IRRIGATION STRATEGY OF SERBIA

A brief on irrigation technology and infrastructure in the Republic of Serbia

For the FAO

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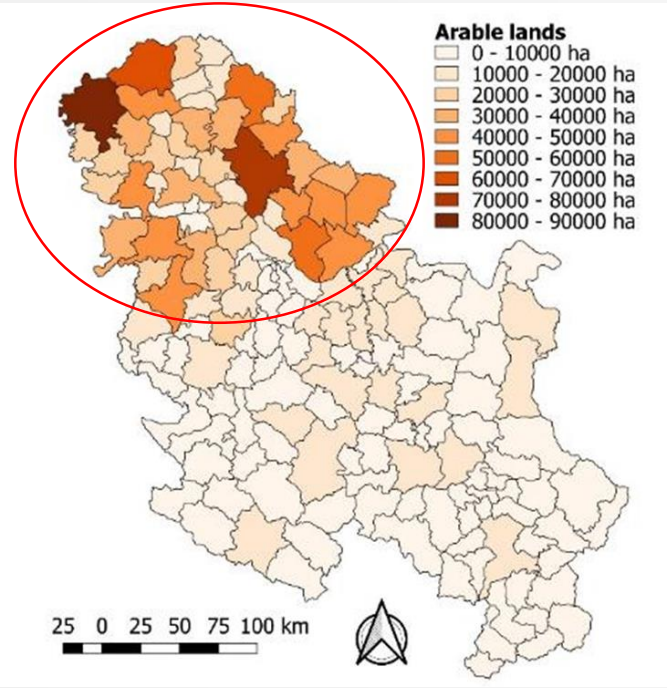
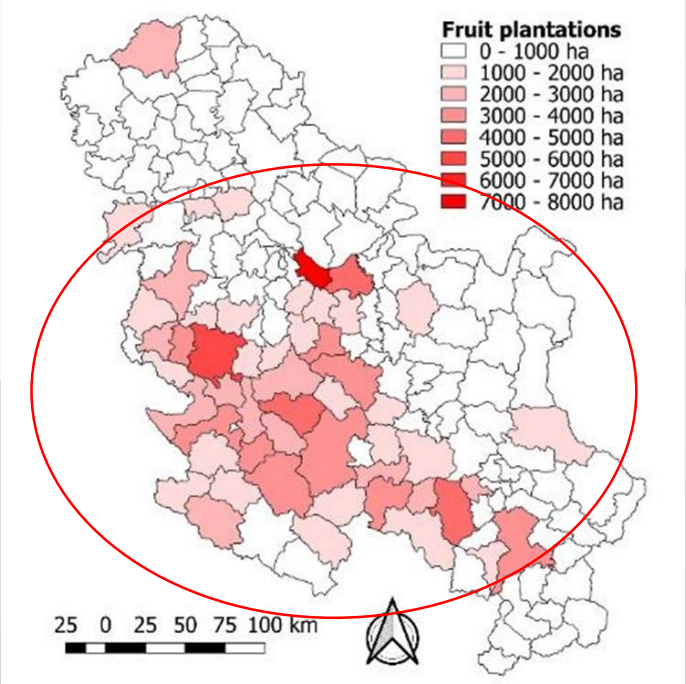
November 2020

Cultivated crops



Data source: Census of Agriculture 2012 (Statistical Office of the Republic of Serbia, 2020)



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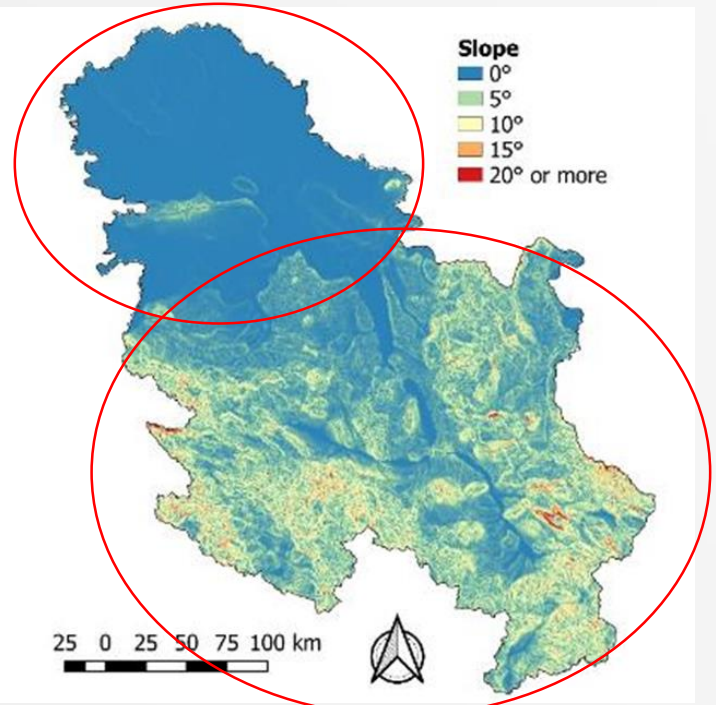
Terrain of Vojvodina and of Central Serbia



Data source:: NASA / USGS / JPL-Caltech (Farr et al., 2007)

Lowlands

- More hectares irrigated with sprinklers
- Intensive drainage canals system
- Large farms, arable crops

Hilly areas

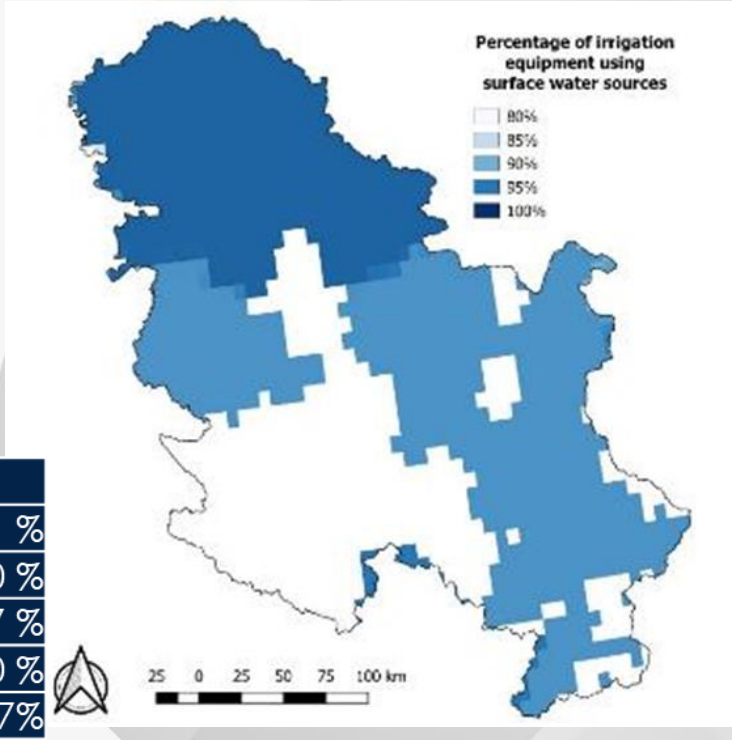
- Irrigating more using ground water
- Smaller farms
- Perennials and high value crops

Irrigated crops and water sources

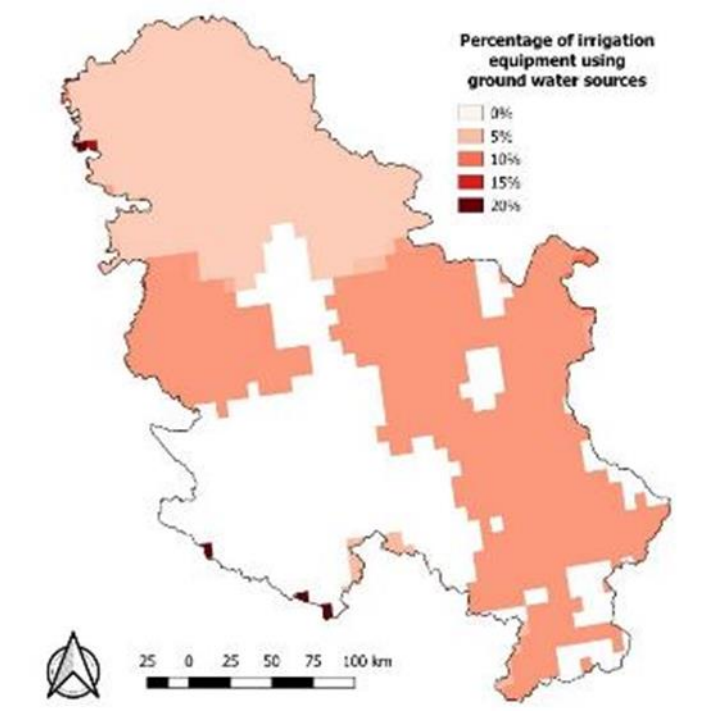
Irrigation in Vojvodina
75000 Ha 20000 farms

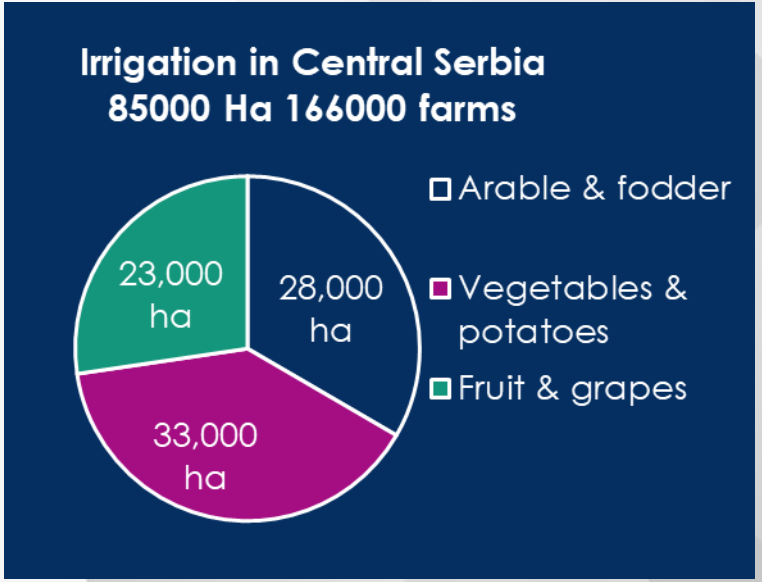
- Arable & fodder
- Vegetables & potatoes
- Fruit & grapes

Most irrigated	
Vegetables	31 %
Fruit	20 %
Maize	17 %
Soy & other	10 %
Potatoes	3.7%



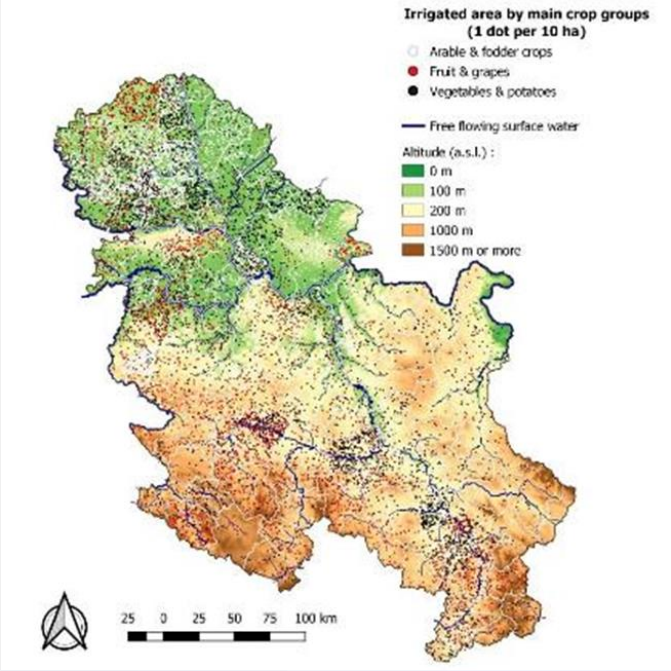
Irrigated crops and water sources



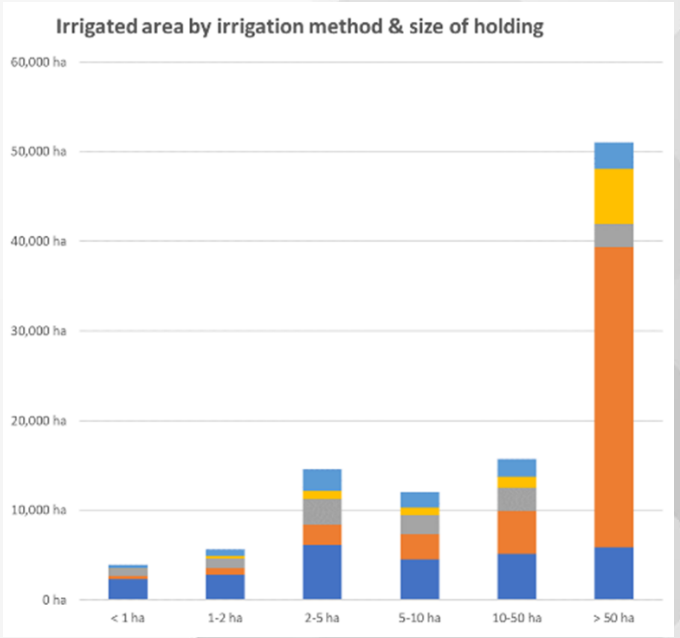


Irrigated crops and methods

- **Large farms:** mainly arable, use more sprinklers
- **Small farms:** mainly vegetables, fruits, perennials

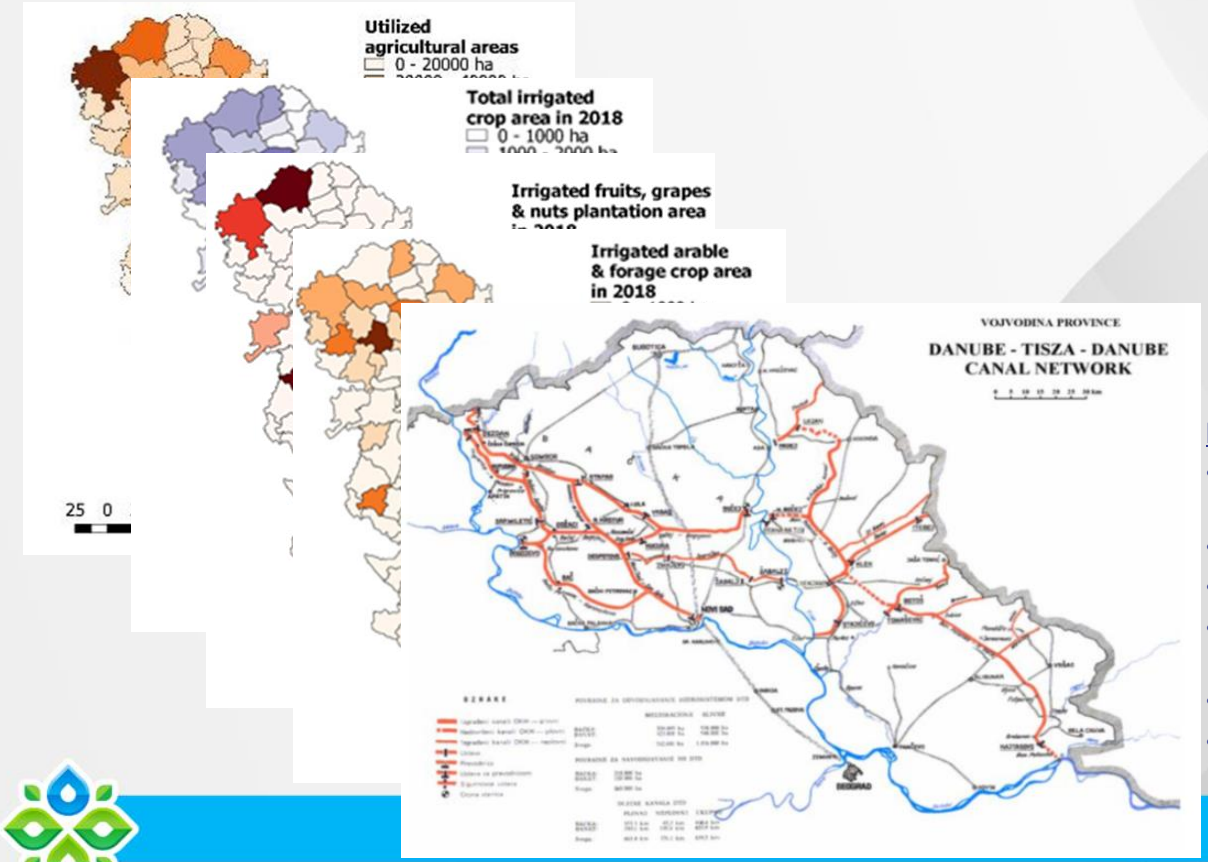


- **Drip** is more adopted in small and medium farms
- **Surface** irrigation: still exist



Data source: Census of Agriculture 2012 (Statistical Office of the Republic of Serbia, 2020)

Technologies & infrastructure overview



Existing irrigation

- More farms use boreholes
- Vegetables and arable
- More sprinklers, less drip
- Larger farms in Vojvodina (more hectares irrigated with surface water)
- New irrigation projects (Abu Dhabi Fund) include pressurized conveyance

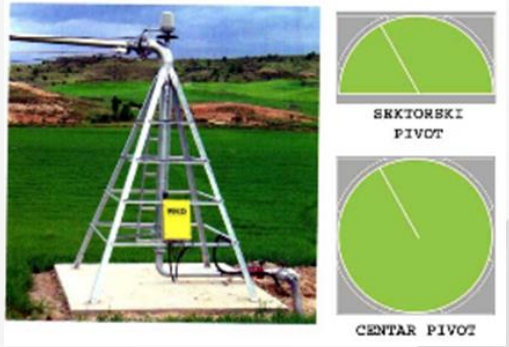
Potential

- Surface water, mainly in Vojvodina; Use drainage canals for irrigation
- Coordinated and governed ground water
- Rain harvesting especially in hilly areas
- Reused sewage water especially near urbanized areas
- Precise irrigation and fertigation
- Low cost technologies for arable

Data source: Census of Agriculture 2012 (Statistical Office of the Republic of Serbia, 2020)

Existing and applicable irrigation technologies

Rain wing (BK)/ Kišno krilo – for medium plots

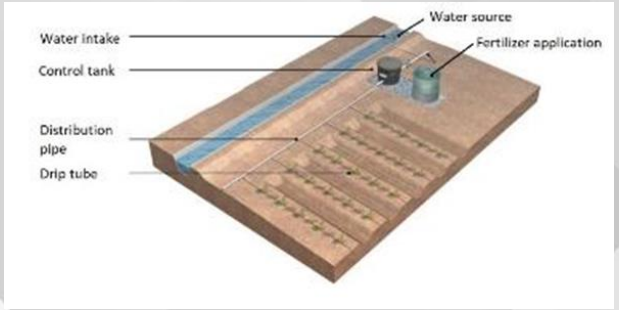


Center pivot – for large plots with minimal labor

Drip –efficient use of water, fertilizers, energy for HVCs

Tifon/typhoon – for minimal labor requirements

Linear na crevo / Rendžer - rainger – for large plots



Gravity micro irrigation – water supply from canals/reservoirs, leveraging gravity created pressure, for LVCs and HVCs

Applicable irrigation technologies

Irrigation method	Small plots	Large plots	Low value crops	High value crops
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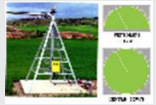		√	√	√
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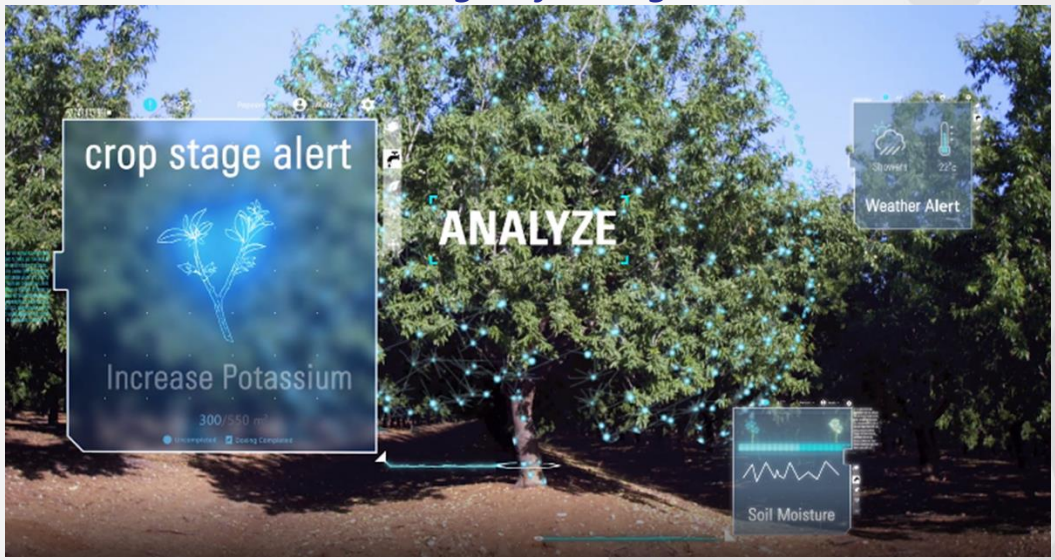
Supportive applicable technologies

Digital farming



The use of Ag-sensors is booming around the world as an effective tool for optimizing the use of important farm resources – water, fertilizers and soil. On-farm sensors for monitoring the crop or the surrounding environment such as soil-moisture, solar-radiation, wind speed and direction, rain, and also off-farm relevant information such as precipitation from the nearest climate station and satellite view for spotting the less irrigated parts of fields.

Supportive applicable technologies

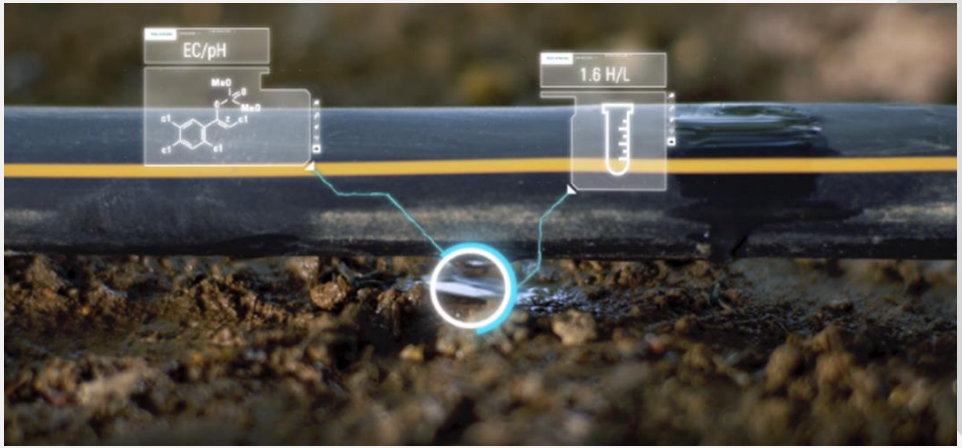
Irrigation control

Time-based and volume-based irrigation control systems, from simple and standalone pre-programmed irrigation controllers all the way to cloud based multi-zone irrigation control. Considering Serbia's climate, a combination of irrigation controllers with rain-sensors would assure optimized scheduling.

Supportive applicable technologies

Pressure-compensating drippers

Pressure-compensating drippers are the most precise irrigation emitters and thus enable precision irrigation in any region with variable topography. This powerful irrigation technology can bring HVCs to Serbia's hilly areas with all the well-proven gains of drip irrigation.



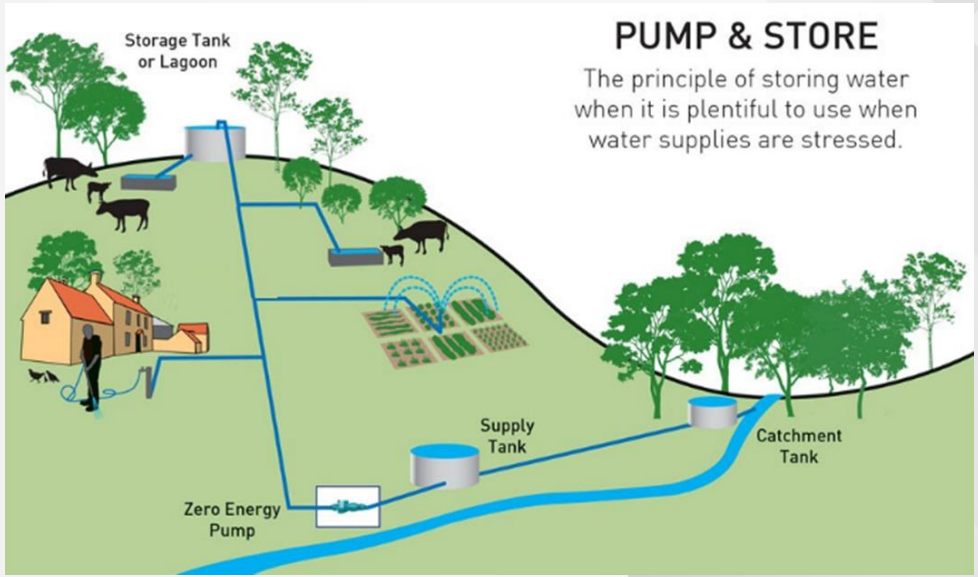
Supportive applicable technologies

Fertigation

Automatic-fertigation systems for accurate and efficient fertilizer application saves farm expenditure while avoiding contamination of underground aquifers. Fertigation is a powerful tool for increased productivity, allow crop rotation and reduces leaching and aquifer contamination. The effectiveness of fertigation is often dependent on the effectiveness of the irrigation system and the full advantages of irrigation and fertigation only become evident if the correct irrigation design is employed to meet plant requirements and to distribute water and fertilizer evenly; Both Central and Northern Serbia would do well if precise fertigation systems and practices would be applied.

Supportive applicable technologies

RAM pump



RAM pumps, which are self-powered water pumps using gravity imposed water-pressure, can help smallholders start irrigating even without access to electricity for water pumping. Many of Vojvodina's farms with immediate access to surface water can also apply this simple but effective tool for irrigating areas that are not yet served with electricity.

Thank you