 'LATEST ENTRIES' and 'FEATURED ARTICLES', each with a grid of article thumbnails and titles.

WIPO Green Technology Book

Solutions for Climate Change Mitigation and Adaptation



أكاديمية البحث العلمي والتكنولوجيا
Academy of Scientific Research
and Technology



CLIMATE TECHNOLOGY CENTRE & NETWORK

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The Green Technology Book - a digital first publication



WIPO
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



OR OFFIC

WIPO

3 Technology areas: Agriculture & Forestry Water & 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

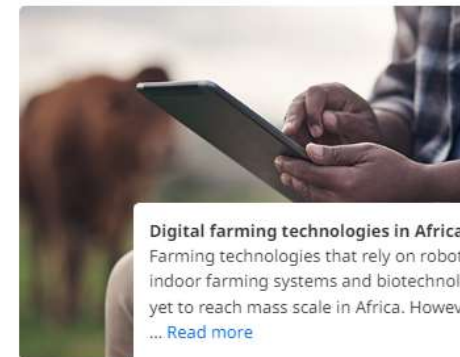
WIPO

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 ▾

WIPO

Focus on technology descriptions



WIPO



3. Agriculture and forestry / Climate-resilient plants / Frontier technologies
Pest control through release of self-limiting insects

Oxitec



Pest species such as armyworm, which feeds maize, sorghum and millet, have spread due to a warmer climate. It is especially destructive in Sub-Saharan Africa. Armyworm could potentially cost 10 of the continent's major maize producing economies between USD 2.2 and 5.5 billion a year in lost maize harvests.[1] Oxitec is a developer of biological solutions to pest control. They work by releasing genetically-engineered male insects with a self-limiting gene into the environment. When they reproduce with wild females, their offspring inherit a copy of this gene and do not survive to adulthood, resulting in a reduction in the pest insect population. This method can be used to control many different kinds of insect pests. Oxitec's technology is now being used to combat the autumn armyworm and improve agricultural outcomes.

- Contracting type: For sale
- Technology level: High
- Country of origin: United Kingdom
- Availability: Worldwide

WIPO



3. Agriculture and forestry / Healthy soils / Frontier technologies
Soil conservation in desert environments

Dake Rechsand



In the United Arab Emirates (UAE) and other Middle Eastern countries, a dry environment and high soil salinity pose challenges for agriculture. Dake Rechsand, based in the UAE, provides a "breathable sand" technology named Rechsand, suitable for soil conservation in such environments. This hydrophobic sand enables water to be retained for extended periods by stopping it from percolating down to the groundwater or soils below roots.

- Contracting type: For sale
- Technology level: Medium
- Country of origin: China, South Africa
- Availability: UAE, United States, India, China, South Africa



Direct link to the WIPO GREEN Database



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

Database Projects Partners Resources IPO Green About us Register Guided Tour

Green Technology Book

WIPO GREEN Database Collection

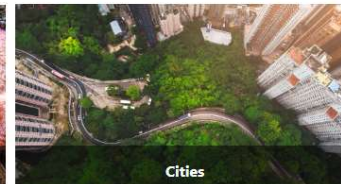
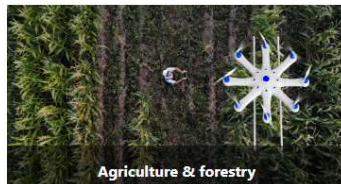


The new WIPO flagship publication showcases technologies for climate change adaptation. Upload to the database to become part of the collection.

Upload your technology or, if not registered, become a WIPO GREEN Database user

[Register](#)

Green Technology Book - Climate Change Adaptation



Green Technology Book - Climate Change Mitigation



Adaptation technologies



- Climate resilient plants
- Forest & ecosystem management
- Irrigation optimization
- Livestock
- Heathy soils
- Farming technologies
- Early warning systems, modelling and monitoring

Irrigation

Crop irrigation has been around for millennia. But faced with global water scarcity, a major area of technological development relates to water use efficiency in agriculture. To combat a predicted increase in global irrigation demand, we showcase innovative examples ranging from drip irrigation to water recycling and remote sensing technologies for precise water application.

PROVEN
FRONTIER
HORIZON

 Alternate wetting and drying (AWD) International Rice Research Institute	 Smartphone control of alternative energy powered i... TECH-INNOV NIGER	 Irrigation control system Agua Control	 Bhungroo rainwater conservation and irrigation Naireeta Services	 Solar irrigation Sunculture Solar, Inc.	 Solar-powered irrigation pumps Simusolar
 Precision irrigation management software Hortau Inc.	 Low-pressure irrigation system Netafim	 Lining irrigation canals giz	 Water Pearls to reduce crop water consumption and ... RHST Industries		

Adaptation - livestock section



Livestock



Despite demand expected to double by 2050, livestock is expected to decline globally. Technologies and climate adaptation solutions often relate to developing resilient feed crop and livestock breeds, pasture rehabilitation and optimizing feed and production systems. This section also presents advances in heat stress detection and management, and digital technologies for livestock monitoring and precision ranching.

PROVEN FRONTIER HORIZON



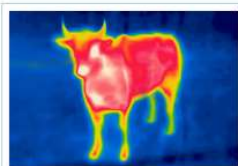
Livestock misting and fogging systems

Truemist



Feed additive and monitoring app for heat stress m...

Thermo



Infrared thermography for heat stress detection

Teledyne FLIR



Conservation of climate-resilient indigenous breed...

AgTech Inc.



Hydrogreen vertical greenhouse livestock feed farm...

CubicFarm® Systems



Croc Trough Pumps

Croc Trough



Improved forage through Chinese juncao technology

Chinese National Engineering Research Ce...



Smart tags for livestock monitoring

Ceres Tag



Livestock control with virtual fencing

Vence



Improved forage through Chinese Juncao technology

National Engineering Research Center for...

See in Database...

Climate resilient plants



PROVEN FRONTIER HORIZON



Seawater rice

Qingdao Hybrid Rice Research Center



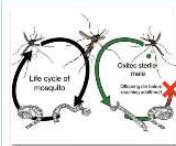
Push-pull technology and intercropping

International Centre of Insect Physiolog...



Improved drought tolerance by priming with seaweed

BioAtlantis



Pest control through release of self-limiting inse...

Oxitec



Potato varieties for mid-altitude, semi-humid subt...

CGIAR



Photo-selectivity mesh for crops

Hortomallas



Parasitoids against fall army worm

Dream Team Agro Consultancy



Special fertilizers composed of glycine chelates

Vert Agrotecnologia Ltda

Climate-resilient plants



Plants must increasingly adapt to salinity, drought, floods and other climate-related impacts. From conventional breeding techniques to CRISPR technology for genetically-modified crops, technology can help increase plant tolerance to such stressors. Meanwhile, integrated farming systems like agroforestry are gaining recognition as a means of strengthening crop resiliency and responding to food security threats.

PROVEN FRONTIER HORIZON



Restoring plants natural heat defense systems

Duke University



Glacial rock flour for yield productivity

Ilisimatursarfik University of Greenland



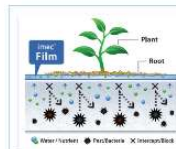
Crop gene-editing using CRISPR technology

Pairwise



Robotics, sensors and machine learning for more ef..

Alphabet



Imec® - Growing Vegetables with Less Water

Mebiol Inc.

Mitigation technologies

- Livestock
- Soils
- Cultivation (wet rice)
- Land use and forestry

Livestock



Livestock causes most of the GHG emission from agriculture. Enteric fermentation and waste are major sources. Innovations maintain high levels of animal protein in our diet.

PROVEN FRONTIER HORIZON

 <p>Insect ingredient production for people, animals,... Ynsect</p>	 <p>NP Rumen a 100% natural feed additive that reduces... LIAV (Industrial Laboratory for Veterin...</p>	 <p>Using seaweed as a feed ingredient to livestock by... FutureFeed</p>	 <p>Hydrogreen vertical greenhouse livestock feed farm... CubicFarm® Systems</p>
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PROVEN FRONTIER HORIZON

 <p>Natural feed supplement to reduce methane emission... MOOTRAL</p>	 <p>Using non-GMO cells for cellular meat production MIRAI FOODS</p>	 <p>Cultured Meat Creation Technology JOES FUTURE FOOD</p>	 <p>Methane absorbing wearable for cows ZELP</p>	 <p>Plant grown animal protein - molecular farming Moolec</p>	 <p>Innovative technology for the effective use of met... Osaka University</p>
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Soil mitigation solutions



Soils



Healthy soils contain large reservoirs of carbon. This can be maintained to act as a carbon sink or it can be released when soils are cultivated unsustainably.

⚙️ PROVEN
⚙️ FRONTIER
⚙️ HORIZON



Restoring degraded farmlands with a climate resili...

Terviva



Soil Microbiology

Duverde Eco Soluções



Drones for spraying biological products

TERRA ECOLOGICA CONSULTORIA LTDA.



Soil microbiome - Soil genetic analysis

GoSolos LTDA



Soil fertility through microbial selection

University of Arizona / Tech Launch Ariz...



Soil carbon platform for farmers

Agreena

Examples

3. Agriculture and forestry / Irrigation / Proven technologies
 Alternate wetting and drying
 International Rice Research Institute (IRRI)



Soil carbon platform for farmers

FARMING & FORESTRY > SOIL IMPROVEMENT | FARMING & FORESTRY



Description

A Fintech company focused on regenerative agriculture, stream and soil health.

Agreena offers a range of services for agriculture, including benefits for soil health, modelling and data analysis.

ID 148034
Owner Agreena

water level can be allowed to drop again before re-irrigation. AWD does not require a well-functioning irrigation management system.

- Contracting type: Free/Locally available
- Technology level: Medium
- Country of origin: N/A
- Availability: Lowland rice-growing areas

Methane absorbing wearable for cows

FARMING & FORESTRY > LIVESTOCK



Description Benefits Other Information

A British company is developing a wearable for cows that can absorb methane. The wearable contains a solar-powered pump that draws air into a chamber where it is oxidized to CO2 in a chemical reaction. The wearable can also be used for other purposes and conditions. Several patents have been obtained.

ID 148279
Owner ZELP
Uploaded by WIPO GREEN Admin
Type Technology
Source User uploads
Published Jun 21, 2023
Updated Jun 26, 2023

 EMAIL OWNER
 VISIT WEBSITE
ZELP

- Country of origin: Republic of Ireland
- Availability: Worldwide



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Thank you !

wipo.int/green



SEARCH

We invite you to search for technologies on our database.



UPLOAD

Register to be a WIPO GREEN user and upload your technology needs and solutions.



CONNECT

The automated matchmaking function on our database makes it easy to connect with technology seekers and providers.