

6

Farm constructed wetlands for nutrient retention

1

A constructed wetland has the ability to reduce nutrients in the water passing through it.



Requirements: 1 field

(Place the constructed wetland field card on 1 field)

Impact (every round):

Environmental score: +1

Social score: +1

0

One-off



IMPACT



Every round



WATERAGRI

Env consequences: Increased biodiversity,
reduced eutrophication effects of agricultural
drainage water

Social consequences: can be used as a site
for teaching, research or leisure activities
and further increased possibilities for
recreation, fishing, and hunting

One-off

COSTS

Maintenance

8

Farm constructed wetlands for water retention

1

Provides temporary storage and can be used to provide water for irrigation and lower flow peaks.



Requirements: 1 field

(Place the constructed wetland field card on 1 field)

Impact (every round)

Resistant to drought weather card

Environmental score: +1

Social score: +1

Water: +1



Drought resistant

0

One-off



IMPACT



Every round



WATERAGRI

Resource benefits: water retention

Env consequences: Increased biodiversity,
reduced eutrophication effects of agricultural
drainage water

Social consequences: can be used as a site
for teaching, research or leisure activities
and further increased possibilities for
recreation, fishing, and hunting

One-off

COSTS

Recurrent



0

Remotely sensed data for water and nutrient resources management

Increases farming efficiency by providing
real-time information about crop health/status



Impact (every round)
Pay 2 to see the event
card at the start of the
round



One-off

IMPACT



Every round



WATERAGRI

The outcomes derived from remote sensing pipeline can be used as an indication of plant health and further integrated into fertilizer use calculations to help farmers improve yields and reduce fertilizer use. All the products from the pipeline can be used directly or further developed to provide advice on agricultural practices, irrigation management, and landscape changes resulting from socio-economic development.

One-off

COSTS

Recurrent

1

1

Irrigation management platform

Provides temporary storage and can be used to provide water for irrigation and lower flow peaks.



Impact (once)

Environmental score: +1

Social score: -1

Impact (every round)

Water savings: 1 per field



One-off



IMPACT



Every round



WATERAGRI

Resource benefits: Yield increase, water retention potential estimation, nutrient recovery potential assessment.

Env consequences: Optimized utilization of water resources will lead to an adaptation of the farm and farming system to ongoing climate change

Social consequences: One of the biggest issues is the training the users to change their working habits and make optimal and efficient use of the proposed solution.

1

1 per field

Enhanced water retainer concept

An organic soil conditioner liquid that can be added to the soil surface to help plants to take-up water, reduce evaporation from bare soils and thus diminish the effects of drought and dehydration



Impact (one-off)

Environmental score: +1

Impact (every round)

Water savings: 1 per field



One-off



Every round



WATERAGRI

Resource benefits: reduced irrigation
water consumption.

Env consequences: extended endurance of
crops during drought periods and better
yield

One-off

COSTS

Maintenance



A filter system for subsurface drainage water treatment using biochar

This technology provides a filter structure that can be inserted to the drainage pipe outlet to retain nutrients from subsurface agriculture drainage water



Impact (one-off)

Environmental score: +2

Social score: +1

Impact (every round)

Nutrients: +2



One-off



Every round

IMPACT



WATERAGRI

Resource benefits: nutrient retention.

Env consequences: Reduction of potential eutrophication of following water bodies, habitat protection, bio-based plastics are used

Social consequences: Through easy handling more individuals can be reached and inspired to care (more) about water usage and nutrient recovery locally

One-off

COSTS

Maintenance

3

1

A bio-inspired multi-layer filter system using biochar adsorbents for water and nutrient uptake

A multi-layered drainage system designed to retain water and nutrients from agricultural runoff (overland flow)



Impact (one-off)

Environmental score: +1

Social score: +1

Impact (every round)

Nutrient: +1

Water savings: 1 (total)



One-off



Every round

IMPACT



WATERAGRI

Resource benefits: water retention and nutrient recovery

Env consequences: climate change adaptation approach in capturing agricultural surface runoff.

Social consequences: contribution to water security of the region's ecosystems and communities

One-off

COSTS

Maintenance



Nano-cellulose membranes for nutrient recovery

Functionalized nanocellulose membranes can take up nitrate and phosphate and can be put back into the soil, thus returning the leached nutrients back for their original purpose, fertilizing.



Impact (one-off)

Environmental score: +2

Social score: +1

Impact (every round)

Nutrient: +1



One-off



Every round

IMPACT



WATERAGRI

Resource benefits: nutrient recovered
can be returned to the fields

Env consequences: decreasing the risk of
impairing the water quality/eutrophication
of ground and freshwater bodies

Social consequences: new entrepreneurship
and job opportunities in the green sector
(when scaled)

One-off

1

2

Microfluidic system for nutrient recovery

This innovative solution utilizes microfluidic networks and adsorbent microbeads to recover nutrients from agricultural wastewater.



Impact (one-off)

Environmental score: +1

Social score: +1

Impact (every round)

Nutrient: +2



One-off



IMPACT



Every round



WATERAGRI

Resource benefits: the recovered nutrients can be marketed, or farmers can reuse them as a pure and effective fertilizer

Env consequences: lowering agricultural carbon footprint

Social consequences: an extra income stream for wastewater treatment plants

One-off

COSTS

Maintenance

3

0

Data assimilation system

Physically based models combined with on-site measurements that help predict crop yield and soil water content for climate resilient agriculture and optimizing irrigation schedules



Impact (one-off)

Social score: -1

Impact (every round)

Pay 1 to see the weather card at the start of the round



One-off

IMPACT



Every round



WATERAGRI

Social consequences: risk of instrument failure, access to computer resources required

Developer: Forschungszentrum Jülich
GmbH (Jülich, Germany)

Tech card