

→ EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

Agriculture and Rural Development

Stakeholder Meeting EO4SD Agriculture Cluster
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Satellite Earth Observation to assess the consequences of armed conflict on agriculture sector in Syria

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Satelligence



food security ↔ conflict

Objective: to assess and monitor status, trends, and adaptive/coping strategies in agricultural areas in Syria using Earth Observation

Satellite Earth Observation (EO) is a powerful and cost-effective technique to assess agricultural production, especially in difficult accessible areas, when normal data collection is disrupted, and agricultural statistics are not reliable

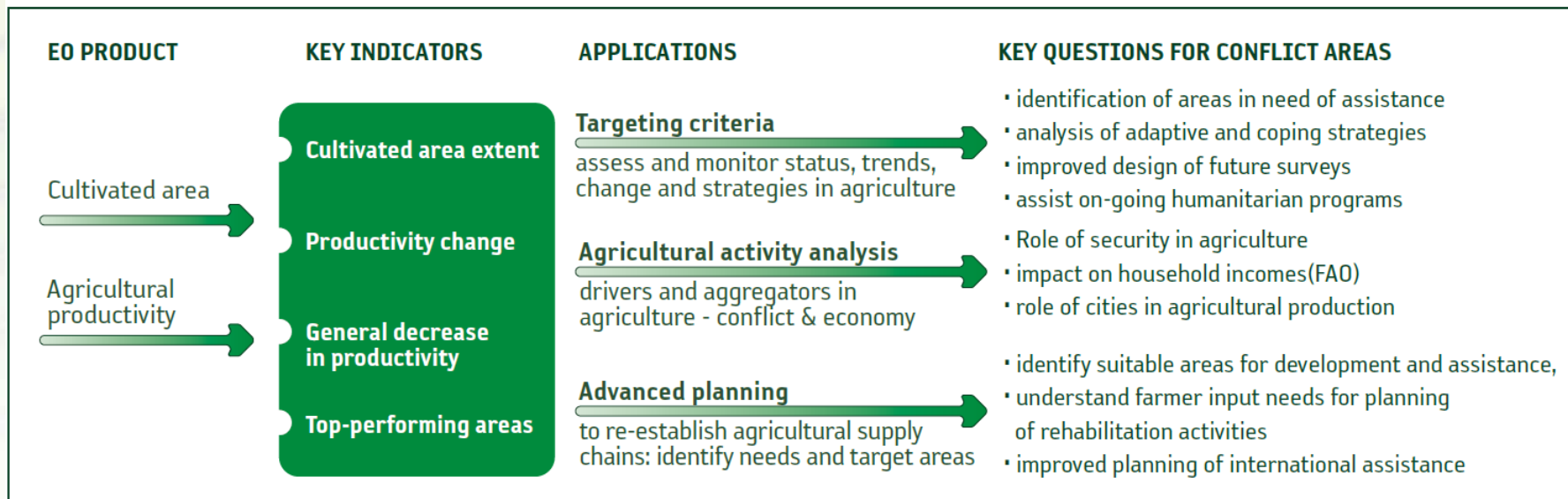
According to the WorldBank, it has limited dialogue with the country.

ESIA: Assessment of conflict impact on agricultural sector draws heavily on work by FAO, REACH, ACAPS, WFP, OCHA and ESA (EO4SD)

Collaboration with local partners:

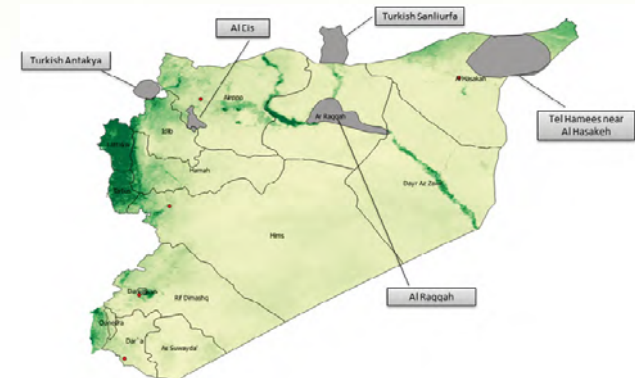
- FAO data (household surveys) shared with EO4SD team
- Interviews with FAO experts on cropping patterns etc

Service description

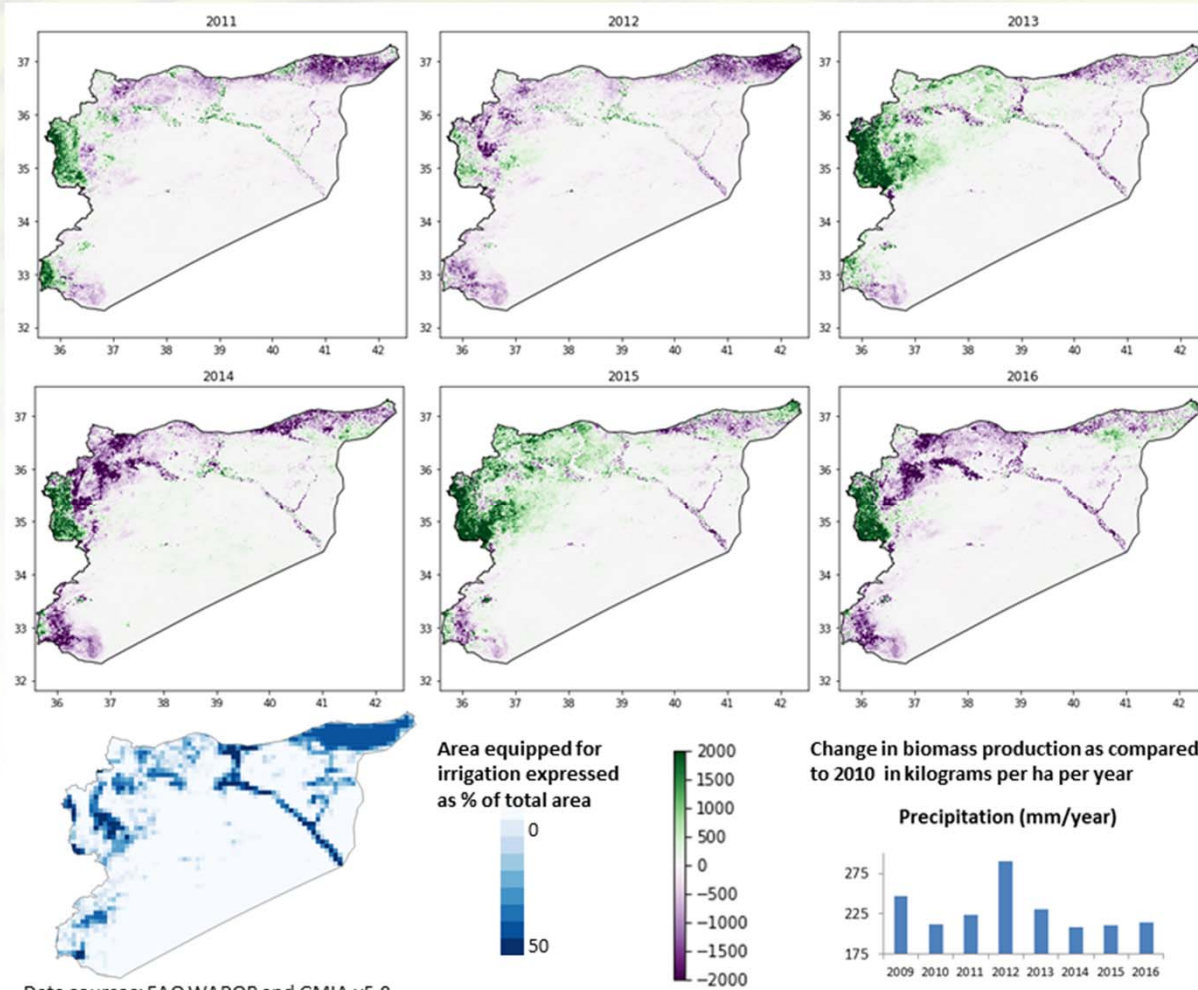


Evaluation of the agricultural production capacity in 3 irrigation schemes under the time of conflict and compared to similar schemes in Turkey

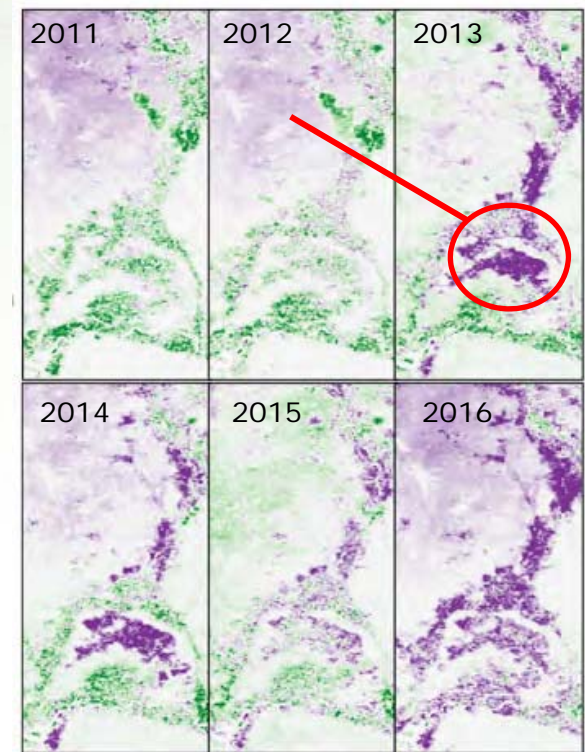
Critical success factor: service had to be ready prior to Spring Meetings at WB



Demonstration: national scale



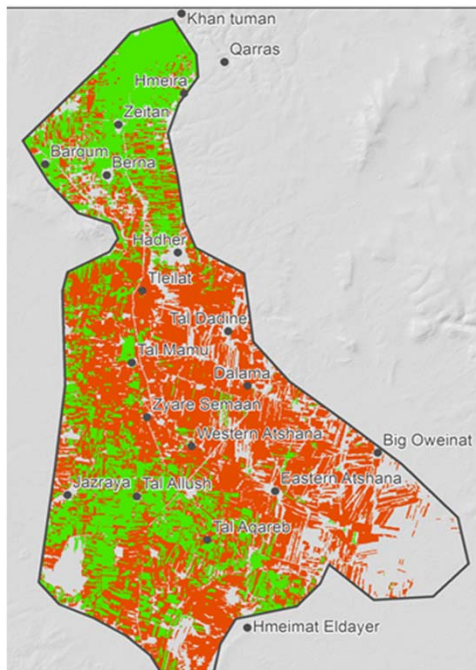
Irrigation area serviced by Bir el Hashim pump station
 (change from 4.6 to 2.4 tons/ha/year)



Cultivated area and agricultural productivity in Syria are strongly affected by conflict



Key findings for Al Eis irrigation scheme, southwest of Aleppo
changes from 2011 (pre-conflict) to 2016 (in-conflict)



Cultivated area extent change

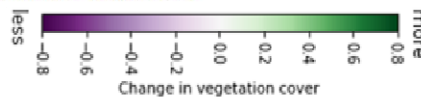
Cultivated area extent change 2011 - 2016

- Remaining cropland
- Abandoned land

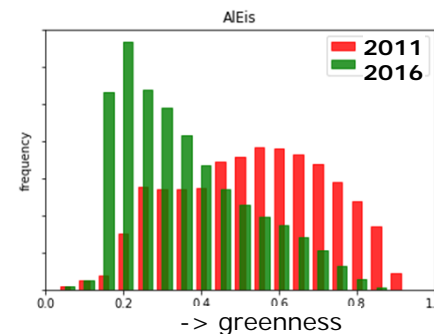
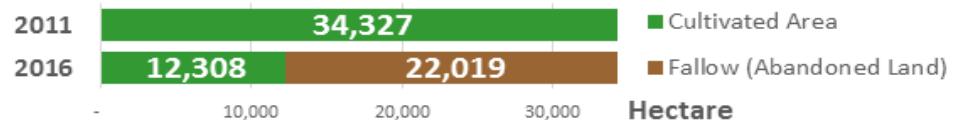


Productivity (vegetation cover) change

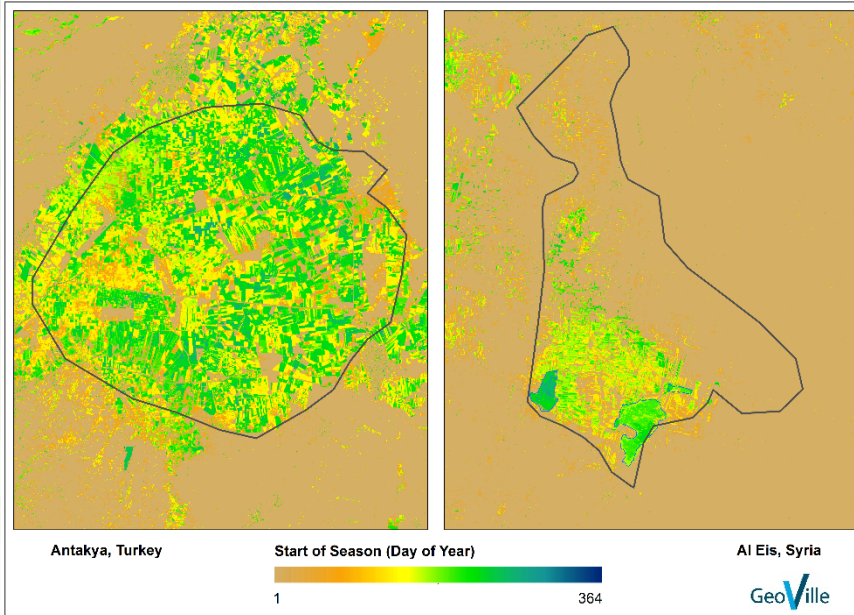
1/9/2011 - 29/8/2016



Cultivated area: reduced by 64%
Agricultural productivity: reduced by 36% (winter) and 47% (summer)
Irrigation: In 2016 only 4% of irrigation scheme was used for irrigated summer crops



Comparision with agriculture in non-conflict areas



Identification of **start of season** and **vegetation chlorophyll** content using Sentinel 2 timeseries: significant difference between non-conflict (Turkish Antakya) and in-conflict (Al Eis, Syria) agricultural areas

→ identify most affected villages and **link to statistical information.**

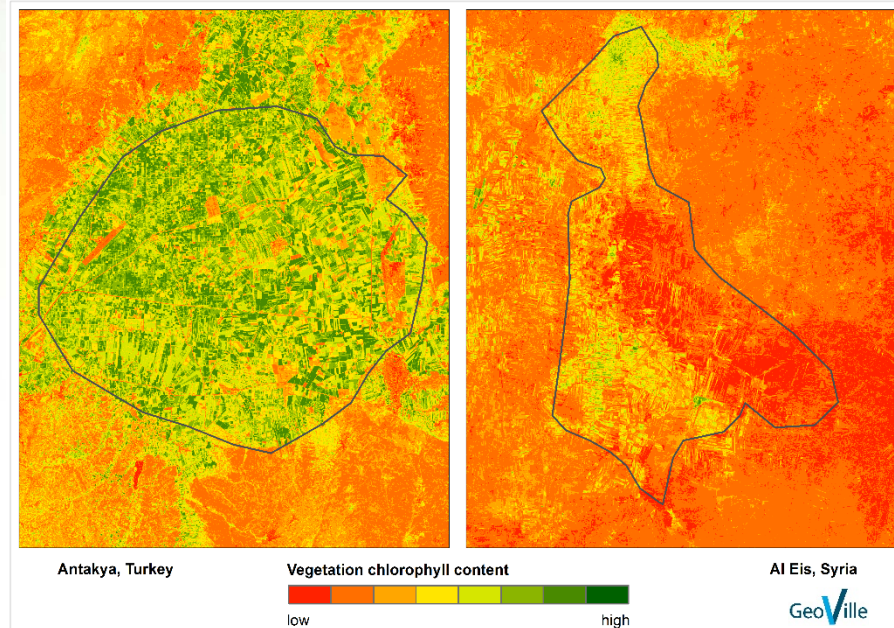
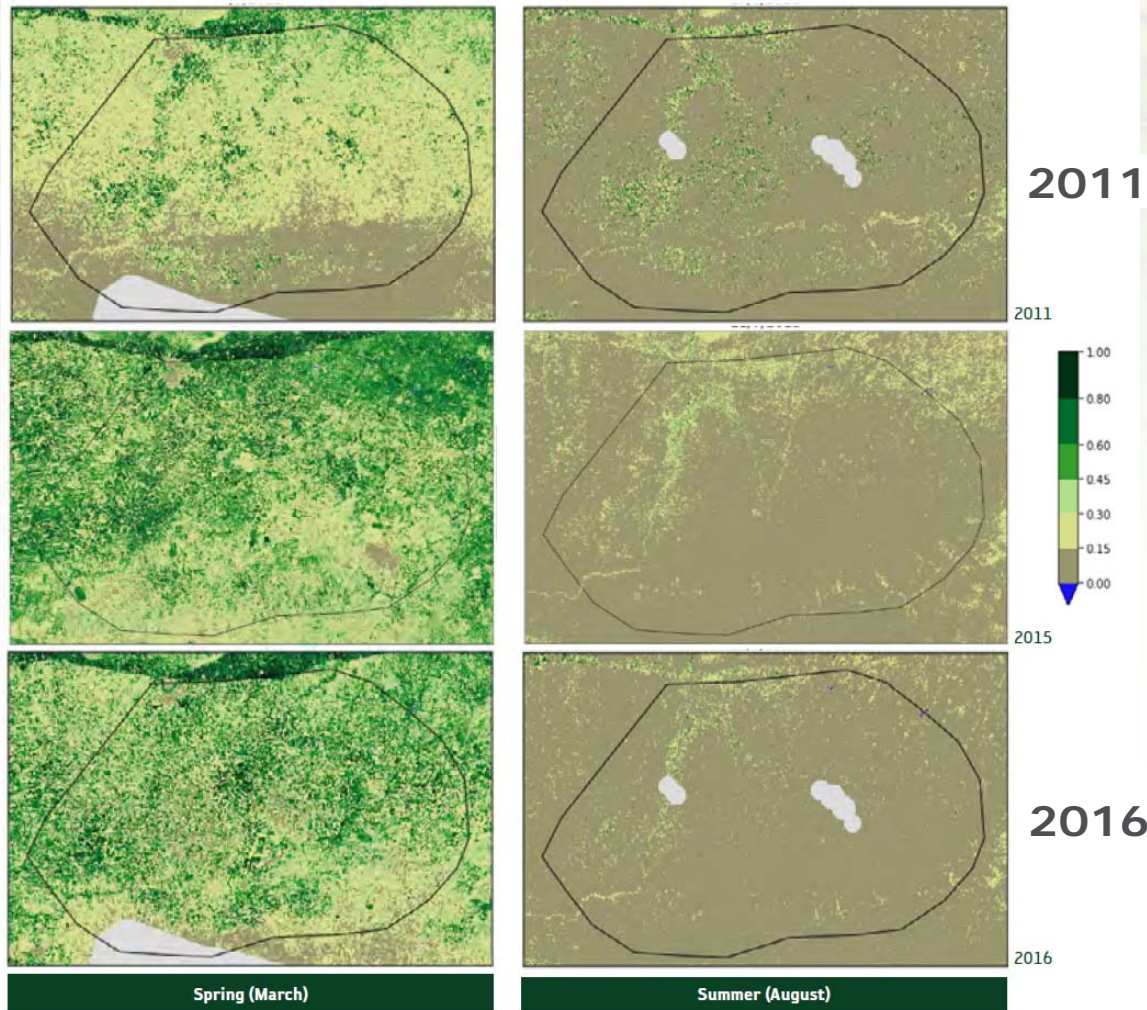


Table 2 Al Eis: Top ten villages regarding the absolute area of abandoned agricultural land (fallow) and top ten villages with most cultivated areas in their surrounding in 2016.

Credic EO45D Agriculture Cluster (eLEAF/GeoVille for ESA/World Bank, 2017) with input data from the FAO

Abandoned agricultural land (fallow)				Cultivated land in 2016		
Postal code	village name		area (ha)	Postal Code	village name	Area (ha)
C1090	Eastern Atshana	قريش قن اشطع	1968	C1167	Zeitan	1512
C1180	Tal Dadine	نيداد لت	1206	C1015	Khan Tuman	1273
C1151	Zyare Semaan	ناحيس قرايز	1136	C1171	Tal Allush	1076
C1093	Western Atshana	قن اشطع	1136	C1152	Hmeira	955
C1182	Hadher	رضاحلا	1108	C1018	Qarras	848
C1178	Dalama	قدالت	979	C1168	Jazraya	780
C1173	Tal Mamu	ومولت	948	C1154	Berna	769
C1177	Tleilat	تاليلت	888	C1071	Tal Aqareb	668
C3900	Hmeimat Eldayer	رياندل تاديومج	794	C1153	Barqum	606
C1067	Big Oweinat	قريشك شان يوع	775	C1182	Hadher	598

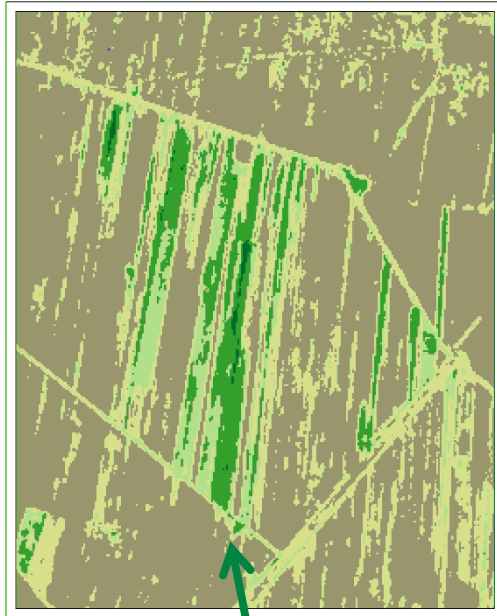
Al Hassakeh: stronger focus on rainfed crops?



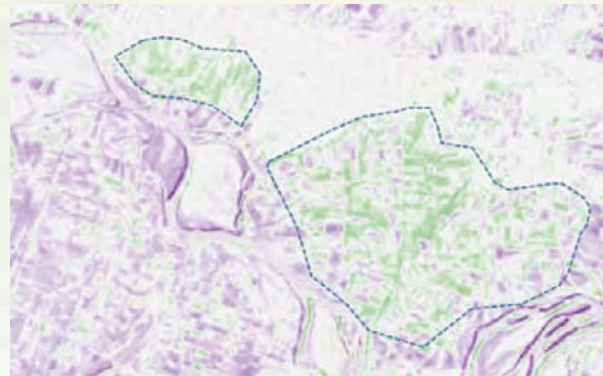
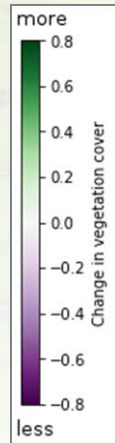
Productivity in Al Hassakeh:

- Increase in spring → shift to rainfed agriculture?
- Summer irrigation in 2011 → disappeared in 2015 and 2016

Coping and adaptive strategies

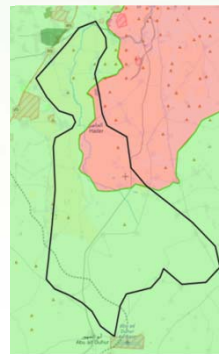


Disruption of irrigation channels but vegetation growth continues as much as possible



Relative increase of productivity near city

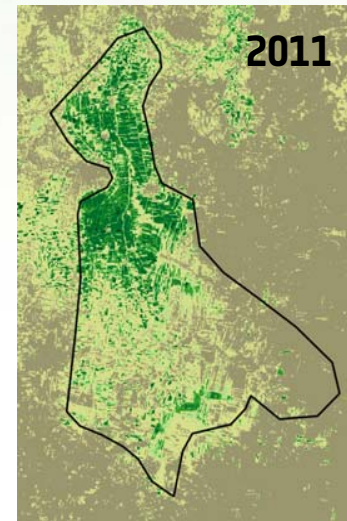
Impact of front line



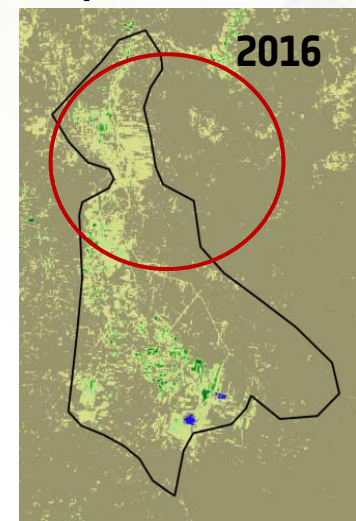
syria.liveuamap.com



Productivity



pre-conflict



during conflict

Results in form of maps and statistics at different administrative levels
-> clear and objective monitoring of status, trends, change and adaptive/coping mechanisms adopted by farmers

Key findings:

- Decrease in productivity and cultivated area since conflict begun
- Cultivated areas in AI Eis irrigation scheme reduced by 64 % (34,327 ha → 12,308 ha). In 2017 only 4% used for irrigated summer crops
- Productivity decreases in both winter (-36%) and summer (-47%) in AI Eis. Other areas also productivity decrease in summer, and stronger focus on rainfed crops.

Feed back: WB has seen the potential of the technology and provided the opportunity to present the results to delegation of Iraq Ministry of Agriculture working on the design of the agricultural component for a WB Emergency Operation

Phase 2 has already been completed

Planning to present the methodology and results to a wider audience at the WB (WB internal technical ESA report)

Results contributed to the WB report “The Toll of War: The Economic and Social Consequences of the Conflict in Syria” issued on July 10, 2017

Presentation of Syria methodology to delegation of Iraq Ministry of Agriculture working on the design of the agricultural component for a WB Emergency Operation

