

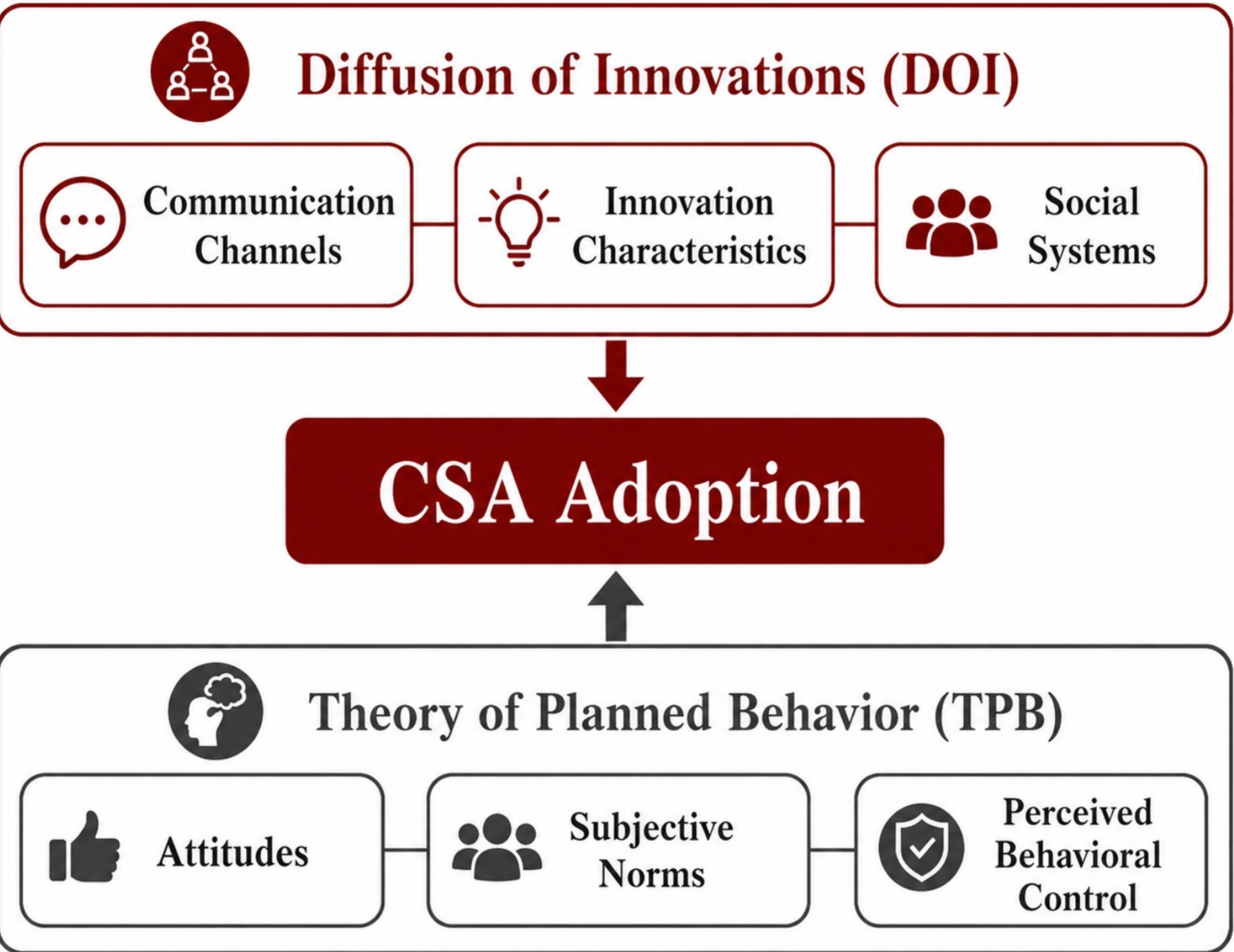
Introduction

- U.S. agriculture, livestock, and seafood sectors play an important role in the national economy and food security.
- Climate change increasingly threatens agricultural production through extreme weather, declining soil health, and water scarcity.
- Climate-smart agriculture (CSA) can enhance agricultural productivity, climate resilience, and greenhouse gas mitigation.
- Despite these potential benefits, CSA adoption among U.S. producers remains limited.
- Limited research has examined how sociological barriers to CSA adoption have changed over time in the United States, particularly within agricultural education, Extension, and communication systems.

Objectives

- To identify and compare the major barriers influencing climate-smart agriculture adoption among U.S. producers across historical and contemporary periods
- To identify implications for Extension and agricultural communication strategies that support CSA adoption.

Conceptual Framework



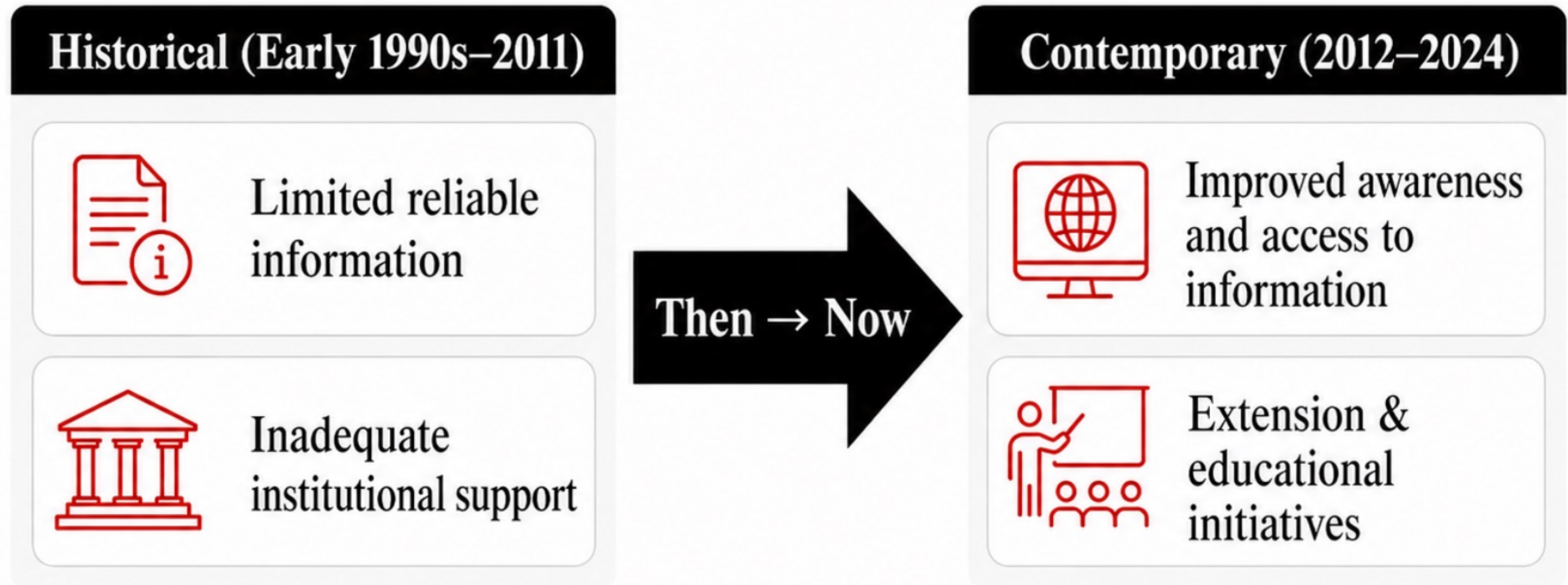
Methods

- Historical research + qualitative content analysis
- Reviewed primary and secondary CSA sources
- Searched Scopus and Web of Science
- Reviewed 19 documents
- Themes grouped into 4 barrier categories
- Compared Historical (1990s–2011) vs. Contemporary (2012–2024)

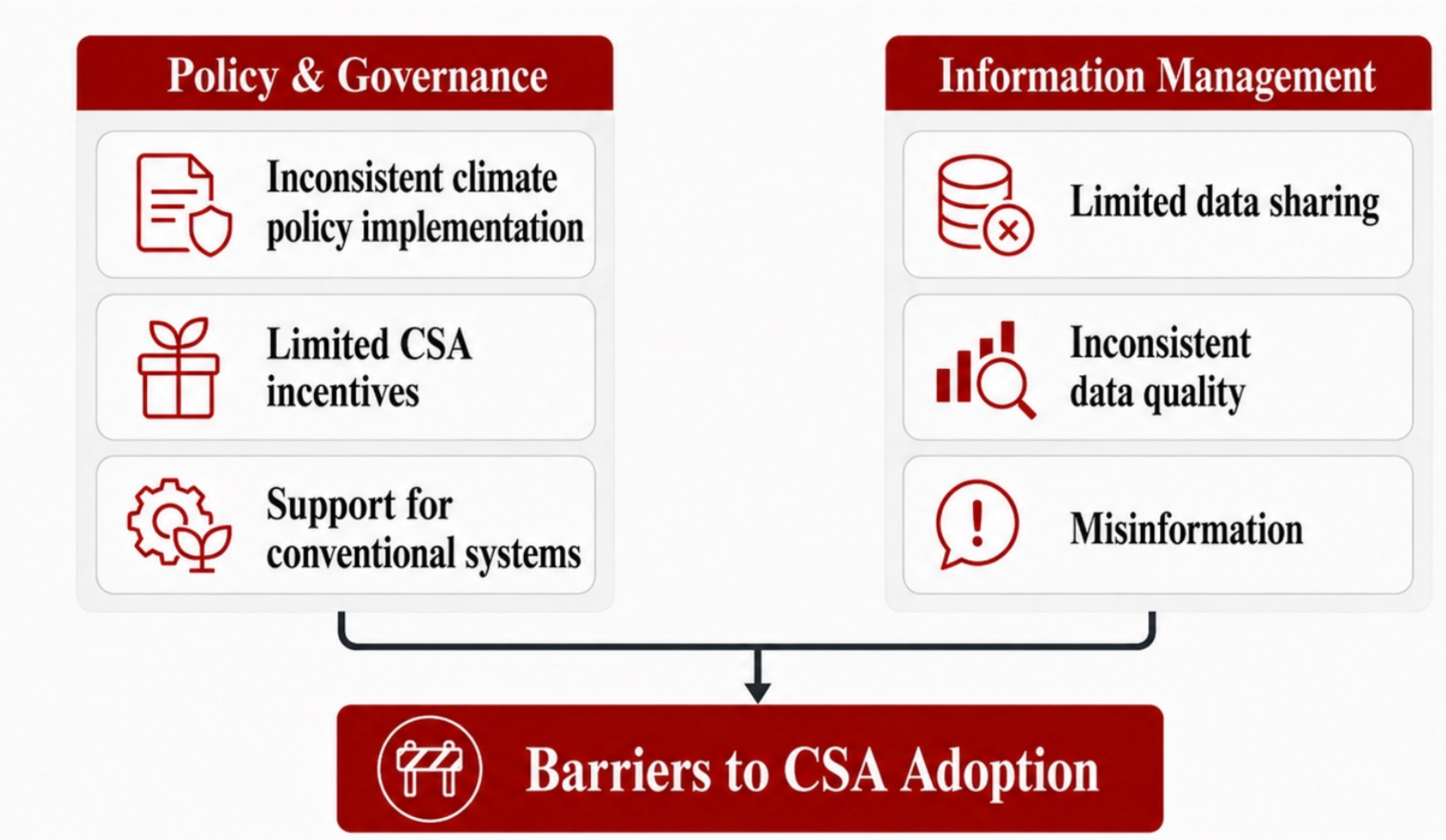
Results

- Four barriers to CSA adoption emerged.
- Grouped by theme but comparisons across historical and contemporary literature can also be found.

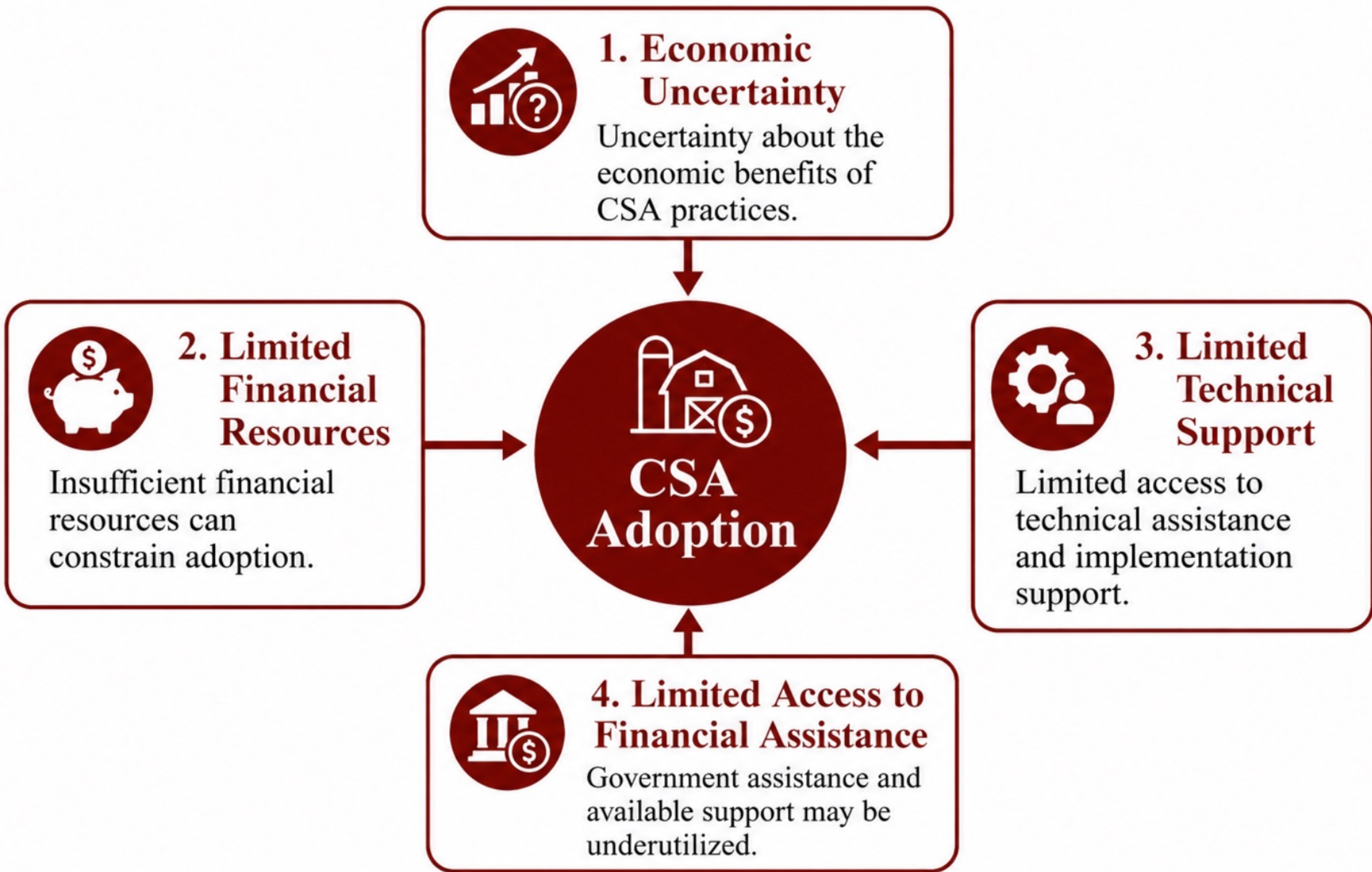
Institutional



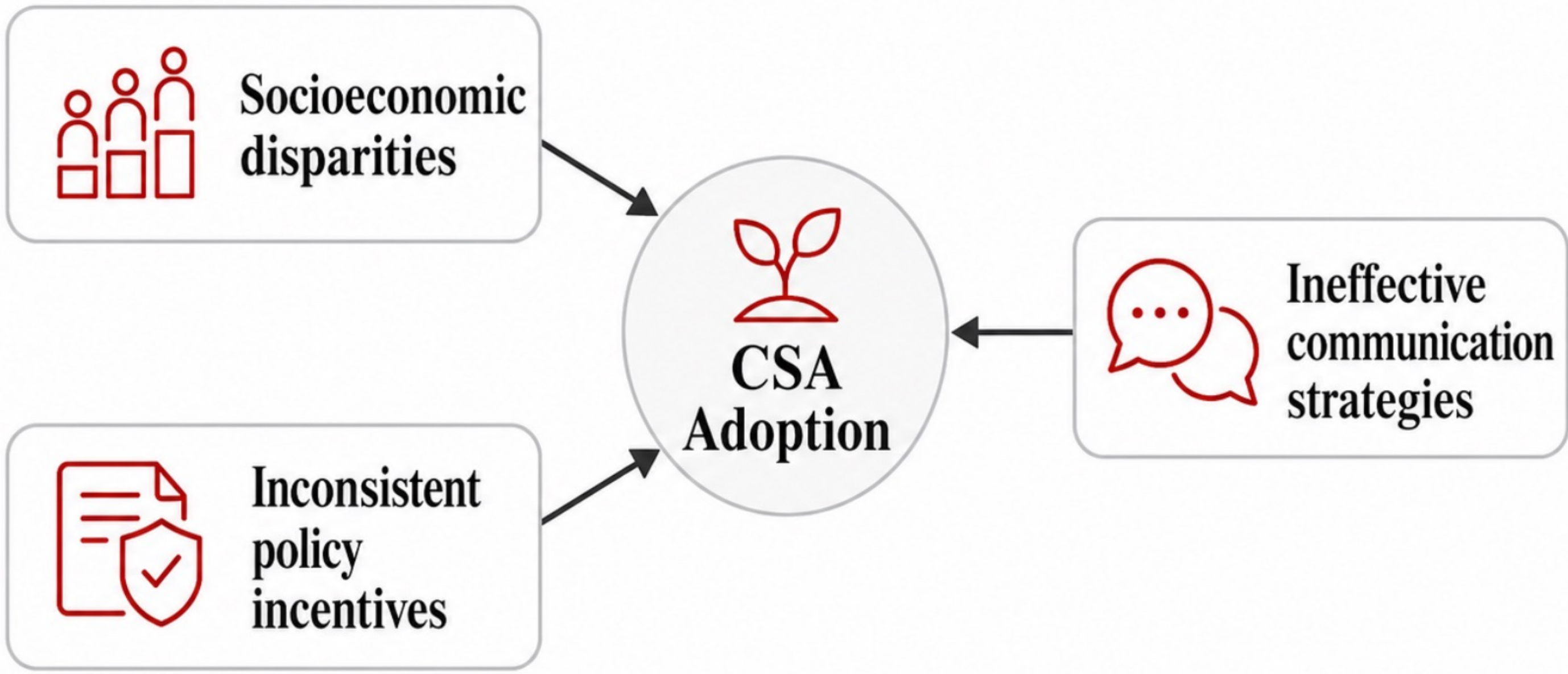
Policy, Governance and Information Management



Economic and Financial



Social and Communication



Conclusion

- CSA adoption faces multiple persistent barriers.
- Information access alone is insufficient to increase adoption.
- Communication, Extension, and local support are critical for diffusion.
- Education, technical support, and resources can strengthen adoption capacity.

Implementation & Recommendations

- Expand Extension outreach and local advisory support.
- Provide clear, credible, and locally relevant CSA information.
- Improve access to financial assistance and policy incentives.
- Strengthen education, technical assistance, and information quality.

