

IRRITECH – un DSS intelligente per la gestione sostenibile dell’irrigazione

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hydrotech
tecnologie smart in agricoltura



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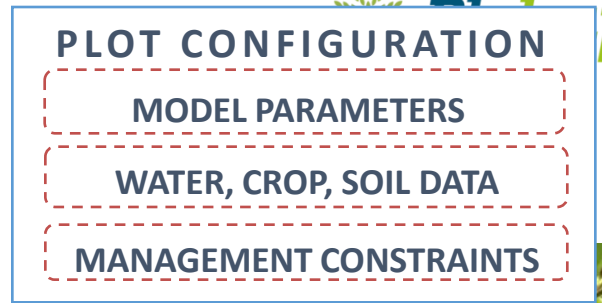
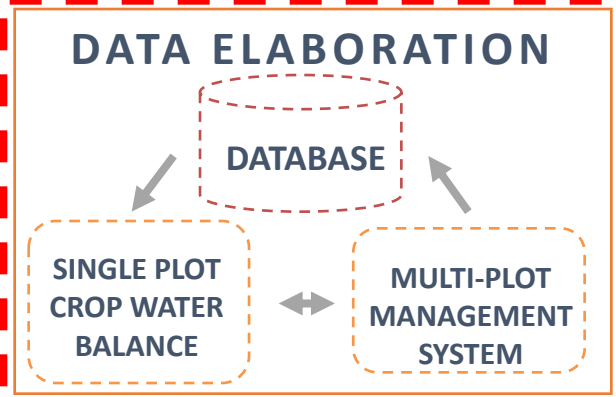
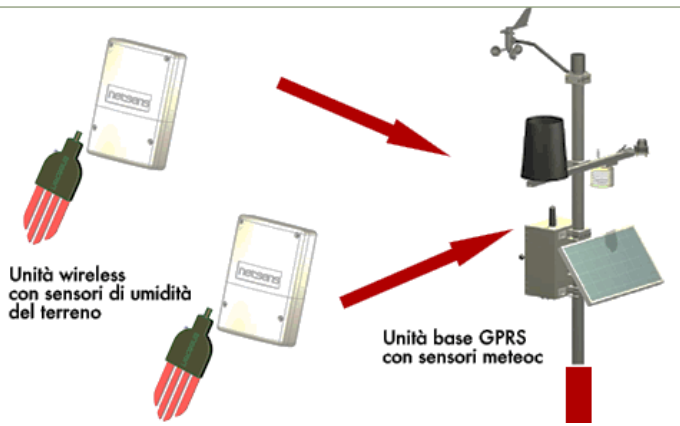
ECO-LOOP

amastuola

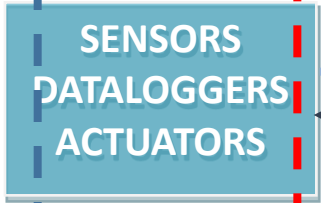


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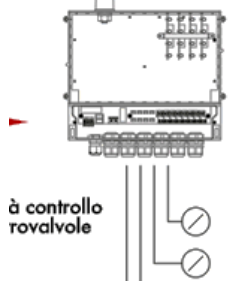
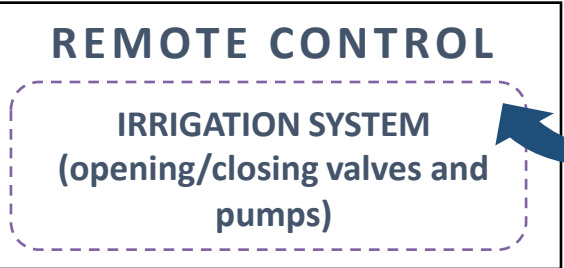




AGRONOMICAL AND TECHNOLOGICAL ASSISTANCE



SOFTWARE COMPONENTS AND CLOUD SERVICES



HARDWARE COMPONENTS FOR DATA ACQUISITION AND CONTROL



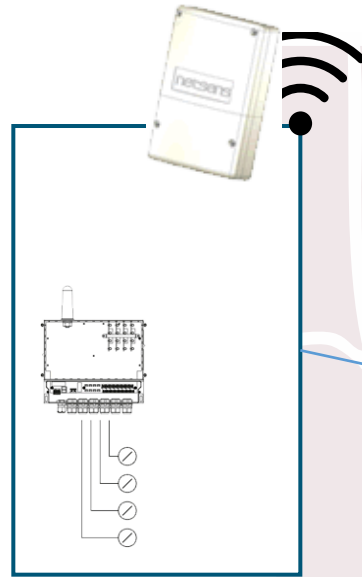
Hydro-Tech – BLULEAF - IRRITECH: main features

- Combines soil/crop water status **monitoring** and soil water balance **modeling**
- Multi ETo model (depending on data availability) – up to 14 formulas
- “Adjustable” K_{Rs} and R_s_measured, K_c to local conditions, W_S to local conditions
- Multi crop development model (days/heat units) with adjustable number of development stages
- Multi “Crop response to Water” model and yield prediction (Stewart+Rao)
- Weather forecasting use in DSS and missing data generation - **METEOBLUE**
- Separate crop development and water management **phases/thresholds** (RDI)
- Completely/partially **automated** (level of automation managed by user)
- Real time remote control and management
- Multi plot/crop management ... **Multi-scale** (field, farm, irrigation district)
- Water management optimization for **dynamic management strategies** for different crops/fields
- On field/crop specific management strategies (priorities water / yield / energy / profit ..., inclusion/exclusion of irrigation days/time, etc.)
- **Eco-efficiency** considered
- **Flexible/Improvable** – permits insert of new/additional sensors/modules

Real time remote control and management WiSense

Remote control of irrigation

- Wi-Fi unit for automation
- remote control of electro-valves
- powered by battery & photovoltaic panel



Soil moisture monitoring

- Wi-Fi unit for soil monitoring
- powered by battery & photovoltaic panel



Farm business center:

- Agro-meteorological station
- remote control of electro-pumps
- GPRS connection with cloud (via SIM card)
- Wi-Fi connection with remote units (guaranteed distance 700 m in visibility)

Separate crop development and water management phases/thresholds (RDI)

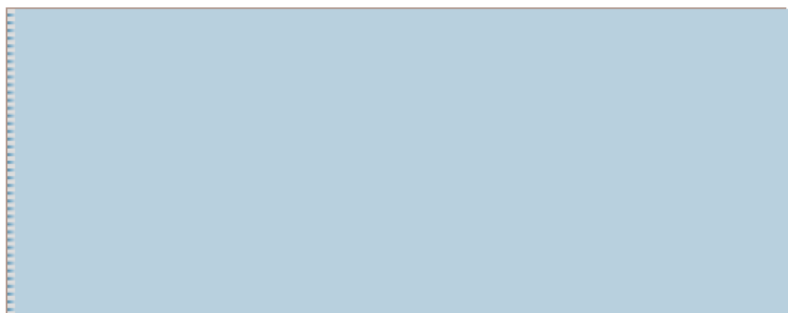
CREA COLTURA

1 Configurazione 2 Parametri colturali 3 Registro fenologico 4 Gestione irrigazioni 5 Gestione nutrienti 6 Conclusione

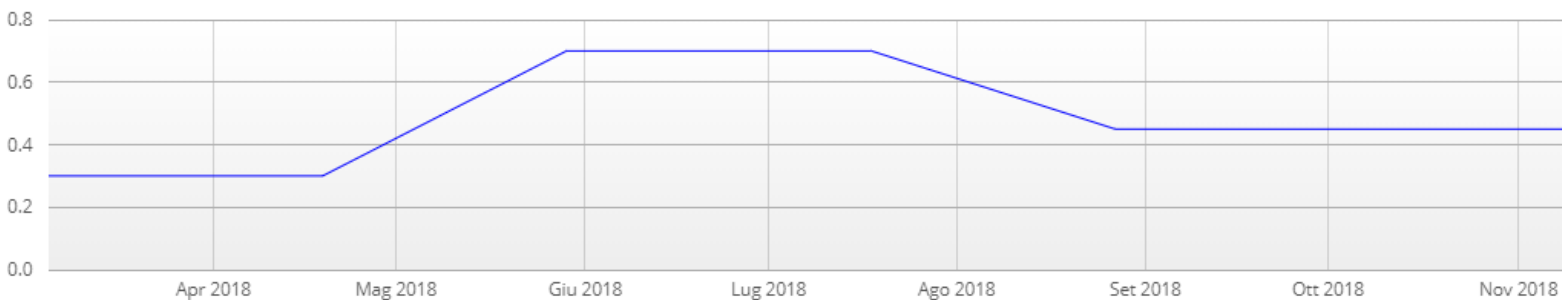
Parametri colturali








Fase	Inizio	Fine	Durata	Kc	P	Pioggia efficace	Espansione radicale laterale	Profondità delle radici
Stadio iniziale	5/3/2018	19/4/2018	45 giorni	0.30	45 %	90 %	100 %	70 cm
Sviluppo vegetativo	19/4/2018	29/5/2018	40 giorni	0.70	45 %	90 %	100 %	↓
Stadio intermedio	29/5/2018	18/7/2018	50 giorni	0.70	45 %	80 %	100 %	↓
Stadio finale	18/7/2018	27/8/2018	40 giorni	0.45	45 %	80 %	100 %	↓
Riposo vegetativo	27/8/2018	10/11/2018	75 giorni	0.45	45 %	90 %	100 %	70 cm

✿ ESPANSIONE RADICALE



✿ COEFFICIENTI CULTURALI



Foglie distese	5/4/2018	15/4/2018	<u>10</u> giorni	
Da grappoli visibili a grappoli separati	15/4/2018	25/4/2018	<u>10</u> giorni	
Fioritura	25/4/2018	5/5/2018	<u>10</u> giorni	
Allegagione	5/5/2018	18/5/2018	<u>13</u> giorni	
Sviluppo grappolo	18/5/2018	9/6/2018	<u>22</u> giorni	
Chiusura grappolo	9/6/2018	4/7/2018	<u>25</u> giorni	
Invaiatura	4/7/2018	5/8/2018	<u>32</u> giorni	
Maturazione frutti	5/8/2018	1/9/2018	<u>27</u> giorni	

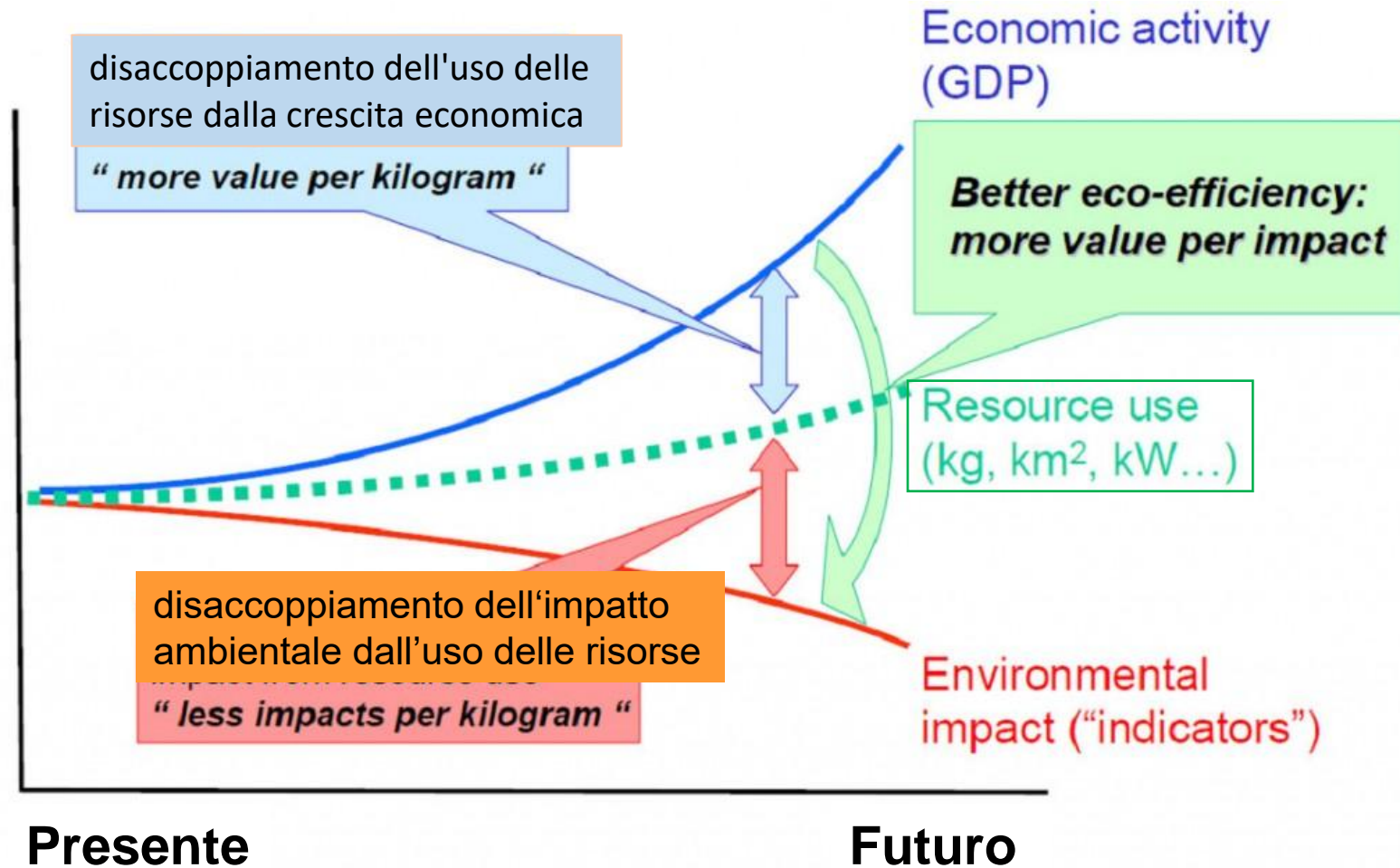
Gestione irrigazioni

Fase fenologica	Livello di stress	Percentuale di ripristino riserva	Suggerimenti
Riposo invernale	Nessuna irrigazione	100 %	i
Da rigonfiamento gemme a inizio germogliamento	Assente	100 %	i
Foglie distese	Assente	100 %	i
Da grappoli visibili a grappoli separati	Assente	100 %	i
Fioritura	Assente	100 %	i
Allegagione	Assente-Leggero	90 %	i
Sviluppo grappolo	Assente-Leggero	90 %	i
Chiusura grappolo	Leggero-Moderato	80 %	i
Invaiaura	Leggero-Moderato	80 %	i
Maturazione frutti	Moderato	70 %	i
Da raccolta ad inizio caduta foglie	Nessuna irrigazione	100 %	i

Azioni su livello di stress

Azioni su percentuale di ripristino riserva

DALL'EFFICIENZA ALL'ECO-EFFICIENZA NELL'USO DELLE RISORSE



Eco-Efficienza in Agricoltura

Product market value – Cost of production (€)



AGRICULTURAL PRODUCT ADDED VALUE

ENVIRONMENTAL IMPACT

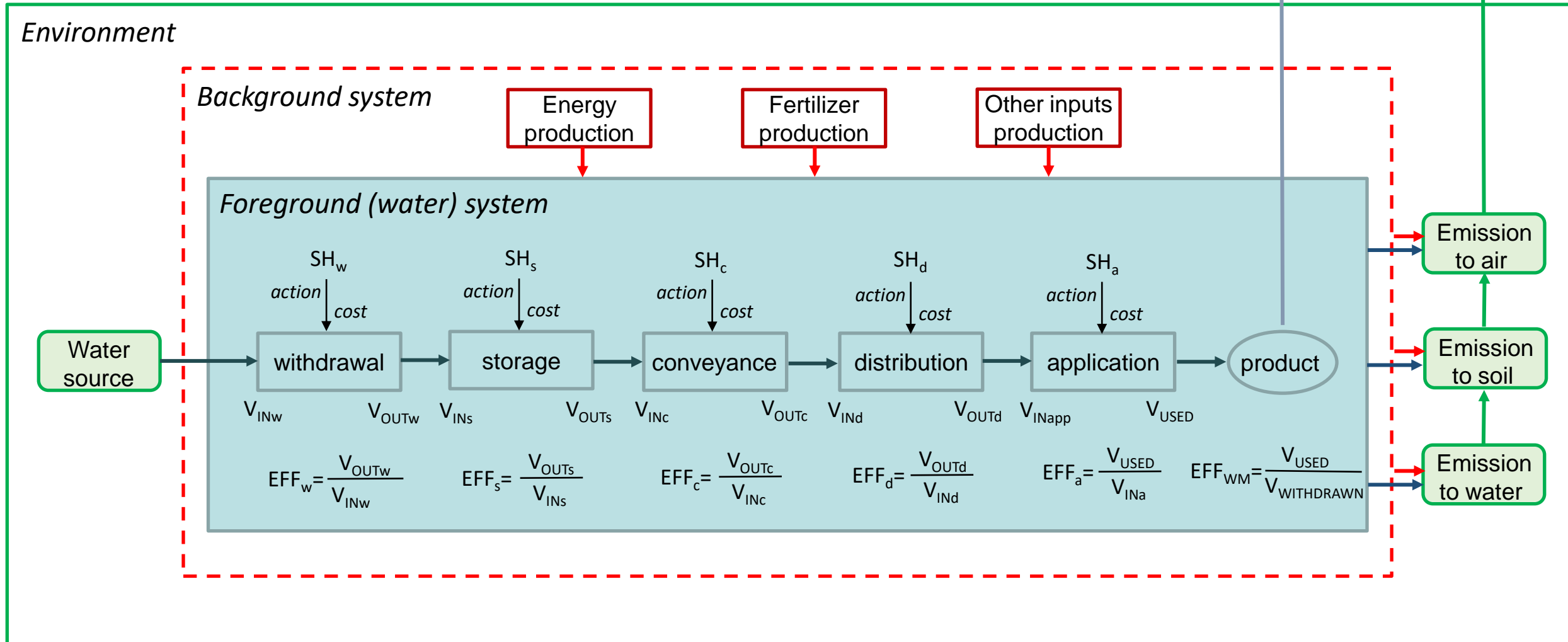


- Water withdrawal (m³)
- Energy consumption (kWh)
- Fertilizers (N, P) application (kg)
- Emissions (kg CO₂ eq)

*Composite
System
Indicator
CO₂ equivalente*

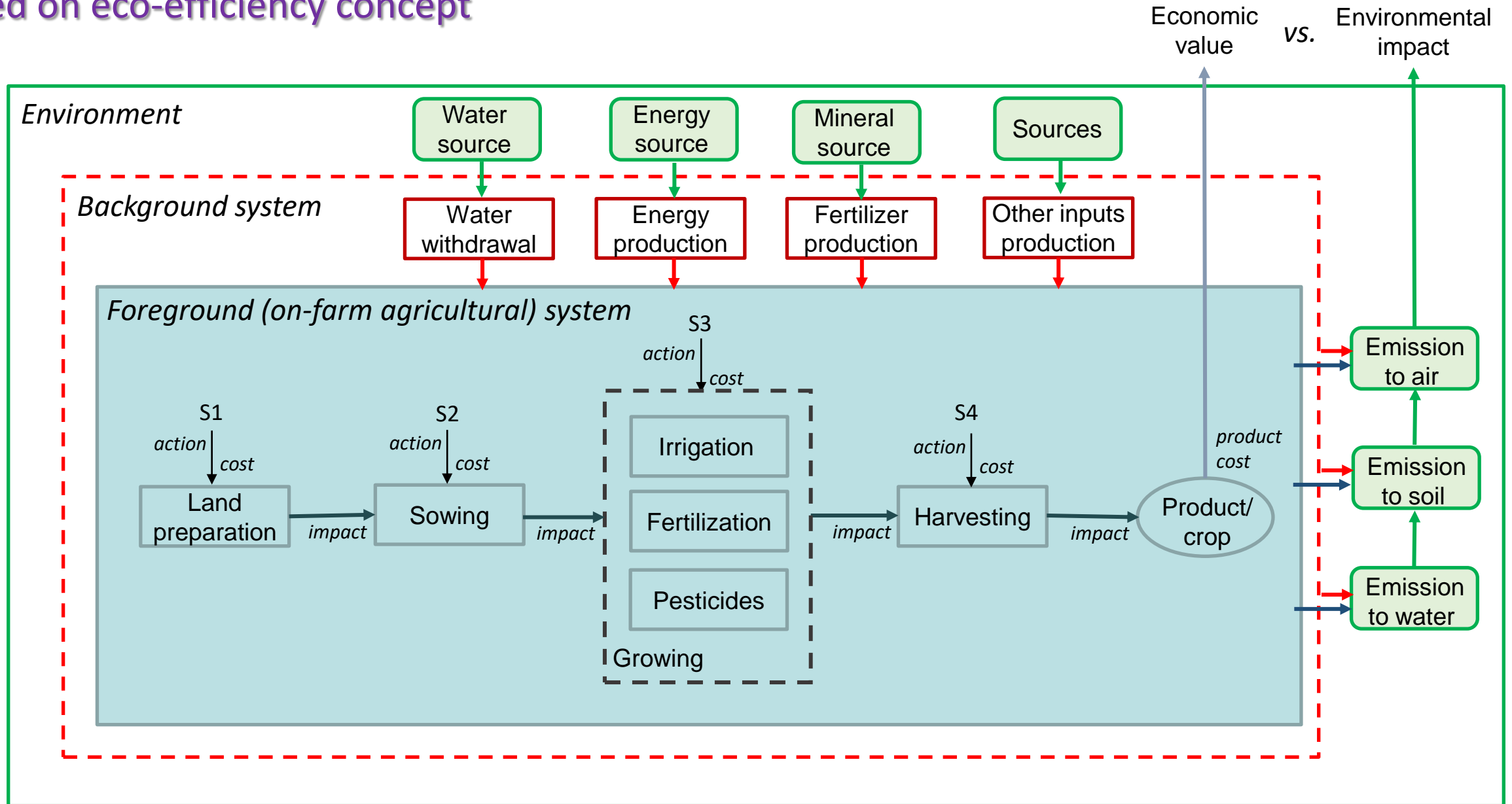
Resource Exploitation Indicator (withdrawal/availability), REI

VALUE CHAIN OF WATER FROM THE SOURCE TO THE PLOT

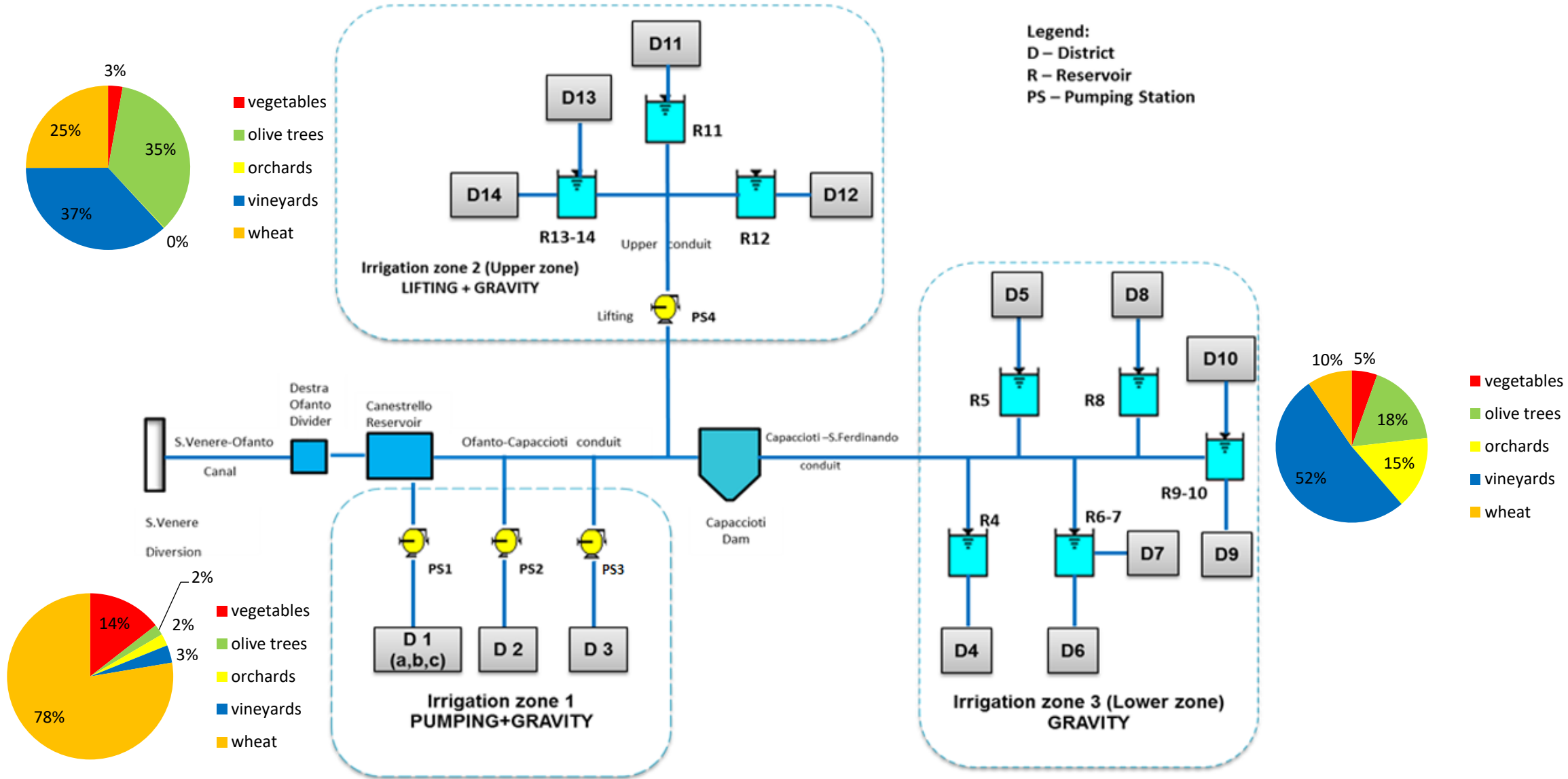


V indicates water volumes – inflows and outflows for different stages indicated as w (withdrawal), s (storage), c (conveyance), d (distribution), a (application). SH and EFF indicate the corresponding stakeholders and water management efficiencies, respectively.

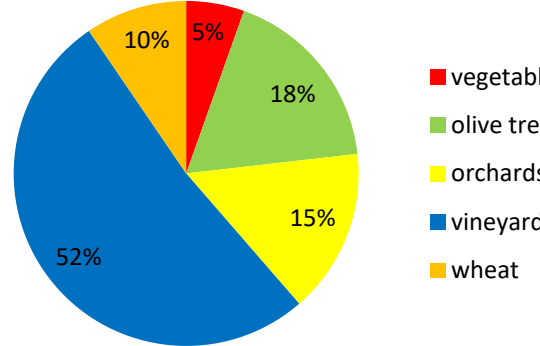
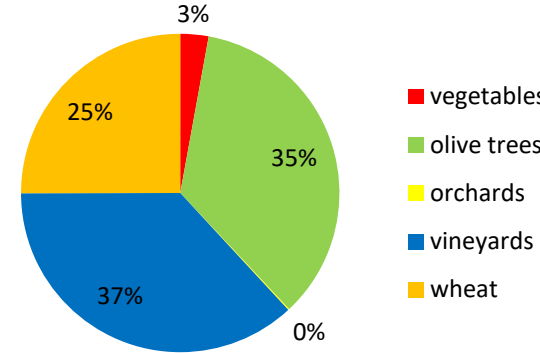
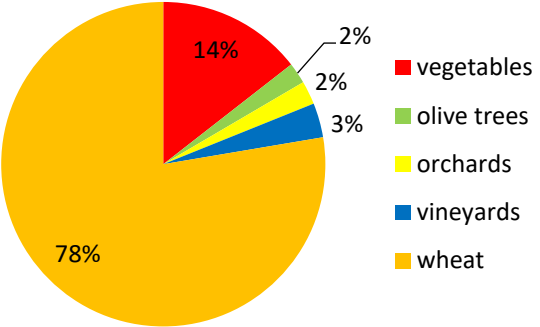
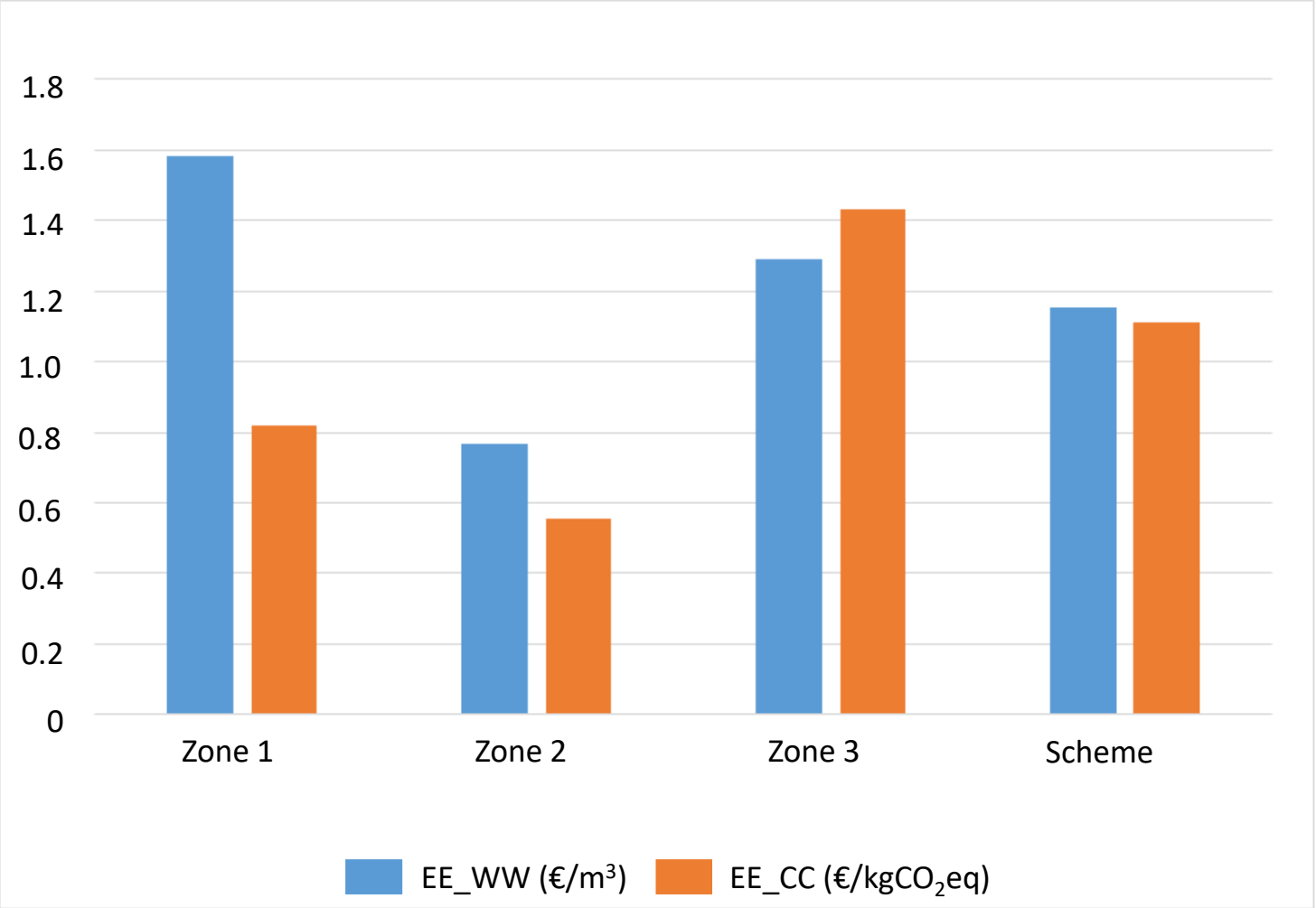
FUTURE ... monitoring, management & certification of cultivation ... based on eco-efficiency concept



Water supply chain mapping of *Sinistra Ofanto* irrigation scheme



Eco-efficiency of *Sinistra Ofanto* irrigation scheme



La strada da seguire ...



CIHEAM
IAM BARI

