Food and Agriculture Organization of the United Nations

FAO virtual booth for the 9th World Water Forum

9TH WORLD WATER FORUM | DAKAR 2021

Cover photo: © FAO/Sarah Elliott

Introduction

By 2050, the world needs to produce an estimated 50 percent more food than in 2012 to ensure global food security, and it must do so while conserving and enhancing the natural resource base. Water is a major input and environmental condition in the provision of food – from production in the field through all the steps in the supply chain. Water is also required to meet personal and household needs, for energy and industrial production, and to maintain important water-dependent ecosystems and their services. With demand and competition for water on the rise, however, the planet's water resources are under unprecedented stress due to climate change, pollution, and poor governance. Agriculture holds the key to successfully achieving the objectives and aspirations articulated in the 2030 Sustainable Development Goals, the Paris Agreement on climate change and the Post-202 Global Biodiversity Framework under finalization. It is also crucial to the livelihoods of over 500 million smallholder farmers and rural communities worldwide. Countries have identified agriculture as a major sector of intervention in their nationally determined contributions (NDC) to the mitigation of climate change, and many have placed water at the top of the list for envisaged adaptation measures.

Water in FAO's mandate

1. Provide information and knowledge through the collection, analysis, interpretation and dissemination of information on water in the context of food and agriculture. FAO fosters knowledge management to improve decision-making and facilitates the timely availability of information for its member countries and partners.
2. Provide legal, policy and technical advice and support, as follows:
    - Legal advisory services for the development, use and protection of freshwater resources, including national water resource legislation and legal issues related to international waters.
    - Support for the formulation, monitoring and evaluation of sustainable water resource policies and strategies and capacity development in public institutions dealing with policy issues.
    - Support for the development of technical capacities to manage agricultural water sustainably and efficiently through best practices on water use and conservation, from water sources to final uses.
3. Contribute to the international water agenda, global knowledge and development as it relates to food and agriculture.
    - FAO is the lead organization in the UN system on water in the context of food and agriculture. FAO collaborates with other UN organizations and international bodies on the preparation of strategic studies, including the UN World Water Development Reports, and at forums such as the World Water Forum. FAO is an active member of UN-Water, which it chaired for two years (2008 and 2009).
4. Advocate for agricultural water
    - FAO is a key partner in the implementation of the Convention on Biological Diversity, the UN Convention to Combat Desertification and the UN Framework Convention on Climate Change, all of which are directly related to agricultural water.

Shaped by these new challenges, FAO's works in water is responding decisively to the needs of its member countries.

Key publications on FAO's work in water for agriculture

The State of the World's Land and Water Resources for Food and Agriculture – Systems at breaking point - SOLAW 2021)

English Version: https://www.fao.org/3/cb7654en/cb7654en.pdf

French Version: https://www.fao.org/3/cb7654fr/cb7654fr.pdf

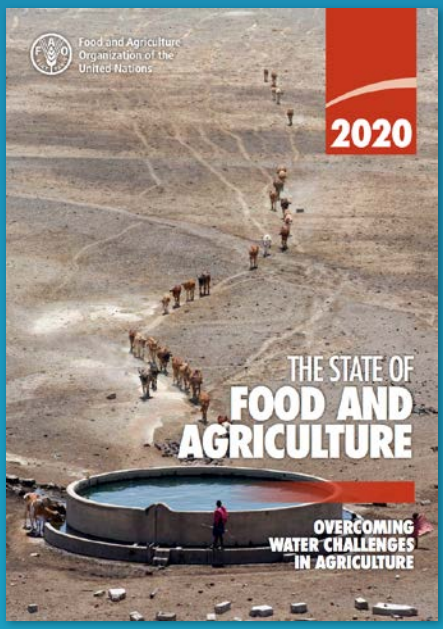
Spanish Version: https://www.fao.org/3/cb7654es/cb7654es.pdf

Chinese Version: https://www.fao.org/3/cb7654zh/cb7654zh.pdf

Arabic Version: https://www.fao.org/3/cb7654ar/cb7654ar.pdf

Russian Version: https://www.fao.org/3/cb7654ru/cb7654ru.pdf

Digital Version: https://www.fao.org/3/cb7654en/online/cb7654en.html



The State of Food and Agriculture 2020

English Version: http://www.fao.org/3/cb1447en/CB1447EN.pdf

French Version: http://www.fao.org/3/cb1447fr/CB1447FR.pdf

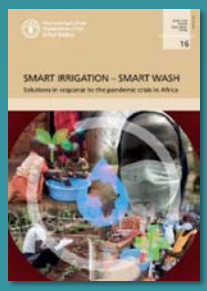
Spanish Version: http://www.fao.org/3/cb1447es/CB1447ES.pdf

Chinese Version: http://www.fao.org/3/cb1447zh/CB1447ZH.pdf

Arabic Version: http://www.fao.org/3/cb1447ar/CB1447AR.pdf

Russian Version: http://www.fao.org/3/cb1447ru/CB1447RU.pdf

WASH publications



Smart Irrigation – Smart WASH: solutions in response to the pandemic crisis in Africa

FAO Land and Water Discussion Paper 16
2020

http://www.fao.org/3/cb1306en/CB1306EN.pdf

Circular sanitation economies for more resilient and sustainable food systems - Future proofing agriculture systems

FAO Land and Water Discussion Paper 16
2021

http://www.fao.org/3/cb2444en/cb2444en.pdf

Water, sanitation, hygiene and wastewater management to prevent infections and reduce the spread of antimicrobial resistance

Technical Brief

English Version: https://www.fao.org/3/ca9120en/ca9120en.pdf
French Version: https://www.fao.org/3/ca9120fr/ca9120fr.pdf
Spanish Version: https://www.fao.org/3/ca9120es/ca9120es.pdf
Russian Version: https://www.fao.org/3/ca9120ru/ca9120ru.pdf
Portuguese Version: https://www.fao.org/3/ca9120pt/ca9120pt.pdf

---

Assessment of treated wastewater for agriculture in Lebanon

2016

English Version: http://www.fao.org/3/a-i5394e.pdf
Arabic Version: http://www.fao.org/3/a-i5394a.pdf

The wealth of waste - The economics of wastewater use in agriculture

FAO Water Report 35
2010

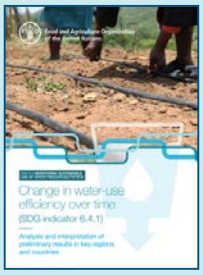
English Version: http://www.fao.org/3/cb1306en/CB1306EN.pdf
Spanish Version: https://www.fao.org/3/i1629s/i1629s.pdf

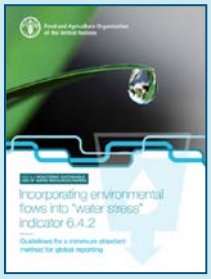
SDG 6.4.1 and 6.4.2 indicators

Change in water use efficiency over time - SDG 6.4.1 - Analysis and Interpretation of Preliminary Results in Key Regions and Countries

2019

http://www.fao.org/3/ca5400en/CA5400EN.pdf





Incorporating environmental flows "Water stress" indicator 6.4.2 - Guidelines for a minimum standard method for global reporting

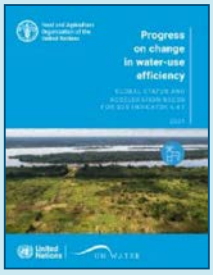
2019

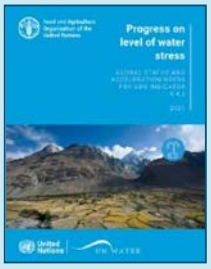
http://www.fao.org/3/ca3097en/CA3097EN.pdf

Progress on change in water-use efficiency - Global status and acceleration needs for SDG indicator 6.4.1

2021

http://www.fao.org/3/cb6413en/cb6413en.pdf





Progress on level of water stress - Global status and acceleration needs for SDG indicator 6.4.2

2021

http://www.fao.org/3/cb6241en/cb6241en.pdf

---

e-Learning courses

SDG Indicator 6.4.1 -
Change in water-use efficiency over time

English: https://elearning.fao.org/course/view.php?id=475

Arabic: https://elearning.fao.org/course/view.php?id=792

Spanish: https://elearning.fao.org/course/view.php?id=761

Russian: https://elearning.fao.org/course/view.php?id=592

SDG Indicator 6.4.2
Level of water stress: freshwater withdrawal in percentage of available freshwater resources

English: https://elearning.fao.org/course/view.php?id=365

French: https://elearning.fao.org/course/view.php?id=519

Spanish: https://elearning.fao.org/course/view.php?id=518

Russian: https://elearning.fao.org/course/view.php?id=588

Water accounting & water productivity

Water accounting

Water accounting and auditing – A sourcebook

FAO Water Report 43
2016

English Version: http://www.fao.org/3/a-i5923e.pdf

French Version: https://www.fao.org/3/i5923fr/I5923FR.pdf

Water accounting for water governance and sustainable development

White paper
2018

http://www.fao.org/3/I8868EN/i8868en.pdf

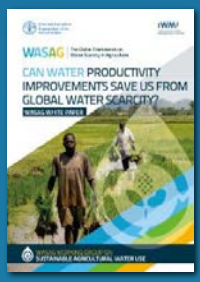
Rapid Water Accounting in the Near East and Northern Africa region

Malawi site in Al Minya, Egypt:
http://www.fao.org/3/cb4194en/cb4194en.pdf

Qazvin Irrigation Network, Iran Al-Mashare', Jordan:
https://www.fao.org/3/cb3654en/cb3654en.pdf

Al-Moqatta', Palestine:
https://www.fao.org/3/cb3654en/cb3654en.pdf

Water productivity



Can water productivity improvements save us from global water scarcity?

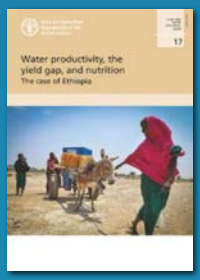
WASAG White Paper
2021

http://www.fao.org/3/cb3896en/cb3896en.pdf

Can water productivity improvements save use from global water scarcity?

WASAG workshop report
2021

https://www.fao.org/3/cb3880en/cb3880en.pdf



Water productivity, the yield gap, and nutrition

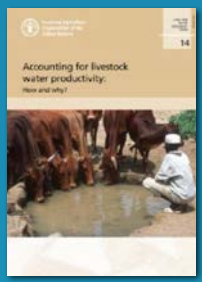
FAO Land and Water Discussion Paper 17
2021

http://www.fao.org/3/cb3866en/cb3866en.pdf

Accounting for livestock water productivity: How and why?

FAO Land and Water Discussion Paper 14
2021

http://www.fao.org/3/ca7565en/ca7565en.pdf



Guidance on realizing real water savings with crop water productivity interventions

FAO Water Report 46
2021

https://www.fao.org/3/cb3844en/cb3844en.pdf

The AquaCrop model: enhancing crop water productivity

FAO Water Report 47
2021

https://www.fao.org/3/cb7392en/cb7392en.pdf

Water productivity (continued)

Yield gap analysis of field crops - Methods and case studies

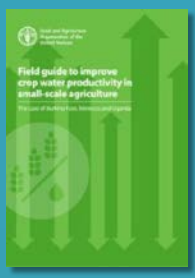
FAO Water Report 41
2014

http://www.fao.org/3/i4695e/I4695E.pdf

Field guide to improve crop water productivity in small-scale agriculture - The case of Burkina Faso, Morocco and Uganda

2020

http://www.fao.org/3/ca8443en/CA8443EN.pdf



Policy guide to improve water productivity in small-scale agriculture - The case of Burkina Faso, Morocco and Uganda

2020

https://www.fao.org/3/ca7596en/CA7596EN.pdf

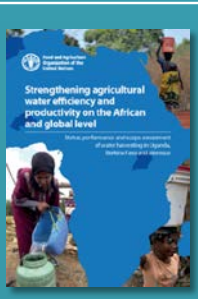
Strengthening agricultural water efficiency and productivity on the African and global level - Status, performance and scope assessment of water harvesting in Uganda, Burkina Faso and Morocco

2016

English Version: http://www.fao.org/3/a-i5976e.pdf

French Version: http://www.fao.org/3/a-i5976f.pdf

Arabic Version: http://www.fao.org/3/a-i5976a.pdf



Field guide to improve water use efficiency in small-scale agriculture - The case of Burkina Faso, Morocco and Uganda

2019

http://www.fao.org/3/ca5789en/CA5789EN.pdf

Policy guide to improve water-use efficiency in small-scale agriculture - The case of Burkina Faso, Morocco and Uganda

2019

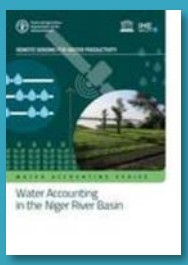
https://www.fao.org/3/ca7144en/ca7144en.pdf

WaPOR portal: Water productivity through remote sensing

WaPOR database methodology Version 2

2020

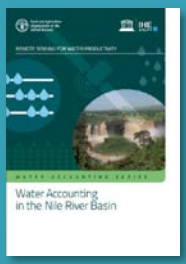
https://www.fao.org/3/ca9894en/ca9894en.pdf



Water Accounting in the Niger River Basin

WaPOR Water Accounting series
2020

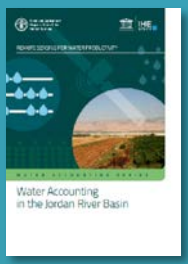
https://www.fao.org/3/cb1274en/cb1274en.pdf



Water accounting in the Nile River Basin

WaPOR Water Accounting series
2020

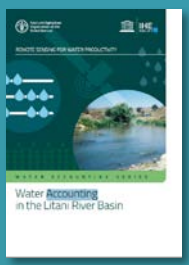
http://www.fao.org/3/ca9895en/CA9895EN.pdf



Water accounting in the Jordan River Basin

WaPOR Water Accounting series
2020

http://www.fao.org/3/ca9181en/CA9181EN.pdf



Water Accounting in the Litani River Basin

WaPOR Water Accounting series
2019

http://www.fao.org/3/ca6679en/ca6679en.pdf

WaPOR Capacity Development series: Stakeholder mapping and needs assessment in Koga, Ethiopia

2018

https://www.fao.org/3/ca1202en/CA1202EN.pdf

WaPOR and ICT

Case study
2021

https://www.fao.org/3/cb4214en/cb4214en.pdf

Irrigation management

Multiple uses of water services in large irrigation systems - Auditing and planning modernization - The MASSMUS Approach

FAO Irrigation and Drainage Paper 67
2013

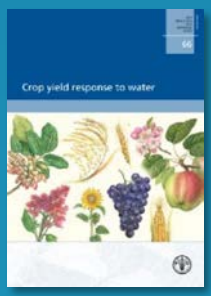
http://www.fao.org/3/i3414e/i3414e.pdf

Crop yield response to water

FAO Irrigation and Drainage Paper 66
2012

English version: http://www.fao.org/3/i2800e/i2800e.pdf

Spanish version: https://www.fao.org/3/i2800s/i2800s.pdf



Modernizing irrigation management – the MASSCOTE approach

FAO Irrigation and Drainage Paper 66
2007

http://www.fao.org/3/a-a1114e.pdf

Irrigation management (continued)

Guidelines on spate irrigation

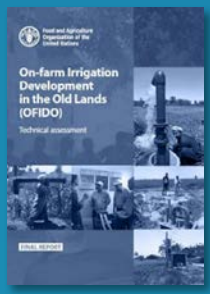
FAO Irrigation and Drainage Paper 65
2010

http://www.fao.org/3/i1680e/i1680e.pdf

Does improved irrigation technology save water? A review of the evidence- Discussion paper on irrigation and sustainable water resources management in the Near East and North Africa

2017

http://www.fao.org/3/I7090EN/i7090en.pdf



On-farm Irrigation Development Project in the Old Lands (OFIDO)

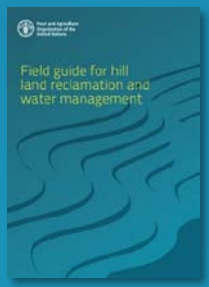
Technical assessment
2020

http://www.fao.org/3/cb0484en/CB0484EN.pdf

Field guide for hill land reclamation and water management

2020

http://www.fao.org/3/ca8381en/CA8381EN.pdf



Assessment of the water harvesting sector in Jordan

2016

http://www.fao.org/3/a-i5390e.pdf

Nature-based solutions and agriculture

Nature-based solutions in agriculture: Sustainable management and conservation of land, water and biodiversity

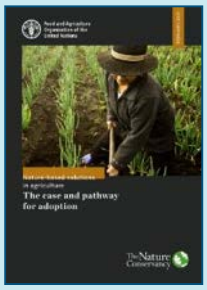
FAO and TNC
2021

http://www.fao.org/3/cb3140en/cb3140en.pdf

Nature-based solutions in agriculture: The case and pathway for adoption

FAO and TNC
2021

http://www.fao.org/3/cb3141en/cb3141en.pdf



Nature-based solutions in agriculture: Project design for securing investment

FAO and TNC

http://www.fao.org/3/cb3144en/cb3144en.pdf

Nature-Based Solutions for agricultural water management and food security

FAO Land and Water Discussion Paper 12
2018

http://www.fao.org/3/CA2525EN/ca2525en.pdf

Water management and governance

Exploring the concept of water tenure

FAO Land and Water Discussion Paper 102016

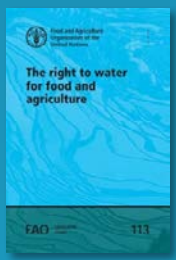
http://www.fao.org/3/a-i5435e.pdf

Unpacking water tenure for improved food security and sustainable development

FAO Land and Water Discussion Paper 15
2020

English version: http://www.fao.org/3/cb1230en/CB1230EN.pdf

Spanish version: http://www.fao.org/3/cb1230es/cb1230es.pdf



The right to water for food and agriculture

2020

http://www.fao.org/3/ca8248en/CA8248EN.pdf

Water auditing/water governance analysis
A methodological guide

2022

Available soon – check here for updates:
https://www.fao.org/policy-support/governance/en/

Water management and governance (continued)

Gobernanza del agua en territorios agrícolas - Estudio de caso en Panamá

Subcuenca del río Candela y de la región hidrográfica Volcán-Cerro Punt
2021

http://www.fao.org/3/cb3728es/cb3728es.pdf

Gobernanza del agua en territorios agrícolas - Estudio de caso en Guatemala

Microcuenca del río Los Amates
2021

http://www.fao.org/3/cb3731es/cb3731es.pdf

Gobernanza del agua en territorios agrícolas - Estudio de caso en El Salvador

Microcuenca El Jute
2021

http://www.fao.org/3/cb3733es/cb3733es.pdf

Gobernanza del agua en territorios agrícolas - Estudio de caso en Chile

Subcuenca del río Tinguiririca
2021

http://www.fao.org/3/cb3617es/cb3617es.pdf

Gobernanza del agua en territorios agrícolas - Estudio de caso en Perú

Subcuenca del río Tinguiririca
2021

http://www.fao.org/3/cb3756es/cb3756es.pdf

Water scarcity, drought and climate change

A rapid review of drought risk mitigation measures - Integrated drought management

2021

https://www.fao.org/3/cb7085en/cb7085en.pdf

Vers une vision maghrébine pour le renforcement de la résilience à la sécheresse

Policy Brief
2021

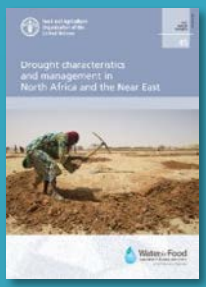
https://www.fao.org/3/cb6399fr/cb6399fr.pdf

Coping with water scarcity - An action framework for agriculture and food security

FAO Water Report 38
2012

http://www.fao.org/3/i3015e/i3015e.pdf

Water scarcity, drought and climate change (continued)



Drought Characteristics and management in North Africa and the Near East

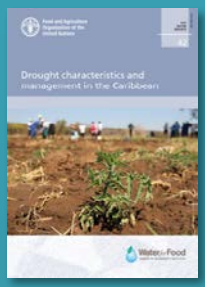
FAO Water Report 45
2018

https://www.fao.org/3/CA0034EN/ca0034en.pdf

Drought characterization and management in Central Asia Region and Turkey

FAO Water Report 44
2017

http://www.fao.org/3/a-i6738e.pdf



Drought Characteristics and Management in the Caribbean

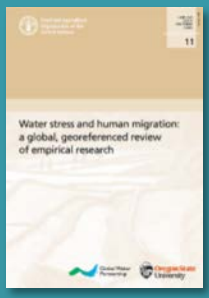
FAO Water Report 42
2015

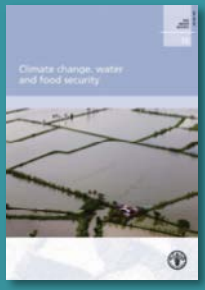
http://www.fao.org/3/a-i6738e.pdf

Water stress and human migration: a global, georeferenced review or empirical research

FAO Land and Water Discussion Paper 12
2018

http://www.fao.org/3/I8867EN/i8867en.pdf



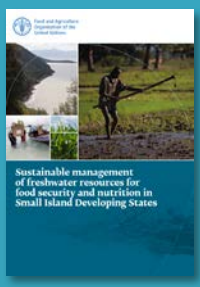


Climate change, water and food security

FAO Water Report 38
2011

http://www.fao.org/3/a-i2096e.pdf

Water scarcity, drought and climate change (continued)



Sustainable management of freshwater resources for food security and nutrition in Small Island Developing States

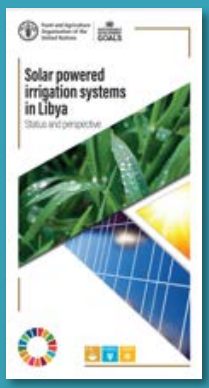
2021

https://www.fao.org/3/cb7200en/cb7200en.pdf

Solar powered irrigation systems in Libya - Status and perspectives

2021

http://www.fao.org/3/cb4139en/cb4139en.pdf



The benefits and risks of solar-powered irrigation – a global overview

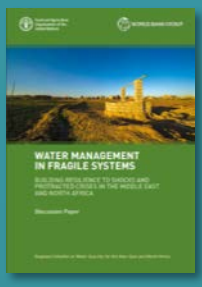
2018

http://www.fao.org/3/i9047en/I9047EN.pdf

Land and water governance to achieve the SDGs in fragile systems

2019

http://www.fao.org/3/ca5172en/CA5172EN.pdf

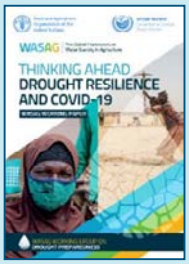


Water Management in Fragile Systems Building Resilience to Shocks and Protracted Crises in the Middle East and North Africa

2018

http://www.fao.org/3/I9730EN/i9730en.pdf

COVID-19 response



Thinking ahead drought resilience and COVID-19

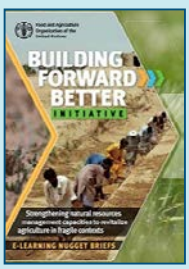
WASAG Working Paper
2021

http://www.fao.org/3/cb5547en/cb5547en.pdf

Building forward better initiative
Strengthening natural resources management capacities to revitalize agriculture in fragile contexts

E-learning Nugget Brief
2021

https://www.fao.org/3/cb7309en/cb7309en.pdf



Building forward better initiative
Strengthening natural resources management capacities to revitalize agriculture in fragile contexts

Initiative Summary & E-learning Nugget Briefs
2020

http://www.fao.org/3/ca9465en/ca9465en.pdf

Videos

The state of the world's land and water resources for food and agriculture

https://www.youtube.com/watch?v=g2sJTVTi8Lg

State of Food and Agriculture (SOFA) 2020: Overcoming water challenges in agriculture

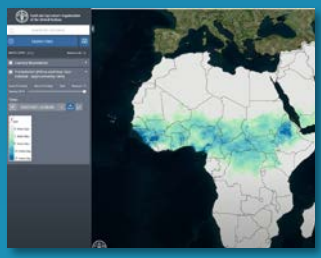
https://www.youtube.com/watch?v=05-k0ql0od4

What does water mean to you?

https://www.youtube.com/watch?v=lZ6ZIdlgv2A

Drought and agriculture - Predict, plan and prepare: Stop drought becoming famine

https://www.youtube.com/watch?v=J5WMyD9-CHs



The use of WaPOR data to monitor agricultural production in near real time

https://www.youtube.com/watch?v=gA_t4HuFNhM

Global Agro-Ecological Zones Version 4

https://www.youtube.com/watch?v=gNpk8rlfO2E

Water Tenure

English version: https://www.youtube.com/watch?v=zdIMEm5zTA0

French version: https://www.youtube.com/watch?v=Mhxy_wajeSY

Sinhala version: https://www.youtube.com/watch?v=MhUyr1vM-qY

Tamil version: https://www.youtube.com/watch?v=cs_uldtfqHo

Wolof version: https://bit.ly/3s47rcv

Kinyarwanda version: https://bit.ly/32A960U

Related links

FAO Sub-regional Office for West Africa
https://www.fao.org/africa/west-africa/en/

AQUASTAT - FAO's global water information system
http://www.fao.org/nr/water/aquastat/main/index.stm

Remote sensing for water productivity (WaPOR)
http://www.fao.org/in-action/remote-sensing-for-water-productivity/en/

AQUAmaps, spatial database on water and agriculture
http://www.fao.org/nr/water/aquamaps/

KnoWat – Knowing water better
http://www.fao.org/in-action/knowat/en/

Contact us

FAO Land and Water Division,
email: land-water@fao.org
website: http://www.fao.org/land-water/en/
Twitter: @FAOLandWater

Food and Agriculture Organization of the United Nations
Rome, Italy