

# Beneficial Uses of Space Technology in the Mexican Agroalimentary Sector

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Verania Echaide Navarro

Mexican Space Agency

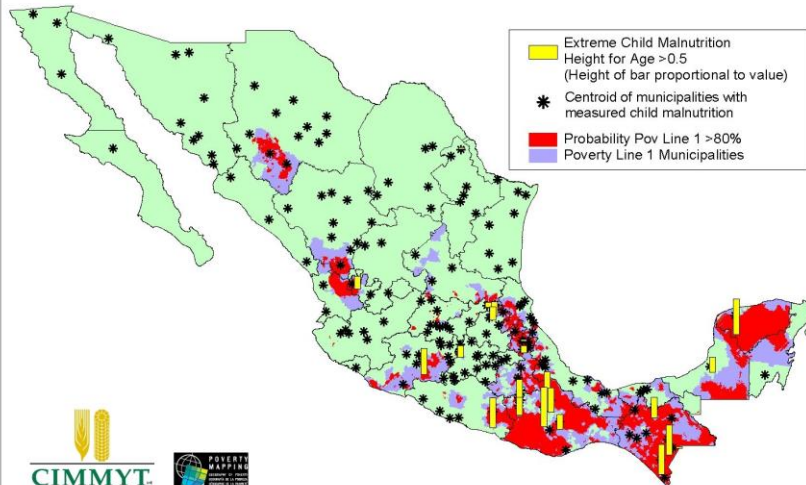
# Agriculture in Mexico

- In Mexico there are about 200 agricultural products that are grown within the country: Sugar cane, corn, potato, etc., and it's the first producer at many products such as organic coffee, avocado and lemon.
- Agriculture in Mexico is considered one of the most important economic activities and that generates more than 12 million jobs in the country.

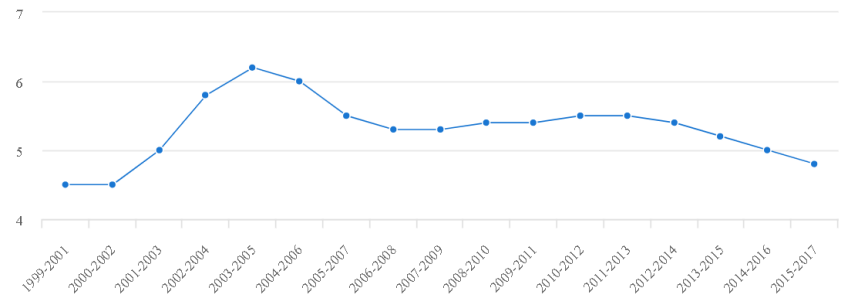


# Rural Poverty in Mexico

Fig.11. Extreme child malnutrition (average municipality height for age value > 0.5) in relation to rural poverty



- According to FAO 4.8, million Mexicans suffer from malnutrition



Number of people with malnutrition in Mexico. (Millions) Source: FAO.

- These 4.8 million people do not have enough food in quality and quantity to feed themselves every day, and the paradox is that most of them are farmers.
- They live in rural areas and grow their own food, but because of the low productivity of their land they can not get the nutrients they need to live healthily.



# Benefits of Space Technology



1.- Productivity: Improve smallholder and farmer crop management, targeted at growers and farm extension services;

2. Environmental impact: Reduce the negative impacts of crop production, targeted at both farmers and government agencies;

3. Supply chain optimization: Improve the coordination of harvesting and logistics by scheduling crop harvesting at the optimum stage, targeted at both growers and millers/logistics companies;

4. Monitoring at regional/national level: Improve market function so that the supply chain operates more effectively;

5. Research and development (R&D) Provide information which can support R&D programs targeted at improving crop productivity in Mexico;



6. Investment: Help the equipment and

# Mexican Space Agency



**Our mission:** Use space science and technology to meet the needs of the Mexican population and generate high added value jobs, promoting innovation and development of the space sector; contributing to the competitiveness and positioning of Mexico in the international community, in the peaceful, effective and responsible use of space.



# Mexican Space Agency



*Dr. Javier Mendieta Jiménez (AEM) and Mr. Christodoulos Protopapas (AEH)*

- **Collaborative Agreements** with National and International Entities (both Governmental and Private): National Institute of Statistics and Geography and National Commission for Knowledge and Use of Biodiversity, etc.
- **Memorandum of understanding** with United Kingdom Space Agency and most recently with the Hellenic Space Agency, helping tackle problems such as illegal deforestation, disaster response and food production.

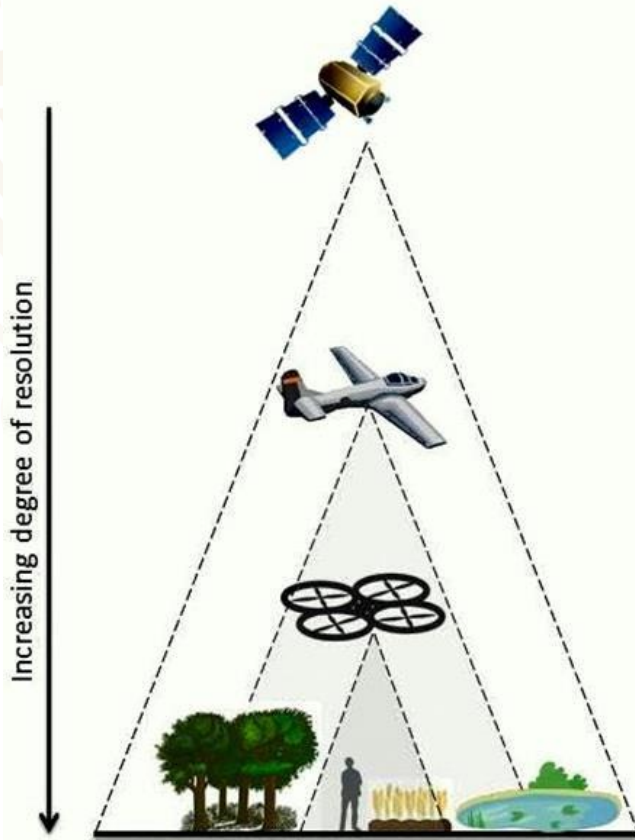
# Proposed Scheme of Action



- Cases of study with the support of the Ministry of Agriculture and farmers.
- Selection of pilot crops (identifying particular challenge crops in different geographical location).
- Evidence and data collection (growing seasons, crops reports, soil state of health, harvesting, EO data, etc...).
- Validation and correlation data (indices, measurements, etc...).
- Technology integration of products and data sources
- Education and Consultation Plan
- Field Trial Results and Project Final Report
- Dissemination & Communications, Sustainable Viability Plan

# COMPASS

## (Crop Observation, Management and Production Analysis Service System)

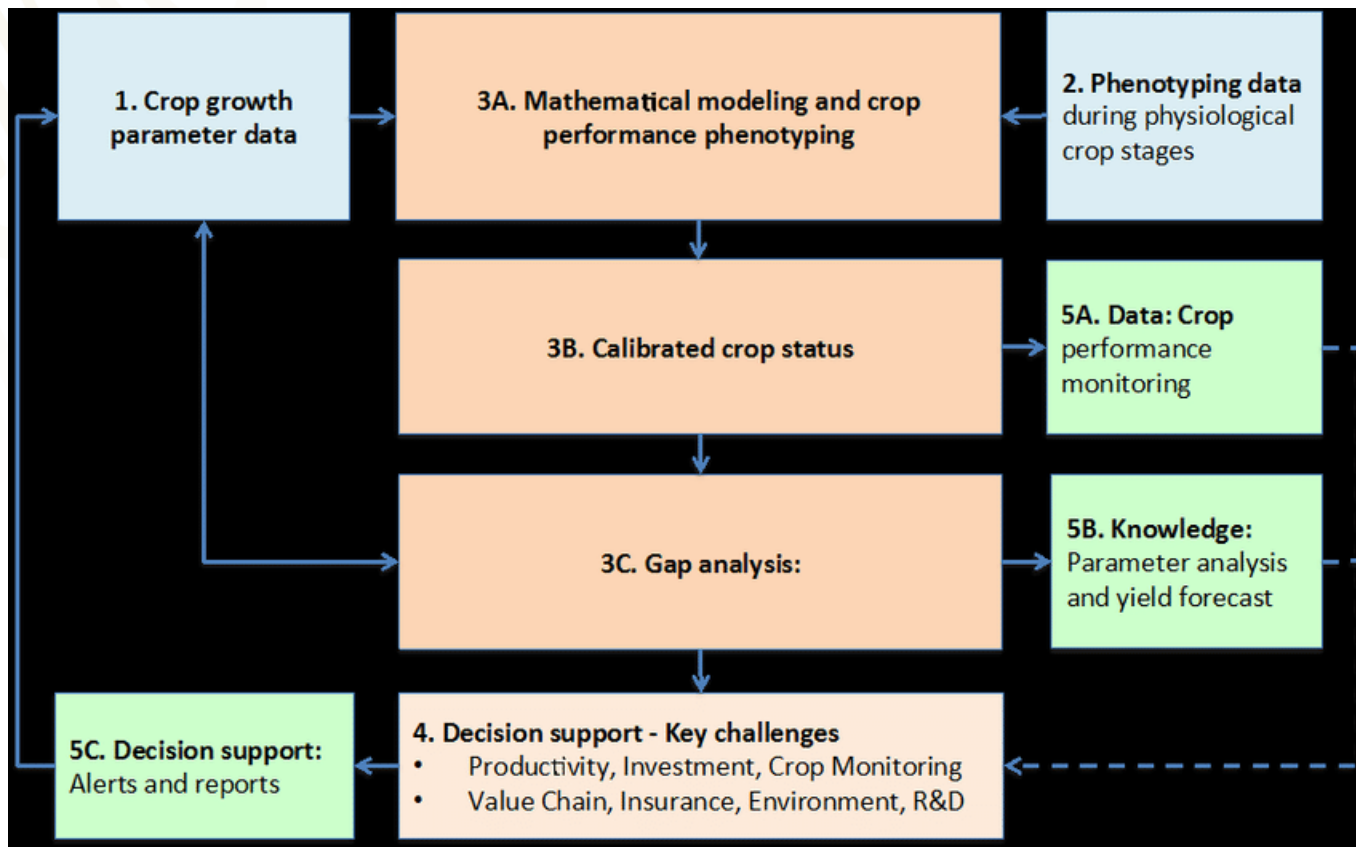


*Earth Observation using remote sensing technologies including satellites and aerial sensors supplemented with ground-based manual observation.*

- Example of a complete system of support to agriculture from the processing of spatial data.
- Project to improve crop yields for Mexican farmers through the provision of new data.
- A pilot project that is currently carried out from a collaboration between the United Kingdom Space Agency, UKSA, the Rezatec and Booker Tate companies, the University of Nottingham, and several Mexican institutions, among which are the International Maize and Wheat Improvement Center (CIMMYT) and the Postgraduate College.

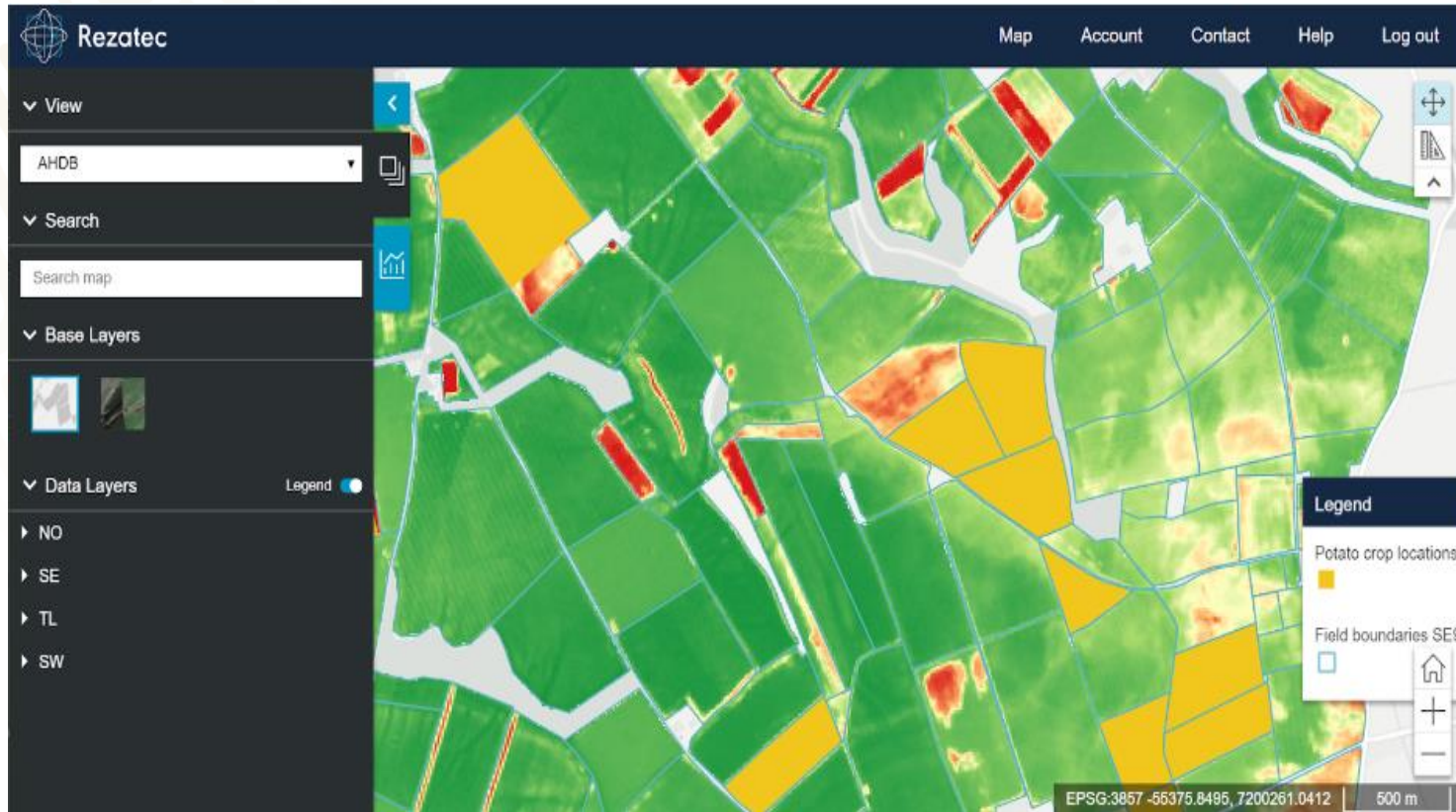


# COMPASS



*Schematic flow diagram of the COMPASS system.*

# COMPASS



*Processed satellite image with false color indication on the condition of the crops. By Rezatec.*

# COMPASS



*Caption 1: A Mexican Sugarcane farmer in Cordoba, using Rezatec's COMPASS mobile app. By Rezatec*

*Caption 2: Rezatec, and other speakers, at the Global Agri Food Tech Forum in Puebla, Mexico, October 2018. By Rezatec*

# Conclusions

 **SUSTAINABLE DEVELOPMENT GOALS**



# ¡Thank You!

Contact:

Verania Echaide Navarro

Mexican Space Agency

[echaide.verania@aem.gob.mx](mailto:echaide.verania@aem.gob.mx)

# REFERENCES



- Nixon, David & Salgado-García, Sergio & Gurusamy, Saravana & Crout, Neil & Rodrigues Jr, Francelino. (2017). An overview of the Mexican Crop Observation, Management and Production Analysis Services System (COMPASS) Project (English translation).
- Canales, Rangel, Ávila, Ledesma, Kreimer, Martínez. (2017). Technological innovation in case of protected agriculture in Mexico.
- Food and agriculture organization of the United Nations, Selected Indicators of Mexico.
- Precision Agriculture in Mexico, Mexican Space Agency (2016).