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REPUBLIKA SLOVENIJA
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LIFE
ViVaCCAdapt

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Adapting to the impacts of climate change in the Vipava Valley

Jože Papež, Silvana Batič, (Hidrotehnik)
Rozalija Cvejić, Marina Pintar (Univerza v Ljubljani, Biotehniška Fakulteta)



INŠTITUT
ZA VODE
REPUBLIKE
SLOVENIJE
Institute
for Water of
the Republic
of Slovenia



Hidrotehnik
Vodnogospodarsko podjetje d.d.

Univerza v Ljubljani
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Life ViVaCCAdapt project ABOUT THE PROJECT

DROUGHT RISK MANAGEMENT IN THE ALPS EXPERT WORKSHOP
& 2ND WATER MANAGEMENT PLATFORM MEETING
September, 14th (Thursday) & 15th (Friday)
Ajdovščina, Slovenia

Coordinating Beneficiary:

- Razvojna agencija ROD Ajdovščina

Associated Beneficiary(ies):

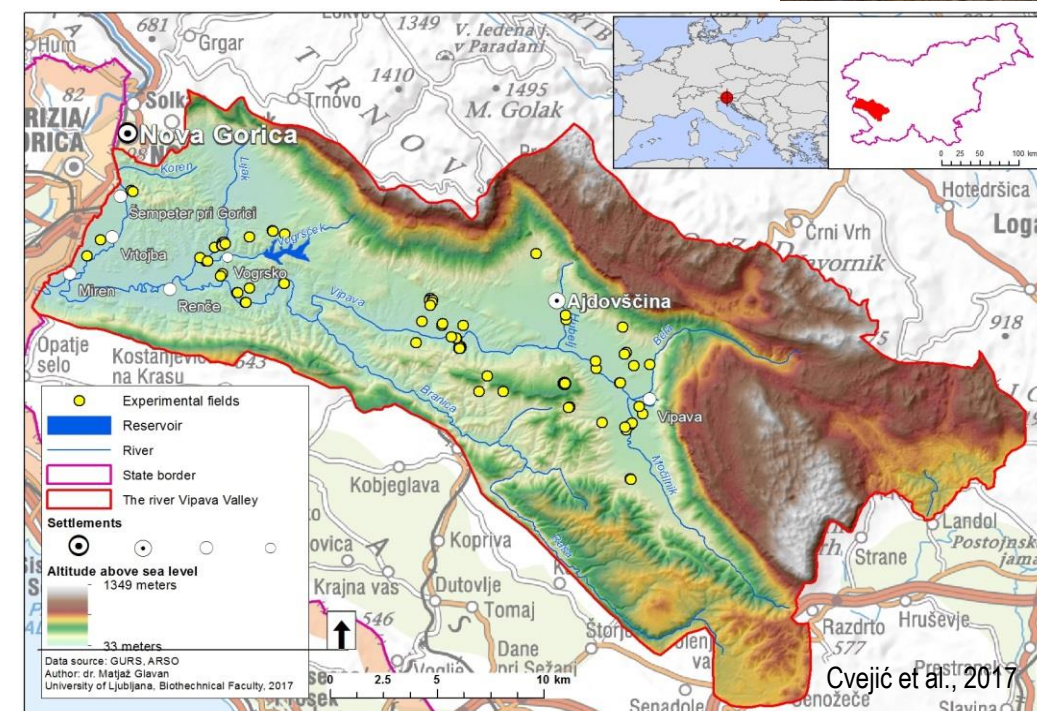
- BO - MO svetovalno podjetje, d.o.o.
- HIDROTEHNIK Vodnogospodarsko podjetje d.d.
- Inštitut za vode Republike Slovenije
- Občina Ajdovščina, Univerza v Ljubljani

Duration:

- Start date: 1.7.2016; End date: 30.6.2021

Budget info:

- Total amount: 869,028 €
- % EC Co-funding: 520,516 € (60% of tot. elig. budget)
- % RS Ministry of the environment and spatial planning (20%)



Cvejić et al., 2017

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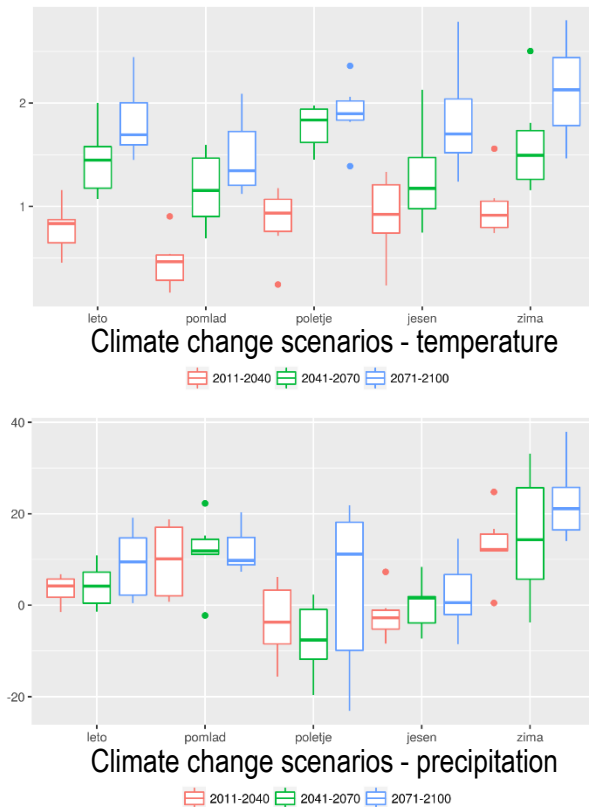
OBJECTIVES & SCOPE

- **Analysis of the current situation** in the Vipava Valley with regard to adaptation to CC.
- **Definition of strategic actions to adapt to CC.** Draw up a set of measures in collaboration between different sectors (agriculture, forestry, hydrology, transport, tourism, urban planning, etc.) with expert assessment to analyze possible environmental problems triggered by proposed agricultural measures.
- **Reconciliation of defined objectives and strategic actions.** Determination of the main (primary) and the other (secondary) measures and propose their sequence of implementation.
- **Establishment of a pilot decision support system (DSS)** for irrigation in order to rationalize water consumption in accordance with the requirement of the Water Framework Directive and by default in the Rural Development Programme of SI.
- **Evaluation of existing WB efficiency (simulations).**
Design the demonstration center to plant WB in order to spread information about them and their importance.
- **Comprehensive strategy for CC adaptation taking into account the specifics of the area discussed.** The proposed strategy for adapting to CCs pursues the objectives of the National Environmental Action Programme and the European Environmental Policy, which advocates sustainable development.

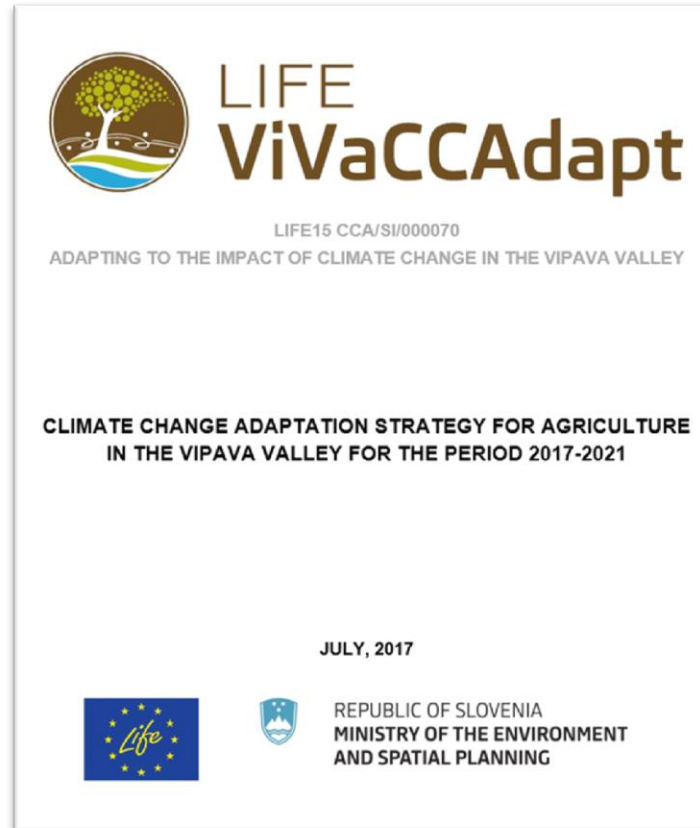
Life ViVaCCAdapt project EXPECTED RESULTS

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Ajdovščina, Slovenia

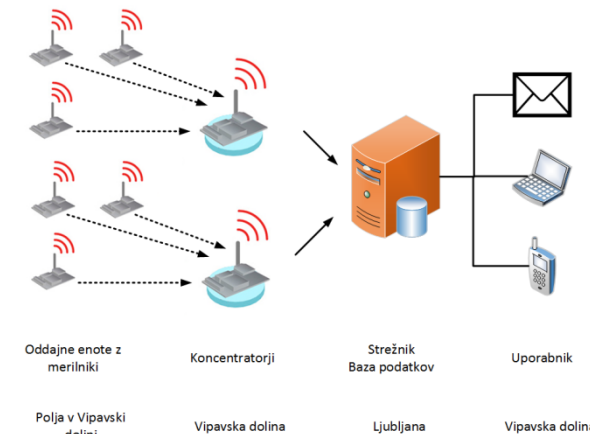
Regional analysis - support to adaptation on CC*



The strategy of adaptation to climate change.



Decision-support system for irrigation.



Increasing the area of plant windbreaks.

- Workshop 11.4.2017; pilot location (200 x 5 m) near Dolga Poljana; cooperation with Slovene Forest Service, implementation 2017-2018



Life ViVaCCAdapt project ADAPTATION STRATEGY

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OPPORTUNITY

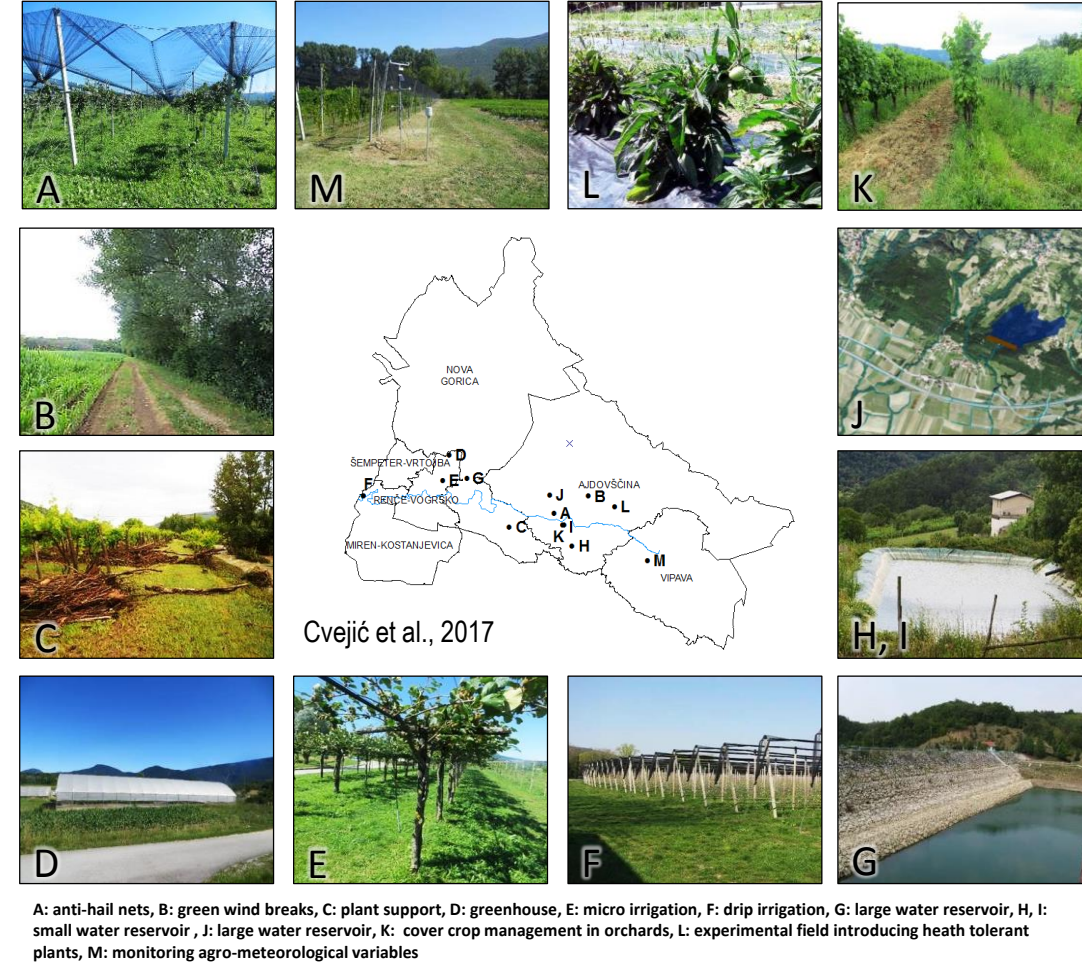
- the Vipava Valley has outstandingly favourable natural conditions for the development of intensive agriculture („Garden of Slovenia“?)

AGGRAVATING CIRCUMSTANCES - CC

- unfortunately, it is exposed to **natural disasters**, **drought**, **floods**, **frost** and **strong winds**, which are becoming more frequent due to the effects of climate change
- agricultural vulnerability to climate change is high in the Vipava Valley (because of high exposure, great sensitivity to climate change and low adaptive capacity)

EXISTING GOOD CLIMATE CHANGE ADAPTATION PRACTICE:

- anti-hail nets, examples of well-preserved and functional green windbreaks, suitable plant-support planning, production in greenhouses, use of irrigation, local water retention for increasing water availability, inclusion of plans for building new water resource in local development documents, cover crop management in orchards, testing and gradual introduction of new plant cultures and varieties resistant to higher air temperatures and wind, and local monitoring of agro-meteorological variables



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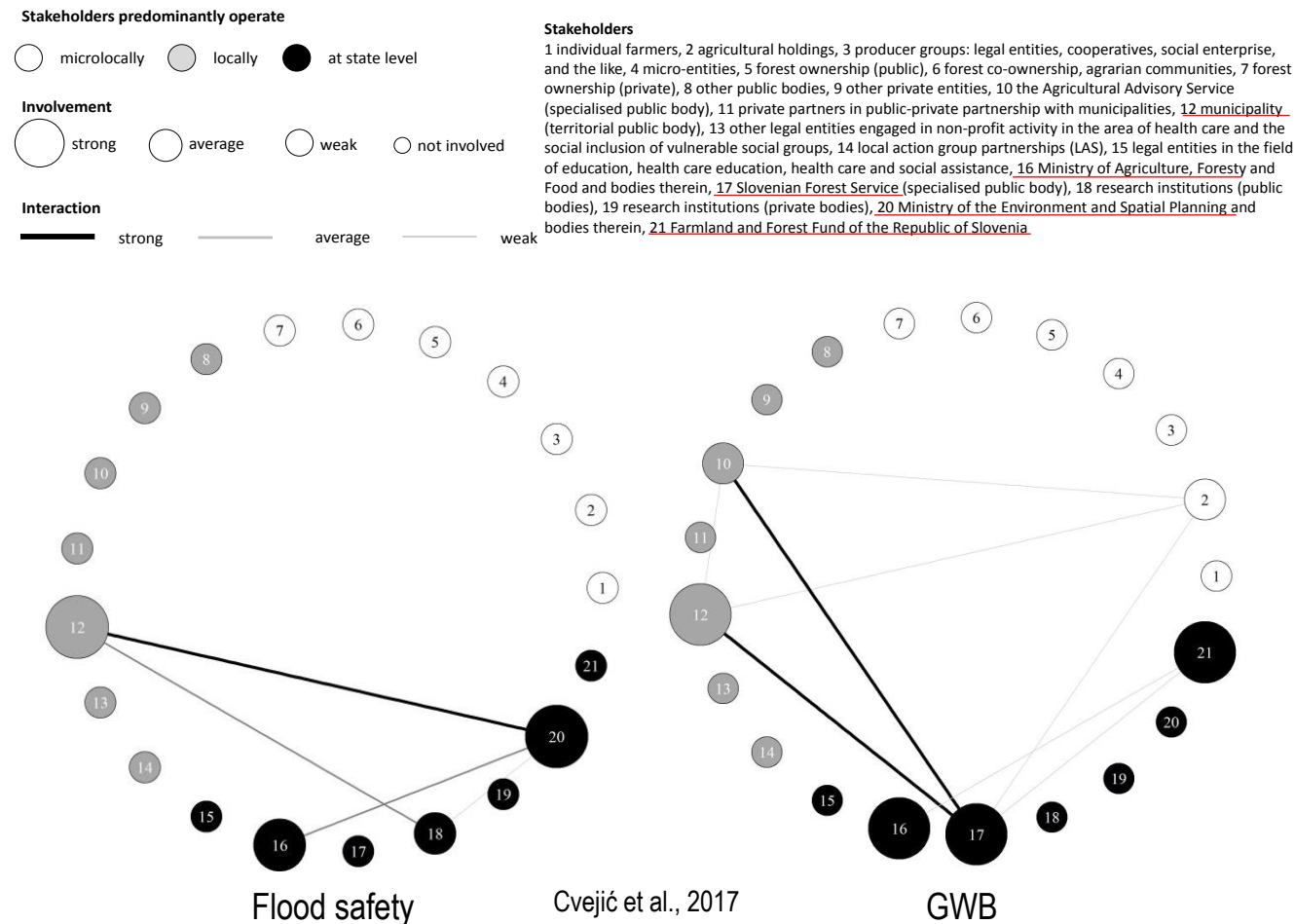
ADAPTATION STRATEGY - measures

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THE LOCALLY-IMPORTANT MEASURES FOR WHOSE IMPLEMENTATION THE MAXIMUM DIRECT ACTIVATION OF LOCAL COMMUNITIES WILL BE INVESTED:

1. Demonstration activities intended to display machinery, procedure, technology, and device utilisation.
2. Agricultural-holding support investment, such as purchasing and setting up nurseries and pertaining equipment, anti-hail nets, agromelioration work implementation, individual irrigation system arrangement and its technological modernisation, and irrigation equipment purchase.
3. Irrigation-system construction investments intended for several users and technological modernisation of irrigation systems intended for various users.
4. Investments in the establishment and development of non-agricultural activities, such as local supply, green tourism, organic waste management and electricity generation from renewable energy sources, such as wood, biomass, manure and liquefied manure, water, wind and the sun.
5. Effective and sustainable water use promotion.
6. Flood safety arrangement of area along the Vipava River.
7. New plant species and agricultural variety cultivation testing.
8. The comprehensive renovation of windbreaks in the Vipava Valley.

PRIORITIZATIONS – most effective / needed measures are also very complex (demanding)



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ADAPTATION STRATEGY - measures

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& 2ND WATER MANAGEMENT PLATFORM MEETING
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Ajdovščina, Slovenia

THE LOCALLY IMPORTANT MEASURES THAT WILL REQUIRE LOCAL COMMUNITY ACTIVATION, THOUGH **PRIMARILY BASED ON OTHER STAKEHOLDER ACTIVATION:**

9. Investment in eliminating the damage to and rehabilitating of forests pursuant to 2014's glaze ice and the arrangement of skid trails necessary for forest rehabilitation.
10. Implementation of agri-environment-climate measures for the management of agricultural holdings in a way which reduces negative farming impact on the environment, contributes to the impact mitigation and climate change adaptation, and ensures the implementation of socially important services and intangible public assets.
11. Implementation of measures aimed at improving animal welfare, for example, breeding with release and pasture.
12. Support for horizontal and vertical supply chain actor cooperation to establish and develop short supply chains and local markets.
13. Diversification of agricultural activity in relation to health care, social inclusion, community-supported farming, and environmental and food education.
14. Implementation of local development utilising the "bottom-up" approach
15. Collaboration of various actors in the field of agriculture and rural development for joint actions in terms of climate change adaptation mitigation.
16. Promotion of sustainable water use, enabling various types of water use, taking into account the long-term conservation of water resources in terms of quantity and quality.
17. Upgrading the support system for water use-related decisions.
18. Monitoring surface and groundwater in light of achieving good water and other water-related ecosystem status.

THE MEASURES LOCALLY AND INDIRECTLY IMPORTANT, AND PRIMARILY BASED ON THE ACTIVATION OF **AGRICULTURAL HOLDINGS, ADVISORY SERVICES AND OTHER STAKEHOLDERS**, AND LESS SO ON LOCAL COMMUNITY ACTIVATION:

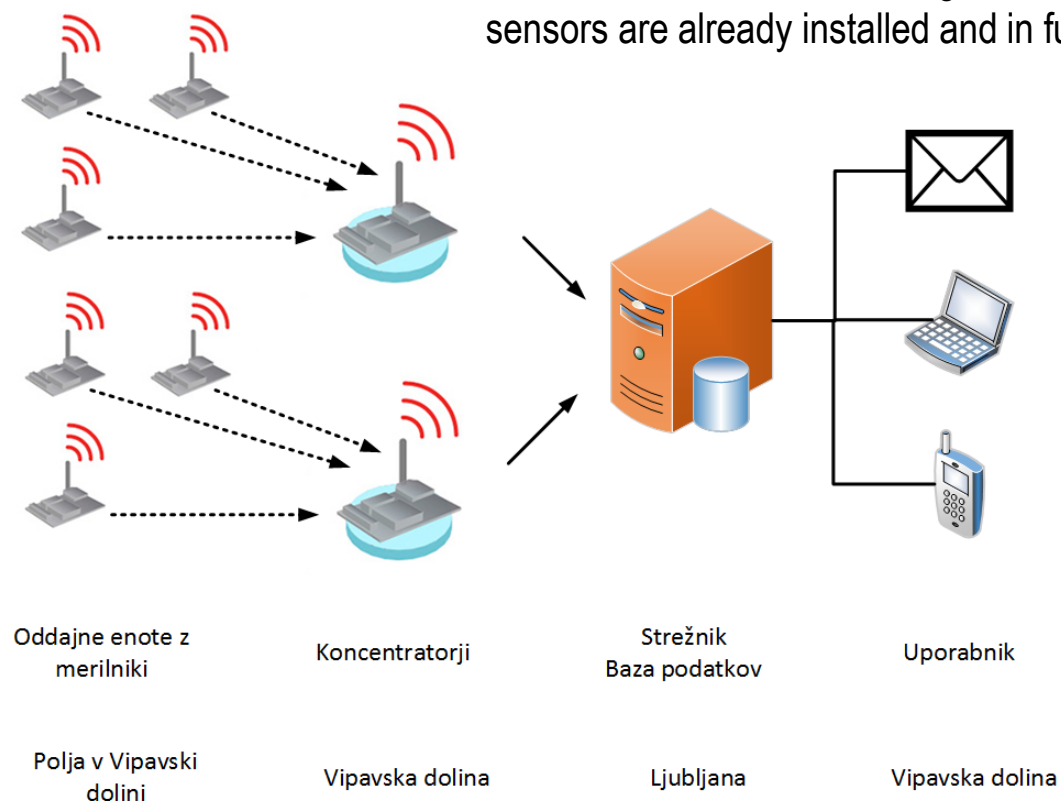
19. Support for vocational training and skills acquisition action
20. Support in seeking help utilising relevant advisory services.
21. Support for new participation in quality schemes.
22. Support for information and promotion activities carried out by internal market producer groups.
23. Support for investment in processing/marketing and/or development of agricultural products.
24. Young farmer business start-up aid,
25. Investment for the purchase of new machinery and equipment for wood felling, harvesting and pre-industrial wood processing.
26. Small farm, business start-up development.
27. Broadband infrastructure support.
28. Establishment of subcontractor groups and organisations agricultural and forestry.
29. Support for the preservation, sustainable use of and development of agricultural genetic resources),
30. Focus on and maintenance of organic farming practices:
31. Maintaining the arability of agricultural land in mountainous areas and other areas with special restrictions.
32. Support for pilot projects and development of new products, practices, processes and technology in connection with the P2 and P3 measures.
33. Preparation of a range of indic. for the announcement of droughts/water shortage strength and thresholds

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DSSI

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35 contracts with owners of agricultural land;
sensors are already installed and in function



WINDBREAKS - historical development



In the framework of the Republic Green plan (1970-1980), shelterbelts (wind barriers) were planted to minimize the impact of wind on agriculture by reducing evaporation and the impact of summer winds on soils (drying, loss of water in soil).

Ajdovsko polje 1976. Source: Turk, 2012



Due to the illegal removal of already planted shelterbelts by farmers (lack of awareness) and improper agricultural practice, the deflationary effects of the bora wind are even stronger, especially in winter.

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GREENWINDBREAKS - current state

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Kompleks/ ha / leto izvedbe	Dolžina v. pasov	Ha	Posajeno ob melioracijah	Protivetrni pasovi danes
Ajdovsko polje 240 ha, 1981-82	6500	3,25	Vse posajeno	95 % izkrčeno
Lokavec 220 ha, 1983-84	8850	4,43	Vse posajeno	70 % izkrčeno
Manče-Podnanos 365ha, 83-84	8361	4,18	Vse posajeno	50 % izkrčeno
Brje-Žablje 722 ha, 1983-84	Zašč.gozd	/	Ni predvideno	/
Log-Zemono 760 ha, 1984-85	14506	7,3	Malo posajeno	90 % izkrčeno
Vipavski Križ 340 ha, 1984-85	10370	5,2	Delno pos.	90 % izkrčeno
Slap-Lože 160 ha, 1985-86	5135	2,1	Ni posajeno	/
Dolenje 65 ha, 1985-86	Ob Vipavi	/	Ni predvideno	/
Lozice 85 ha, 1985-86	2500	1,25	Delno pos.	50 % izkrčeno
Ob Avtocesti (širina cca 8 m`)	7000	5,6	V šopih	Okrasno drevje
Bruto Zg.Vipavska 2957 ha	63222	33,31		

Few preserved sections, even less well-preserved sections



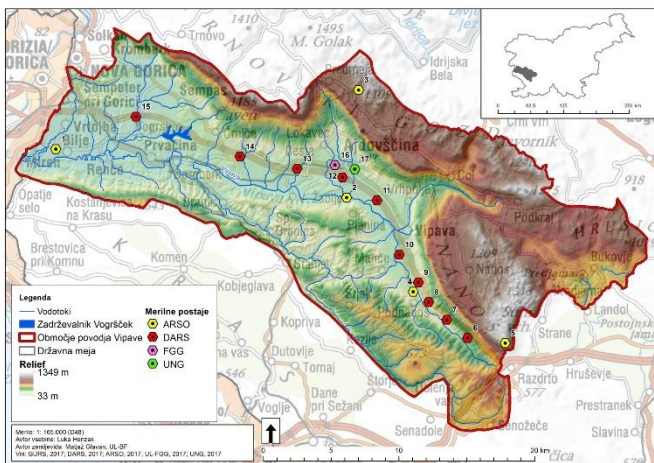
Source: Črv and Turk, 2012 Quality GWB weaknesses in the Vipava Valley: incomplete windbreak profile, interrupted windbreaks (power line corridors ...) or windbreak gaps due to dilapidating trees, too short sections.

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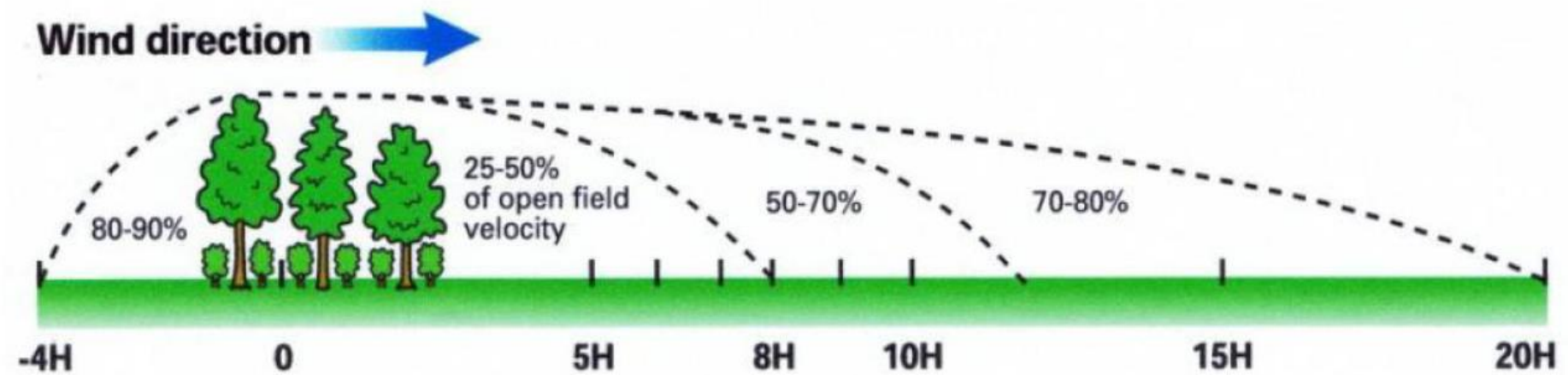
GREENWINDBREAKS – wind (bora)

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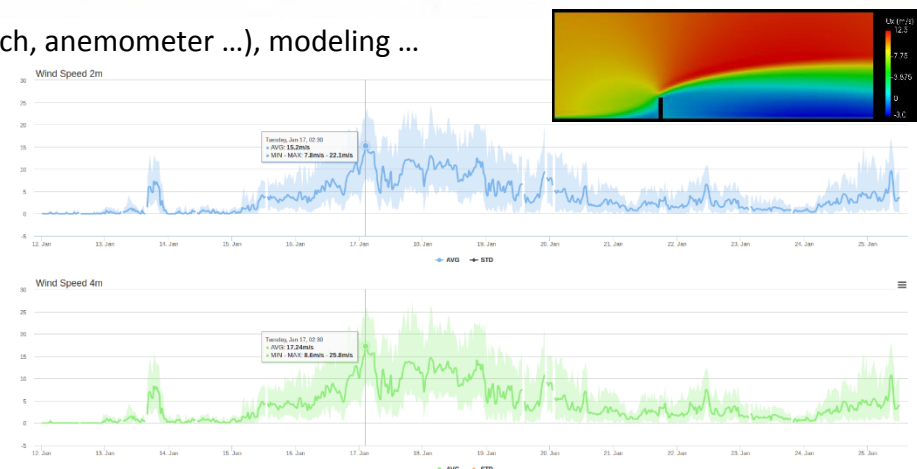
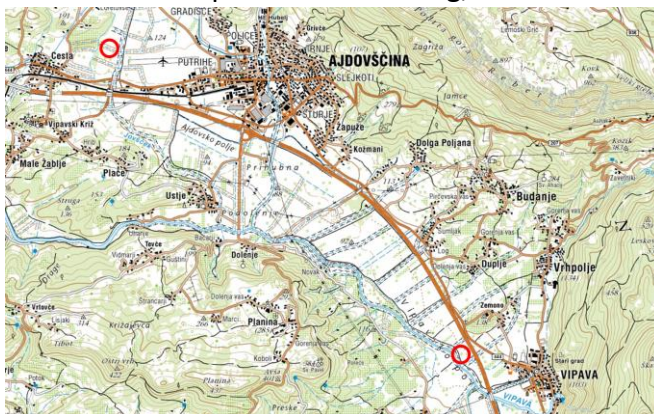
Monitoring station (state, highway administration)



Existing knowledge



LIFE ViVaCCAdapt wind monitoring, the effectiveness of existing GWB (different type of WB, 4 measurements location for each, anemometer ...), modeling ...



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POLICY IMPLICATIONS

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According to **Water Framework Directive (WFD) (2000/60/EC)** the new Rural development program funds renovation of irrigation systems only if there is 15% more effective usage of water after the renovation. With project we have to seek for new opportunities to increase water use efficiency for irrigation.

DSSI, when farmers are supported with all requested information, as well with the forecasted precipitation, anable to irrigate as less as possible but still obtain optimal crop production.

GWB presence within agricultural landscapes has positive benefits for the ecosystem and society as a whole (e.g. carbon sequestration, maintenance of biodiversity, protection of soil at a landscape level, and promotion of pollinators and pollination).

By using DSSI and GWB we want to convince people to continue agricultural production, to prevent the overgrowth of agricultural landscapes and prevent the reduction of associated habitats.

By using DSSI, food production with lower water footprint for 46.875 and 1.250.000m³/year (indicator 1.5) and **lower energy consumption for 7,813 and 68,750 kWh/year** (indicator 3.1.1) both for the project running time and after it respectively. Up to 30 farmers will be introduced to the project to become more conscious of the water footprint, alongside the carbon footprint. **CO₂ emission will be reduced by 4 and 106 t CO₂/year during the project and after it respectively.**

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POLICY IMPLICATIONS

** CC in Vipava valley: It is expected that the T will increase by **0.8°C** (0.5–1.2°C) in the near future, **1.4°C** (1.1–2°C) by the middle of the century, and **1.8°C** (1.4–2.4°C), but also increase (small) in precipitation on average – but in the main growing season in the summer will decrease + evapotranspiration will increase (Average annual evapotranspiration is expected to increase by 3% (0–5%) in the near future, 6% (3–9%) by the middle of the century, and 6% (2–9%) by the end of the century. Evapotranspiration is also expected to increase in all seasons, primarily autumn, 6%, 8% and 9% respectively, and summer, 3%, 7% and 6%) = all together (T + evapotransp.) leads to a descending conclusion that the requirements of plants for water will increase = increased pressure on local water supplies.*

Thank you for your attention

References

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