UNITED NATIONS / AUSTRIA SYMPOSIUM 2021

CentroGeo
19°17'30"N 99°13'17"O 2489m

UN/AUSTRIA SYMPOSIUM: "SPACE APPLICATIONS FOR FOOD SYSTEMS"

PARTICIPATORY METHODS FOR THE RESILIENCE OF MILPA AND COFFEE PLANTATIONS, MEXICO.

Lilian Juárez Ph.D. (Ecology and natural resources management)

José Manuel Madrigal-Gómez MSc (Agropecuary)

September 7, 2021.

Principal food systems in Costa Grande, Guerrero, Mexico.

National contribution:
- Coconut 20%
- Mango 82%

Subsistence farming:
- Corn - milpa
- Coffee plantations

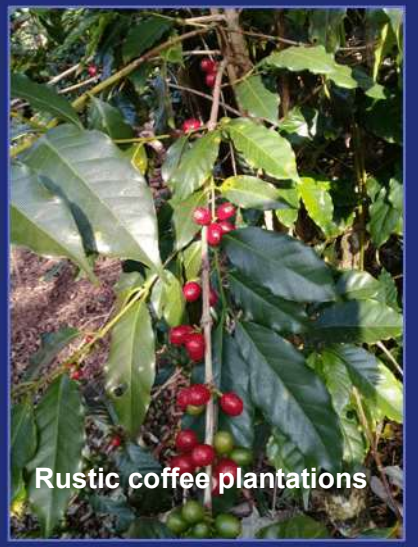
National contribution:
- Coconut 20%
- Mango 82%

Subsistence farming:
- Corn - milpa
- Coffee plantations

The landscape:
- A matrix of different types of vegetation and land uses
- The cloud forest with highest biodiversity
- 3 Hydrological regions
- Altitud from 0 to 3000 m.a.s.l.
- Slope 20 ° – 25°

Social
- Low education level
- Emigration for insecurity and low job opportunities
- High population growth rate
- Woman excluded from land properties


Milpa


Rustic coffee plantations


Mango


Cocconut

INEGI, 2015; SIAP, 2018..

Participative planning Agenda

Project:

To build a land use plan with a local development agenda through a participatory planning process that contributes to strenghthening the local economy and gobernance in Costa Grande, Guerrero.

To understanding the socio-ecological problems associated to the food systems of Costa Grande

To co-generate common objectives and research questions

To analyze and formulate solutions

Return of results

Co-generated models through transdisciplinary methods

Identification of common objectives:

- Informal talks

Analysis:

- Territory dialogues with local and governmental institutions
- Social perceptions
- Sociograms
- Interviews
- Participatory mapping
- Field work validation

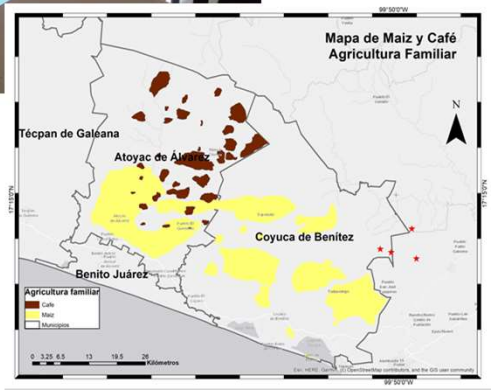
Feedback and aproppiation mechanisms:

- Visual methods
- Projection Augmented Landscape Model (PALM) to generate erosion maps (soil management)

Some findings to improve on coffee and milpa systems:

- A commercial strategy to improve local economy: for local consumption
- A local nursery for coffee plants
- A monitoring system for natural disasters, climate variability, pandemic.

Climate variability



Participatory workshop for local and regional perceptions on drought

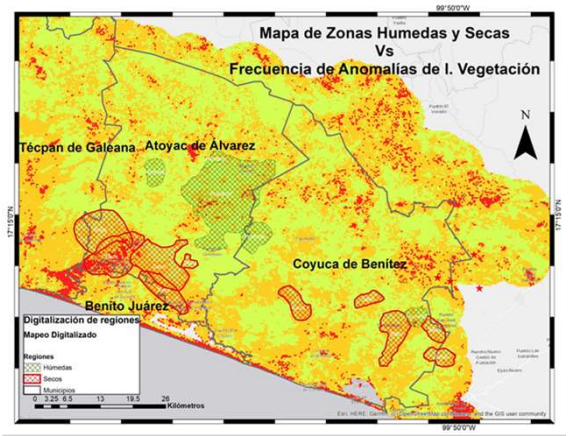
MOD13Q1

Normalized Difference Vegetation Index (NDVI)

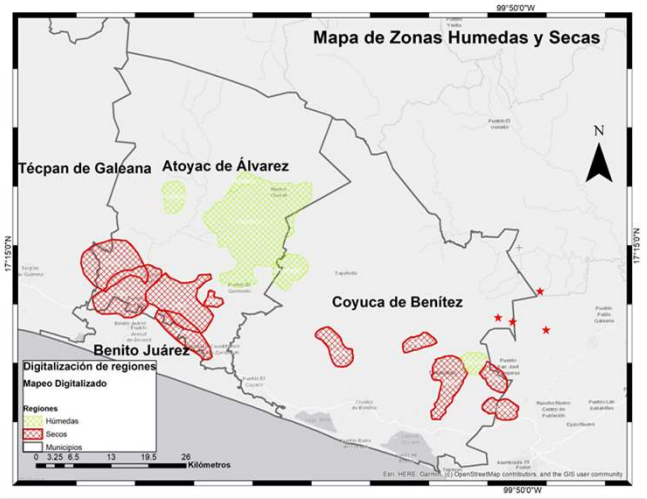
Time Serie SoftwareTIMESAT

Calculation of standardized anomalies

Frequency map of standardized anomalies with NDVI



Detection and digitization of dry and humid regions



Integrated methods of droughts in milpa and coffee plantations

Young people participation for the validation process “Jóvenes Construyendo el Futuro”

Management of GPS global positioning system, digital questionnaires and ODK software
Training on the platform

Validated maps

Madrigal-Gómez J.; Torres-Lima, P.; Roldán-Aragón, I. León-Villalobos, L.. 2021. Detection of climate variability through local indicators and remote sensors in rainfed corn cultivation in Mexico. In process.

A website meteorological information system for the farmers

- A creation of a **website** with climatic information (anomalies in precipitation and temperature)
- Basic concepts
- Climatic atlas
- Seasonal calendar

http://adesur.centrogeo.org.mx/cms/servicios-mcpr

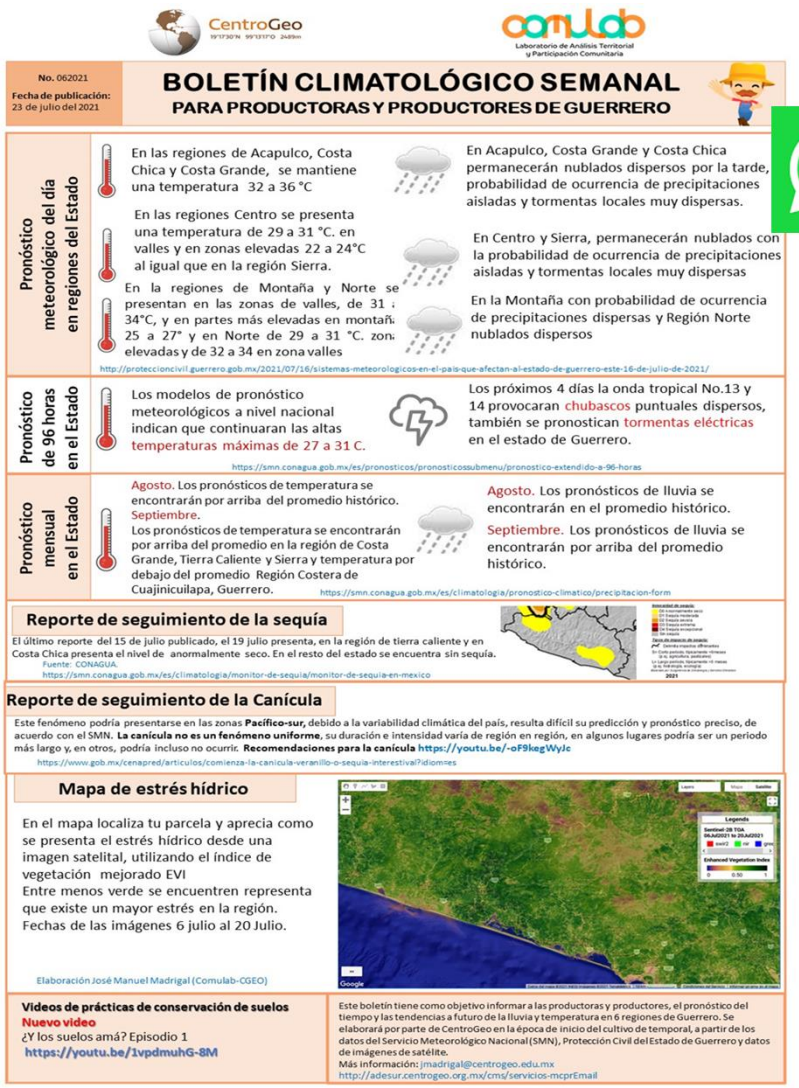
- A **climatic bulletin** shared by social media
- feedback with farmers about weather and crops to anticípate risks
- feedback between farmers and local traditional knowledge exchange
- Climatic communication network
- Communication system during the pandemic

http://adesur.centrogeo.org.mx/cms/multimedia/servicios-mcpr/menuSect-15-757

Next steps:

- To develop of a mobile App.
- To replicate to other regions of Mexico

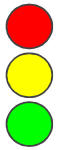
Climatic bulletin for farmers



To co-create a local drought monitoring system

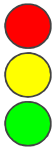
1.- Climate information module

- Precipitation
- Temperature
- extreme events (hurricanes, drought, floods, etc).
- Traffic light alerts

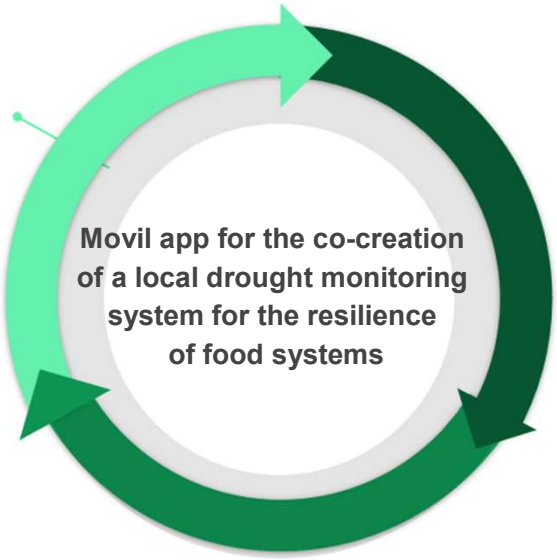


3.- Remote Sensing module

- Vegetation health: water stress and phenological graphs
- Reports of every 10 days
- Validation by the farmer
- Traffic light alerts
- Processed by Google Earth Engine
  Sentinel 2A NDVI - EVI

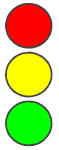


Google Earth Engine



2.- Crop module form

- Geographic ubication of cultivation
- Seasonal cultivation calendar
- (dates, management strategies, planting, care and harvests)
- Periodic feedback with photographs
- Traffic light alerts



These will allowed to identify and disseminate strategies built from the local level in order to anticipate and to reduce negative effects in food systems

Guerrero farmers are self organized

Agreed with agro-ecology thinking

Open to work with other social actors

Thank you!

jmadrigal@centrogeo.edu.mx and ljuarez@centrogeo.edu.mx, biologaljuarez@gmail.com

José María León Villalobos, Nirani Corona, Elena Méndez-López

Laboratorio de Análisis Territorial y Participación Comunitaria

http://adesur.centrogeo.org.mx/cms/comulab