



Together for sustainable irrigation

Irrigation Forum Autumn 2021

08 Oct , 2021

THE HOUSEKEEPING RULES FOR A SMOOTH FORUM

- The event is recorded and will be shared
- Please remain muted during the meeting, turn on microphone only when you are speaking
- Make sure your full name and organisation is properly displayed
- Please announce questions or comments that via the chat box. The President will open the floor for questions at each agenda point
- The questions will be managed by Anne Claire. Questions will be read loudly from the chat box, or participants will be given the floor
- If you can, turn on your camera on so we can see each other

THE HOUSEKEEPING RULES EIA CODE OF CONDUCT

- EIA believes it is important that its activities are at all times carried out in accordance with the applicable law, especially competition law.
- EIA believes that business shall be conducted in an atmosphere of free competition, i.e. on the basis of price and quality.
- The Code of Conduct aims at providing clear rules to EIA's members, thus reducing the risk of improper conduct and consequently of fines being imposed.
- This Code of Conduct shall be binding on all members as well as on other participants when taking part in activities of EIA.

Agenda 8 October 2021

14:00-14:10	Opening	Moshi Berenstein/ EIA President
14:10-14:15	Welcome to New Members	Fleur Martin/ EIA communication officer
14:15-14:45	Working Groups: updates & work progress	Presenting the work of EIA 6 Working Groups by their leaders
14:45-15:15	Guest speaker: “EU water policy - a call for adaptation”	Mr Adriano Battilani, General Secretary, Irrigants d'Europe
15:15-15:45	Guest speaker: “The best planning for Landscape irrigation systems”	Marcos Pérez Martinez, Phares Ingeniería Áreas Verdes S.L. Spain
15:45-16:00	Innovation and Technology by our members: Responsive Drip Irrigation	Jan Gould, CEO, RDI
Closing session		
16:00-16:20	EIA General Assembly	Anne Claire Rasselet/ EIA Secretariat

Welcome new members

EIA has welcomed **7 new members** since the Spring Irrigation Forum in April.

We now have **65 members** in the association, and **27 new members** in 2021



AQUAMATIC S.A.

SISTEMAS DE REGA AUTOMÁTICA

Aquamatic S.A. is a Portuguese company founded in 1987 dedicated to supplying professional landscapers and gardeners.

Our 5 stores stock everything for automatic irrigation in commercial and residential landscape, sports fields and agriculture along with the pipes and fittings.

We provide irrigation design and our sales staff will give customer support in the field.

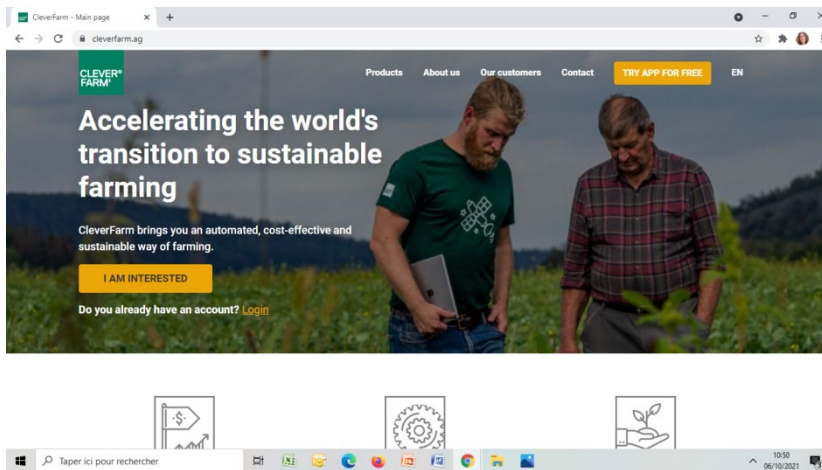
Our specialized team have built the irrigation systems in more than 600 sports fields over the last 10 years.

We also represent major power tools brands and have our own repair department.

Find us in www.aquamatic.pt or write to us at Lisboa@aquamatic.pt



CLEVER° FARM'



Clever Farm

Contact for EIA :
Adam Severa

Email : adam.severa@cleverfarm.ag

emrgy

Irrigation Hydropower

Emrgy transforms irrigation canals into sources of renewable energy with no construction or flow impedance.

Turbine equipment is manufactured by GE Hydro France and supplies electricity on-farm or to the grid.

Projects in 3 countries and 4 US States.

For more information, please contact:

Emily Morris, CEO - emily@emrgy.com

Nader Jandaghi, CCO - nader@emrgy.com

Camille Cruz, Technical Sales - camille@emrgy.com

Or visit our web:

www.emrgy.com



U.S. DEPARTMENT OF
ENERGY

Georgia
Tech



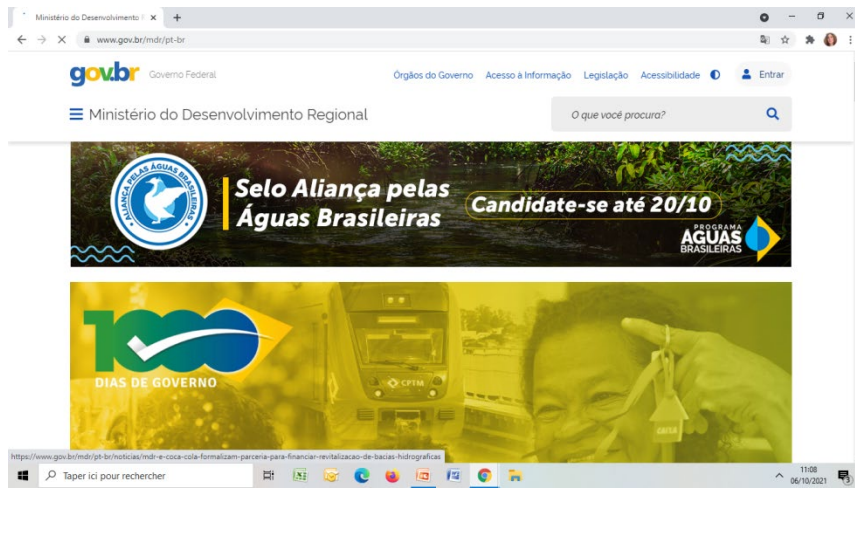


Ministerio do Desenvolvimento Regional

Contact for EIA :

Rafael José da Silva

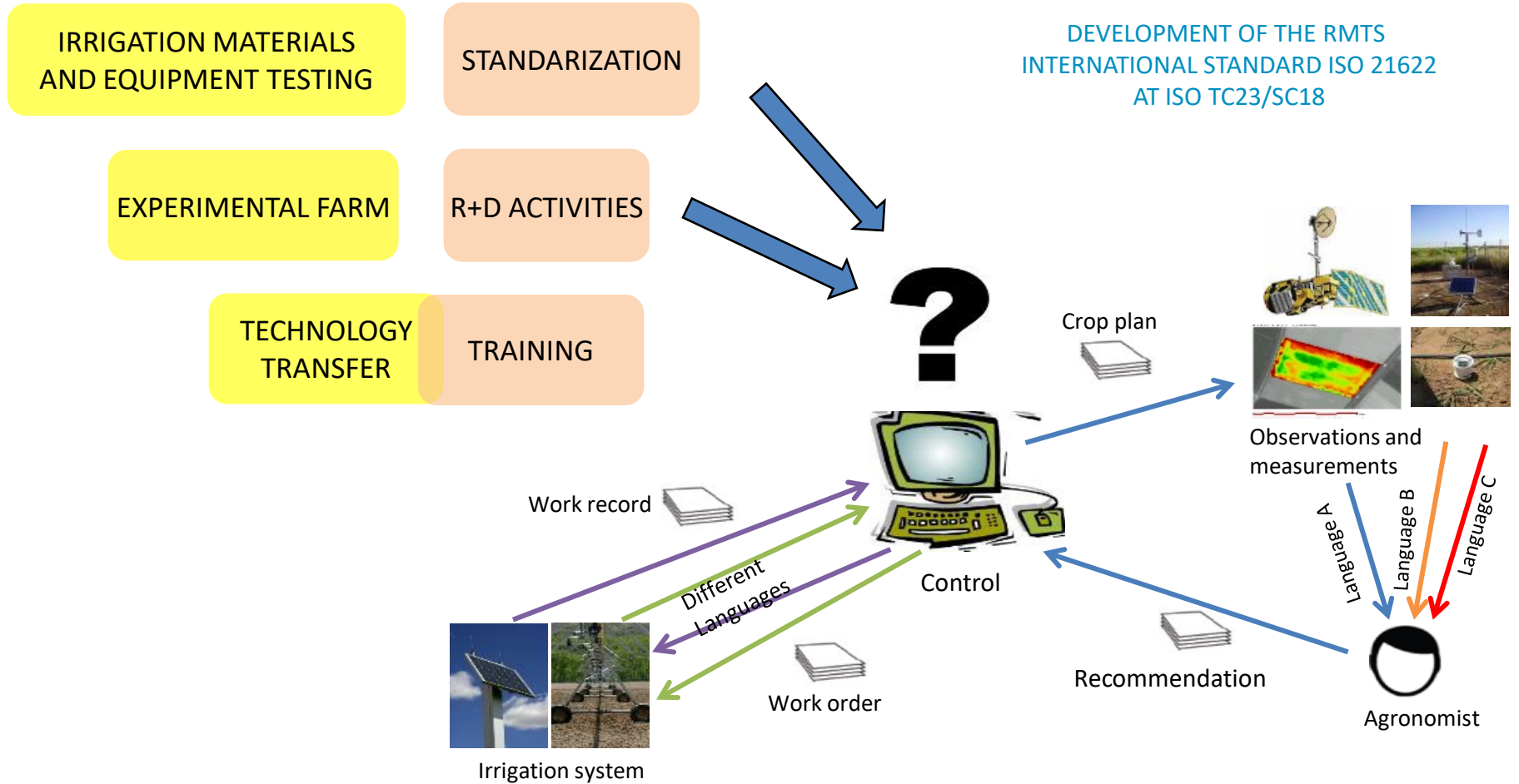
Email : rafael.silva@mdr.gov.br



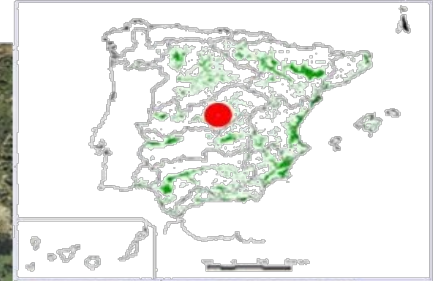


NATIONAL CENTRE FOR IRRIGATION TECHNOLOGIES

CENTER WORKING AREAS



EXPERIMENTAL FARM



Maximum efficiency, respect for the environment,
clean energy, common and cutting-edge
technologies, sustainability.



EXPERIMENTAL FARM: IRRIGATION SYSTEMS



Gravity Irrigation



Sprinkler Irrigation



Pívo



Frontal Irrigation machine



Localized Irrigation

CENTRAL LABORATORY FOR IRRIGATION EQUIPMENT AND MATERIALS TESTING



- UNE-EN ISO/IEC 17025: “General requirements for the competence of testing and calibration laboratories”
- Continuous work of calibration and quality controls: Guarantees the precision of the measurements recorded

TEST BENCHES

- ✓ Filters
- ✓ Hydrostatic Pressure
- ✓ Durability Test Benches
- ✓ Remote Control
- ✓ Training Benches
- ✓ Sprinklers
- ✓ Emitters and Emitting Pipes
- ✓ Sprayers
- ✓ Meters
- ✓ Head Loss and Regulating Valves
- ✓ Electrovalves

INTERNATIONAL IRRIGATION STANDARIZATION



ISO/TC23/SC18

Irrigation and drainage equipment

CA	WG1	Definitions	ES	WG8	Remote monitoring and control tech.
US	WG3	Irrigation sprinklers	IS	WG10	Filters
ES		<i>ISO/WD 15886-2 & 3 – Project Leader</i>	IN	WG11	Plastics saddles
CA	WG4	Laboratory test equipment	ES	WG12	Sprayers
IN	WG5	Microirrigation emitter. Clogging	ES	AHG	Meters for irrigation water
IS	WG7	Valves			

10
Working
Groups

3 WG led by Spain

1 WG led by USA

1 WG led by Canada

2 WG led by Israel

1 WG led by India

CTN318



CONTACT

NATIONAL CENTRE FOR IRRIGATION TECHNOLOGIES

Camino de la Vega, s/n

San Fernando de Henares

28830 Madrid

Tel: +34 91 347 69 40

Email:

normalizacion@mapa.es for standarization

bzn-labocenter@mapa.es for laboratory and tests

RIEGOS Y TECNOLOGIA SL (RITEC) is Spanish company specialized in

- Design, supply and installation of irrigation and climate control systems.
- Manufacturers of our own tailor made fertigation and climate control units, **NUTRITEC** and **CLINVERTEC**.
- More than 25 years of experience.
- Projects in more than 50 countries.

For more information, please contact:

- Luis Miguel Peregrín – CEO – luismiguel@ritec.es
- Luis López – International Manager – luislopez@ritec.es
- Sebastián Rabal – Technical & commercial Dept. – srabal@ritec.es



AFEID



Hunter



Challenge Agriculture®
L'eau et les minéraux maîtrisés

INAQUA



sateam



Van den Borne
Kracht in water

irritec
don't wait for rain™



Irrigazette
International Irrigation Magazine

ecofilae
GIVING VALUE
TO WASTEWATER



Irritrol

ARVALIS
Institut du végétal



B.J.Lamy
International
OEM Irrigation Specialist

CLEVER FARM

emrgy

Senninger
AGRICULTURAL IRRIGATION | A Hunter Industries Company

OCMIS
we irrigate the world



NAANDANJAIN
A JAIN IRRIGATION COMPANY

AQUAMATIC S.A.
SISTEMAS DE REGA AUTOMÁTICA



SOLEM



LINDSAY



TORO

ALDOMINT

RAIN BIRD

irrigazione
smart water project

Mazzei

AQUA4D
IRRIGATION



IRRIFRANCE

NETAFIM™ PROMOSNASTKA
GROW MORE WITH LESS



K RAIN



RDI
RESPONSIVE DRIP IRRIGATION

SRC

rain pro

scarabelli
IRRIGAZIONE
www.scarabelli.it

PLASSON

INRAE
la science pour la vie, l'humain, la terre

center
CENTRO NACIONAL DE
TECNOLOGÍA DE REGADÍOS

Regaber
matholding group



Rivulis



TC
OSING PUMPS

Majed Sabbarini



Sustainability in agriculture



Urban Landscape



Standardization

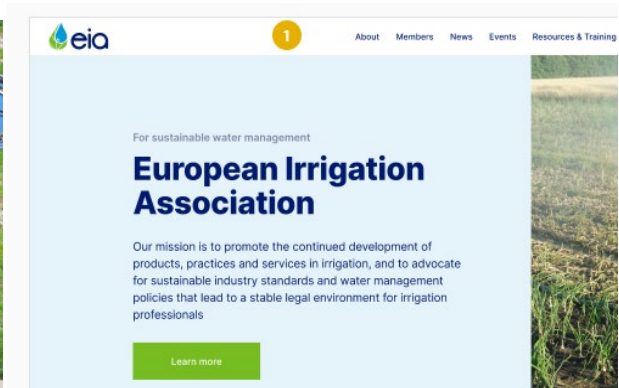
EIA Working Groups - updates



Training



Wastewater Reuse



Communication



WG 1 : Sustainability in Agriculture

Leader : Giulia Giuffrè, Irritec

Irritec Board Member & Sustainability Ambassador

2021 UN Global Compact SDG Pioneer

Participants :

- **Giulia Giuffrè** and **Giusy Inferrera**, Irritec
- **Ramunas Rederis**, consultant
- **Amnon Amir**, consultant
- **Paolo Antini**, Sentek
- **Stefania De Pirro**, Rivulis
- **Sophie Gendre**, Arvalis
- **Pablo Carnicero**, Regaber
- **Moshi Berenstein**, Netafim
- **Voijta Malina** and **Tomas Brzobohaty**, Clever Farm
- **Thibaut Scholasch**, Fruiti on Sciences
- **Xavier Corbella**, ITC

What is WG 1 ?

This WG intends to pay attention to issues concerning the promotion and activation of projects that sustainable development goals, with a focus on irrigation in agriculture



WG 1: Sustainability in Agriculture

Activity&objectives

Promotion of **correct management of water** as part of the solution for food demand, water and energy saving

Promotion of **high-performance recycling** material included in good quality irrigation systems in all countries.

Promotion of **gender equality** in agriculture and irrigation sectors

Definition of a standard model to **calculate savings in water, energy, fertilizers** and **production increase** for each type of irrigation system

WG 1 : Sustainability in Agriculture

Activity&objectives

Collaboration with **Associations and Institutions** involved in sustainability, to share experience and ideas for the pursuit of the Sustainable Development Goals

Promotion and organization of **events** linked to sustainable agriculture.

Proposals for solutions for the problem of **plastic in agriculture** and related legislation.

Inclusion of irrigation model in **certifications** of sustainability for fruits and vegetables.

EIA Working Group 2

“URBAN LANDSCAPE”



Image courtesy of Egypt's Economic Development Conference

EIA Working Group 2

“URBAN LANDSCAPE”

Goal of this Working Group

To be able to provide with a kind of White Book for
the Urban Landscape

EIA Working Group 2

“URBAN LANDSCAPE”

Key Points Developed

- A. Reasons to have green areas in urban environments.
- B. Importance of maintenance of those areas in the long term.
- C. Reasons to always have irrigation in those areas (no matter what kind of vegetation has been chosen).
- D. New trends to make irrigation more efficient and lower the water maintenance cost keeping the areas green and healthy.
- E. Solutions for big cities managing many green areas in order to simplify and optimize maintenance thanks to the new technologies, centralized and integrated systems (smart cities ect).

EIA Working Group 2

“URBAN LANDSCAPE”

Topics being developed:

1. The need of green areas in urban environments
2. No blue, no green. No irrigation no relevant benefits of green areas.
3. More blue with less water. Improving the efficiency of irrigation systems and steps to take on defective established irrigation systems.
4. Right irrigation designs, right irrigation products, right irrigation installation, right irrigation maintenance to maximize the benefits of green areas at long term
5. Current products, water management systems and maintenance procedures to maximize the water efficiency on irrigation systems for green areas.



Thank you!

EIA WG 3 : Standardization

Leaders : Michel Histel, Specialist European Standards

Bruno Molle, Inrae



What is WG 3 ?

- The EIA encourages its members to collaborate with the **national organizations involved in standardization** and to support the establishment of comprehensive and quality-orientated international norms and standards.
- The EIA recently joined two Technical Committees of the CEN, the European Standardization Committee: the **CEN/TC 334** (Irrigation techniques) and the **CEN/TC 144** (Tractors and machinery for agriculture and forestry, including hose reels machines, center pivots and lateral move systems).
This status of Liaison Partner gives the EIA a unique opportunity **to influence the preparation of standards** in these two key areas of our industry's activities.

Participants :

- **Romeo Dragan**, Rivulis
- **Alessandro Calanna**, Irritec
- **Jean-François Cornacchia**, Irrifrance



EIA WG 3 : Standardization

For more information :

- ISO Standards and projects on Irrigation and drainage equipment
 - Titles and scopes available : <https://www.iso.org/ics/65.060.35/x/>
 - Online Browsing Platform : <https://www.iso.org/obp/ui/#home>
- Access the most up to date content in ISO standards, graphical symbols, codes or terms and definitions. Preview content before you buy, search within documents and easily navigate between standards.
- CEN Standards and projects on Irrigation and drainage equipment
 - Titles and scopes available:
<https://standards.cencenelec.eu/dyn/www/f?p=205:105:0>

European Irrigation Association

Working Group 4

Training and Knowledge Transfer

Group leader: Damir Čizmek, In-Aqua

Group members: Rafael V. Diaz, Rain Bird Iberica / Joao Florido, Norma Group / Rob Hoogeveen, Certified Irrigation Designs Inc. / Ramunas Rederis, Consultant



EIA WG4 - Training and Knowledge Transfer

Constraints

- Limited EIA resources for **development of training materials** (training manuals, course presentations, tests questions, handouts, ...).
- Limited availability of trainers to teach EIA courses in **multilingual European environment**.
- Broad effort and lot of time required to build **EIA certification relevance** in national competence verification schemes.
- **Certification renewal management** is a special challenge requiring additional courses and internal administration capacity.

EIA WG4 - Training and Knowledge Transfer

Opportunities

- Enormous knowledge already available at EIA members in all fields relevant for irrigation and water conservation.
- Existing training materials developed by EIA members can be adapted with reasonable effort into recorded webinars and interactive on-line training courses.
- Opportunity for active contribution of members and their enhanced visibility outside commercial context.
- Improving EIA visibility through transfer of knowledge from key industry players to irrigation professionals.

EIA WG4 - Training and Knowledge Transfer

Principles

- EIA courses to focus on advanced knowledge relevant for improved irrigation water conservation rather than teaching basic irrigation skills.
- EIA courses should teach concepts and models, not products or brand distinctive industrial solutions.
- Product photos allowed, but product features descriptions and product specs not allowed.
- Course formats: recorded webinars, interactive on-line training courses.
- Each course to be subjected to screening and verification procedure by EIA WG 4 members.
- Courses to include appropriate participation fees and create revenue for EIA.

EIA WG4 - Training and Knowledge Transfer

Sample titles

- Subsurface irrigation in Agriculture
 - Subsurface turf irrigation
 - Nozzle efficiency and irrigation scheduling
 - MAD irrigation scheduling
 - Basics of frost protection
 - Soil sensing and irrigation scheduling
 - Irrigation of crops (vineyards, olive orchards, blueberries, potatoes, ...)
 - Challenges of irrigation with reclaimed water
 - Irrigation system audit
 - Electric safety for center pivot systems
- and numerous other topics of interest

EIA WG4 - Training and Knowledge Transfer

Share your knowledge through EIA
for the benefit of our industry and for
the benefit of our environment!

Contact communication@irrigationeurope.eu to offer your contribution.



EIA WG 5 : Wastewater Reuse

Leader : Bruno Molle /INRAE - Research Institute

A key component
of rational use of
water

A way to make
circular economy a
reality

A complex
multidisciplinary
problem

Economy, Finance,
Safety

Objectives of WG 5 ?

- Collect the **questions of EIA members** on the topic
- Share **technical experiences among members and beyond**
- List and learn **how to turn obstacles to the development of Reuse's projects**
- Produce **thematic technical notes for EIA members**
- Organize with **WG4 training sessions**
- **Become a stakeholder** in the development Reuse policies and contribute to the regulations

Participants (October 5th 2021) :

- **Seba Schifris**, Netafim
- **Damir Čizmek**, In-Aqua
- **Sophie Gendre**, Arvalis Institut du vegetal
- **Manuel M. Marti**, Hunter

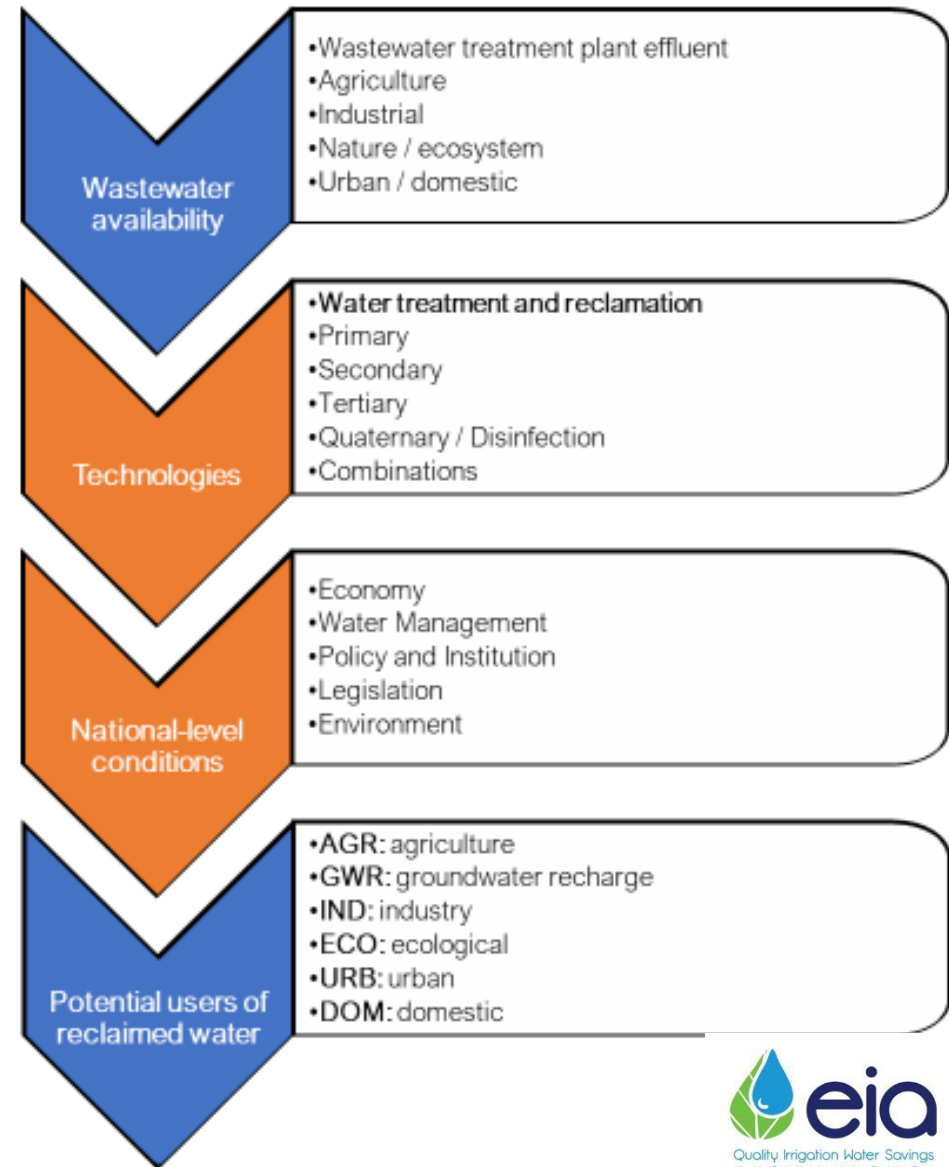
EIA WG 5 : Wastewater Reuse

Examples of activity

Presentation of Poseidon tool box for the EIA next forum

- Dr. Dieter Muntz GIZ
- DS tool dedicated to the analysis of WWR project feasibility
 - Effluent availability, treatment technology
 - Local Regulation,
 - Potential uses
 - LCA and CBA
- An operational free access tool

Seeking for similar tools produced by research projects that lack of dissemination



<https://www.madforwater.eu/wp-content/uploads/2020/07/D5.3-final.pdf>

EIA WG 6 : Communication

Leader : Fleur Martin, Irrigazette's Editor in chief

What is WG 6 ?

The group is working on the **implementation of the EIA Communication strategy**, improving communication tools (website and social networks) and organizing EIA events and forums.

The group is also responsible for the Editorial Committee aiming to create a non-commercial **technical and agronomic library** for the members.

Participants :

- **Vicky Barbouti**, Rivulis
- **Keith Bellin**, Irritec
- **Céline Palvadeau**, Netafim
- **Pilar Uretta**, Matholding



WG 6 : Communication

Organisation of forum and events :

- EIA hosts a **virtual forum twice a year**, one in **the fall** and one in **the spring**.

- EIA will have a **stand in Eima !** Visit us on **Pav. 22, Stand A1** , October 19-23, 2021

- **We invite you to a Cocktail** for the **25th anniversary** of the Association on **Wednesday 20 October at 5:30 pm** on the trade-fair Pav. 16/18, mezzanine floor, Room Opera.



EIA WG 6 : Communication



European Irrigation Association

25th Anniversary

The EIA invites you to attend its cocktail on

Wednesday 20 October 2021 at 5:30 p.m.

on the Eima show floor, in the **Pavilion 16/18, Mezzanine Floor, Room Opera.**

We will have a toast to celebrate the 25th anniversary of the European Irrigation Association.

It will also be the occasion to thank the all our members who have contributed to the development of the association and to create a stronger voice for irrigation in Europe during all these years.

Moshi Berenstein, President.

**Visit EIA at Eima
Stand A1, Hall 22
October 19-23, 2021**




WG 6 : Communication

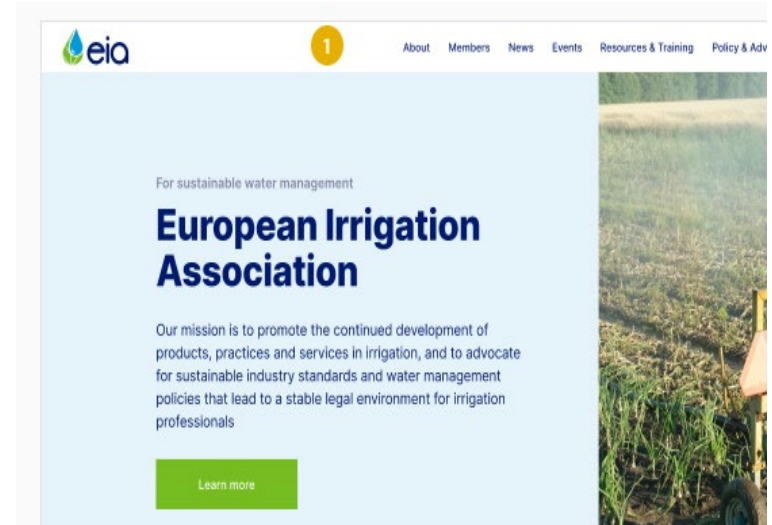
Communication tools :

- The new website is **GOING LIVE** next month!

- Social network :  LinkedIn : 959 followers

-  Facebook : 246 followers

- New brochures in 4 languages, posters, pins will be available on the stand at Eima



WG 6 : Communication

Editorial Committee :

- Build a **library of technical articles** available to our members on the EIA website.
- Articles provided by the members or other resources such as Irrigazette magazine.
- Before publication, an **editorial committee** certifies their content and relevance to our objectives.





Sustainability



Urban Landscape



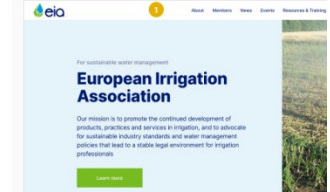
Standardization



Training



Wastewater Reuse



Communication

We invite you to join our Working Groups

Please contact Fleur Martin:

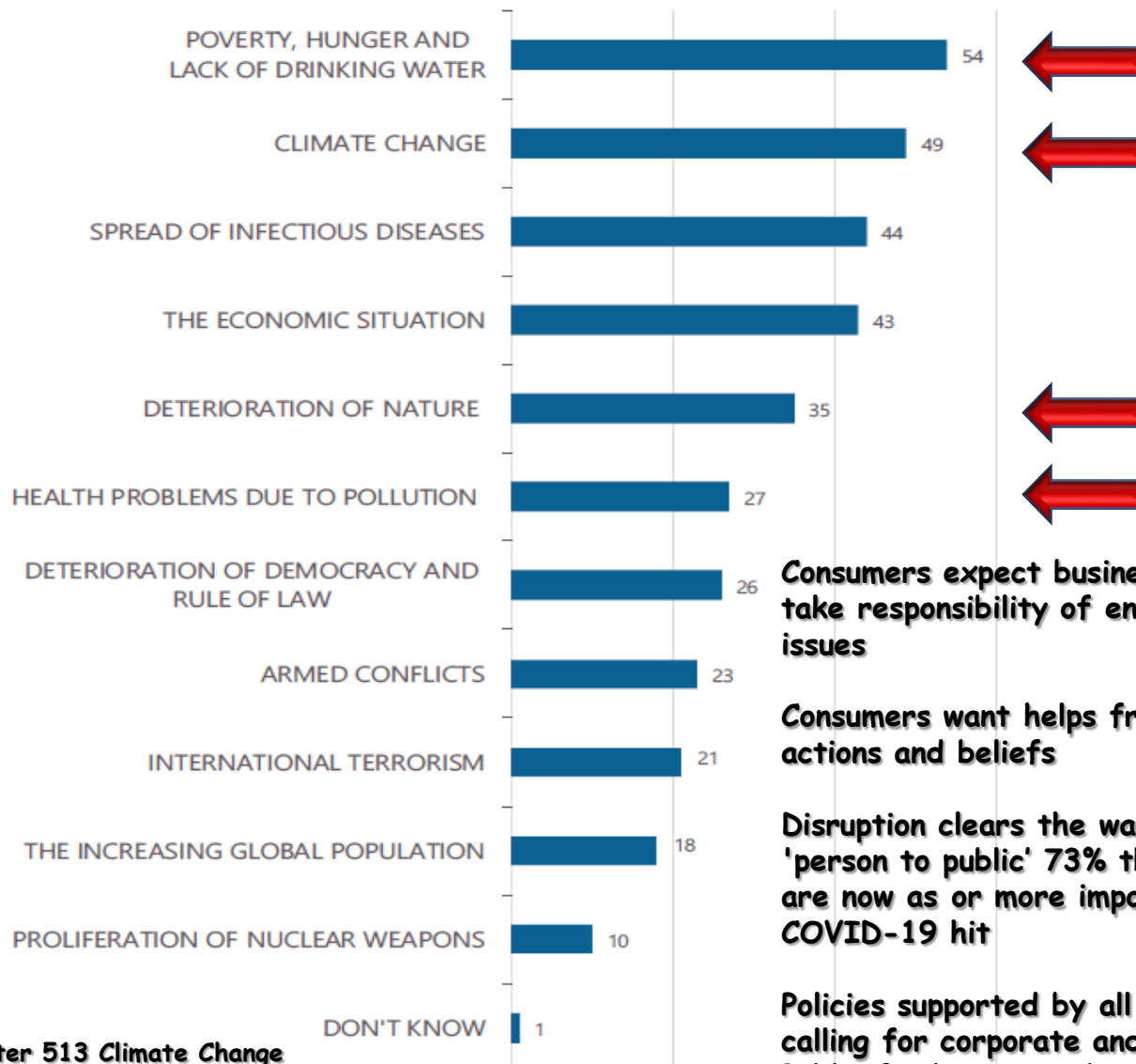
communication@irrigationeurope.eu

EU water policy - a call for adaptation





March-April 2021



Consumers expect businesses and government to take responsibility of environmental and social issues

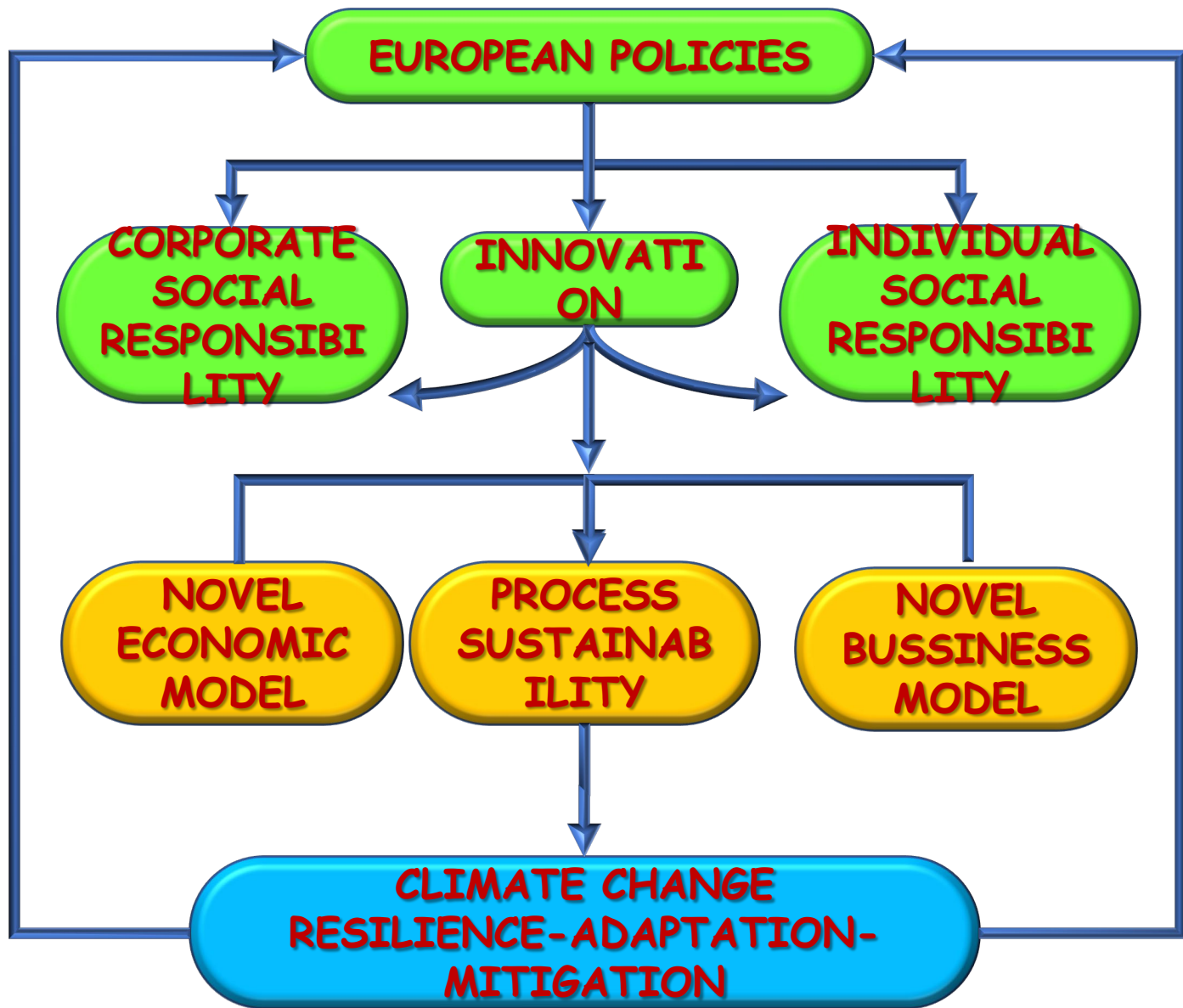
Consumers want helps from brands to align their actions and beliefs

Disruption clears the way for the shift from 'person to public' 73% think environmental issues are now as or more important since when COVID-19 hit

Policies supported by all the Eu parties are calling for corporate and individual responsibility. Public funds are used to obtain public goods and benefits.

Special Eurobarometer 513 Climate Change July 2021



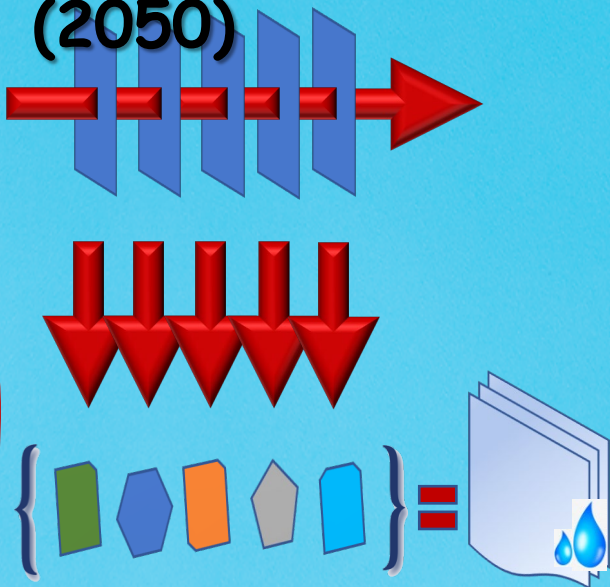


WATER

2007-2019

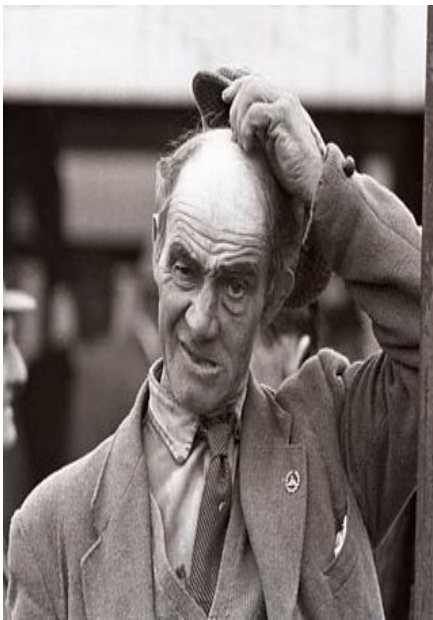


2020-2030
(2050)

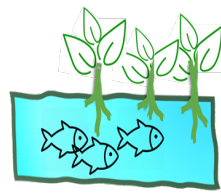


CLIMATE &
ENVIRONMENTAL
POLICIES





Compliance with EU and National regulations



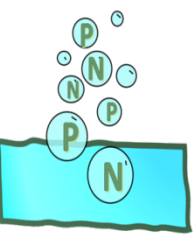
Water quality and riverine biodiversity



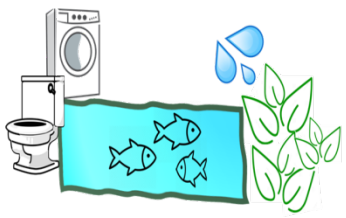
Decarbonisation and creation of new carbon sinks



Biodiversity increase and pollinators safeguard



NUTRIENTS REMOVAL OR RECOVERY



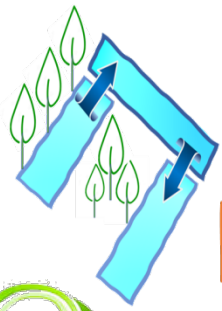
WATER REUSE



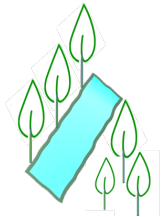
RENATURING AGRICULTURAL LANDSCAPE



NEW REGENERATED SOIL AND SOIL HEALTH ENHANCEMENT



INTERCONNECTED NBSs, ECOLOGICAL CORRIDORS



WATER STORAGE, FLOOD BUFFERING, INFILTRATION



INNOVATION CHALLENGES

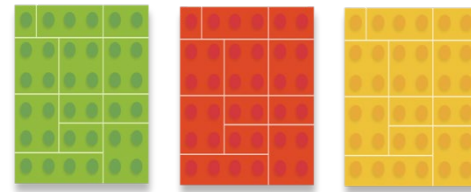
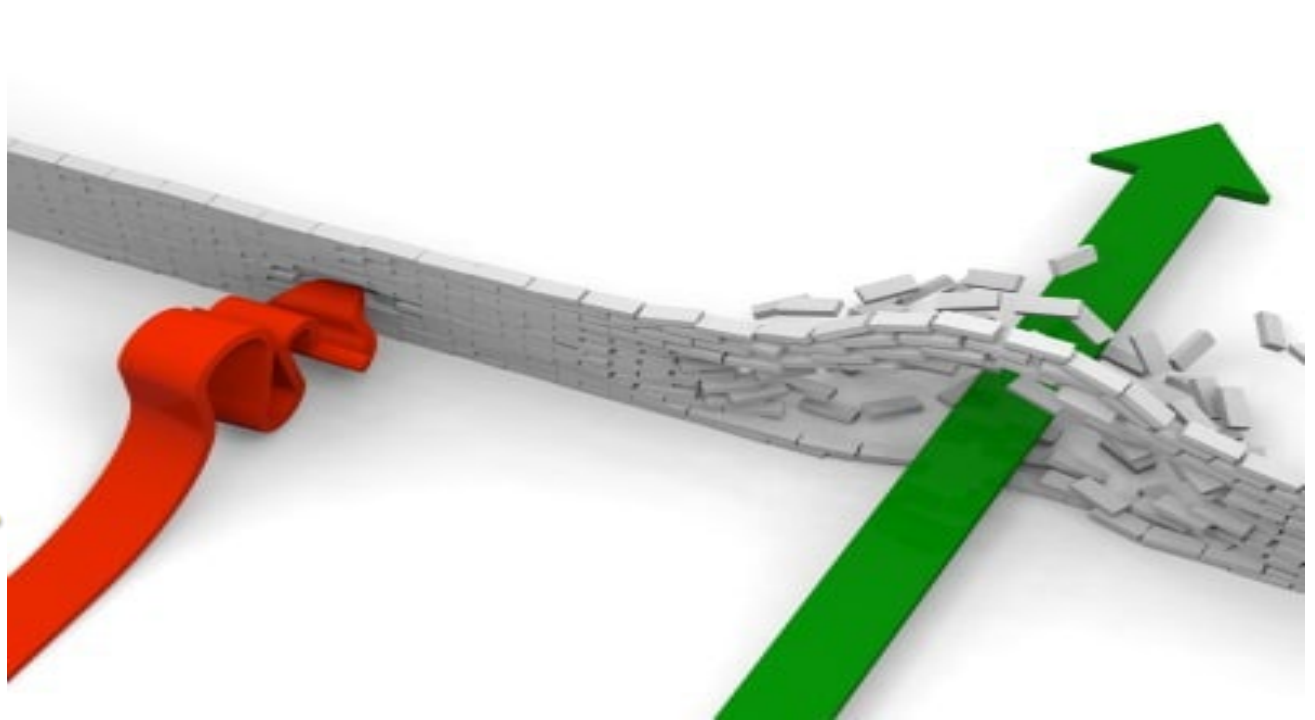


Target	Enabling Techs desired characteristics	Benchmark
DECARBONISE	Low Energy Irrigation systems/equipments; reduced production processes embedded energy (as for extended Life Cycle Assessment)	Surface non pressurised irrigation
AVOID WATER TRANSPORT OF CONTAMINANTS	IT/AI supported precise irrigation; small/homogeneous sub-plot application scale; multi-targeted optimisation tool coupled with flexible equipments	Real time sensor driven Sub Surface ultra-low flow irrigation
CAPITALIZE WATER	Not even a drop can be wasted - multitargeted irrigation management infrastructures, criterias and tools	Real shift in water productivity while securing ecosystem services
BIODIVERSITY	Irrigation techs enabling carbon + nutrients conservative/regenerative soil management; Reconcile Irr. with aquatic life	Soil carbon storage, temperature, humidity; Soil micro+meso biota; Aquatic macro+meso habitats
FOOD QUALITY	High quality healthy food	Low income citizens dietary standards
YIELD/INCOME	«Subsidized»; Fair trading actions; Reduce food wastage	<i>[Equal income and opportunities for farmers than neighbouring towns, currently -40%]</i>





MARKET DRIVEN TECHNOLOGICAL INNOVATION



PREVIOUS SOLUTION



NEW SOLUTION

POLICY ORIENTED MARKET DRIVEN MULTISECTOR & MULTIACTOR INNOVATION





BREAK RESISTANCES, BAU AND NIMB FORCING INNOVATION INTO THE MARKET





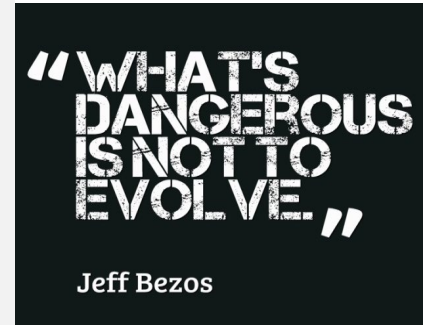
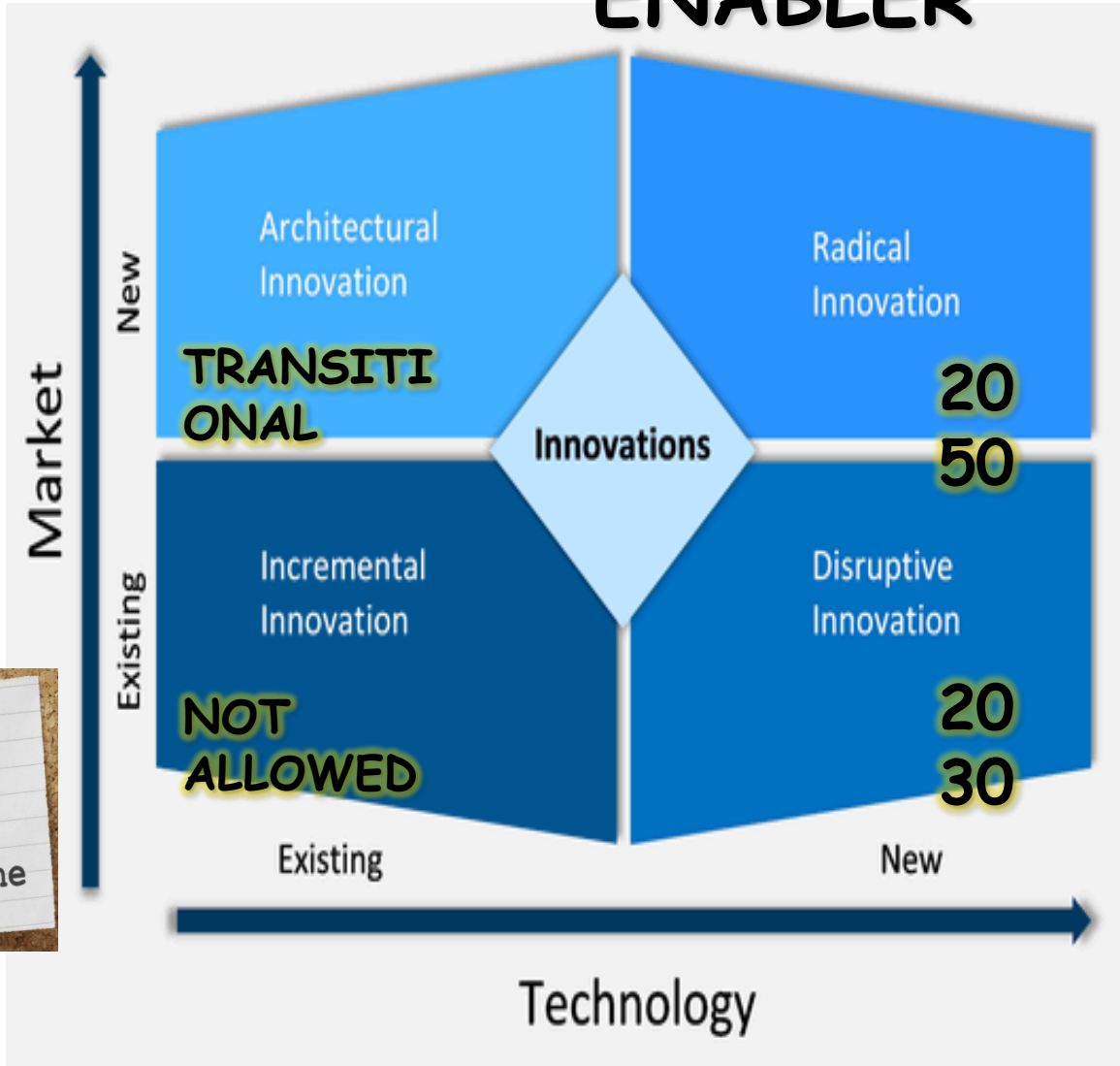
EU RESULT BASED PAYMENT POLICY



RISK IDENTIFICATION, MANAGING AND SHARING TO MINIMIZE TRADE-OFFS FOR ALL THE ACTORS






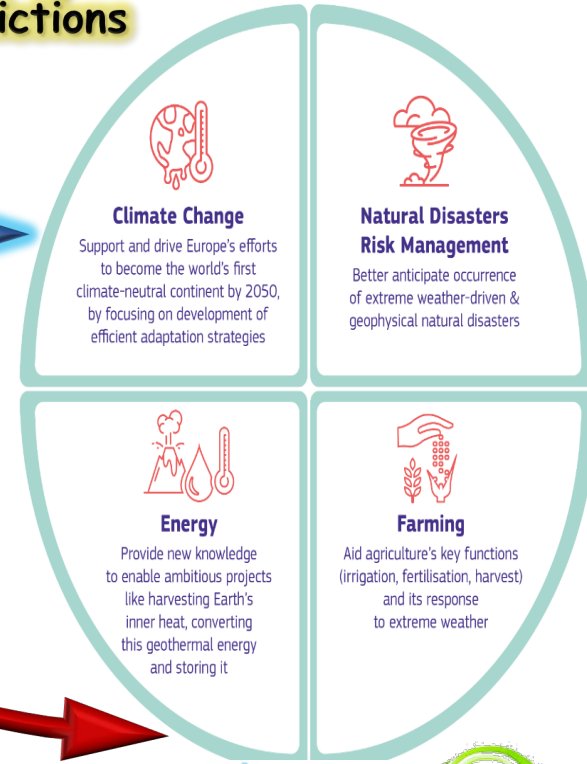
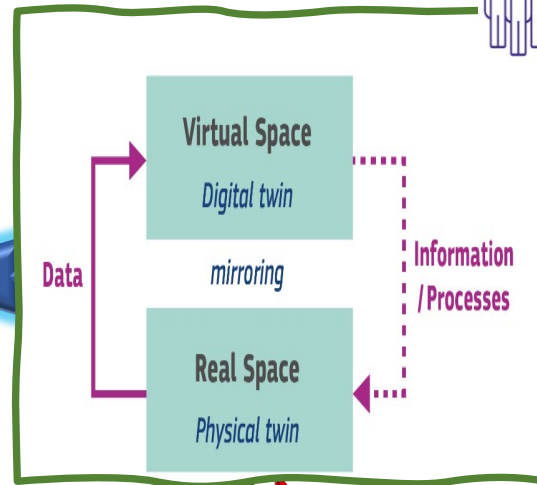
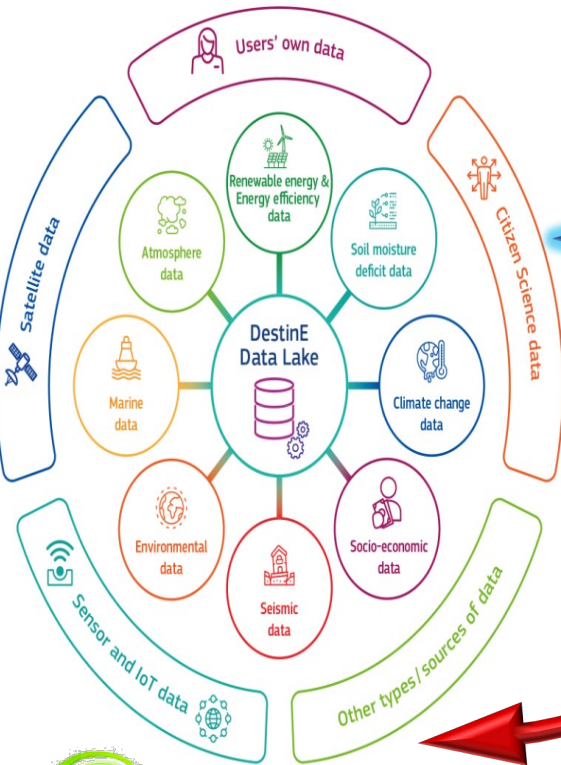
TECHNOLOGICAL INNOVATION AS ENABLER





DestinE and Digital Twins

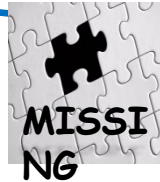
 Evidence-based policy development
 Contribution to the **GNDE**
 Accessing data/benchmarking models
 **User-Specific and Actionable Predictions**



BREAKTHROUGHS POLICIES TO BOOST WATER GOVERNANCE IN AGRICULTURE



- Fit for Purposes
- Digitalisation
- DestinE & DigitalTwins
- Risk analysis
- Non AI/AI Optimisation Tools
- Participative approach (involvement of agri water board and associations)
- Capacity Building/Educational campaigns (Serious Games)
- Water Reuse/Water Circularity schemas
- Fair trading (rules to import into the internal EU market)



TRADE-OFF ANALYSIS, BUSINESS PLANS & NEW BUSINESS MODELS





THANKS FOR YOUR ATTENTION

Guest Speaker 2 : Marcos Perez Martinez, Phares Ingenieria Areas Verdes S.L.

Friday, 8th October 2021

eia
Quality Irrigation Water Solutions
EUROPEAN IRRIGATION ASSOCIATION

The best Planning for Irrigation Systems

by Marcos Pérez Martínez Agricultural Engineer and Landscape Designer by UPM CEO at Phares Ingeniería

What is right and what is wrong for Saving Water?

The beginning...YEAR 2001
Welcome to the real world

Today, 8 October 2021
El Boalo, Madrid, Spain

Real World



RDI RESPONSIVE
DRIP
IRRIGATION



THE WORLD'S FIRST AND ONLY PLANT-RESPONSIVE
IRRIGATION & FERTIGATION SYSTEM

Land Use Change & Climate Impact

- The combustion of fossil fuels is **not the only anthropogenic source of carbon dioxide**. When ecosystems are altered and vegetation is either burned or removed, the carbon stored in them is released to the atmosphere as carbon dioxide. The principal reasons for deforestation are agriculture and urban growth, and harvesting timber for fuel, construction, and paper. Currently, up to a quarter of the carbon dioxide emissions to the atmosphere can be attributed to land-use change.
- Modern agriculture, food production and distribution are major contributors of greenhouse gases: Agriculture is directly responsible for 14 per cent of total greenhouse gas emissions, and broader rural land use decisions have an even larger impact. Deforestation currently accounts for an additional 18 per cent of emissions.
- Dr. Rattan Lal, Professor of Soil Science at Ohio State University, has calculated that over the last 150 years, 476 billions of tones of carbon has been emitted from farmland soils due to inappropriate farming and grazing practices.
- These reductions of 'living carbon potential' have resulted from:
 - Deforestation - biodiversity loss - accelerated soil erosion - loss of soil organic matter
 - salinization of soils - costal water pollution - acidification of the oceans

GLOBAL WATER CRISIS



BY 2025 TWO-THIRDS OF THE WORLD'S POPULATION COULD BE LIVING UNDER WATER STRESSED CONDITIONS

- **37 countries** currently face "extremely high" levels of water stress, meaning that more than 80 percent of the water available to agricultural, domestic, and industrial users is withdrawn annually
- **21 of the world's 37 largest aquifers** — in locations from India and China to the United States and France — have passed their sustainability tipping points
- **By 2050, at least 1 in 4** people will likely live in a country affected by chronic or recurring fresh-water shortages
- According to the U.S. Intelligence Community Assessment of Global Water Security, **by 2030** humanity's "annual global water requirements" will **exceed "current sustainable water supplies" by 40%.**

Sources: worldbank.org, worldvision.org, wri.org, worldwaterday.org, washingtonpost.com, zerohedge.com, fao.org, agu.org, nasa.gov



1.6 BILLION

PEOPLE LIVE IN COUNTRIES OR
REGIONS WITH ABSOLUTE WATER
SCARCITY



70%

OF GLOBAL FRESHWATER
IS USED FOR AGRICULTURE

FEEDING 10 BILLION PEOPLE



IN FAST GROWING ECONOMIES UP TO 90% OF THEIR FRESHWATER IS USED FOR AGRICULTURE

- **A 19% increase in agricultural water consumption** will be required to meet increased population needs by 2050
- **A 56 percent food gap** between crop calories produced in 2010 and those needed in 2050
- **A 593 million-hectare land gap** (an area nearly twice the size of India) between global agricultural land area in 2010 and expected agricultural expansion needed by 2050
- **An 11-gigaton GHG mitigation gap** between expected agricultural emissions in 2050 and the target level needed to hold global warming below 2°C (3.6°F), the level necessary for preventing the worst climate impacts



33%

OF THE WORLD'S ARABLE LAND
HAS BEEN LOST TO EROSION OR
POLLUTION IN THE LAST 40 YEARS

Keeping Our “Blue Planet” Green – Is It Possible Plant-Responsive Solutions Present an Opportunity for Change

GLOBAL PROBLEMS:	PLANT - RESPONSIVE TECHNOLOGY DELIVERS SOLUTIONS:
1. Increasing Water Scarcity (70% of water used in agriculture)	1. Reduces water usage by 30-90% over other forms of irrigation; GrowStream™ can use poor quality water & reclaimed water
2. Global food production demands to meet population increases	2. Dramatically increases crop yield
3. 21 of the largest aquifers passed their sustainability tipping point	3. Center pivot irrigation draws 3,000 gal/hr from an aquifer – Plant – Responsive tubing uses 70-90% less water than center pivot
4. Agriculture is responsible for 30% of carbon emissions	4. No electricity or fuel is needed with Plant – Responsive tubing, no carbon footprint
5. Agriculture practices & use of agrochemicals resulted in degradation of soil & increased salinity in soil and water	5. Improves soil health and its ability to sequester CO ₂ , improves microbial activity in rhizosphere, eliminates fertilizer run-off
6. Pandemic lead to disruptions in supply chains – countries are focused on food security and	6. Works in harsh climates & non-arable land, enables local farms to implement crop diversity

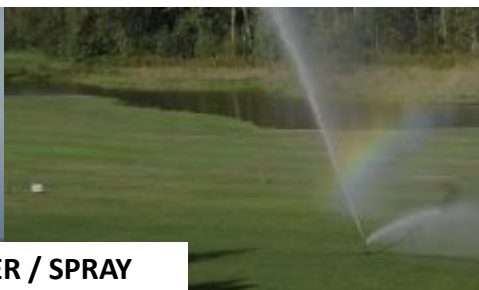
All previous irrigation technologies "force" water into the soil, attempting to uniformly distribute moisture and ideally match evapotranspiration rates (ET). New "smart" controllers and sensor technology allow for greater insight into crop environments - but can still only estimate the need of a broad area of plants.

Plant-Responsive Tubing ushers a new generation for water delivery - the world's first system able to interact with plant roots to deliver exactly what EACH plant calls for, minute-by-minute, plant-by-plant.

The world's first and only "nature-driven" irrigation technology!



SPRINKLER / SPRAY



DRIP / MICRO



SOAKER, HYDROPONICS



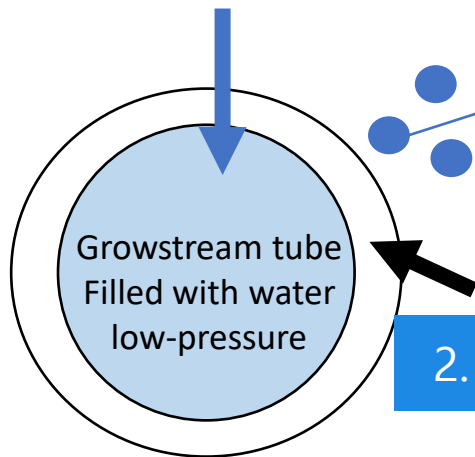
A UNIQUE INTERACTION WITH ROOT SIGNALS TO DELIVER WATER

STANDARD "FORCED" irrigation is based upon timed intervals for delivery of set amounts of water

PLANT-RESPONSIVE irrigation is based on organic chemistry, **interacting directly with the plants' roots** to deliver water and nutrients **on demand**. RDI technology operates at constant low pressure, providing a **reservoir** that plants can access when needed. Water and nutrient delivery fluctuates **in response to the plant**.

1.

Growstream has a smooth interior surface that has been **infused with a hydrophilic polymer** => Creates a **chemical bound** to keep water molecules inside the tube



2.

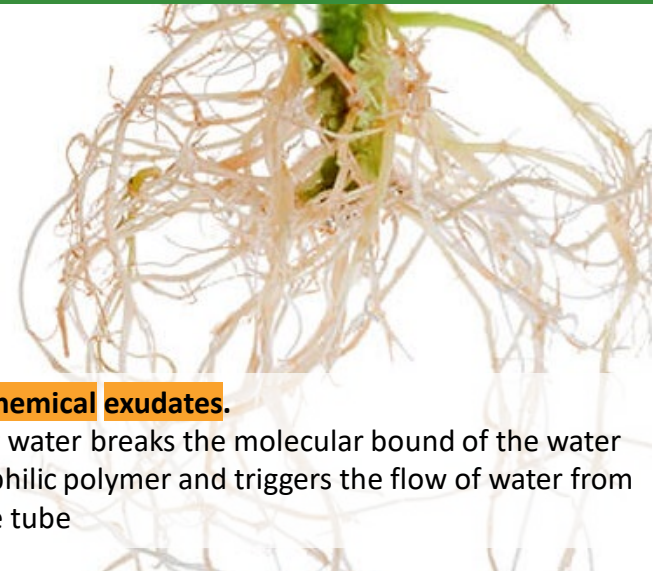
Micropores in the tube will enable the movement of the water molecules and water soluble fertilizers/nutrients if there is a force from the outside to release it.

Patents of RDI support the science behind **Plant-Responsive technology** that prohibits it from "clogging"

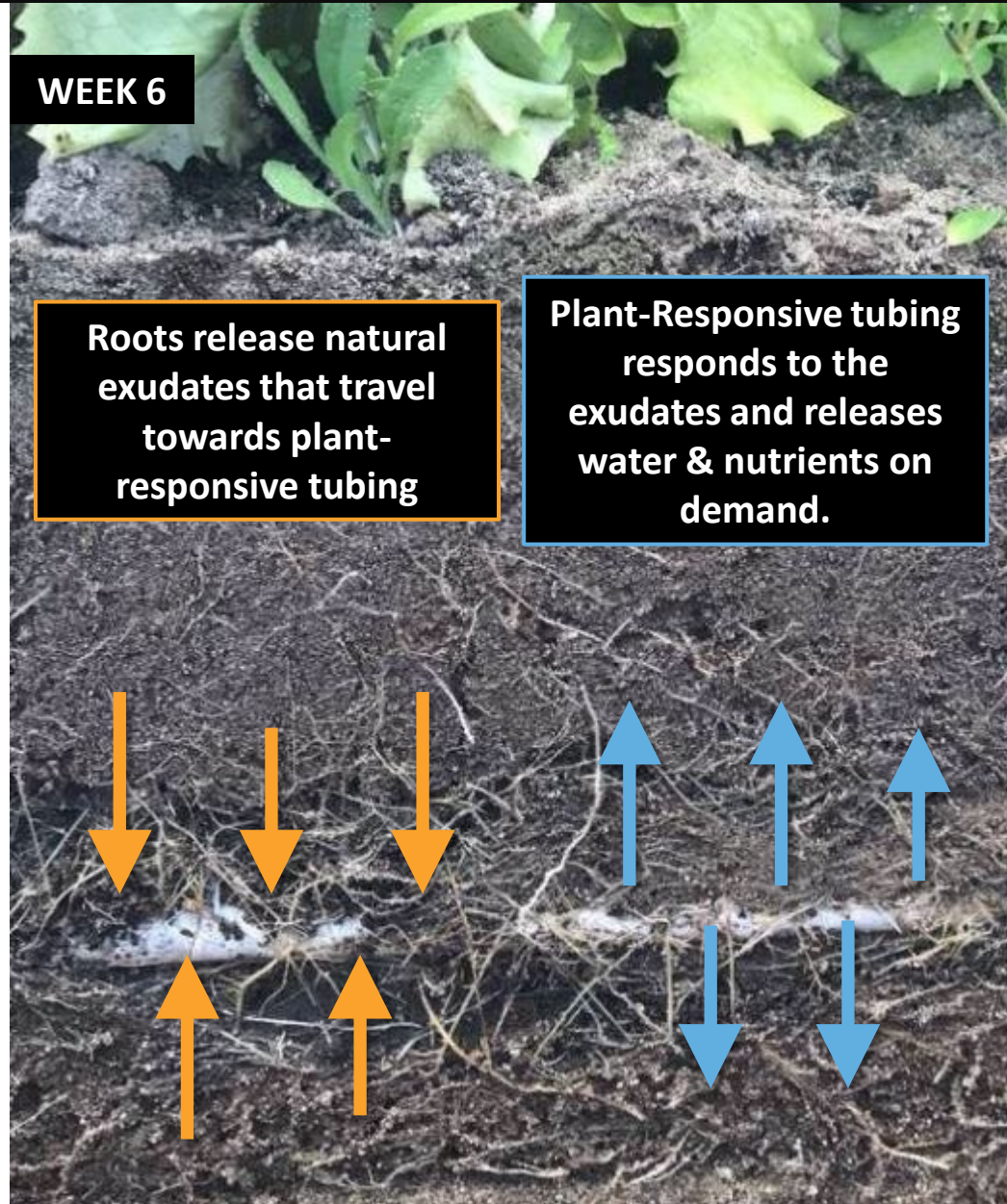
3.

Plants release **chemical exudates**.

Their affinity for water breaks the molecular bound of the water from the hydrophilic polymer and triggers the flow of water from the inside of the tube



Plant- Responsive Tubing Working With Plant Roots



WEEK 6

Roots release natural exudates that travel towards plant-responsive tubing

Plant-Responsive tubing responds to the exudates and releases water & nutrients on demand.



NEXT-GENERATION EFFICIENCY ZERO ELECTRONICS

PLANT-RESPONSIVE TUBING HAS BILLIONS OF MICROPORES
THAT RELEASE WATER AT COMPLETELY VARIABLE RATES,
ALLOWING
EACH & EVERY PLANT TO CONTROL ITS OWN WATER DELIVERY



WASTELAND OR **THE PROMISED LAND?**

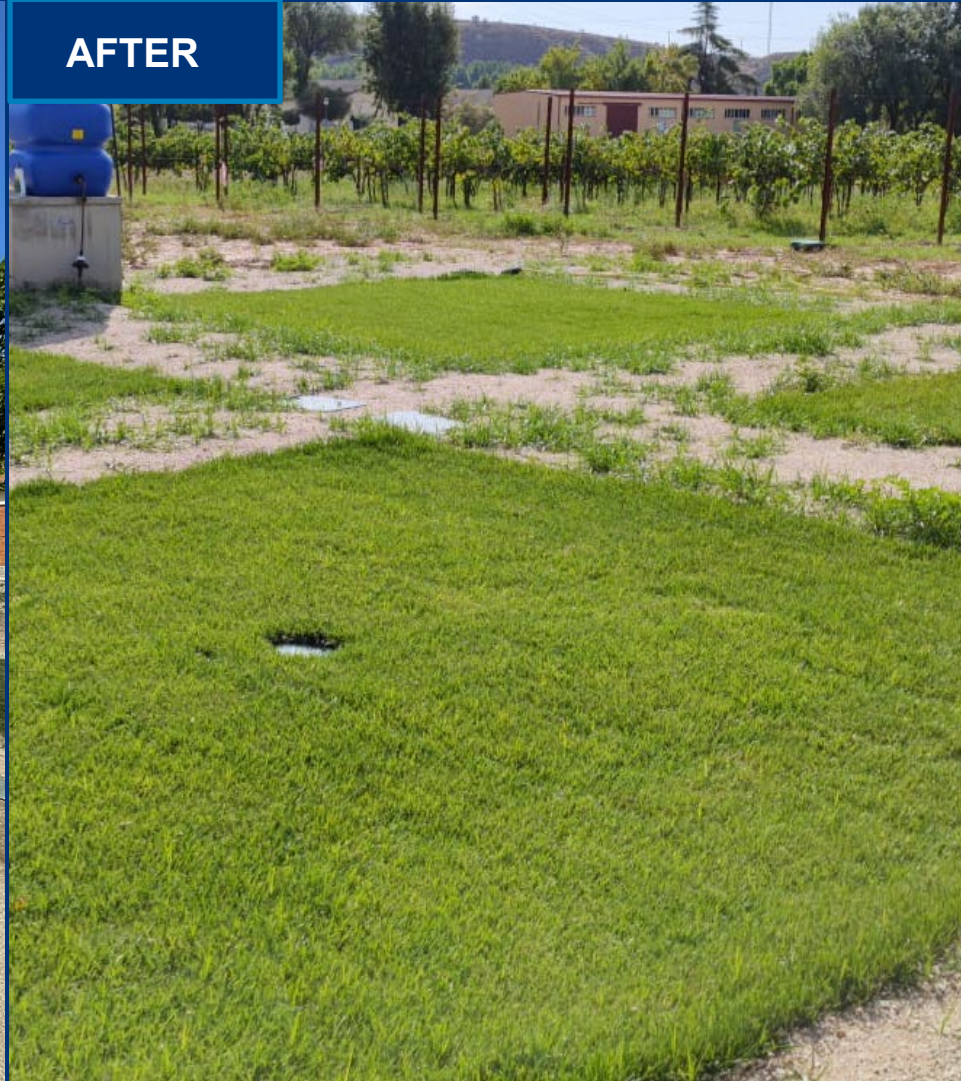




BEFORE



AFTER



NATIONAL CENTER FOR IRRIGATION TECHNOLOGY, MADRID - SPAIN

PLANT-RESPONSIVE TECHNOLOGY- NOT ONLY SAVE WATER

UNMATCHED WATER SAVINGS
Compared to all other irrigation
techniques

HEALTHIER PLANTS with FASTER
GROWTH
=> EARLIER HARVEST (agriculture)
=> SIGNIFICANT HIGHER YIELD
(agriculture)
=> MORE BEAUTIFUL PLANTS
(landscape)

SAVINGS on ENERGY
SAVINGS on INTRANTS and
TREATMENTS





RDI  RESPONSIVE
DRIP
IRRIGATION

CREATING LIVEABLE
AND SUSTAINABLE
CITIES FOR FUTURE
GENERATIONS



PARKS



ROADWAYS



GOLF COURSES



SPORTS FIELDS

SAVING WATER
KEEPING THE PLANET GREEN



RESIDENTIAL



COMMERCIAL

HOLLYWOOD HILLS -
BEFORE



AFTER 6 MONTHS



ORANGE COUNTY, CA POLLINATOR
GARDEN



AFTER 30 DAYS



ULTIMATE EFFICIENCY - ULTRA EASY

- **30 – 90% LESS WATER USE**
- Completely variable emission rates to support mixed plantings
- No controller, electric valves or wiring needed
- Fewer, larger zones

SET IT AND FORGET IT

- No complicated controller to program & support
- Automatically adjusts for weather conditions and plant maturity
- No wiring to go bad, no valves to break, no root intrusion or clogging

SMARTER THAN
THE SMARTEST
CONTROLLERS,
PLANT-
RESPONSIVE
TECHNOLOGY
WORKS WITH
NATURE, NOT
AGAINST IT.

An aerial photograph of a coastal town. In the foreground, there are residential houses with red and grey roofs, some with swimming pools. A paved road with several cars curves through the middle ground. In the background, a sandy beach meets the ocean with waves breaking. The entire scene is framed by a semi-transparent grey rectangle with an orange border.

GrowStream

REDUCES OUTDOOR WATER
USE IN LANDSCAPES AND
ELIMINATES RUNOFF TO
CREATE MORE SUSTAINABLE
CITIES
AND RESTORE THE
ENVIRONMENT



GrowStream

CONSERVING THE
WORLD'S WATER
WHILE FEEDING THE
PLANET'S GROWING
POPULATION

PLANT - RESPONSIVE TECHNOLOGY FOR AGRICULTURE



- ✓ Improved plant health
- ✓ Faster development: earlier 1st harvest & then additional harvest
- ✓ Reduced disease & pest infestations
- ✓ Soil regeneration
- ✓ Higher yields

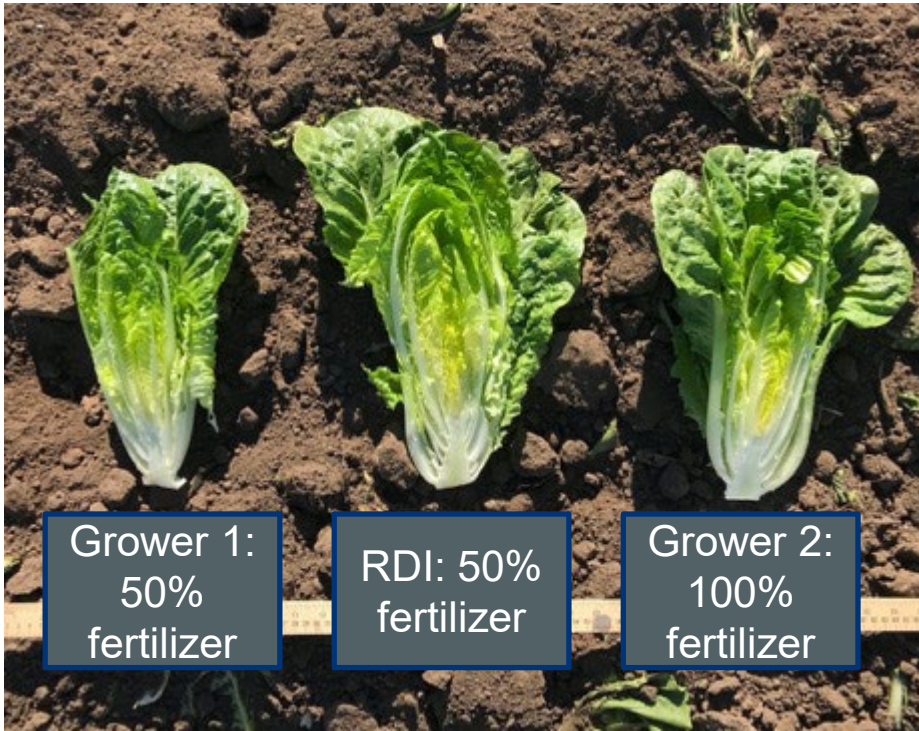


- ✓ Use in permanent and semi-permanent crops: vineyards, orchards, date palms, nut trees, alfalfa, hay, etc.
- ✓ Use in seasonal crops & regenerative farming utilizing no-till or low-till.
- ✓ Use for alley-cropping and intercropping for biodiversity and maximum land use

**2017 | ORGANIC ROMAINE
CENTRAL VALLEY, CALIFORNIA USA**



2017 | ORGANIC ROMAINE - CENTRAL VALLEY, CALIFORNIA USA

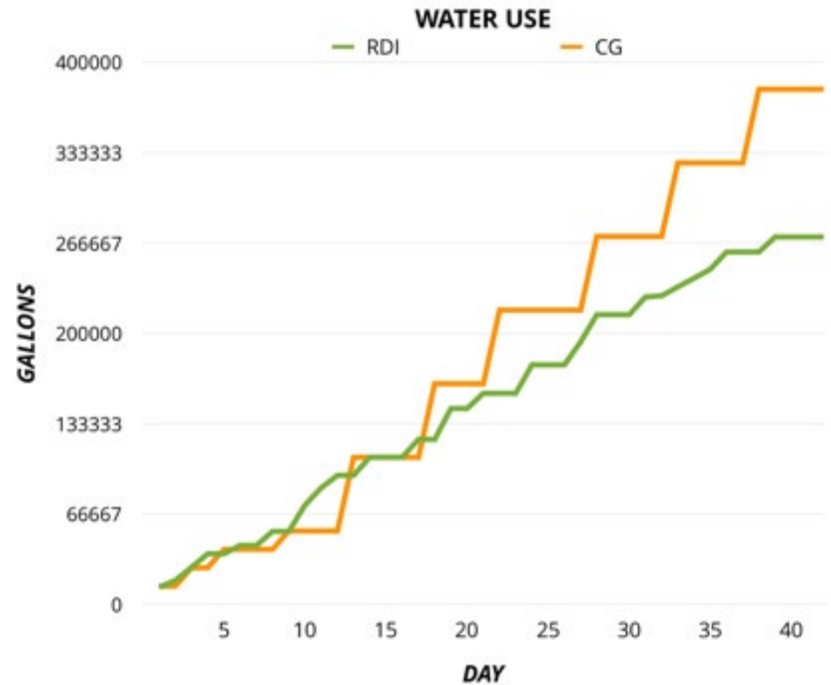


Grower 1:
50%
fertilizer

RDI: 50%
fertilizer

Grower 2:
100%
fertilizer

**WITH
LESS FERTILIZER AND**



**43% WATER SAVINGS vs
DRIP IN ONLY 40 DAYS**

PLANT-RESPONSIVE TECHNOLOGY FOR LIMITED SPACES



VERTICAL-LAYERED PLANTERS



ROOFTOP GARDENS



GREENHOUSES



LIVING WALLS

PLANT-RESPONSIVE TECHNOLOGY IN REMOTE AREAS



- No complex ET or flow rate calculations are required
- Reduces carbon footprint - can operate on single solar panel to pump water from well or pond
- Ultra low operating pressure can irrigate field via gravity fed system from raised water tanks
- Grows food for small farms and to feed families & villages
- Dubbed “the magic tube”

PLANT-RESPONSIVE TECHNOLOGY IN REMOTE AREAS

KAKUMA REFUGEE CAMP



PLANT-RESPONSIVE TECHNOLOGY SUPERIOR PERFORMANCE

ARTICHOKES: MONTEREY, CA

Reduced Water Use: 28%

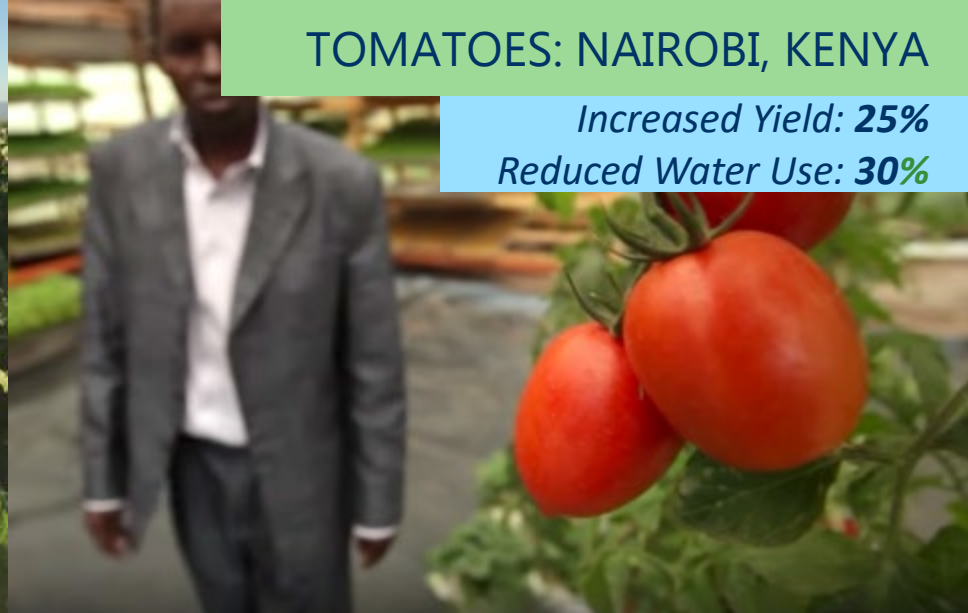


RDI Yield vs Standard Drip: 226%
Reduced Energy Use: 27%

NATIONAL AGRICULTURE
RESEARCH CENTER, PAKISTAN

TOMATOES: NAIROBI, KENYA

Increased Yield: 25%
Reduced Water Use: 30%



RDI Yield vs Standard Drip: 388%
8 Days Faster to Market





USA Office
Responsive Drip Irrigation, LLC
Florida
Tel: +1-941-792-9788

UAE Office
Responsive Drip Irrigation Manufacturing, Ltd.
Abu Dhabi
Tel: +971 2 6666156

Rita Pinto de Abreu
Europe Sales Manager & New Business Development

r.pintodeabreu@reponsivedrip.com

Tel: +351 912 740 104



RDI  RESPONSIVE
DRIP
IRRIGATION

PRESERVING WATER:
THE ESSENCE OF LIFE

www.responsivedrip.com

Forum Closing Session

