DUPC2 Webinar Series

Wastewater Treatment and Reuse: Creating Resources for Agriculture and Addressing Water Scarcity

Thursday 08 June 2023
11:00 CEST

WATER AND DEVELOPMENT PARTNERSHIP PROGRAMME

IHE DELFT
Institute for Water Education under the auspices of UNESCO

Ministry of Foreign Affairs of the Netherlands

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WATER AND DEVELOPMENT PARTNERSHIP PROGRAMME

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Waste water treatment and reuse: The potential, and pathway to reach scale

Key-factors to increase sustainable wastewater reuse in the M-East

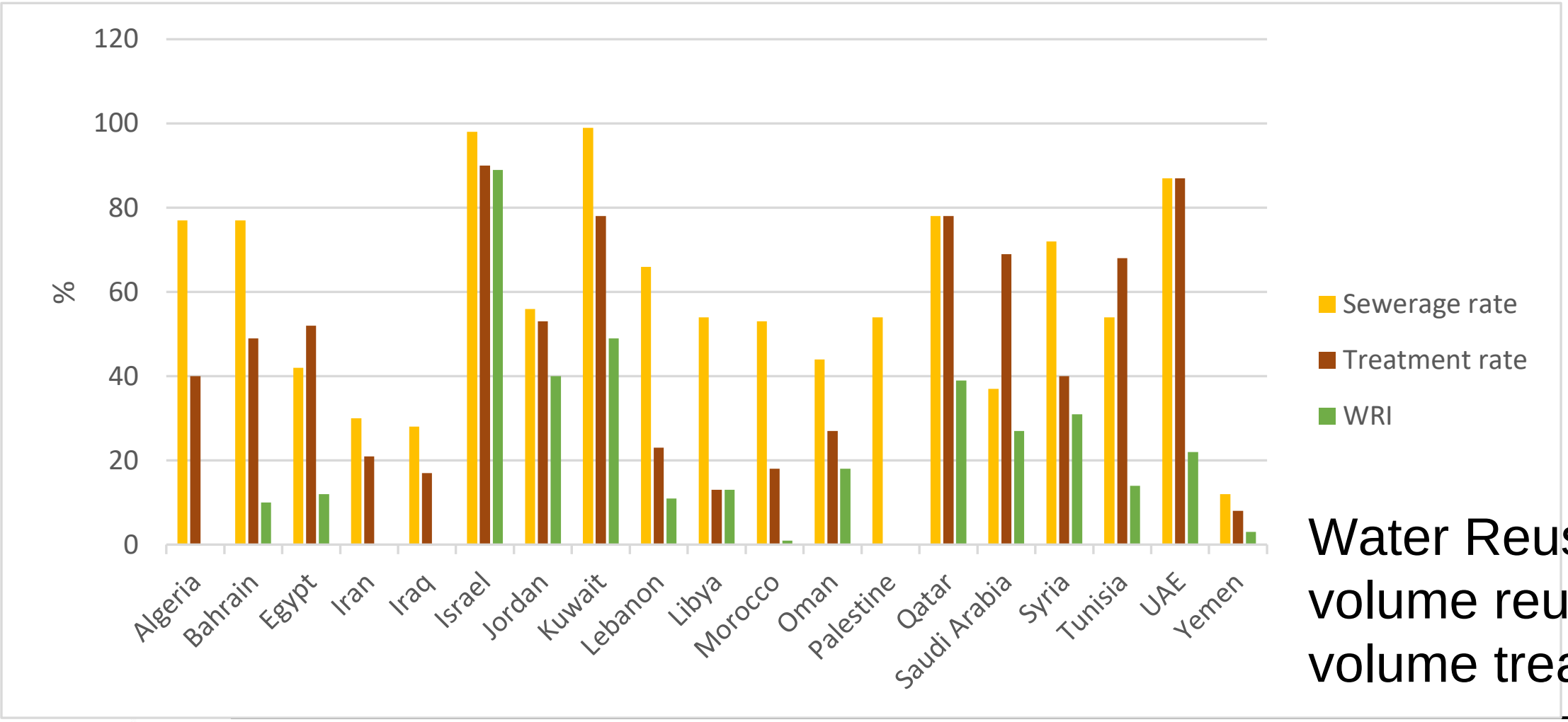
Peter van der Steen

DUPC2 / WDDP

ValleyWater project in Jordan

KidronNar project in Palestine and Israel

Scope for improvement: the potential of wastewater reuse not yet fully used



Water Reuse Index = volume reused / volume treated

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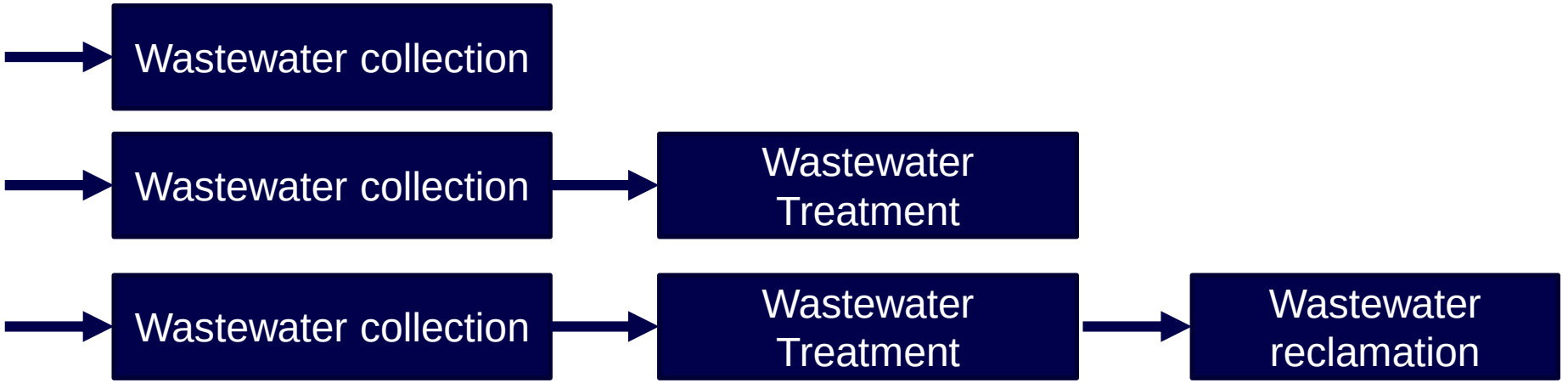
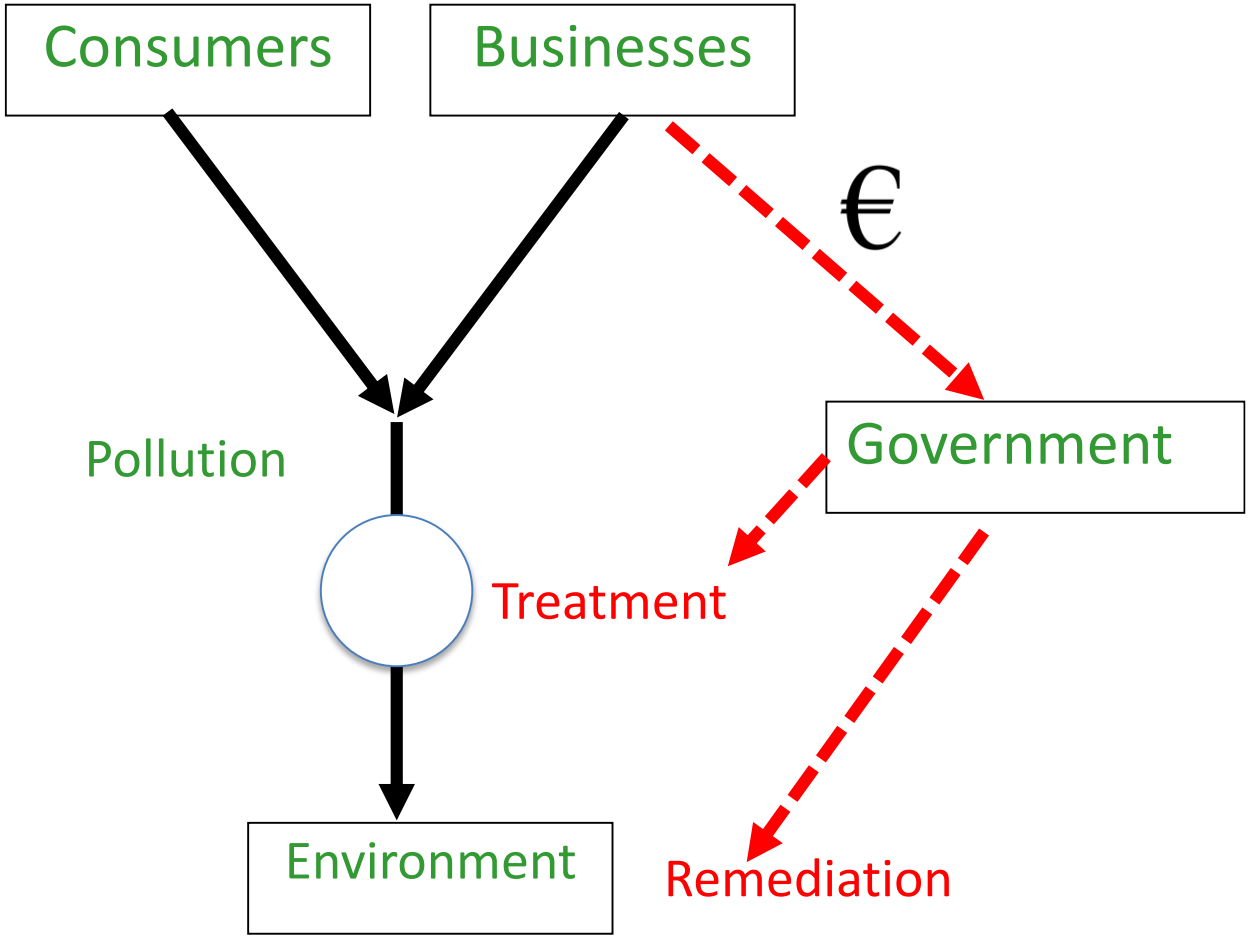
Systems or chain approach



–Investment in collection and treatment are pre-conditions for successful reclamation projects.

– Polluter-pays-principle

The lesser one pollutes – the lesser one pays



Decentralised wastewater treatment and reuse

Citizen observatory, stakeholder participation
Municipality council
Long term effort required to establish cost-recovery and proper O&M






Resource recovery ?

Is it possible to cover collection and treatment costs by sale of treated wastewater to farmers?

Certainly not; only partial recovery is possible

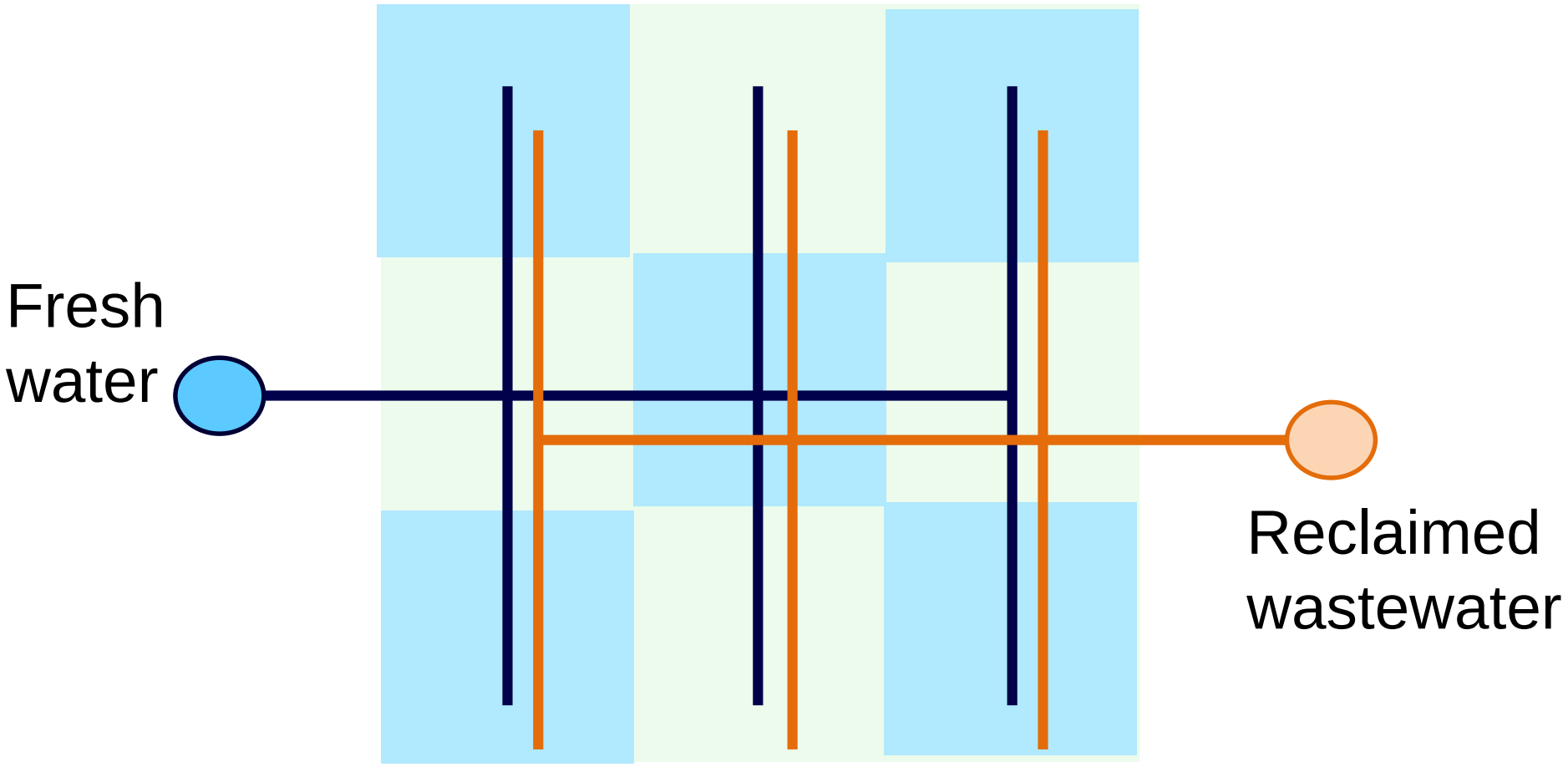
Costs of collection, treatment reuse: 0.25 – 2.0 USD/m3

Reclaimed water tariff ME: 0.02 – 0.3 USD/m3

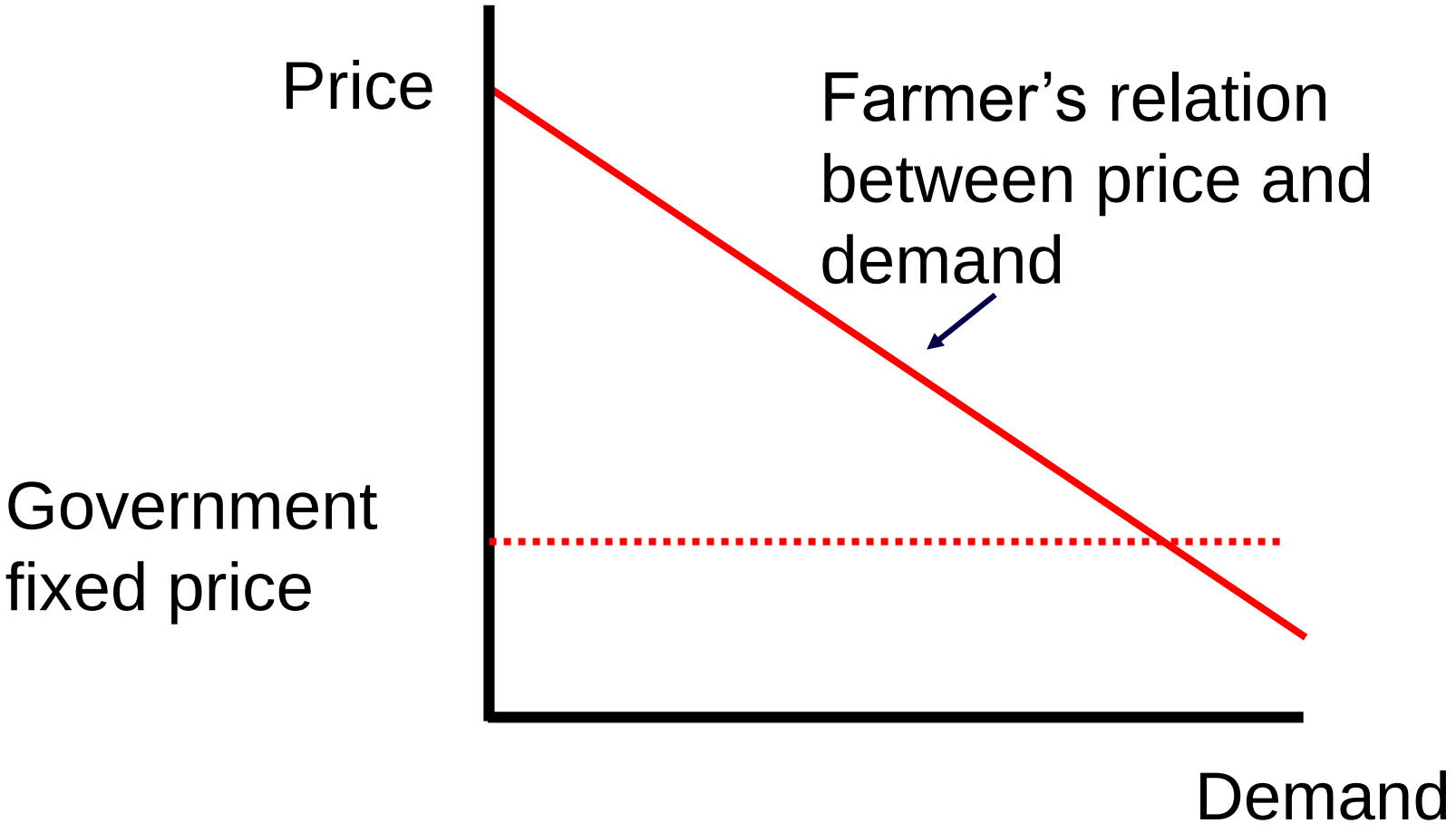
Economist’s approach

How do tariffs for fresh water sources compare to costs of providing treated wastewater to farmers? And how does that affect demand for treated wastewater?

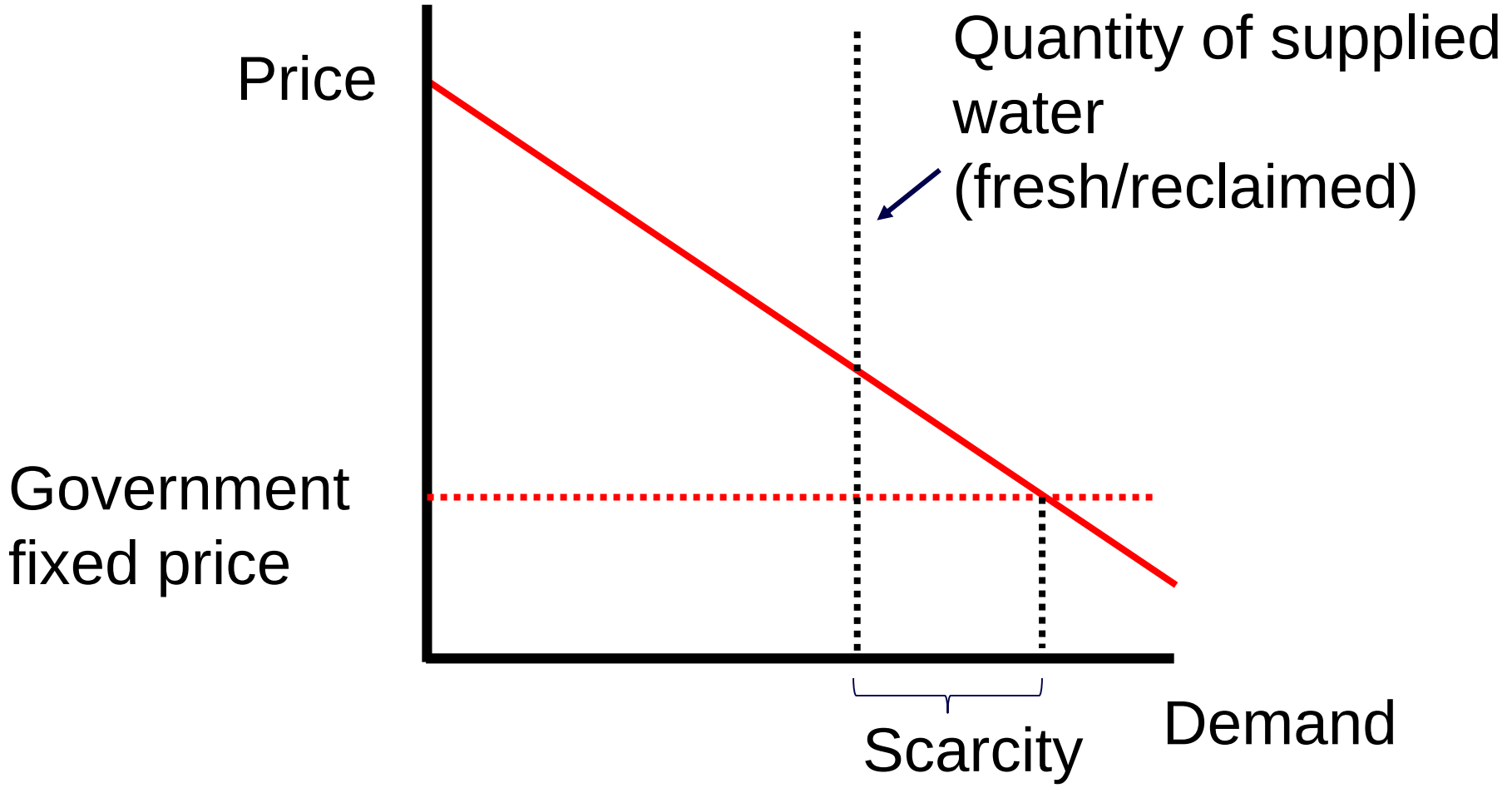
Case where farmers have two options



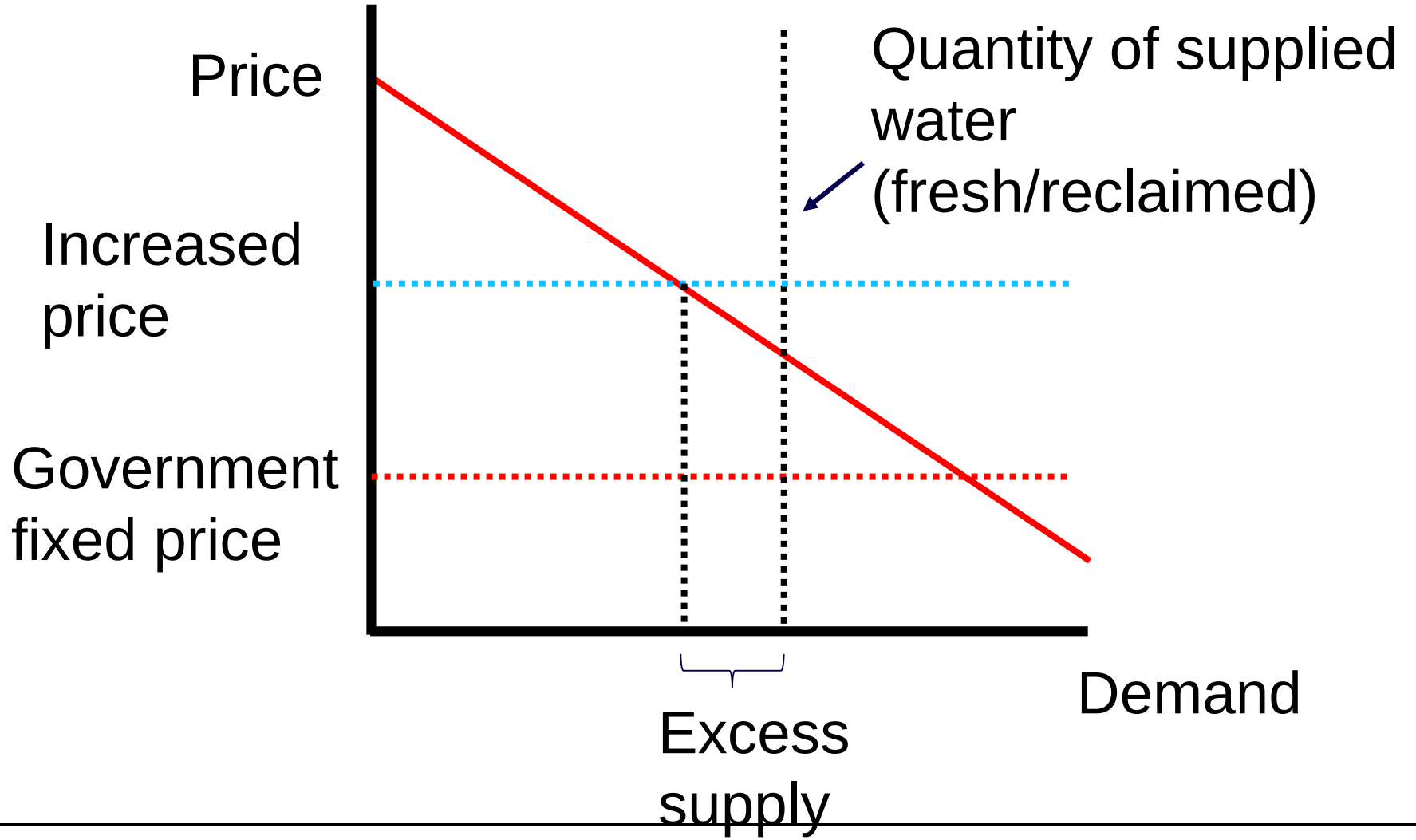
Price demand curves



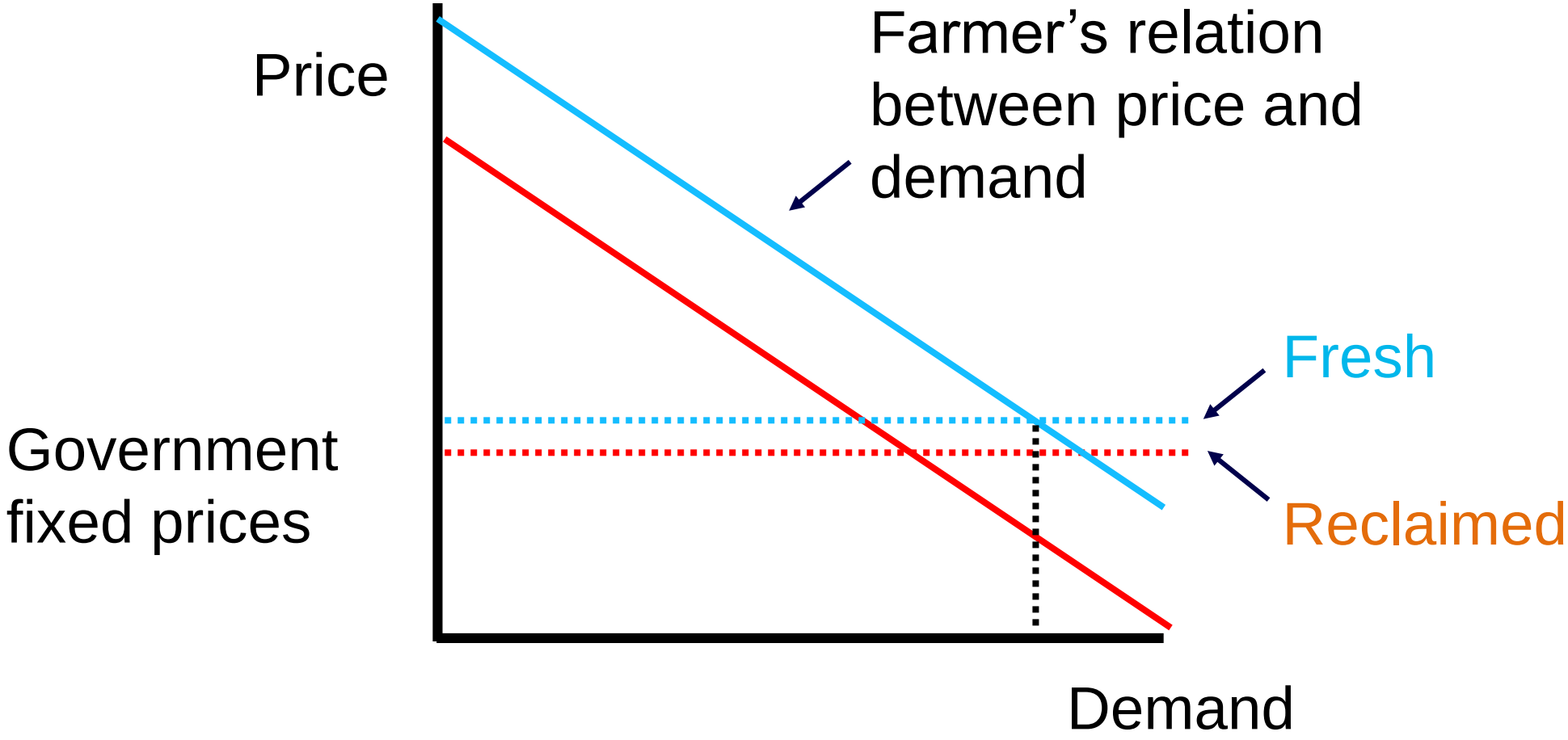
Price demand curves - scarcity



Price demand curves - scarcity

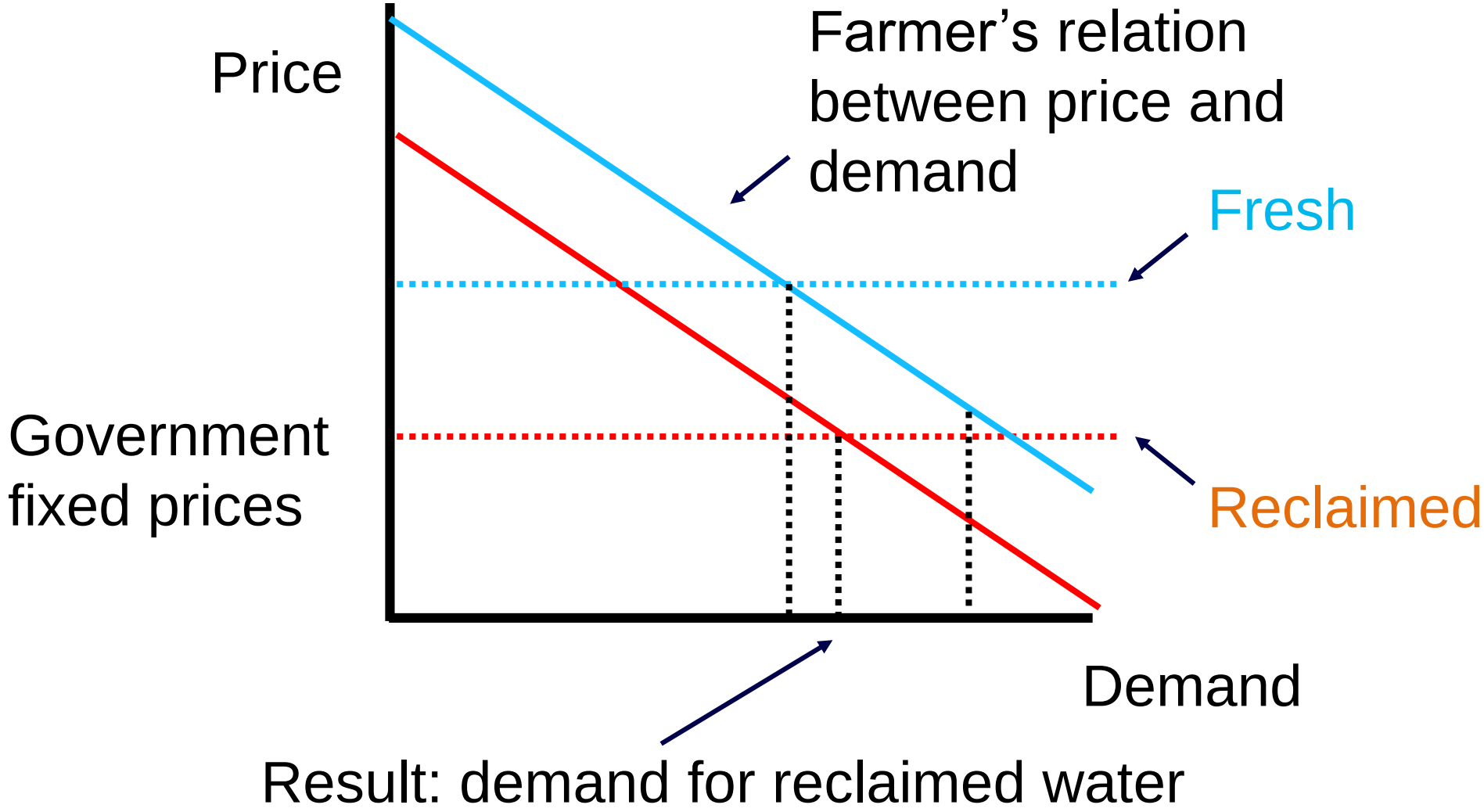


Price demand curves



Result: no demand for reclaimed water

Price demand curves



Economist's approach

Reuse is not financially attractive due to low tariffs for fresh water sources.

As long as users have a choice between conventional fresh and reclaimed water, it will be hard to achieve extensive reuse, since users will continue to attempt to use the cheaper conventional sources

Jordan Valley (Northern)

City of Irbid – Wastewater Treatment plants

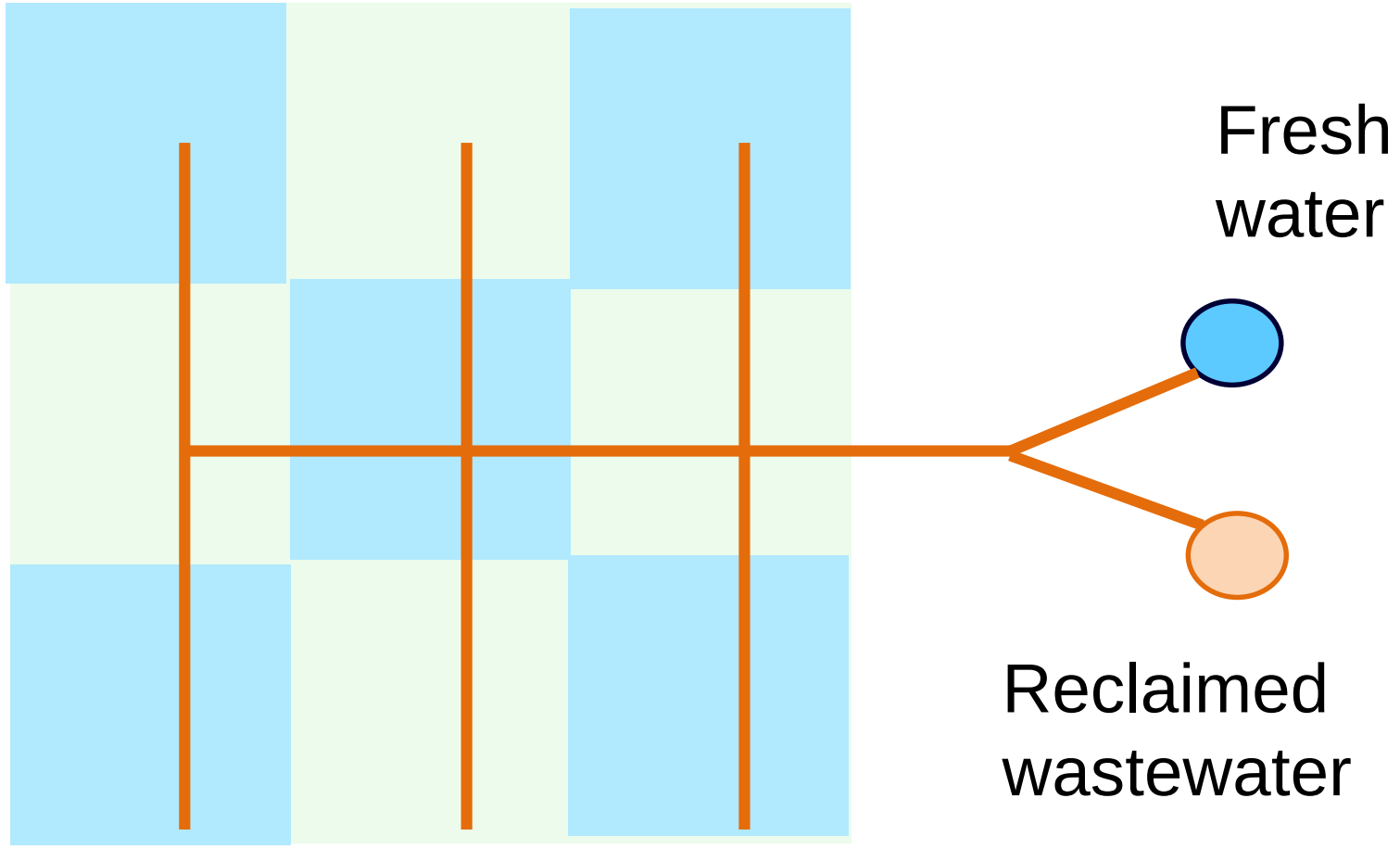
Citrus crops – effluent quality

Awareness, demonstration, proof

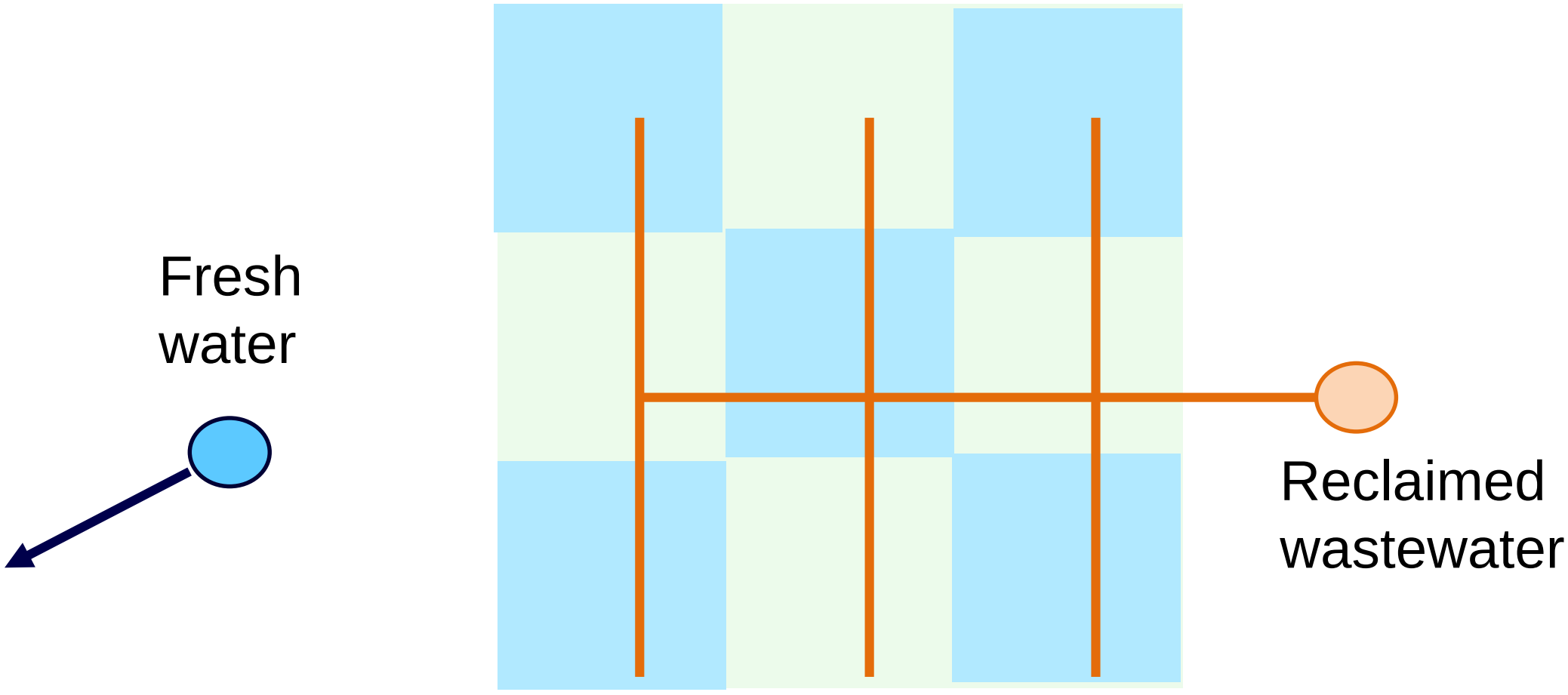
Planning

Often reuse is not considered from the initial stages of wastewater treatment projects: the end use of reclaimed wastewater should decide the effluent quality, technology, and location of treatment plants.

Cases where farmers have no choice but to reclaim



Case where farmers have no choice but to reclaim



Water quality aspects

Better, cheaper treatment technologies are required

Emerging contaminants, decentralized

But also: the reluctance of farmers to use treated wastewater is in several cases not based on a scientific basis. For instance, reuse for citrus, reuse of olive mill wastewater. Awareness raising and training.

Public acceptance

Awareness raising about the real costs of water supply, water scarcity and the broader water management context

Difficult message: reduce subsidies (take care of those that can’t afford)

Communication is key: clear messages that generate trust in safety of reuse schemes

Conclusions

Key-factors to increase sustainable wastewater reuse in the M-East:

- Communication and stakeholder involvement
- Systems or chain approach is required: collection, treatment, storage and reuse
- Collection and treatment to be paid by the polluters
- Tariff setting of reclaimed water relative to cost of fresh water is essential: fresh water for farmers in the ME is too cheap and forms a bottleneck for going to scale with wastewater reuse

References

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A big thank you to all our partners in the region!

Thank you for your attention; any questions?