What Farmers Think (and Do) for Climate Change

Factors affecting climate mitigation and adaptation practices and future opportunities

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Major Topics

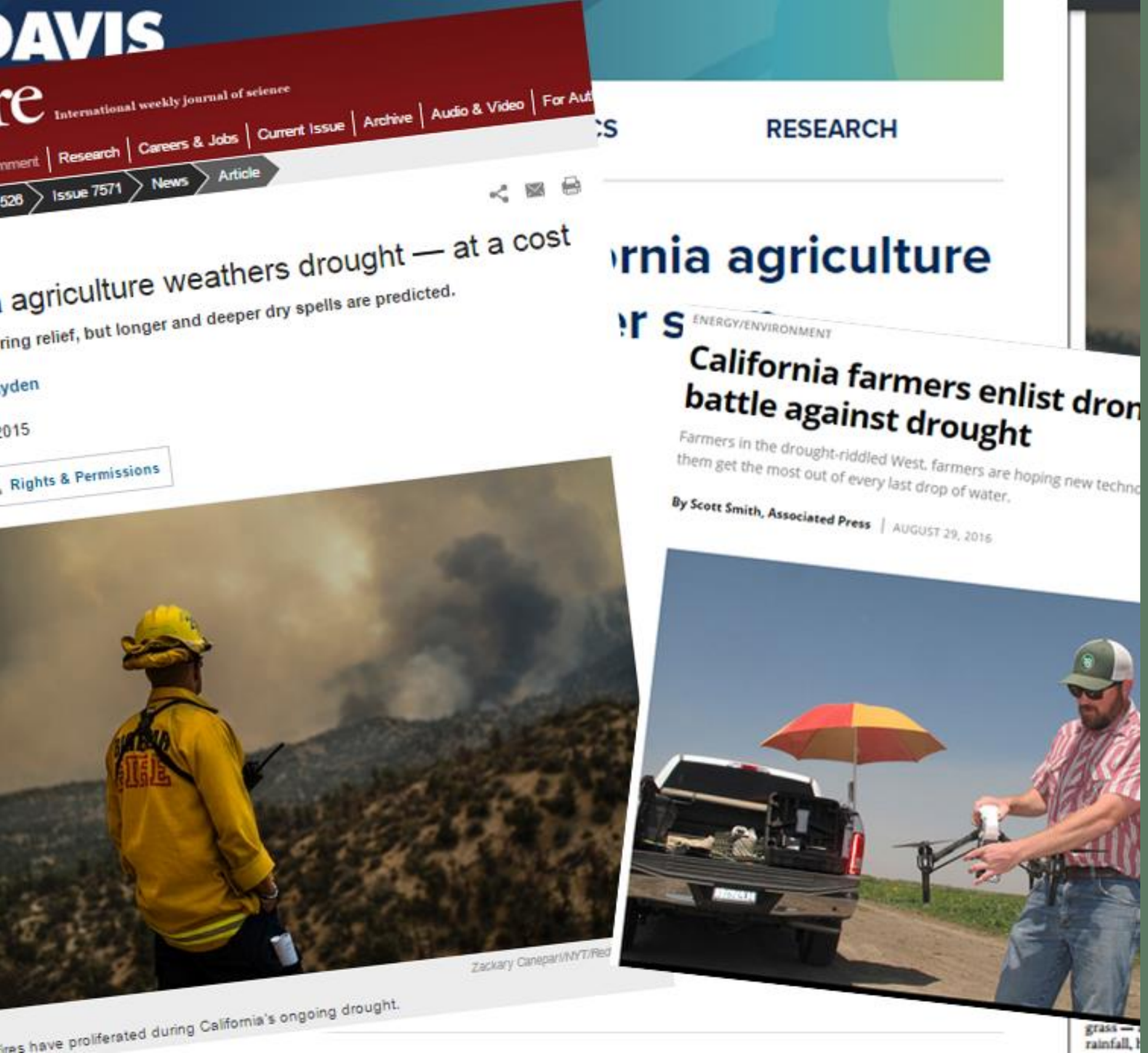
Outline of Discussion

What do farmers think about climate change?

Factors affecting adoption

What practices have they adopted (or want to?

Policy design and opportunities

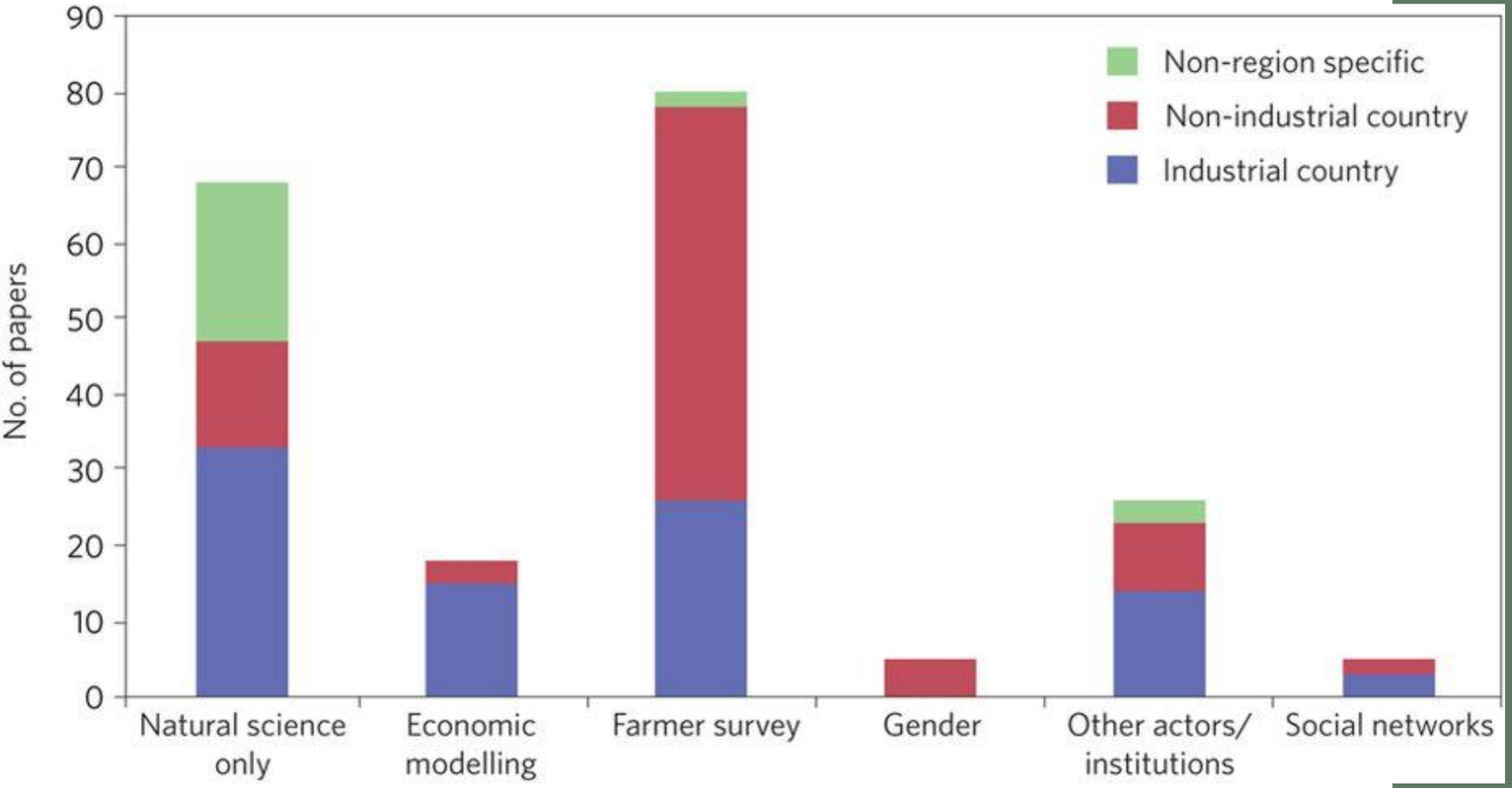


Agriculture and Climate Change

Agriculture is both a contributor to climate change and a potential victim of its impacts

Farmers are critical for adaptation and mitigation

Agricultural Adaptation Research



Large body of research with farmer surveys, especially in low-income countries

Davidson, D. Nature Climate Change volume6, pages433–435 (2016)

U.S. Farmers and Climate Change

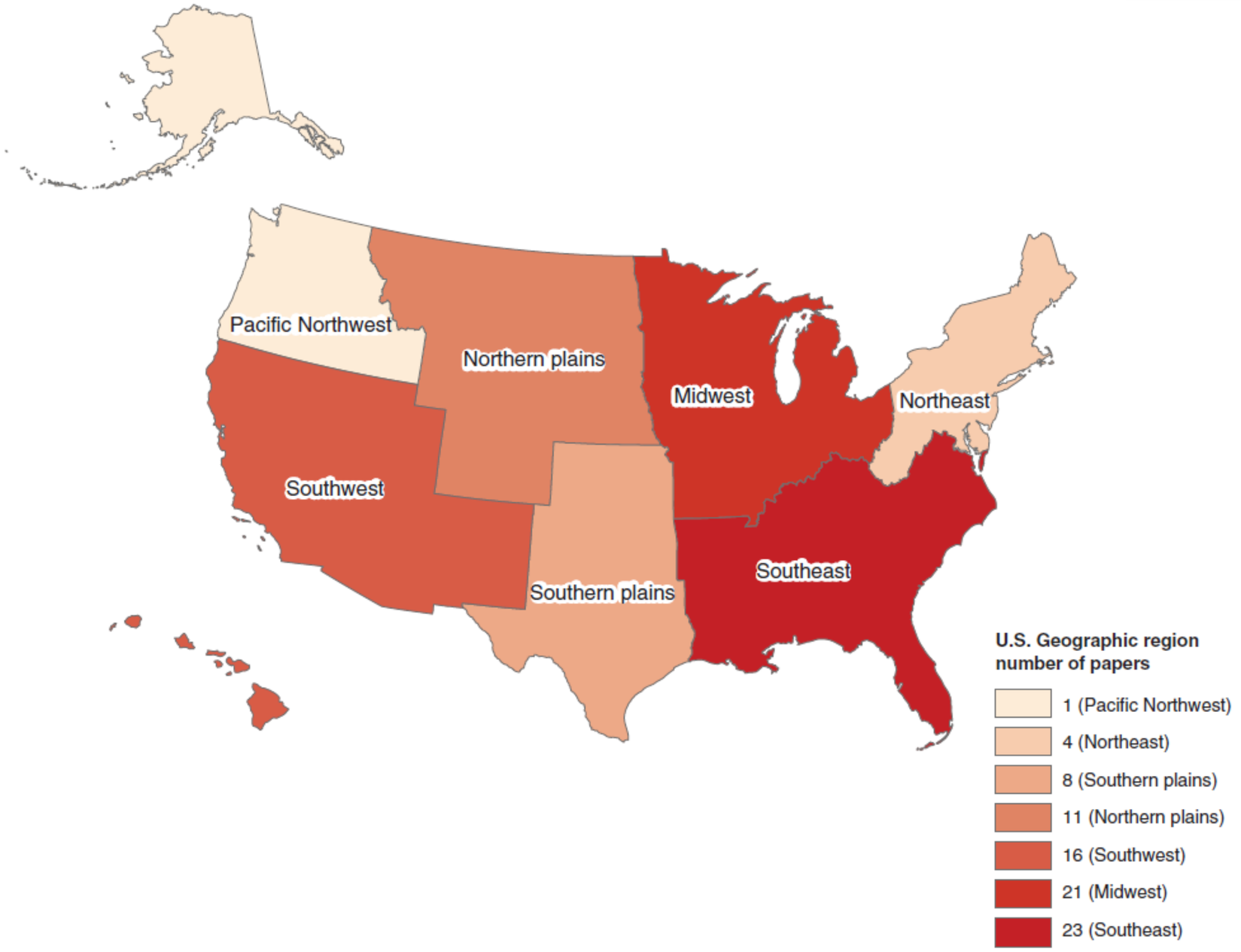


FIGURE 2 | Map of studies conducted between 1997 and 2015 on U.S. agriculture stakeholder views and decisions on climate change and extreme weather, by USDA Climate Hub region (n = 84, as some studies spanned multiple regions).

Research across the U.S.

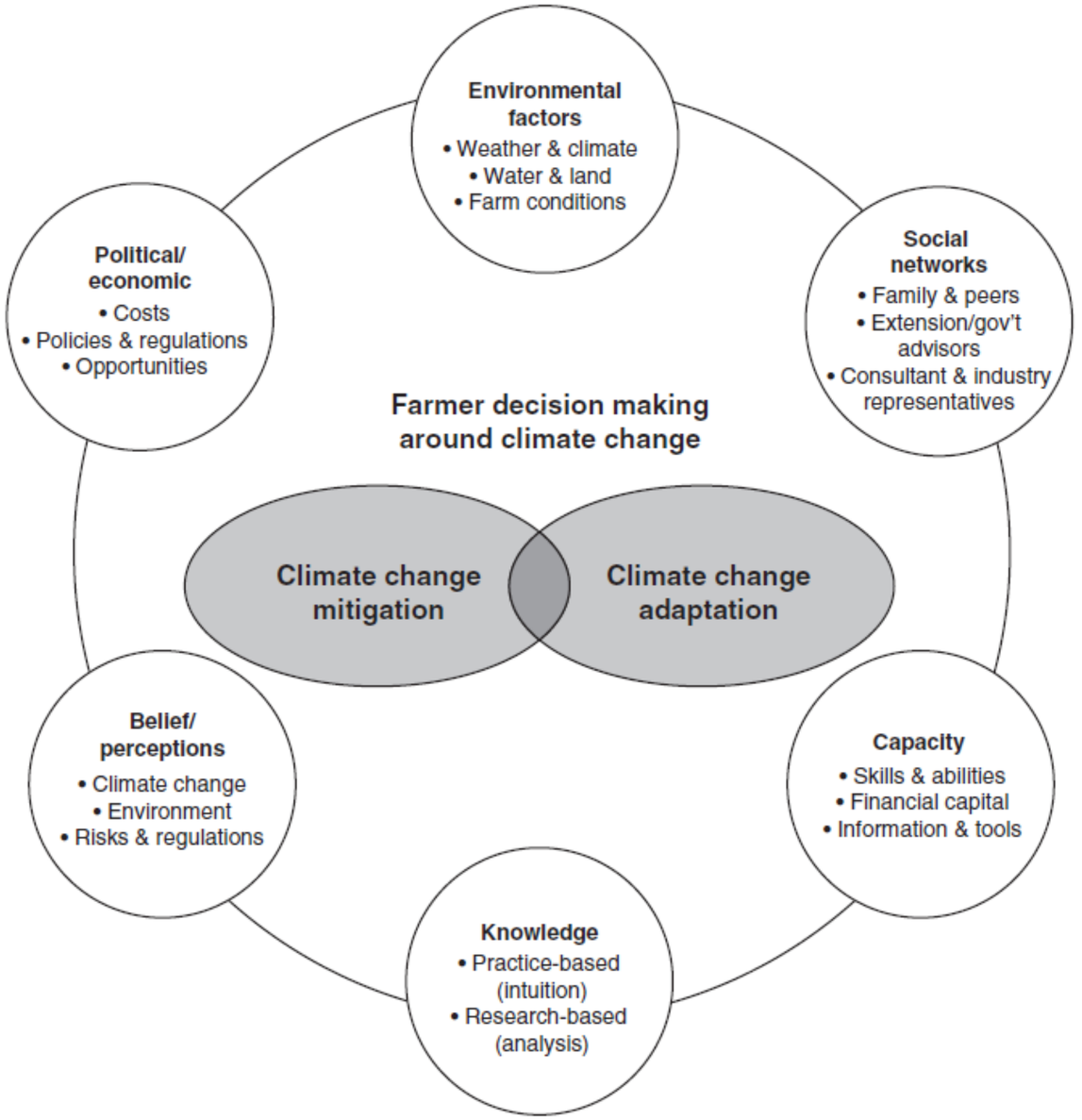


FIGURE 1 | Conceptual framework of the factors that affect U.S. farmers' decision making around climate change, based in part on Fishbein and Ajzen, White and Selfa, Park, and White.[18,32–34]

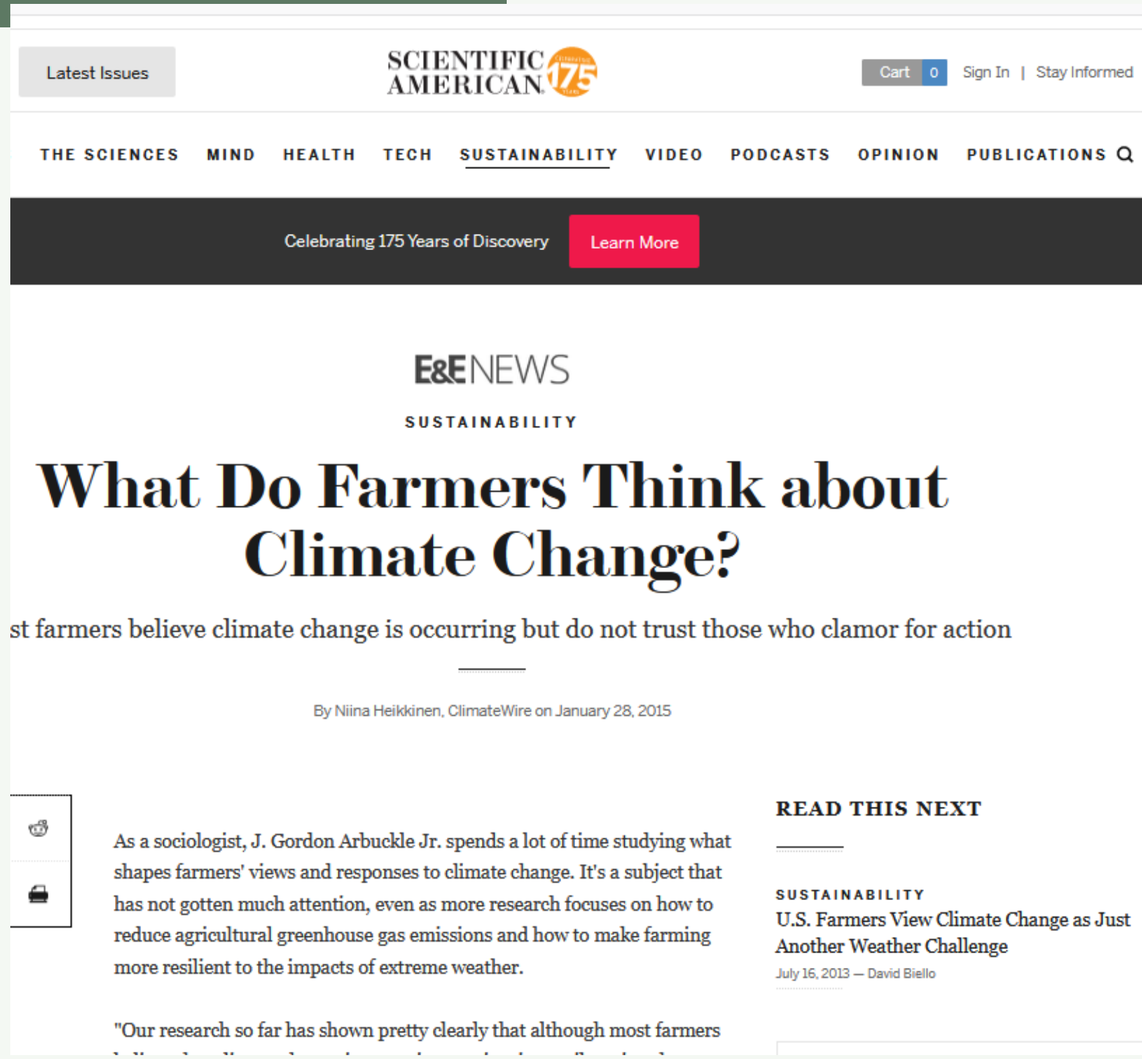
FACTORS AFFECTING CLIMATE BEHAVIORS

Belief/perceptions
Knowledge
Capacity
Social networks
Environmental factors
Political/economic

Belief and Perceptions

The majority of US studies show farmers believe climate change is happening

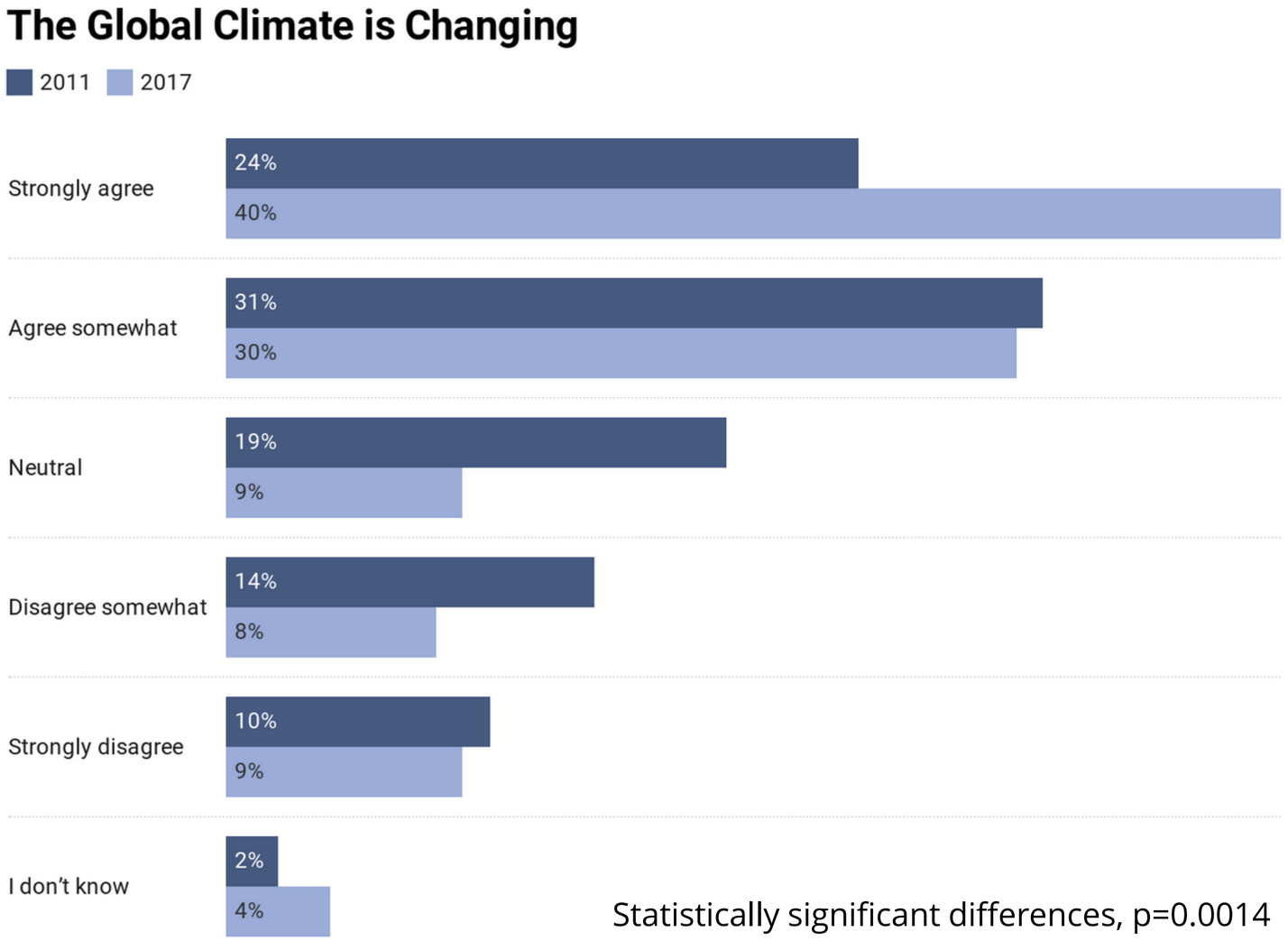
- On average, 65% of farmers believe the climate is changing (Chatrchyan 2017)
- Fewer believe in the anthropogenic nature of climate change (40%)
- These may be changing



Belief and Perceptions

California shift in climate perspectives

- 55% climate change belief in 2011, 70% climate belief in 2017
- Human attribution belief 35% to 45%



Statistically significant differences, p=0.0014

Niles et al. 2019

Belief Threshold?

94% of Puerto Rican farmers believed the global climate is changing in 2018

Survey of 405 farmers following Hurricane Maria in 2018

90%

Agreed that climate risks were both LOCAL and GLOBAL

95%

The effects of climate change are being felt today

Rodriguez- Cruz and Niles. In Review.

Capacity

Actual and Perceived

- Financial, technical, human, psychological capacities
- Perceived capacity was the only predictor of both farmer's actual and intended adoption (Niles et al. 2016)
- Perceived capacity positively associated with cover crop use (Gardezi and Arbuckle 2019)

"Fostering a sense of capacity and confidence for people to be able to change their behavior is crucial for both intention and actual adoption. This can help people overcome a sense of powerlessness that may be particularly acute for a collective action problem like climate change".

Niles et al. 2016 Climatic Change.

Social Networks

Trust and information sources affect climate beliefs and behaviors

- Agricultural industry and farm groups are most trusted by farmers (Arbuckle 2013)
- Farmer group participation positively associated with no-till adoption on New England vegetable farms (White et al. 2020)

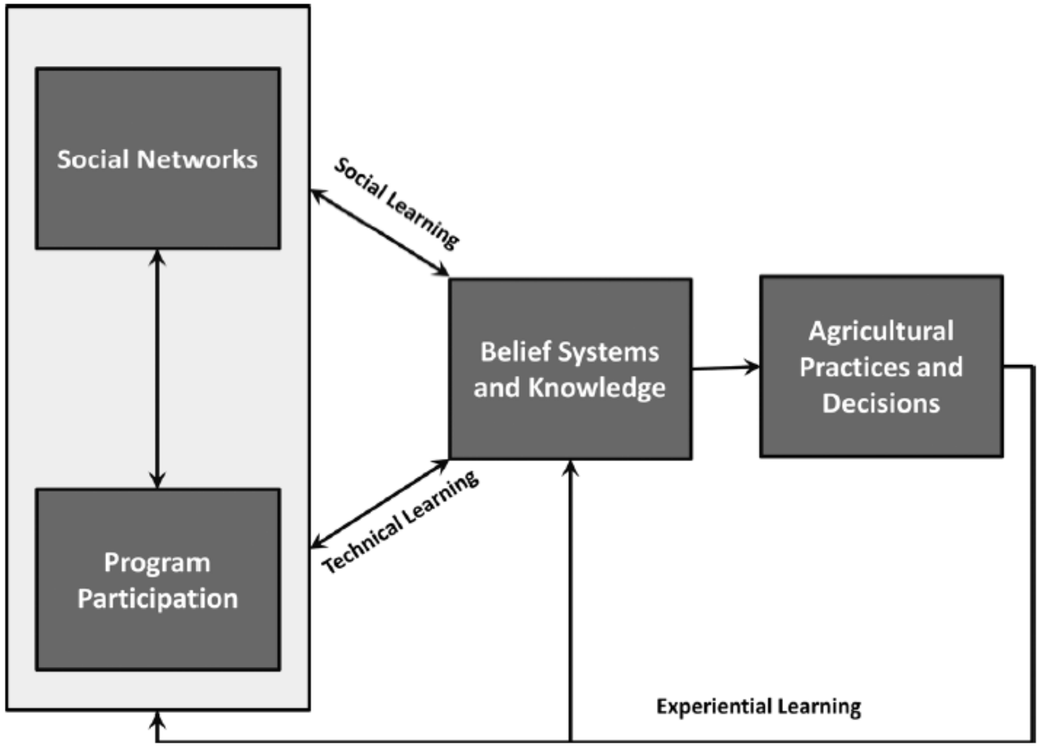


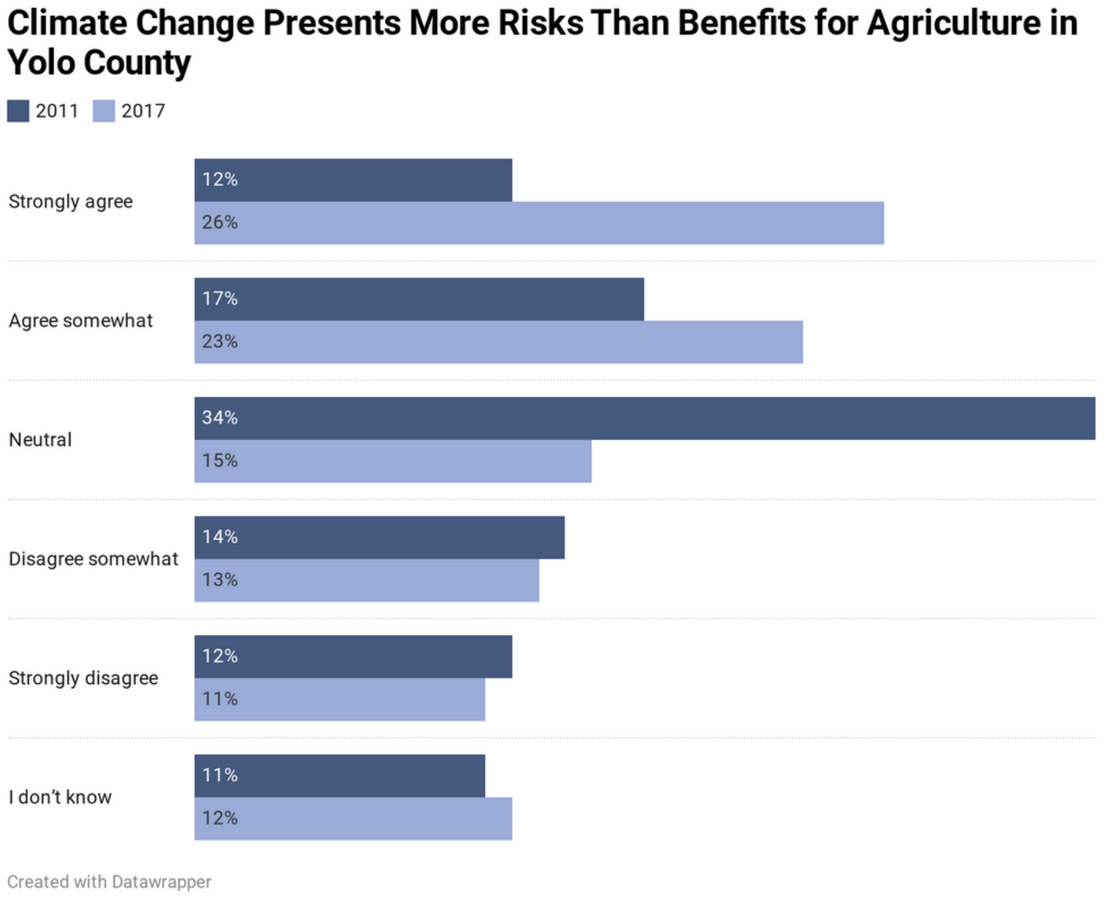
Figure 1. Theoretical framework for agricultural knowledge systems.

Agricultural knowledge networks are increasingly complex. Lubell et al. 2014

Environmental Factors

Farmer perceptions of risk were most important for adaptation practice adoption (Mase et al. 2017)

- These perceived risks appear to be increasing in some places like California (Niles et al. 2019)



Change in risk perceptions for Yolo County farmers between 2011 and 2017. Niles et al. 2019.

Statistically significant differences, p=0.005

“

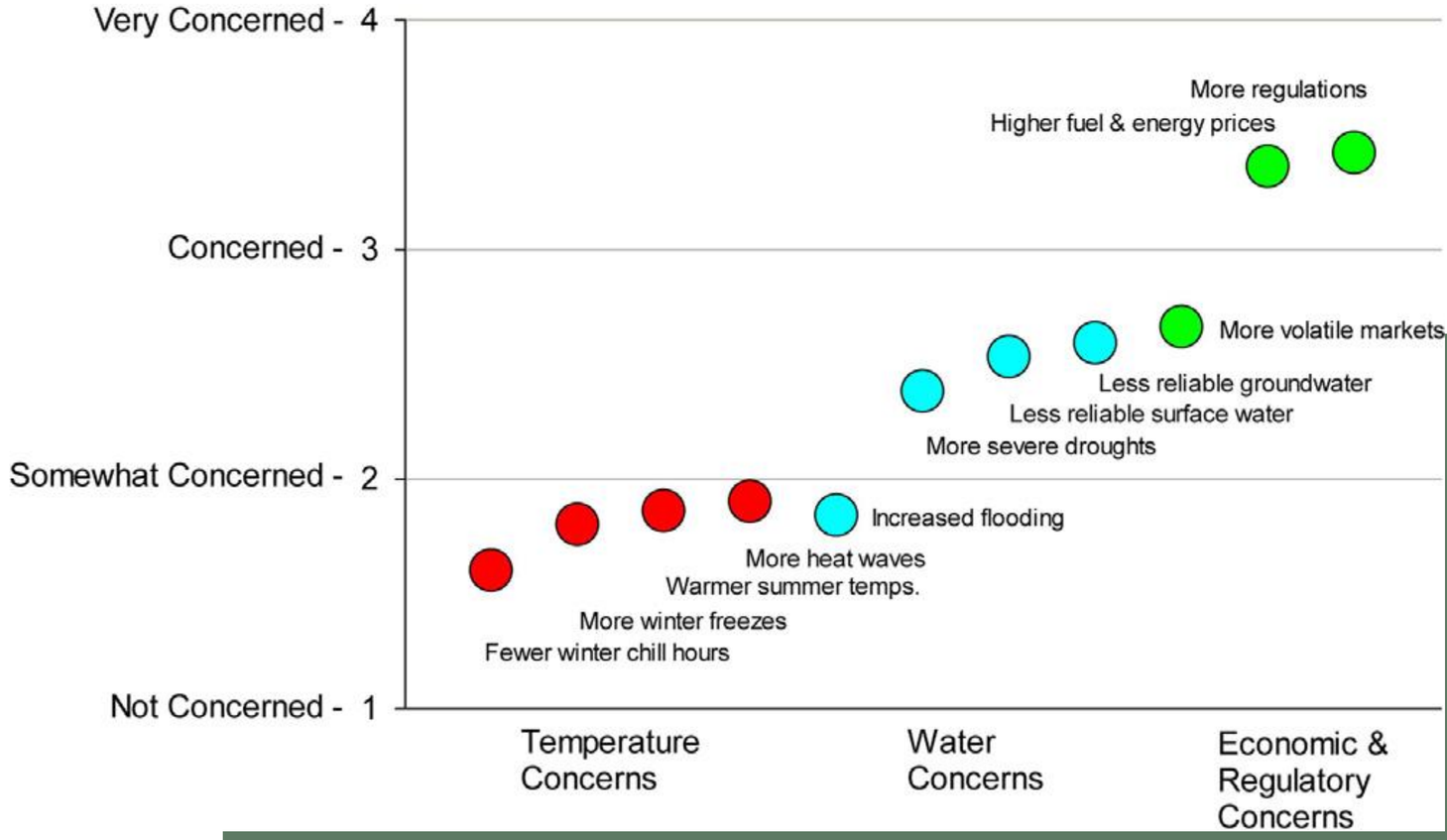
WE CAN ADAPT TO CLIMATE CHANGE. I'M NOT SURE WE CAN ADAPT TO THE LEGISLATURE.

YOLO COUNTY FARMER- 2012

Political and Economic

Concern for Regulation and Economics

- Farmers were more concerned about climate policy than climate impacts (Niles et al. 2013)
- 48% indicated any interest in a government program for climate mitigation/adaptation

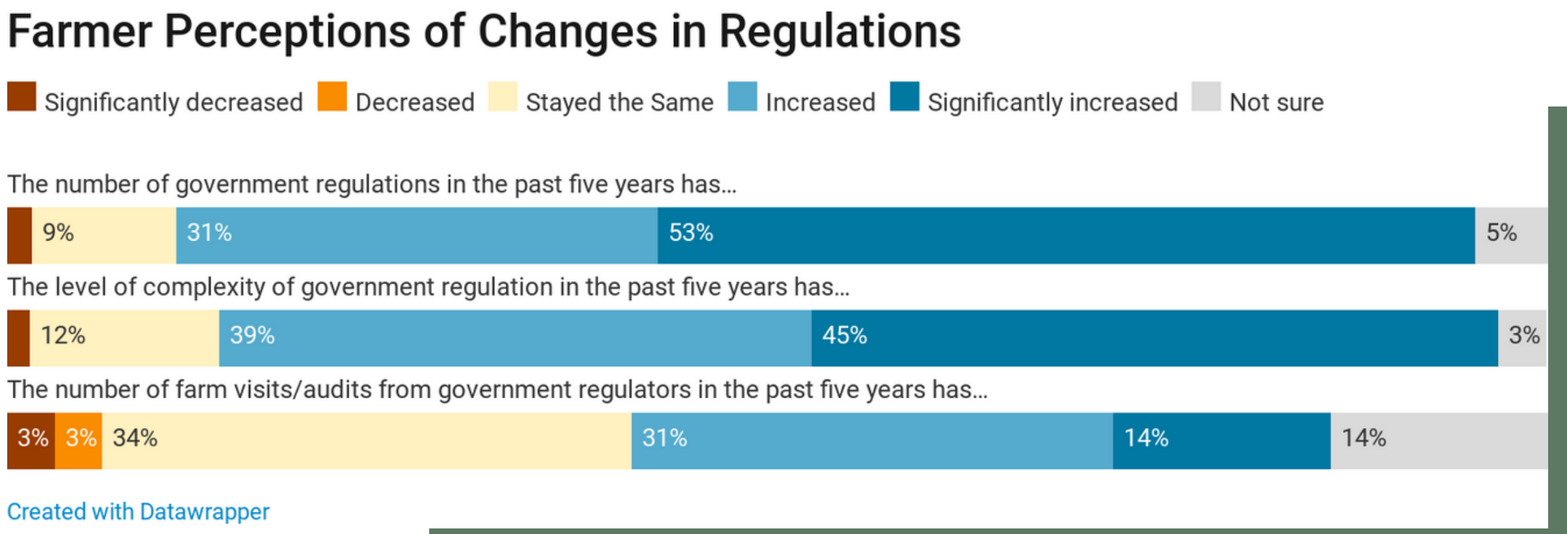


Farmer concern for varying climate related impacts among Yolo County farmers, 2012. Niles et al. 2013

Political and Economic

Simplicity?

- Over 80% of farmers in California and Vermont think government regulations and paperwork have increased in the last 5 years (Niles and Hammond-Wagner 2020, Niles et al. 2018)

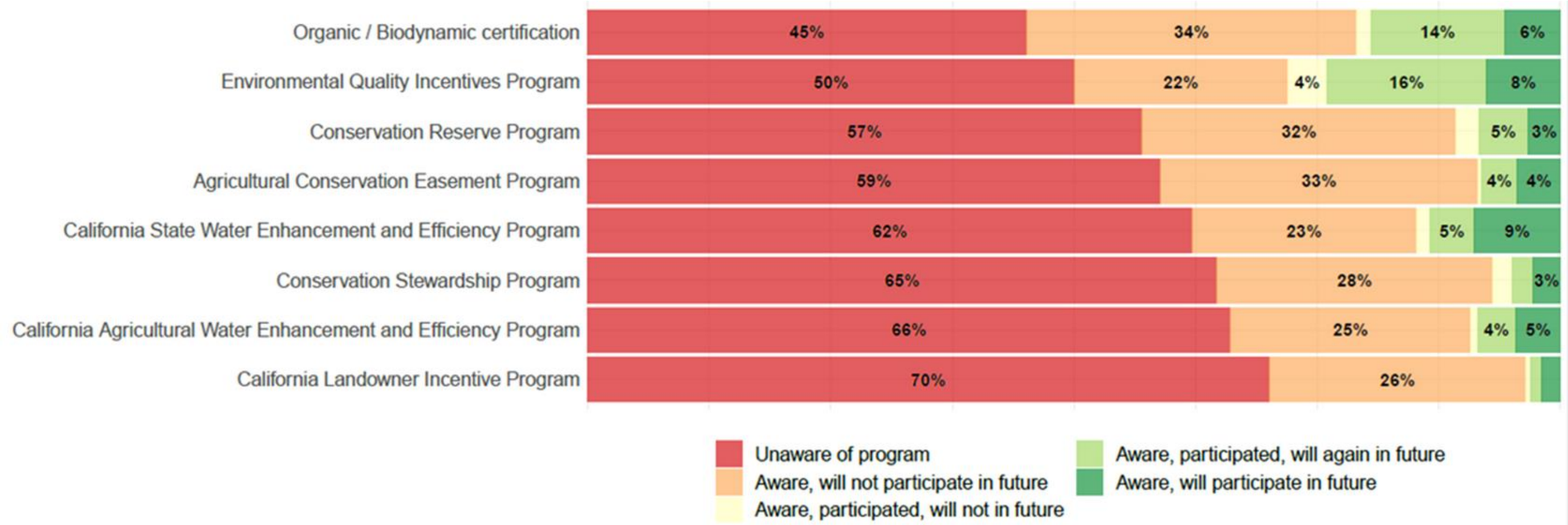


Vermont farmer perceptions of government regulations. Niles 2018.

Political and Economic

Do farmers know what exists?

- And even if they do, why don't they want to participate?



California farmer familiarity and interest in participating in a range of government conservation programs (Niles and Hammond-Wagner 2020)

Do We Need the Government?

Many new programs,
mostly not the government

- Indigo Ag
- Industry efforts
- Carbon markets

CIVIL EATS

FOOD + POLICY FARMING HEALTH ENVIRONMENT DONATE

Will Indigo Ag's New Private Carbon Market Pay Off for Farmers?

The company has raised millions to help farmers sequester a trillion tons of carbon in the soil.
A California carbon farming advocate weighs in.

New initiatives will pay farmers to keep carbon in the ground

07/22/20 6:30 AM By Steve Davies

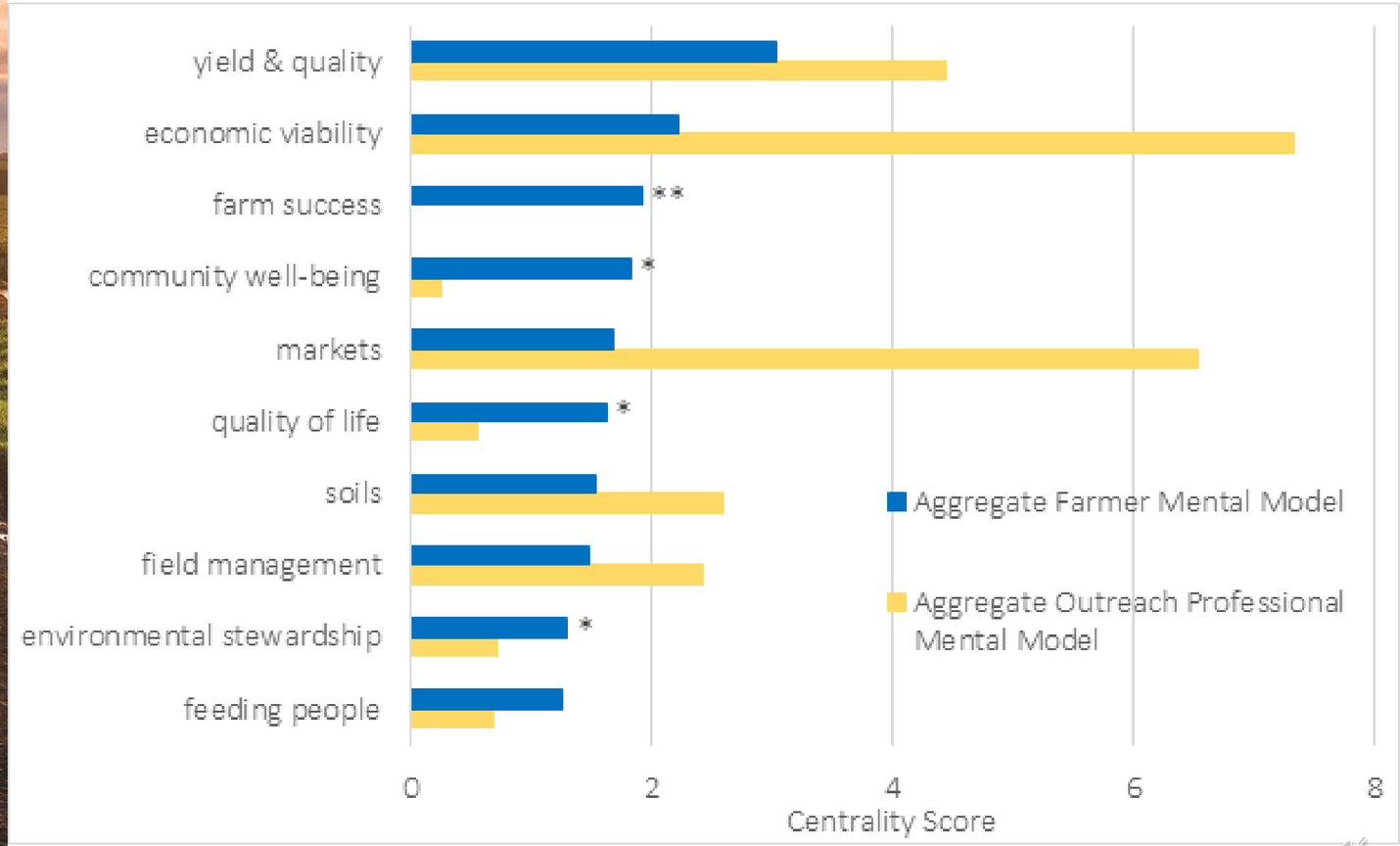
KEYWORDS BAYER CARBON INITIATIVE CLIMATE CHANGE COVER CROPS GREENHOUSE GASES JOE BIDEN LISA SAFARIAN NO-TILL

Other Factors

Mitigating and adapting is about more than climate change

PERCEPTIONS DIFFER

Mental models of Maine and Vermont farmers show different priorities. Farmers more likely to value farm success, community well being and quality of life.

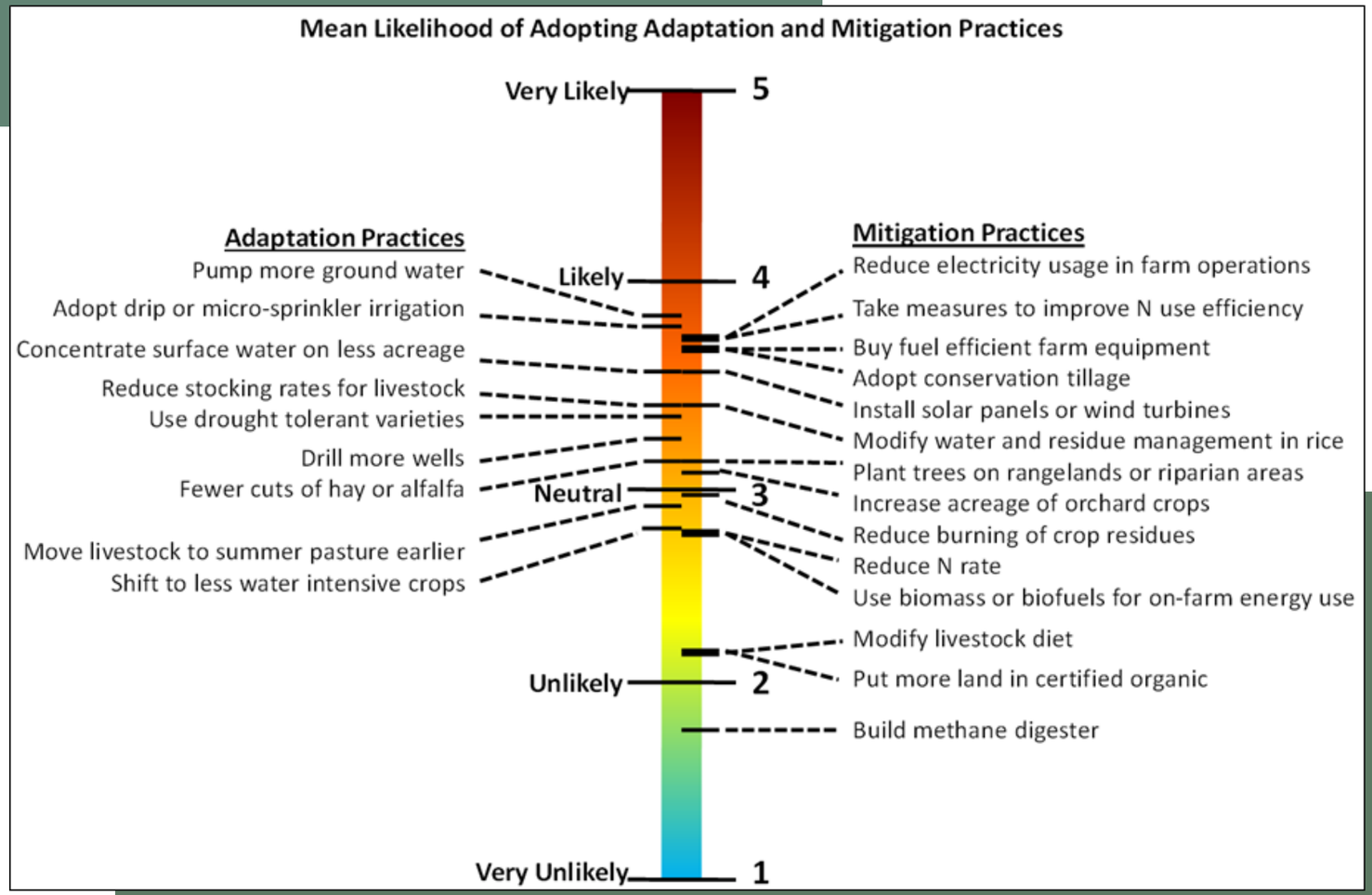


Clements et al. In Review

What Practices?

Not all will have co (or public) benefits

- Conservation practices, crop insurance, and technologies most likely adaptation (Mase et al. 2017)
- Adaptation greater interest than mitigation
- "Payment for ecosystem services?" Friendly language?



Likely adoption of adaptation and mitigation practices among Yolo County farmers (Haden, Niles et al. 2012)

Concluding Thoughts

WHAT WE KNOW

A lot about farmer perceptions of climate change, potential factors affecting adoption

WHAT WE KNOW LESS

Mix of co-benefits across practices and how this affects potential adoption

POLICY DESIGN

Many (most?) farmers don't want to participate in government programs

OPPORTUNITIES

Non-government partners? Trusted advisors? Regulatory versus incentive structures?

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Questions?