Funded by the European Space Agency

SenSPa

Sentinels for Sustainable Pasture management

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Challenge

- In Central Asia countries, population livelihood relies on livestock farming and pastures condition.
- Authorities, policy makers, land managers and livestock farmers have to take decisions about sustainable pasture management according to the rangeland productivity and status.
- Tools providing such information are missing for the targeted area. Only few tools exist worldwide (e.g. Pastures from space - Australia, Green Space - UK).
- Collecting field data regarding the current condition of vegetation (plant cover, forage production) is time and labor intensive.

Project Objectives

1. Develop the necessary infrastructures for supporting automated data acquisition, pre-processing and processing of satellite (Sentinel-2) imagery for pasture monitoring.

2. Deliver a cost-efficient, marketable web-based service using up to date satellite information to support sustainable pasture management.

3. Demonstrate and verify the added value, flexibility and adjustability of the SenSPa services at regional scales and highlight the expected societal benefits of SenSPa application in developing countries.

4. Develop a methodological approach for modeling and assessing grassland productivity, rangeland condition and grazing capacity.

5. Engage stakeholders and promote the use of the SenSPa tool.

Project Team

Prime Contractor (PC):

KARTERIS APOSTOLOS - KARTERIS MARINOS OE (trade name: kartECO - Environmental and Energy Engineering consultancy).

Subcontractor 1:

GMV INNOVATING SOLUTIONS LTD.

Subcontractor 2:

Democritus University of Thrace.

Local Team:

- INTEGRIS LLC.
- Agro Research Center.

Study Area

Azerbaijan

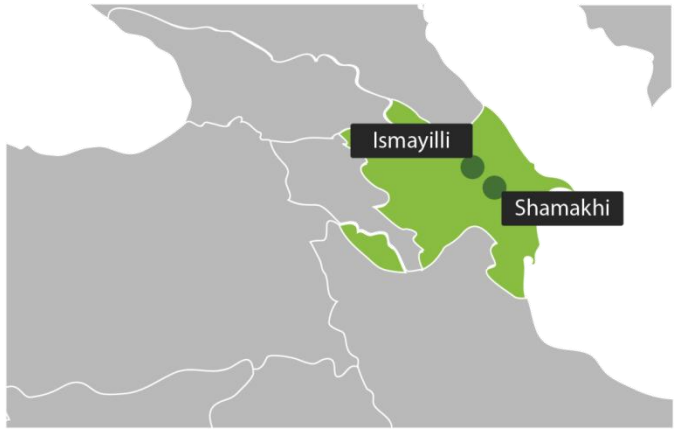
Why?

1. 40% of the working population is making some part of their living in agriculture.
2. Grazing is applied to an area corresponding to less than 30% of the useful pastures.
3. Problems: Climate change, overgrazing and unsustainable practices.

Where?

Ismayilli and Shemakhi (area ~ 3,685 km^2):

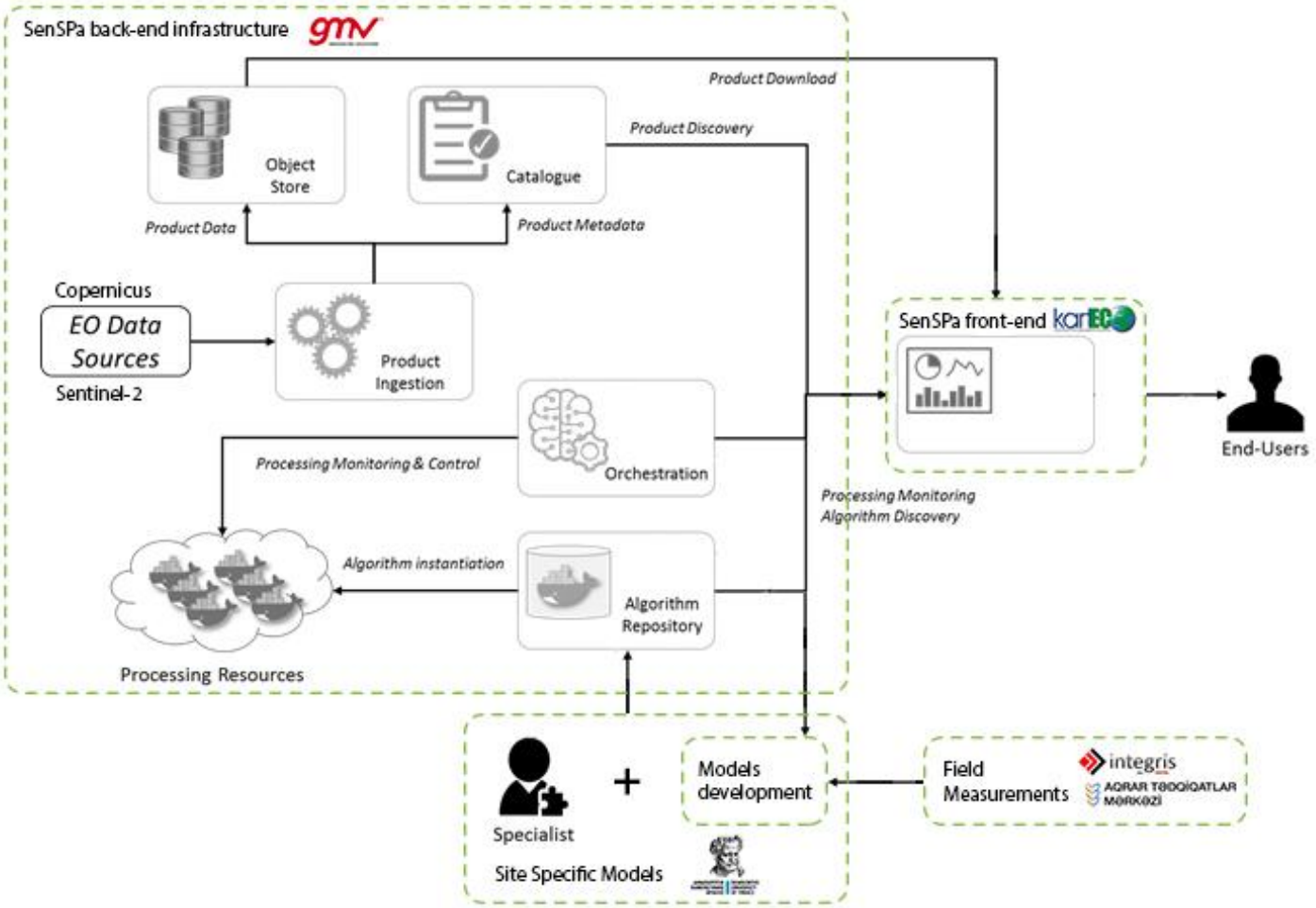
- Primary occupation is sheep and cattle farming.
- SPM is socio-economically and ecologically vital.
- Societal threats (SWOT analysis 2017):
  1. Overgrazing of summer & winter pastures.
  2. No spring and autumn pastures.



Development Approach

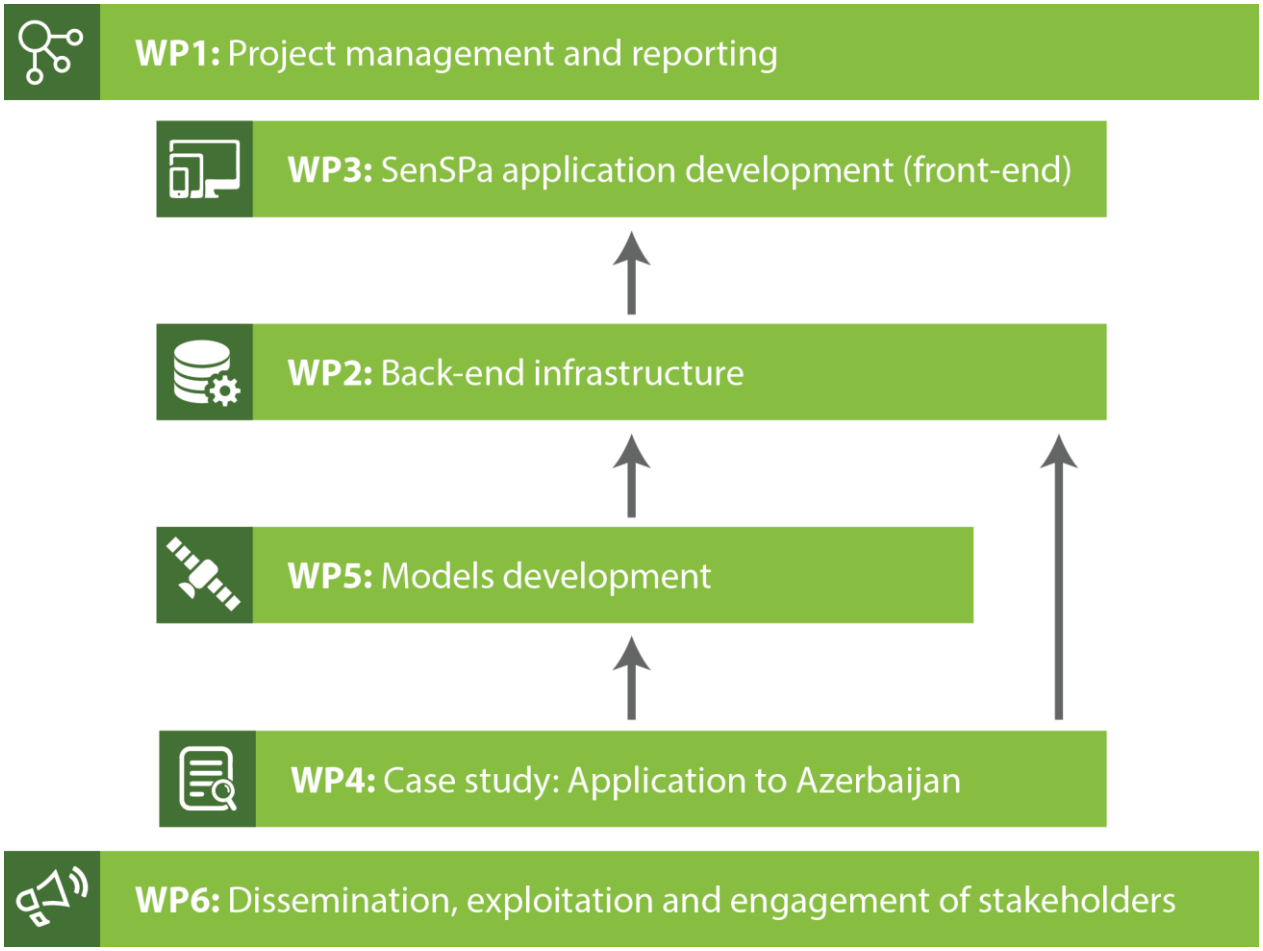
1. Establish of the SenSPa back-end infrastructure.
2. Development of the SenSPa application (front-end).
3. Implement a case study in Azerbaijan.
4. Development of site specific models.
5. Dissemination, exploitation and stakeholders' engagement.

SenSPa Methodological Approach



Main Target Groups

Work Breakdown Structure



Gantt Chart

Work packages / Tasks	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
WP1: Project management and reporting												
Task1.1: Project management and reporting by kartECO												
Task1.2: Project management and reporting by GMV												
Task1.3: Project management and reporting by DUTH												
Task1.4: Project Quality Assurance												
Task1.5: Data Management Plan												
WP2: Back-end infrastructure												
Task 2.1: Fast track users requirements gathering …												
Task 2.2: System configuration according to the users' …												
Task 2.3: Index calculation and model implementation												
Task 2.4: Product quality check												
Task 2.5: Support for the back end – front end integrations												
WP3: SenSPa application (front-end)												
Task 3.1: Design												
Task 3.2: Development												
Task 3.3: Support for the back end – front end integrations												
WP4: Case study: Application to Azerbaijan												
Task 4.1: Collection of historical data												
Task 4.2: Field measurements												
WP5: Models Development												
Task 5.1: Elaboration of the original and synthetic bands												
Task 5.2: Model development for condition assessment …												
Task 5.3: Model validation												
WP6: Dissemination, exploitation and engagement of stakeholders												
Task 6.1: Dissemination and communication												
Task 6.2: Stakeholders' engagement												
Task 6.3: Training Seminar and Webinars												
Task 6.4: Exploitation												

Major Outcomes

✓ Brief rangeland condition assessment and evaluation of the current practices.

✓ Brief determination of the grazing capacity and identification of overgrazed areas.

✓ Guidelines for model developing in other regions/areas of the country.

SenSPa tool:

- Sustainable tool exploiting open EO data and products. Modules:

1. Free of charge module:
2. Payment module. All tools, data and models. Specific information on:

✓ Forage production	✓ Plant cover
✓ Grazing capacity	✓ Pastureland condition

✓A training seminar and at least 2 webinars will be planned.

Expected Impact and Benefits

- Contribute to Sustainable Pasture Management and use of Natural Resources.
- Reduce costs, increase household income and livelihood.
- Increase of animal production.
- Increase employment and investments.
- Contribute to reach the UN Sustainable Development Goals (SDG):

Topics for discussion

- 1
- 2
- 3