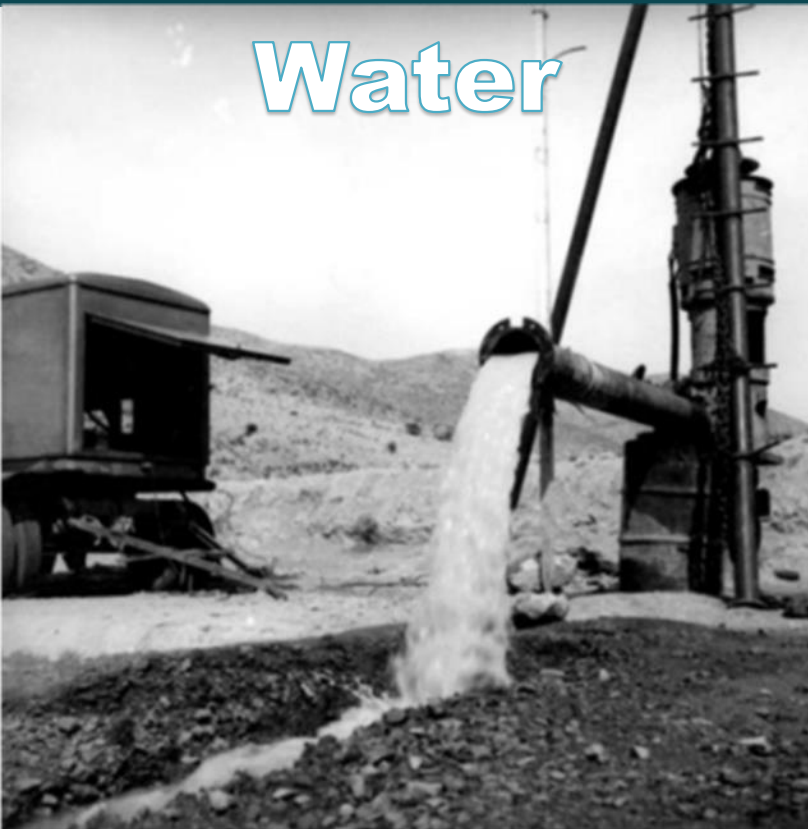


Water strategy in Cajamar: 45 years of innovation and change



Water

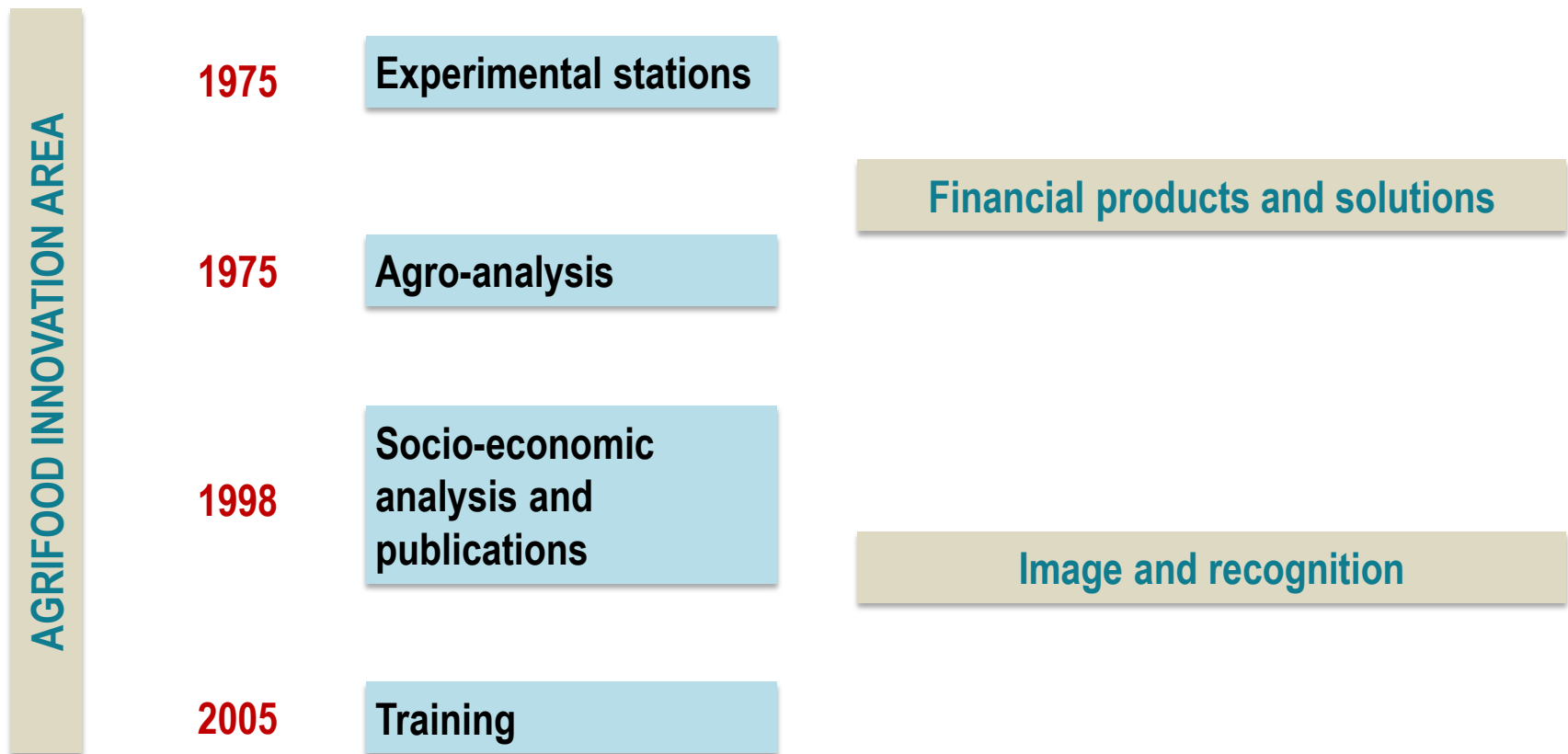


Almería (60' years) – Origins

- Poorest province of Spain
- The most arid area in Europe
- Very hilly
- Far away from anywhere



Innovation as a factor of competitiveness



Investigación



Fomentando la sostenibilidad
económica, social y
mediambiental del sector
Agro.

Formación



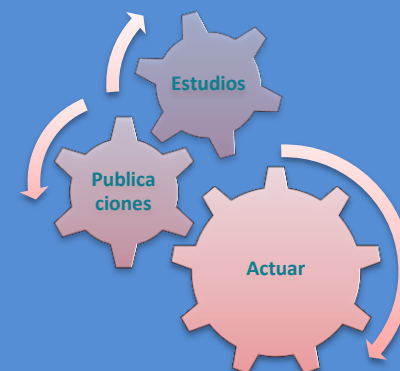
Apostando por la generación
de conocimiento como pieza
clave del desarrollo
socioeconómico.

Agroanálisis



Analizando las distintas
variables que influyen en la
situación del sector Agro.

Estudios y publicaciones



→ Our mission is to consolidate the leadership and specialisation of the Cajamar Cooperative Group as a benchmark entity in the spanish agri-food sector.

<https://www.cajamar.es/es/agroalimentario>

<https://www.publicacionescajamar.es>

<https://www.fundacioncajamar.es>

Experimental stations



FOOD AND HEALTH

BIOECONOMY

AGROSUSTAINABILITY

GREENHOUSES TECHNOLOGY



FRANSFER OF KNOWLEDGE

CAJAMAR FOUNDATION EXPERIENCE

- Evaluation of localised irrigation installations
- Studies of the state of groundwater resources
- Generation of alternative water resources
- Irrigation programming for horticultural crops in greenhouses
- Use of sensors in irrigation programming
- Controlled Deficit Irrigation Strategies
- Nitrate leaching
- Effect of salinity on crops
- Recirculation of nutrient solutions in substrate crops
- Reuse of waste water for irrigation
- Use of microalgae for wastewater treatment

OPTIMAL DESIGN OF IRRIGATION NETWORKS

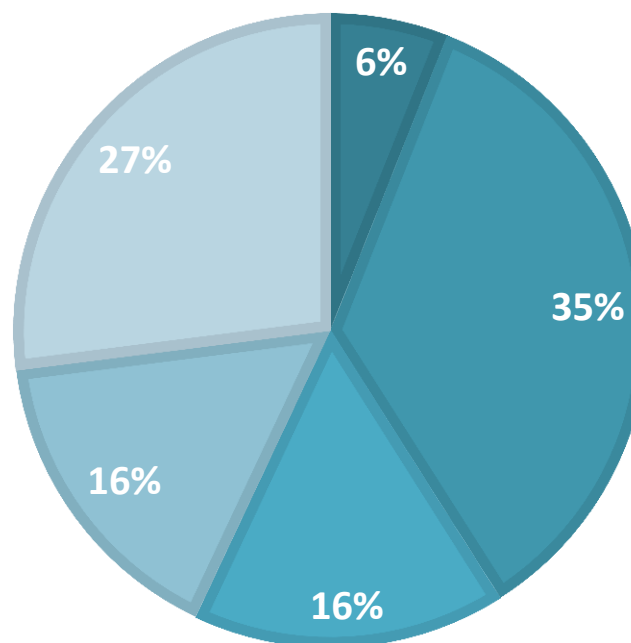
Uniformity coefficient

Irrigation network

- Optimal design
- Flow meters
- Manometers
- Energy consumption
- Maintenance

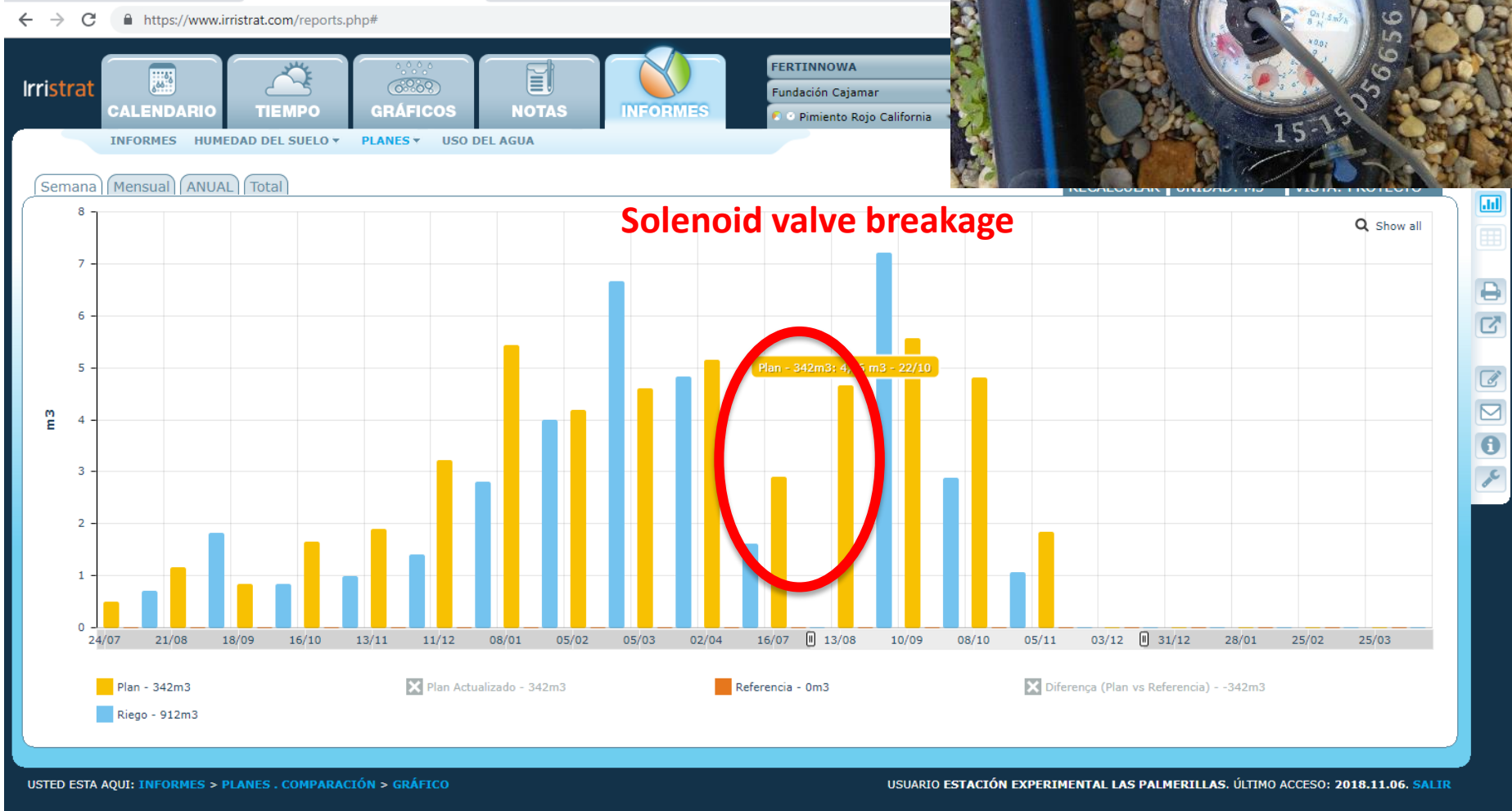
CAMPO DE DALÍAS

■ >95 ■ 85-95 ■ 80-85 ■ 70-80 ■ <70



Fuente: Rafael Baeza, IFAPA La Mojonera

Water meter



Watering Dose Recommendations

Estimation of water needs through PrHo Program

- ✓ Climatic data (external radiation and temperature inside the greenhouse)
- ✓ Use in combination with sensors (tensiometers)



Program and manual
Free download at:

<http://bit.ly/2pW9gsu>



Consumos medios del cultivo de PIMIENTO [litros/m² día]

FECHAS DE TRANSPLANTE

MES	SEMANA	2ª quincena Julio	1ª quincena Agosto	2ª quincena Agosto	1ª quincena Septiembre	2ª quincena Septiembre
JULIO	del 16 al 23	0,76				
	del 24 al 31	0,83				
AGOSTO	del 01 al 07	1,46	0,79			
	del 08 al 15	2,11	0,75			
SEPTIEMBRE	del 16 al 23	2,73	1,18	0,70		
	del 24 al 31	3,21	1,78	0,70		
OCTUBRE	del 01 al 07	4,16	2,62	1,34	0,69	
	del 08 al 15	4,32	3,01	1,85	0,64	
NOVIEMBRE	del 16 al 22	3,97	3,27	2,22	0,93	0,57
	del 23 al 30	3,47	3,31	2,41	1,27	0,50
DICIEMBRE	del 01 al 07	3,14	3,14	2,60	1,57	0,73
	del 08 al 15	2,66	2,66	2,51	1,64	0,93
ENERO	del 16 al 23	2,41	2,41	2,41	1,78	1,13
	del 24 al 31	2,09	2,09	2,09	1,79	1,23
FEBRERO	del 01 al 07	1,79	1,79	1,79	1,70	1,22
	del 08 al 15	1,61	1,61	1,61	1,61	1,23
MARZO	del 16 al 22	1,48	1,48	1,48	1,48	1,26
	del 23 al 30	1,23	1,23	1,23	1,23	1,12
ABRIL	del 01 al 07	1,02	1,02	1,02	1,02	0,99
	del 08 al 15	0,96	0,96	0,96	0,96	0,96
MAYO	del 16 al 23	0,87	0,87	0,87	0,87	0,87
	del 24 al 31	0,85	0,85	0,85	0,85	0,85
JUNIO	del 01 al 07	0,86	0,86	0,86	0,86	0,86
	del 08 al 15	0,92	0,92	0,92	0,92	0,92
JULIO	del 16 al 23	0,91	0,91	0,91	0,91	0,91
	del 24 al 31	1,00	1,00	1,00	1,00	1,00
AGOSTO	del 01 al 07	1,16	1,16	1,16	1,16	1,16
	del 08 al 14	1,19	1,19	1,19	1,19	1,19
SEPTIEMBRE	del 14 al 21	1,24	1,24	1,24	1,24	1,24
	del 22 al 28	1,25	1,25	1,25	1,25	1,25
OCTUBRE	del 01 al 07	1,33	1,33	1,33	1,33	1,33
	del 08 al 15	1,47	1,47	1,47	1,47	1,47
NOVIEMBRE	del 16 al 23	1,74	1,74	1,74	1,74	1,74
	del 24 al 31	1,86	1,86	1,86	1,86	1,86
DICIEMBRE	del 01 al 07	2,18	2,18	2,18	2,18	2,18

IRRIGATION PROGRAMMING METHODS

How much and when to irrigate

- Evapotranspiration (ET_c) estimation

Climatic parameters

$$E_{tc} = E_{to} \times k_c \times k_r$$



- Measurement of the water content in the soil



- Measurement of the plant's water status



Potential: energy with which water is retained by the soil

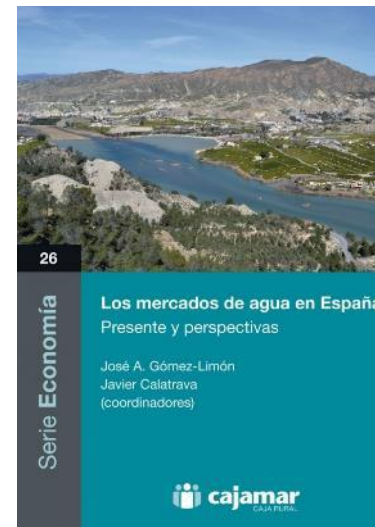


Water content: the amount of water that normally occupies the pore space of the floor



CAJAMAR FOUNDATION EXPERIENCE (socioeconomic analysis)

- Water value
- Irrigation water economy
- Socio-economic importance of irrigation in the Spanish Mediterranean
- Effects of the irrigation modernisation
- Water markets in Spain



THE NEXT STEP



Incubator of high-tech companies in water



A way of making Europe



A new Strategy:

t

labour

Talent

T

i

intensification

Innovation

I

C

Capital

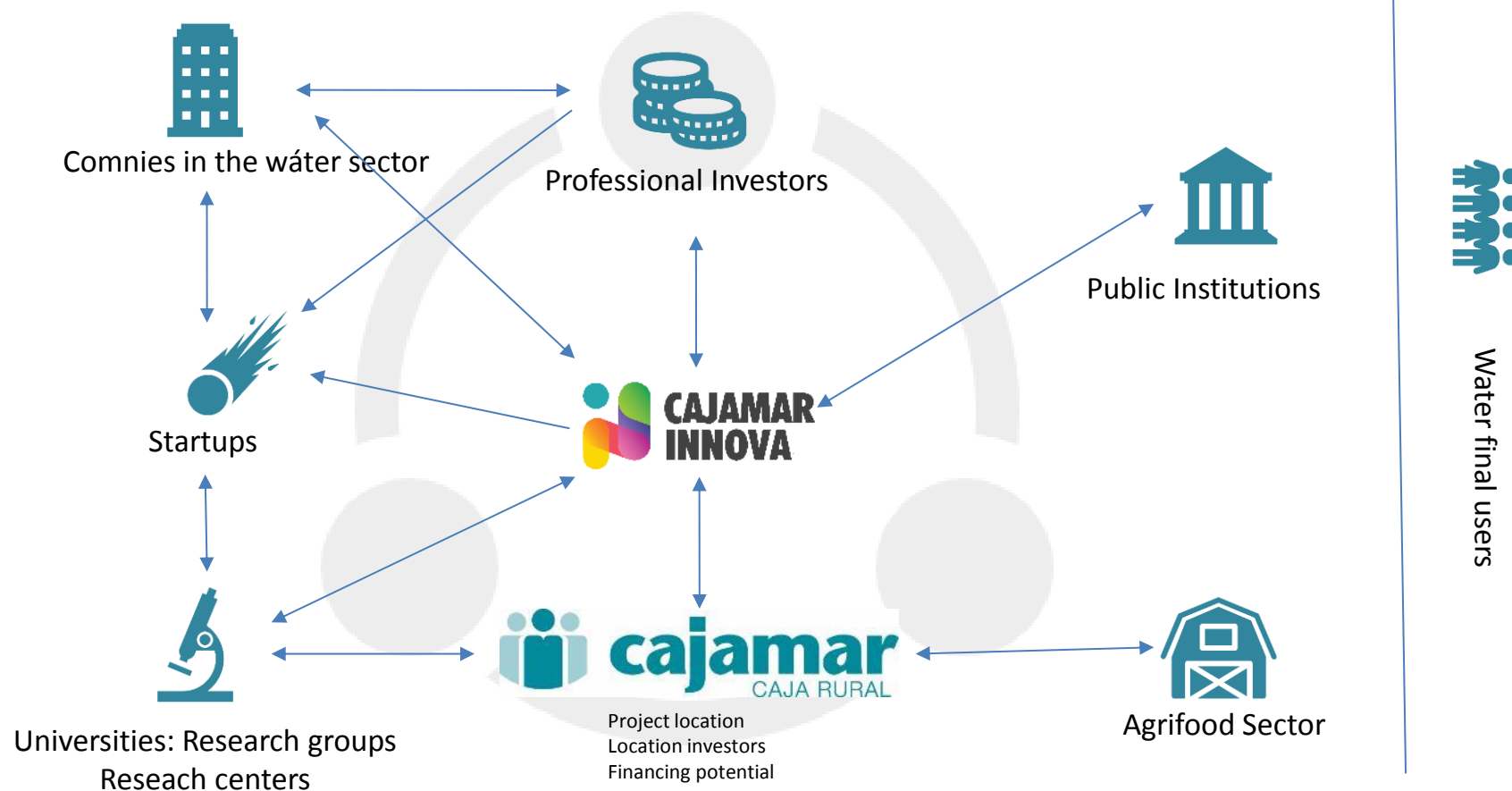
Capital

C



To promote the creation of companies whose innovations and technologies contribute to improving water management

CAJAMAR INNOVA ECOSYSTEM



We are creating the Cajamar Innova Community:



Colaboration for innovation

Together we can solve global water challenges



Súmate a nuestra comunidad Cajamar Agua

Government



Water supply



Large corporations



Agents of knowledge



Agrifood sector



Agents of entrepreneurship



Irrigation Communities



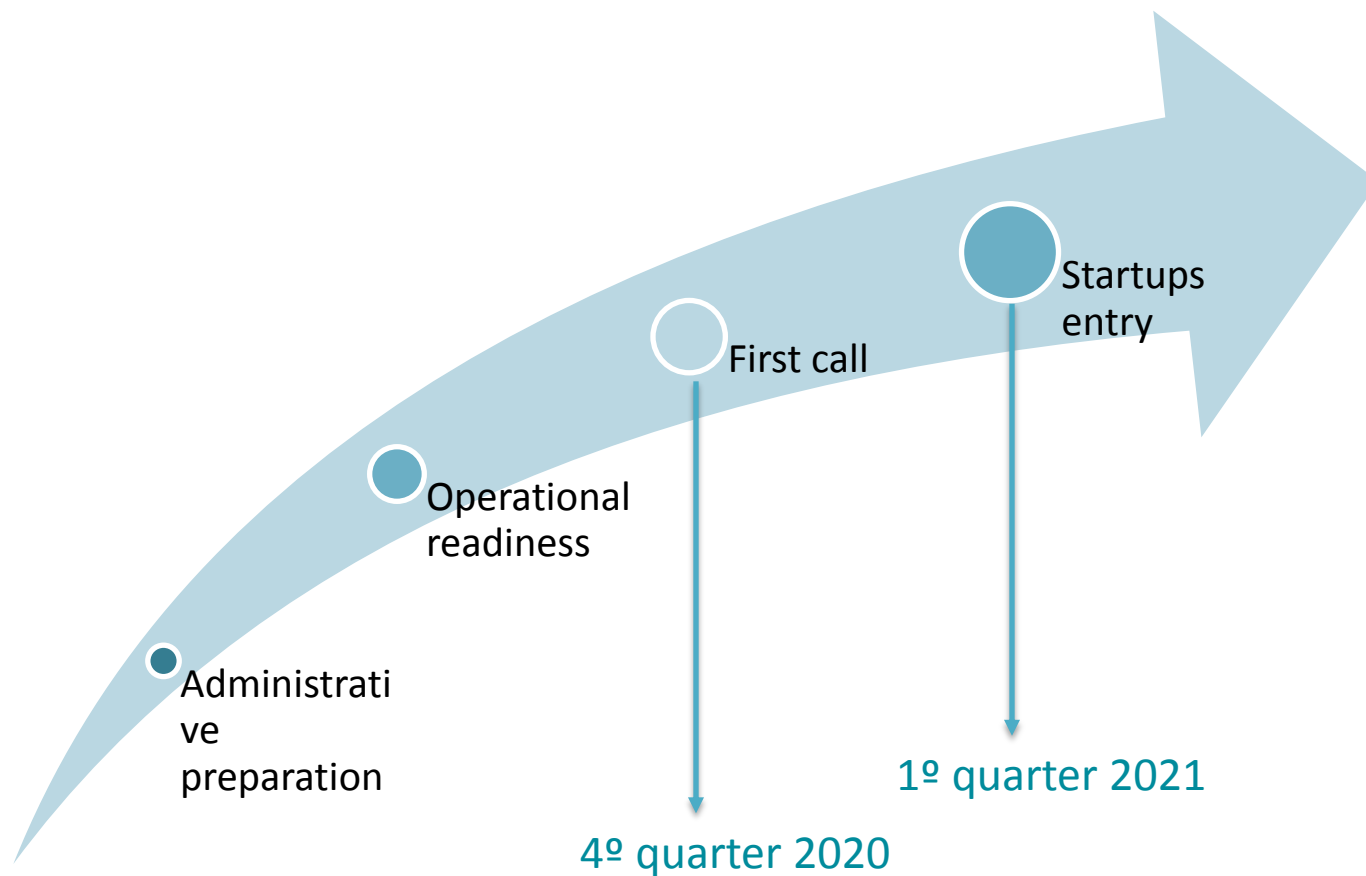
Investors



Technology



Roadmap



Our differential model

The perfect place

We are specialists

Pilots in real
environments

Networking



Innova Next

Lines of specialization

Circular water economy

Digitisation (IoT, Big Data, Artificial Intelligence, etc.)

Management and governance

(politics, laws, sensibilization, training...)

Water resources

Desalination
Debugging
Regeneration
Aquifers
Recruitment
Distribution

Efficiency

Sensors	Mechanization/
Remote sensing	Automation
Control	Artificial vision
equipment	New materials
Hydraulics	
Fertirrigation	

Energy and environment

Renewable energies	Water footprint -
Energy	Carbon footprint
optimization	Vertical
Water/energy	Agriculture
storage	Fish Farming
Water Economy	Microalgae

Resources - Infrastructure



600 m² office space

Capacity

60 people

20 startups

2 Experimental Stations

Team (50)



A high-speed photograph of water droplets falling into a pool of water, creating concentric ripples. The water is a deep blue color, and the droplets are captured in mid-air, reflecting light. The text "Do you want to change the world with us?" is overlaid in white, bold, sans-serif font.

Do you want to change the world with us?

**Muchas
Gracias.**

