



GENILLARD & CO
—INSURANCE FACTORY—

Agriculture Risk Metrics

Risk Management Tool for Agriculture in Croatia

Workshop on Climate Change Impact on Agriculture in Croatia
22.09.2020, Zagreb

INTRODUCTION



Insurance

Science

Policy

- Holistic risk view, science -> insurance

“Agriculture Risk Metrics” – Our Tool-Kit for Risk Management in Agriculture

- Combines public + private know-how
- Big Data Analytics → damage & hazard information (crop & price models? / RS?)
- Tech solution: Data crawling, Advanced analysis, Clever visualizations



THE ARM TEAM



Christopher Genillard
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Insurance & Reinsurance Expert



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Agronomist



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AGENDA



**Risks Increasing for
Agriculture**

**Challenge for
Stakeholders**

**Our Risk
Management
Solution: ARM**

**Visualisation
Examples using
ARM**

**The value for You:
Holistic Risk Data
View**

1. INCREASING CLIMATE- RELATED RISKS

CROATIAN AGRICULTURE INCREASINGLY VULNERABLE FROM ELEMENTARNA NEPOGODA

- Drought
- Floods
- Spring Frost
- Hail
- Extreme Rainfall
- Wildfires
- Heat waves

Losses extreme weather events in agro
EUR 167 million per year

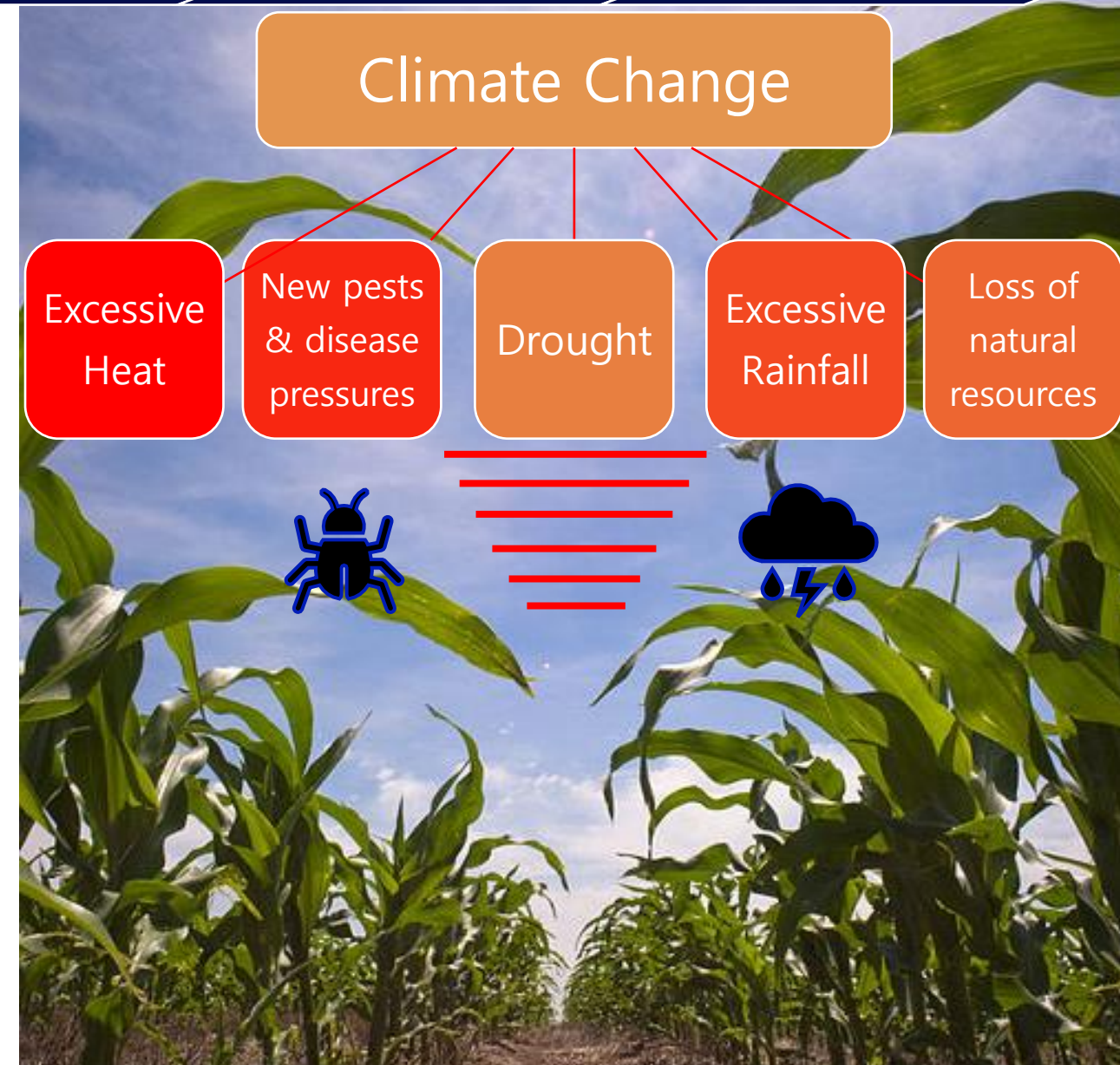


Figure adapted from [Lars Plougmann](#), [Creative Commons Attribution-Share Alike 2.0 Generic](#)



1. STAKEHOLDERS CARRYING CLIMATE RISK

CONCERNS

- Family income
- Farming enterprise success
- Input price stability
- Adaptation to changes
- Access to credit

RISKS

- **Loss of income**
- Loss of subsistence source
- Debts
- No investment power

167 M€



FARMERS, AGRIBUSINESS

INSURER



16 M€

GOVERNMENT



6 M€

CONCERNS

- Insurance product repertoire
- Marketing costs
- Financial health of insurance company
- Stakeholder communication
- Sales partner education
- Innovation

CONCERNS

- Agricultural sector resilience
- Gross Value Added
- Rural development
- Safeguarding financial sector & Income stability
- Insurance regulations
- Data Generation and Access
- Stakeholder Insurance and financial Literacy (education!)

RISKS

- **Loss payouts – too often, too much**
- Stop product offering / no product uptake
- Customers frustration

RISKS

- Natural Damage payments
- Insufficient state budget
- **Collapse of agricultural sector**
- Dependency on foreign aid
- Decline of citizen support



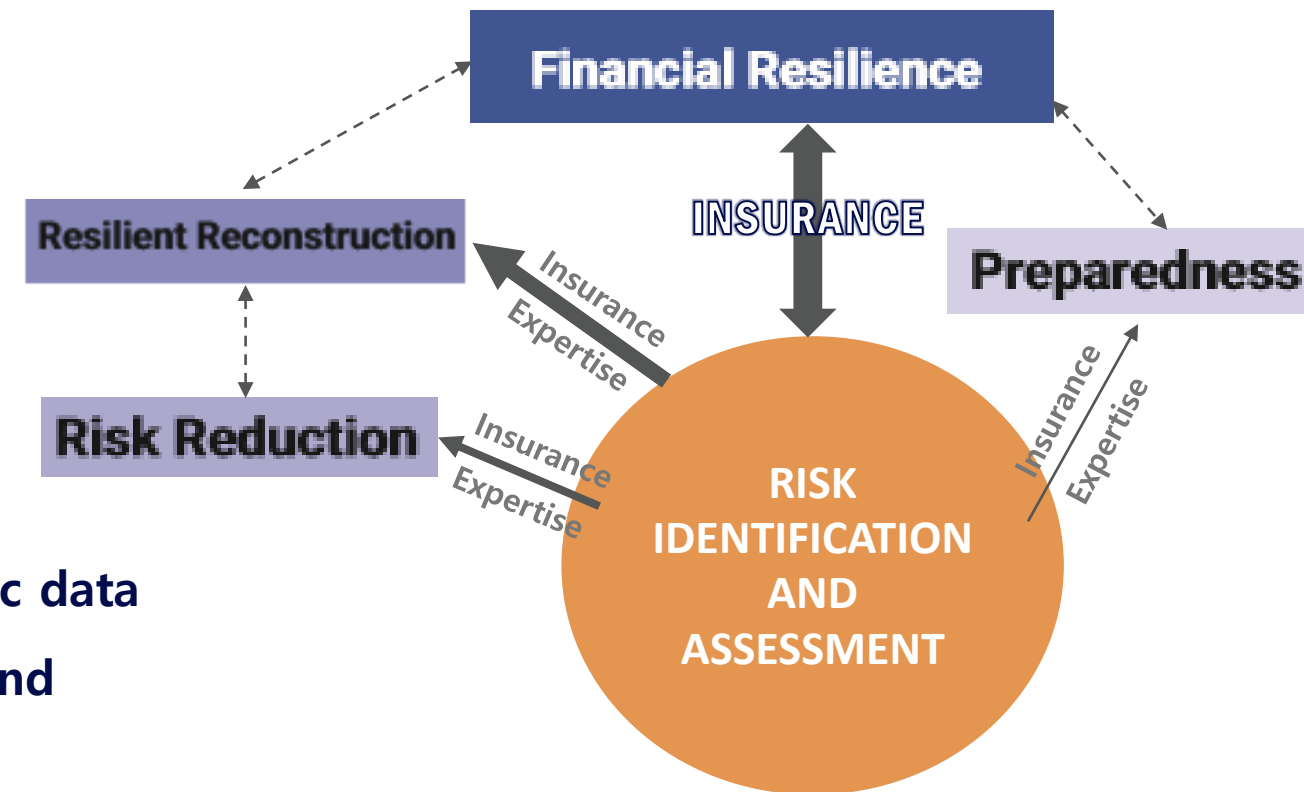
2. CHALLENGE FOR STAKEHOLDERS IN AGRICULTURE

- Increase awareness of changing climate and risks
- **Understand** historical climate characteristics
- **Monitor** current climate risks
- **Manage** current and future risks



- **Need: Ready-to-use, easily understandable, up-to-date, live, comprehensive and holistic data**
- **Need: Technological solution to integrate and visualize all data**

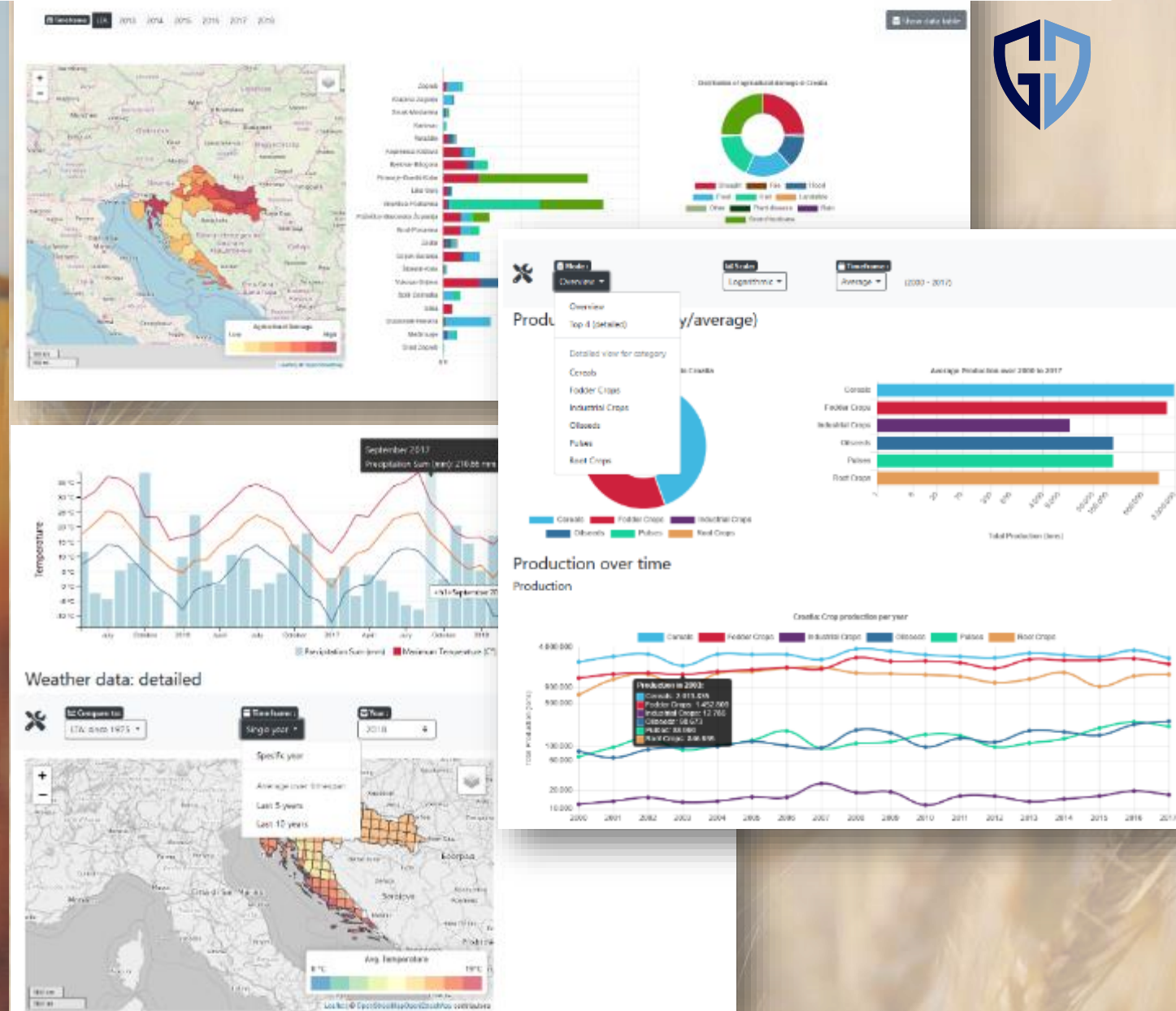
DISASTER RESILIENCE FRAMEWORK
adapted from **CASS¹ & World Bank²** papers



1. Jarzabkowski et al., 2019, "Insurance for climate adaptation: Opportunities and limitations.", CASS Business school background paper.
2. Ghesquiere and Mahul, 2010, „Financial Protection of the State against Natural Disasters“, World Bank Policy Research Paper

3. AGRICULTURE RISK METRICS

ARM PORTAL OUR SOLUTION





3. AGRICULTURE RISK METRICS (ARM) - PORTAL

- **Ready-to-use, easily understandable, up-to-date, live, comprehensive and holistic data, on....**
- ✓ Economic damage to Croatian agriculture (2013-2019) – *Croatian Ministry of Finance*
- ✓ Croatian agricultural production volumes and values (2000-2016/2018) – *FAO*
- ✓ Croatian agricultural demographics: farm and farmer statistics (2019) – *APPRRR*
- ✓ Weather and hazard information: frequency & severity (1975-2020) – *JRC/DHMZ/ESWD*
- ✓ Climate trend information: expected future climate in Croatia (2011-2100) – *CORDEX*

3. AGRICULTURE RISK METRICS (ARM) - PORTAL



➤ In maps, on county level →

- ✓ Economic damage to Croatian agriculture (2013-2019)
- ✓ Croatian agricultural production volumes and values (2000-2016/2018)
- ✓ Croatian agricultural demographics: farm and farmer statistics (2019)



Based on most recent scientific and statistical data !

Supplemented with smart analytics !

Up-to-date !

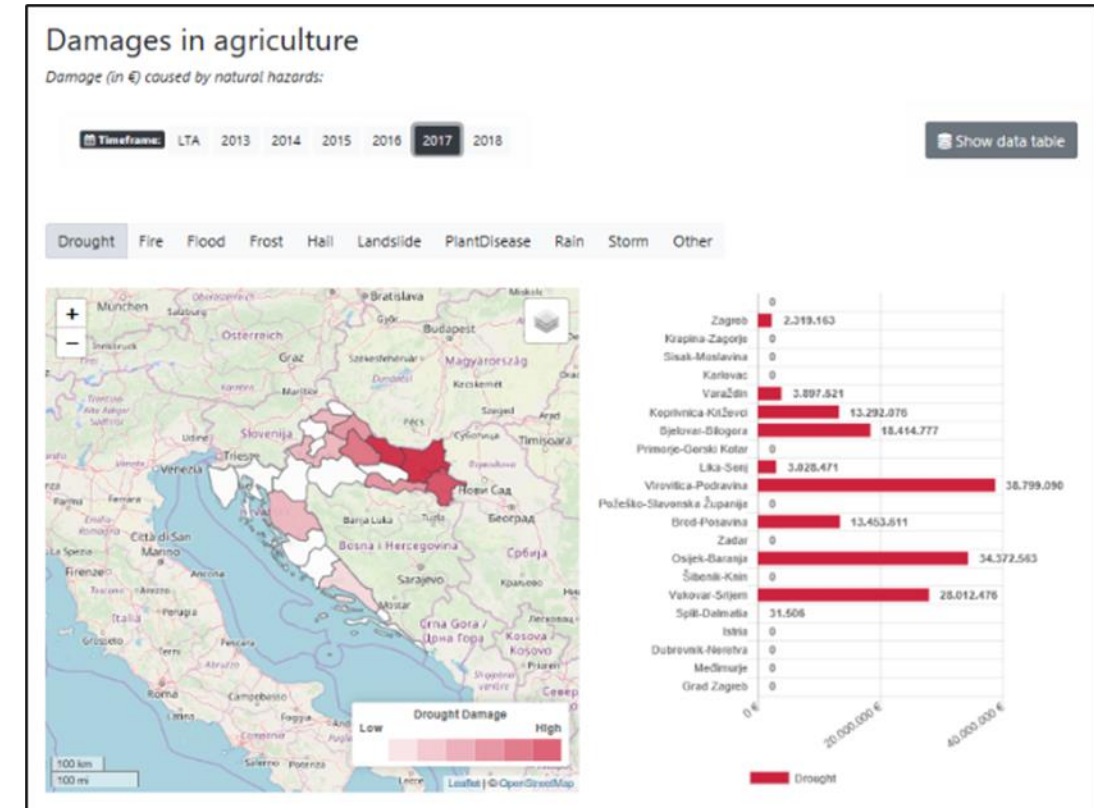
Live !



4. ANALYTICAL WORK FOR DROUGHT INSURANCE SOLUTION

1. Design drought insurance scheme

1. Possible production losses because of drought

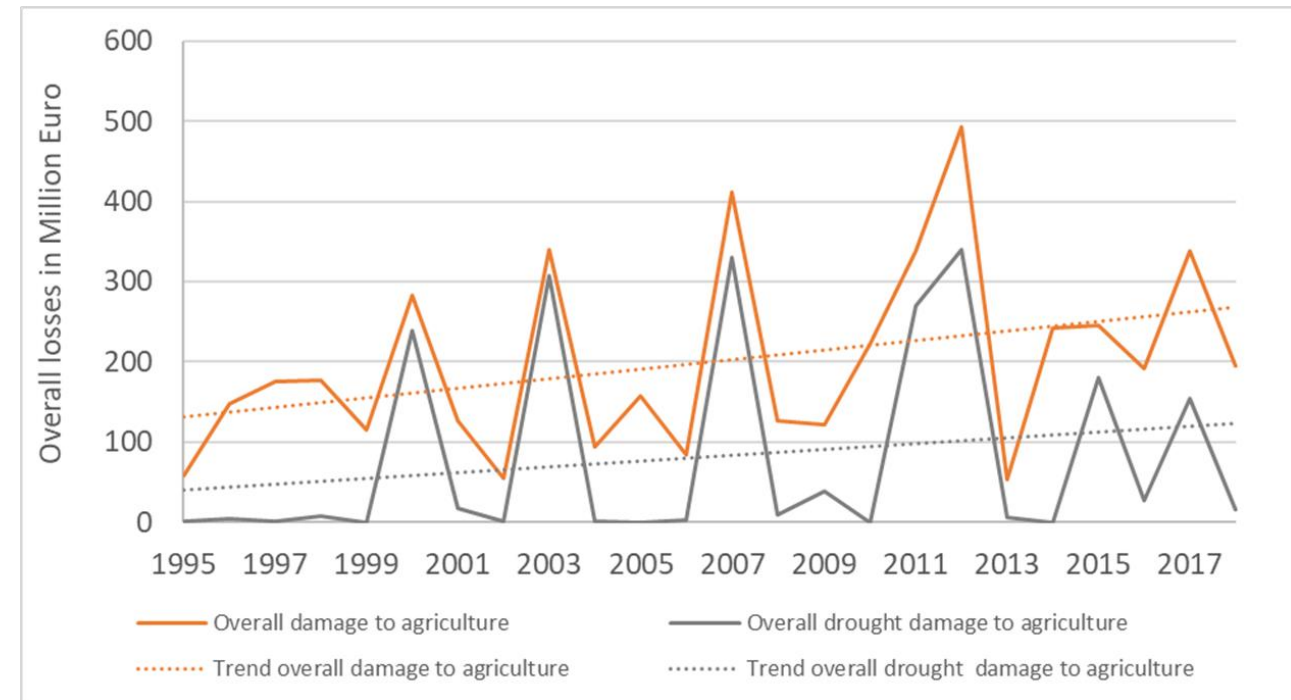


4. ANALYTICAL WORK FOR DROUGHT INSURANCE SOLUTION



1. Design drought insurance scheme

1. Possible production losses because of drought
2. Drought event frequency



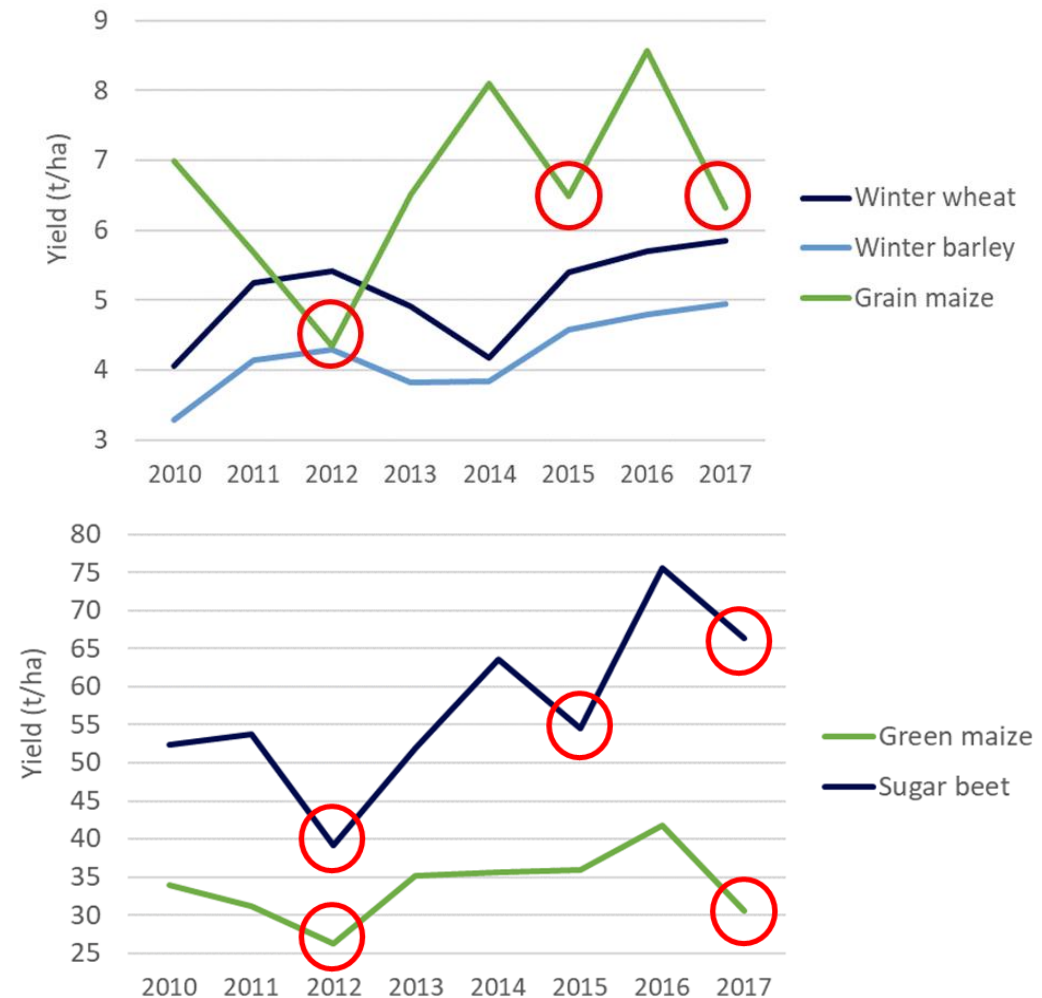


4. ANALYTICAL WORK FOR DROUGHT INSURANCE SOLUTION

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1. Possible production losses because of drought
2. Drought event frequency
3. Which crops suffer most?

Production data for Kontinentalna Hrvatska 2010-2017 for selected crops

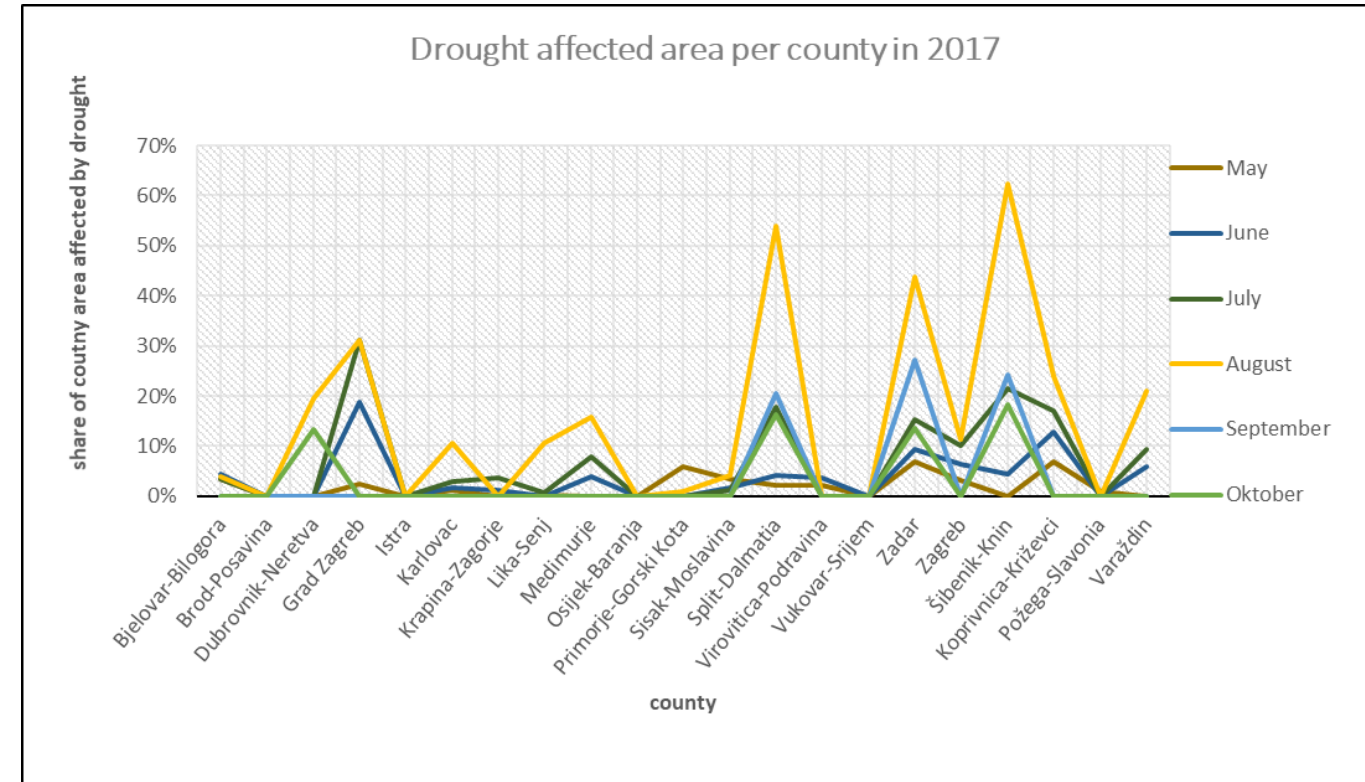




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3. Which crops suffer most?
4. Regional differences



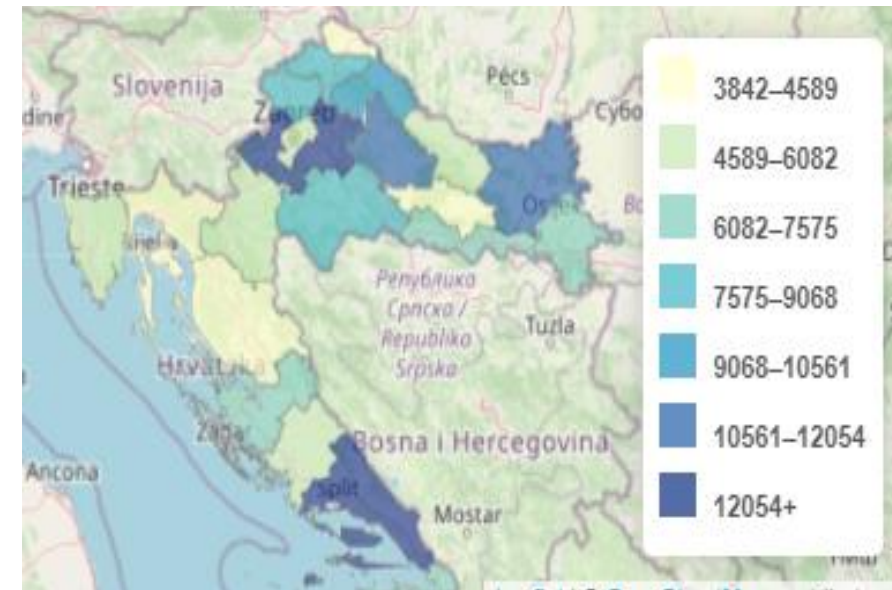


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4. Regional differences
5. How many producers affected?

Agricultural Holdings per county

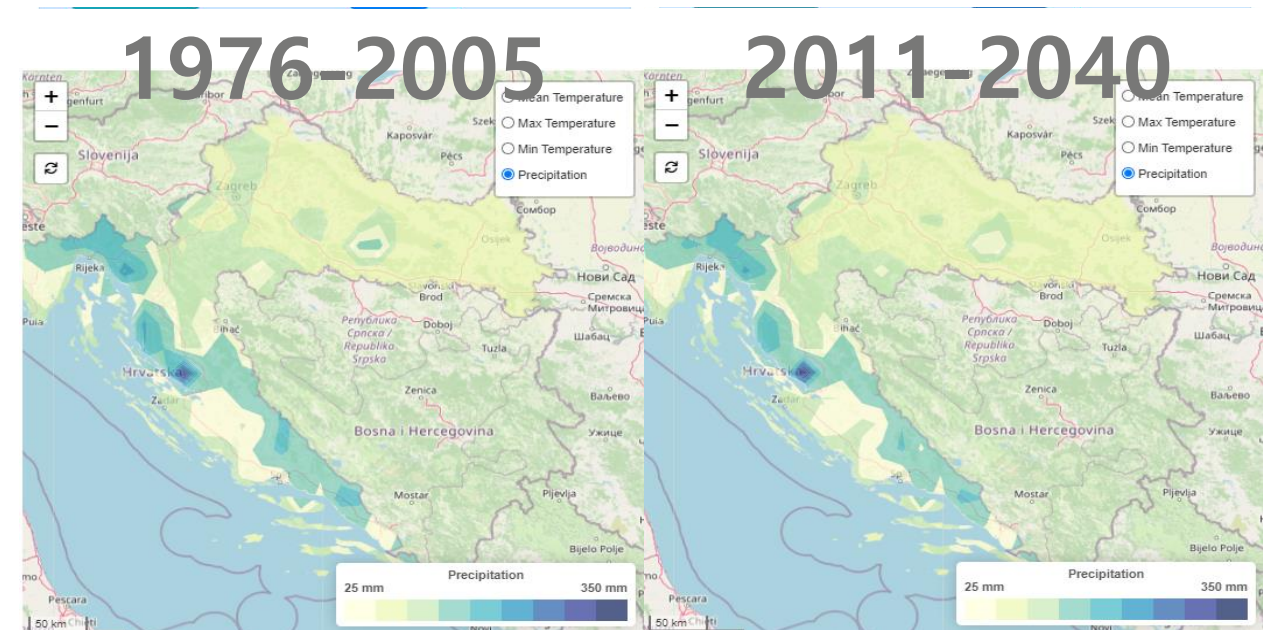




4. ANALYTICAL WORK FOR DROUGHT INSURANCE SOLUTION

1. Design drought insurance scheme





1. Possible production losses because of drought
2. Drought event frequency
3. Which crops suffer most?
4. Regional differences
5. How many producers affected?
6. Future expected climate characteristics?





5. VALUE FOR YOU

➤ Risk data in your hands

-  ✓ Unlocks available risk-relevant information
-  ✓ Visualizes in an intuitive, easily understandable way
-  ✓ Facilitates risk-management decisions
 - ✓ Risk transfer, risk mitigation, risk knowledge sharing
-  ✓ Saves you unexpected losses



5. BENEFITS FOR THE DIFFERENT STAKEHOLDERS



Activity	WITH ARM Portal
Policy Making	Supported and safe agricultural sector
Farm Management	Stable income and investment capacity
Risk Pricing	Adequate prices and acceptable losses
Education & training	Understanding of holistic risk management
Stakeholder Cooperation	Yes



OUTLOOK – EXPECTED NEEDS OF STAKEHOLDERS

- Additional crop production data: yield prediction, prices, import/export
- Additional hazards: wildfire, other drought indicators
- Additional farming data: irrigation, agro-ecological zones, crop masks, crop calendar
- Impact CAP-implementation
 - Governmental expenditures (e.g. subsidies)
- Index insurance lab
- Remote sensing data: soil moisture, vegetation growth, burnt area

CONTACT US



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ARM Croatia Prototype:

<http://project.drtime.com/workshop/index.html>

(not adapted to mobile view yet)

