

Emerging Role of Urban
Agriculture and Food
Production to Address Food
Security and Water Resource
Challenges

*2021 SUSTAINING COLORADO
WATERSHEDS CONFERENCE*

*“TOGETHER LIKE NEVER
BEFORE”*

Ochotona
Consulting



ochotona

Urban Agriculture: A Multi-beneficial Strategy

Urban agriculture is agricultural production that occurs in or near a city and is often centered around communal benefits such as community cohesion, food security, soil health, and urban biodiversity enhancement.^[1]

People: access to fresh foods, improved food security, adds much needed green space, and contributes toward community cohesion

Planet: reduces the urban heat island effect, reduces food miles, controls run-off, and

Profit: creates community wealth, financial savings, and job opportunities



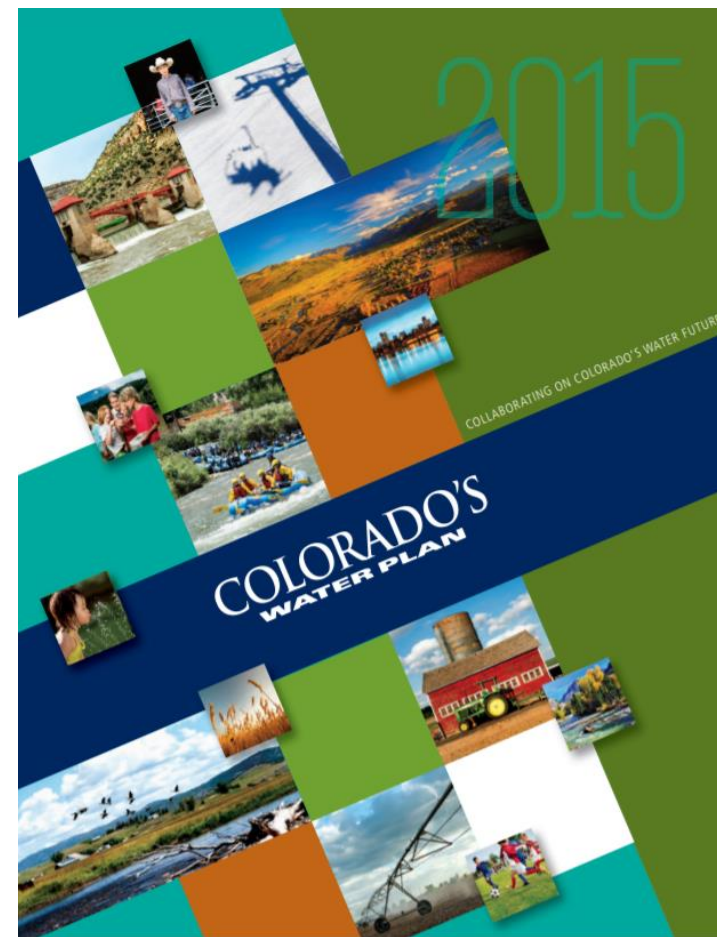
Figure 1. Mountair Park Community Farm in Lakewood, CO. Operated by Sprout City Farms.

Urban Agriculture & the Colorado Water Plan



ochotona

- The original plan doesn't touch on urban agriculture water issues/opportunities (neither does the South Platte or Metro BIPs, for that matter)
- Based on CWCB's community listening sessions and literature review project, it is now known that there's an active and growing urban agriculture community in Colorado and that they face some unique water issues
- Current water planning acknowledges that urban ag can play a pivotal role in expanding recycled water and can help further green infrastructure and water conservation objectives



Denver One Water Plan: Cross Cutting Themes



- Identify opportunities where regulatory updates can be made to allow more urban agriculture (urban gardens, plant nurseries, etc.), improve existing agricultural systems and management practices, and streamline the permit process.
- Integrate water aspects of City and County of Denver's Green Infrastructure Implementation Strategy, Denver Living Streets, Water Quality Management Plan, and Storm Drainage Master Plan
- Create a framework with comprehensive criteria to identify and prioritize multi-benefit projects or water management strategies based on measures of social, environmental, and economic benefits and costs



Why Water Reuse?

Wastewater can be treated up to different qualities to satisfy demand from different sectors, including industry and agriculture.

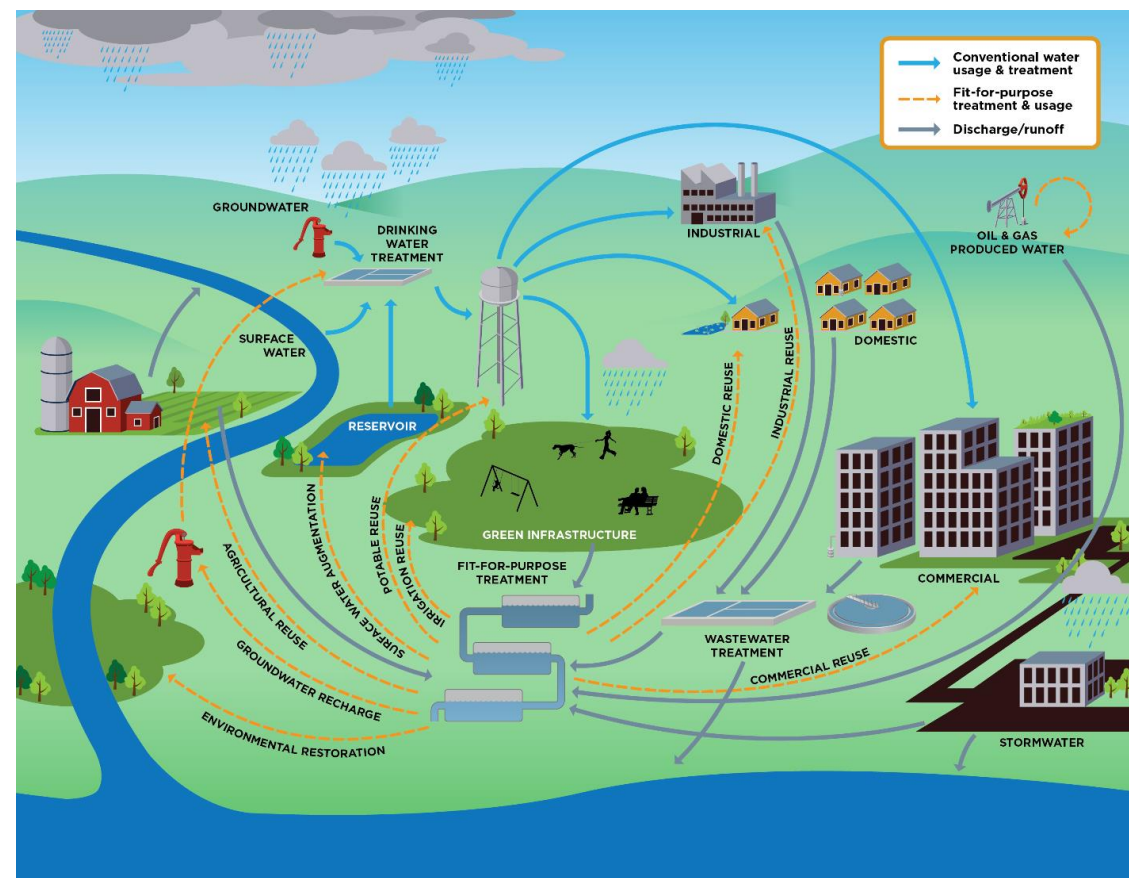
It can be processed in ways that support the environment—and can even be reused as drinking water. Wastewater treatment frees scarce freshwater resources for other uses or preservation.

In addition, by-products of wastewater treatment can become valuable for agriculture and energy generation, making wastewater treatment plants more environmentally and financially sustainable.

<https://www.worldbank.org/en/topic/water/publication/wastewater-initiative>



ochotona

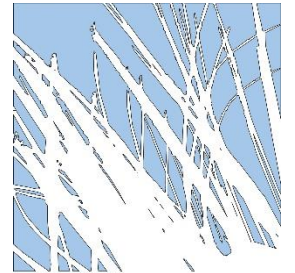


<https://www.epa.gov/sites/production/files/2019-11/water-reuse-flowchart.png>

Colorado State Regulation 84

Purpose: The purpose of this regulation is to establish requirements, prohibitions, standards and concentration limits for the use of reclaimed water to protect public health and the environment while encouraging the use of reclaimed water.

<https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=8485&fileName=5%20CCR%201002-84>



ochotona

Regulation 84 Expansion: Edible Crops



In January 2020, new rules went into effect that allow for the irrigation of edible crops under Regulation 84. There are three new user categories:

- Commercial*
- Noncommercial**
- Residential***

*Commercial Growing Food Crop Operation means a “covered farm” under the Food Safety Modernization Act, Produce Safety Rule. 21 CFR 112.4.

**Non-Commercial Food Crop Growing Operation means any operations growing food crops that are not considered a “covered farm” under the Food Safety Modernization Act, Produce Safety Rule, 21 CFR 112.4.

***Resident-Controlled Food Crop Irrigation means irrigation of vegetables, fruits and other food crops located on the property dedicated to a single residential property (e.g. the garden for a single residence such as a house, row home or duplex).



<https://grpg.org/visit/guadalupe-gardens/community-garden/>

Promising Practices: Urban Agriculture & Water Conservation



Denver Water & Denver Urban Gardens (2015)

- Community gardens: 11 gal/ ft²
- Traditional bluegrass: 18 gal/ ft²
 - **40% water savings**

Aurora Water (2015)

- Turf to veggie conversions at two sites (City Hall and Griswold)
 - **74% water savings**

California Farm & Garden (2021)

- Replacing lawns with vegetable and fruit gardens
 - **75% water savings**



Stormwater Management & Urban Agriculture



- Sister Garden Farms - Denver
 - Designed proactively to manage stormwater
- City and County of Denver - Green Infrastructure Implementation Strategy (2018)
 - Water Resources Center at the National Western Complex
- New York (2016)
 - Community gardens in NYC may be retaining 12 million gallons of stormwater annually

“Urban agriculture is an innovative green stormwater infrastructure tool that can be implemented in vacant lots or previously vegetated areas. Urban agriculture not only reduces stormwater runoff but it also increases the nutritional health of the surrounding community, improves the local economy, and provides residents with green space.”

- American Rivers, 2015

At the Intersection of Water Reuse & Urban Agriculture: Action Steps for the CWCB



- Pursue demonstration projects with municipal and agricultural partners to understand the water use/conservation tradeoffs between urban agriculture and other landscaping options
- Demonstration projects can inform state and local government land and water use planning efforts such as Growing Water Smart, water efficiency plans, and municipal integrated water planning initiatives to incorporate urban agriculture as a water conservation strategy with significant community co-benefits
- Create a demonstration project assessing the green infrastructure and carbon sequestration benefits of urban agriculture in a semi-arid state
- Results will inform state planning and programming, including making urban agriculture development an eligible activity under the 319 Non-Point Source Grant Program and the state Clean Water Revolving Fund
- Develop a technical assistance and financial resources water hub for urban agricultural producers for the Front Range region

At the Intersection of Water Reuse & Urban Agriculture: Action Steps for the CWCB



- Securing funding to address infrastructure needs
- Developing model ordinances to encourage urban agriculture
- Hosting training events on topics such as recycled water for edible crops
- Launch a recycled water demonstration project focusing on edible crop cultivation demonstration of the project will assess the cost-effectiveness for producers to transition from municipal tap (potable) to recycled water and evaluate other potential concerns such as salinity levels, nutrient management, and crop quality
- CWCB will work with local partners and water providers to develop education materials for producers to assist in navigating the current recycled water regulations and associated food safety requirements

National & International Support: Taking A Coordinated Approach



- *2017: United Nations World Water Development Report, “Wastewater: The Untapped Resource”*

<http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/2017-wastewater-the-untapped-resource/>

- *September 2019: draft National Water Reuse Action Plan*

<https://www.epa.gov/sites/production/files/2019-09/documents/water-reuse-action-plan-draft-2019.pdf>

- *February 2020: Water Reuse Action Plan (WRAP): Improving the Security, Sustainability, and Resilience of Our Nation’s Water Resources*

<https://www.epa.gov/sites/production/files/2020-02/documents/national-water-reuse-action-plan-collaborative-implementation-version-1.pdf>

"All the water that will ever be is,
right now."

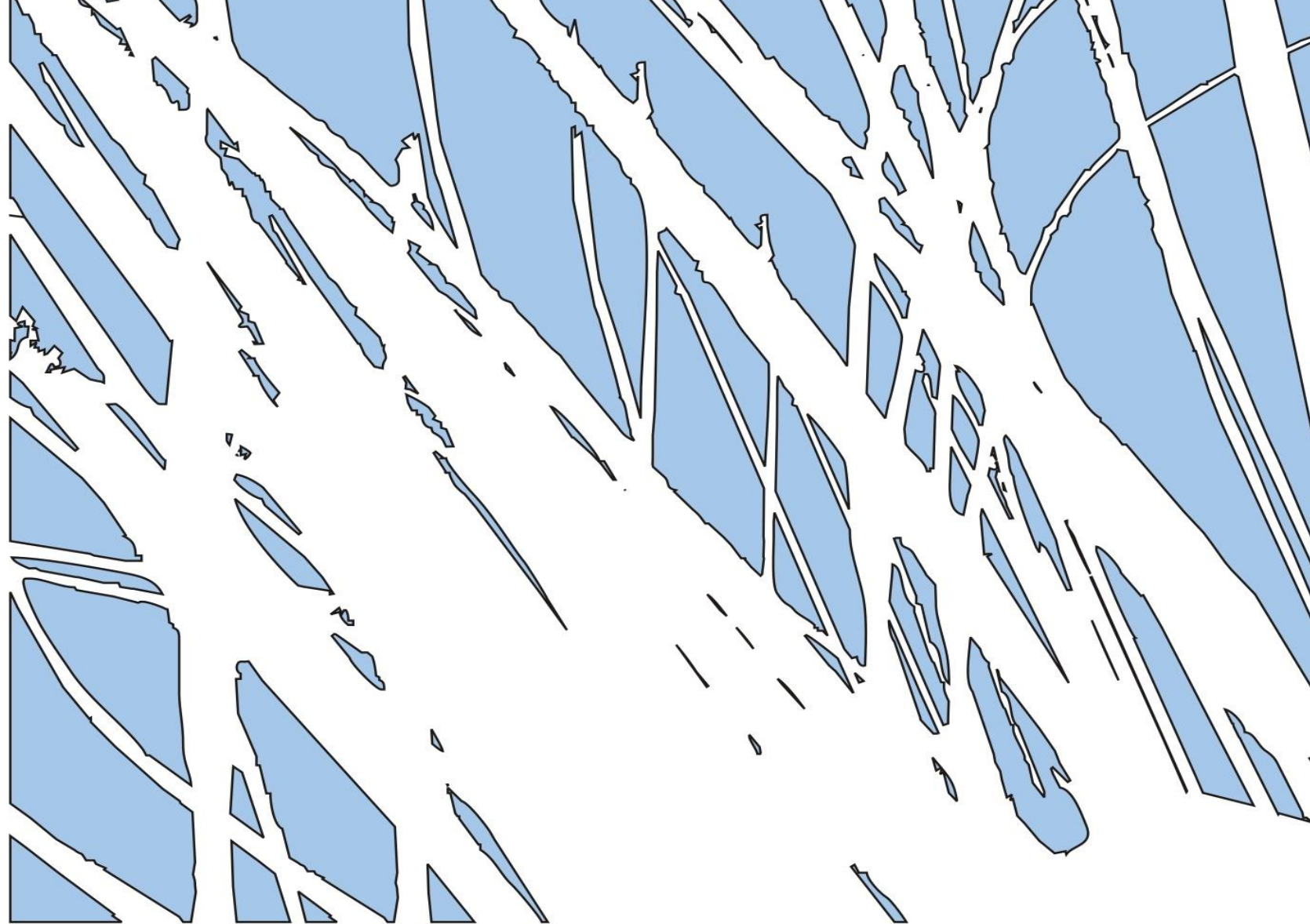
- *National Geographic*,
October 1993

Shannon Spurlock

Ochotona Consulting

shannon@shannonspurlock.com

303.875.2249



ochotona