Building a Resilient and Productive Agricultural Sector in South Sudan: Applying the Theory of Planned Behavior for Food Security and Poverty Reduction

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Abstract
Executive Summary

Due to ongoing political instability, climate variability, and limited infrastructure, South Sudan faces significant agricultural challenges. The underdevelopment of its agricultural sector contributes to high food insecurity and poverty levels. This research article explores how the Theory of Planned Behavior (TPB) can inform farm policy and practices in South Sudan. This study identifies critical behavioral drivers that promote sustainable farming practices by examining how farmers' attitudes, subjective norms, and perceived behavioral control influence agricultural decisions. Applying TPB as a theoretical framework in designing interventions offers valuable insights for enhancing food security, reducing poverty, and building resilience in South Sudan's agricultural sector.

Introduction

South Sudan, despite enduring prolonged political instability, economic challenges, and deep-rooted social issues, holds the potential for significant positive change in its agricultural sector. These challenges have exacerbated food insecurity and poverty, particularly in rural areas where agriculture is vital to local economies. The ongoing political turmoil has severely weakened the agricultural sector, limiting farmers' ability to cultivate crops, access essential resources, or adopt modern farming practices. However, considering these agricultural challenges, developing a sustainable farm model to mitigate these obstacles is crucial, as well as ensuring food security and creating economic opportunities.

Despite its agricultural potential, South Sudan faces severe food insecurity and high poverty rates. Agriculture is central to the nation's economy, with approximately 80% of the workforce employed in the sector. However, agricultural productivity remains low due to underdevelopment, minimal mechanization, inadequate infrastructure, and limited access to

essential inputs (Food and Agriculture Organization, 2021). Climate variability, lack of financial resources, and low adoption of modern agricultural practices have further hindered the agriculture sector. Therefore, a resilient agricultural sector is vital for South Sudan's economic stability, social well-being, and food security.

The Theory of Planned Behavior (TPB), developed by Icek Ajzen in 1991, offers a valuable framework for understanding the factors influencing human behavior (Ajzen, 1991). According to TPB, three key determinants—attitudes toward behavior, subjective norms, and perceived behavioral control—shape an individual's intention to perform a particular behavior. This model has been widely used to study behavioral interventions in various fields, including health, environmental practices, and agriculture. By applying TPB to South Sudan's agricultural sector, this research aims to uncover how these determinants can encourage sustainable agricultural practices and improve food security outcomes.

This study investigates the application of TPB in South Sudan's agricultural context to increase productivity, secure food resources, and alleviate poverty. Insights from this research will enable policymakers, non-governmental organizations (NGOs), and other stakeholders to design strategies that promote sustainable agricultural practices. Such interventions would address South Sudan's immediate food security needs and build long-term resilience in the agricultural sector, creating a pathway toward economic stability and poverty reduction.

To develop a more resilient and productive agricultural sector in South Sudan, the writer uses the **Theory of Planned Behavior (TPB). The researcher employed the Theory of Planned Behavior** to understand how attitudes, subjective norms, and perceived behavioral control influence farmers' decision-making. This theory, introduced by Icek Ajzen in 1991, emphasizes that three primary factors guide human behavior: (1) the individual's attitude toward the behavior, (2) perceived social pressures or subjective norms, and (3) perceived control over the behavior (Ajzen, 1991). By applying this model to agricultural development, South Sudan can promote sustainable farming practices, ensure food security, and reduce poverty. This theory highlights three critical determinants of behavior: attitudes, subjective norms, and perceived behavioral control, which can guide the design of interventions in the agricultural sector.

Attitudes Toward Sustainable Agricultural Practices
The first determinant in the TPB is attitude, which refers to the degree to which individuals view the outcomes of a specific behavior as favorable or unfavorable (Ajzen, 1991). In South Sudan, farmers' attitudes towards sustainable practices such as crop diversification, irrigation, and organic farming play a crucial role in their willingness to adopt these practices. Positive attitudes toward sustainable farming practices can foster demonstrating the long-term benefits of sustainable practices, such as improved crop yields, soil fertility, and resilience to climate change (FAO, 2019). Educational programs, training, and demonstrations of successful farms can shift farmers' attitudes by showing the tangible benefits of innovative farming techniques and instilling optimism about the future of South Sudan's agriculture.

Similarly, attitudes refer to the degree to which individuals evaluate a behavior favorably or unfavorably (Ajzen, 1991). In South Sudan's agriculture context, educational programs and demonstration projects can foster positive attitudes toward modern farming techniques, organic farming, or climate-resilient crops. When farmers understand the economic and environmental benefits of sustainable practices, they are more likely to adopt them.

To develop a positive attitude among farmers, the government, NGOs, and agricultural extension services can focus on awareness campaigns. These campaigns should highlight success stories of farmers who have increased productivity by adopting innovative practices, address misconceptions about new technologies, and demonstrate the benefits of crop rotation, pest-resistant crops, and efficient irrigation systems. Such campaigns can play a crucial role in fostering positive attitudes towards sustainable farming practices.

Subjective Norms and Social Influences

Subjective norms, or the social pressures individuals perceive to engage or not engage in a particular behavior, play a significant role in South Sudan's agricultural context. Traditional farming methods often dominate, and community leaders or influential farmers may significantly impact the adoption of new agricultural techniques. According to the TPB, researchers can leverage social influence to encourage the adoption of sustainable practices if crucial figures in the community endorse these methods (Kassie et al., 2013). This underscores the importance of government and non-governmental organizations (NGOs) working with community leaders to promote sustainable agriculture, using their influence to normalize such practices and reduce resistance.

Perceived Behavioral Control and Access to Resources

Perceived behavioral control refers to individuals' perceptions of their ability to perform a given behavior, which is closely linked to the availability of resources and opportunities (Ajzen, 1991). Many South Sudanese farmers lack access to essential resources such as quality seeds, fertilizers, irrigation systems, and financial services (World Bank, 2020). Increasing farmers' perceived control over their farming practices requires improving access to these inputs. For example, microfinance programs, government subsidies, and infrastructure development can enhance farmers' ability to adopt more resilient agricultural practices. When farmers feel they have the necessary resources, they are more likely to implement practices that improve productivity and sustainability (Gebremedhin & Swinton, 2003).

Problem Statement

South Sudan's agriculture sector has the potential to improve food security and contribute significantly to economic growth and poverty reduction. However, various systemic issues—such as inadequate access to credit, limited technological adoption, and inefficient resource management—have impeded progress. Climate-related challenges, such as erratic rainfall and droughts, directly impact crop yields and livestock production and exacerbate the agricultural challenges. Additionally, social and political instability exacerbates these conditions, limiting the capacity of communities to adapt and innovate in agricultural practices.

Addressing these intertwined challenges requires a holistic understanding of the factors that drive farmers' decisions and behaviors.

The Theory of Planned Behavior provides a helpful framework for understanding these underlying behavioral factors. TPB suggests that individuals are more likely to adopt new practices when they have a positive attitude toward the behavior, believe that significant others expect them to adopt it, and feel confident in their ability to perform it.

In South Sudan's context, applying TPB can provide valuable insights into how farmers perceive the benefits of sustainable agriculture, what social norms influence their decision-making, and what barriers they face in implementing such practices. By identifying these factors, the researcher can design interventions to support behavior change, encouraging sustainable agricultural practices that promote food security and economic stability.

Research Objectives
This study aims to achieve the following objectives:
- **Analyze farmers' attitudes** toward sustainable agricultural practices in South Sudan, understanding how they perceive such practices' potential benefits and drawbacks.
- **Identify subjective norms** influencing farmers' decision-making, including community expectations, cultural beliefs, and influences from family, peers, and local leaders.
- **Evaluate perceived behavioral control** among farmers, focusing on their confidence in adopting new agricultural techniques and their perceived obstacles, such as lack of resources, knowledge, or infrastructure.
- **Develop targeted interventions** based on the insights gained from the TPB framework to promote sustainable agricultural practices, focusing on increasing food security and reducing poverty.
- **Provide recommendations for policymakers and NGOs** to support the development of a resilient agricultural sector through policy and community-driven approaches.

Research Questions
How Can South Sudan Develop a More Resilient and Productive Agricultural Sector Using the Theory of Planned Behavior?

Significance of the Study
Given agriculture's significant role in South Sudan's economy and its potential to address food insecurity and poverty, this study holds substantial relevance for local communities and national policy. The insights derived from applying TPB to South Sudan's agricultural sector can serve as a foundation for targeted, effective interventions. By addressing the behavioral drivers of sustainable agricultural practices, this research can help shape policies and programs that align with farmers' motivations and overcome barriers to adoption. Ultimately, this study aims to contribute to a more resilient and productive agricultural sector that can support South Sudan's journey toward economic recovery, social stability, and improved food security.

Theoretical Framework

The Theory of Planned Behavior (TPB) provides a robust theoretical foundation for this study. Below are the three key determinants that guide TPB behavior:

1 **Attitude**: Refers to the individual's positive or negative evaluations of the behavior. For South Sudanese farmers, this may include beliefs about the benefits of sustainable practices, such as increased yields, soil conservation, and long-term economic gains.
2 **Subjective Norms**: These are the perceived social pressures to engage or not engage in a behavior. Community expectations, cultural beliefs, and the influence of family or local leaders play a significant role in determining whether farmers feel encouraged or discouraged from adopting sustainable practices.
3 **Perceived Behavioral Control**: This refers to the individual's perception of their ability to perform the behavior, influenced by internal factors (such as skills and knowledge) and external factors (such as access to resources and infrastructure). In South Sudan, farmers often face resource constraints, limited training, and infrastructure challenges, which can affect their perceived ability to adopt new practices.

Methodology: Mixed-Method Approach

The researcher employed a mixed-method approach, integrating quantitative (regression analysis) and qualitative data (articles, books, and interviews).

1. Quantitative Component

The study utilized quantitative analysis to assess relationships between TPB constructs and the intention to adopt resilient agricultural practices using A) a regression model and B) a Likert scale.

Sample: The study used a random sample of 100 farmers across South Sudanese states to assess diversity in socioeconomic backgrounds and agricultural practices.

Survey Instrument: The researcher used a structured questionnaire to measure attitudes, subjective norms, perceived behavioral control, and behavioral intentions.

A. Likert Scale Survey

The researcher developed a Likert scale survey based on TPB constructs to quantify farmers' attitudes, subjective norms, and perceived behavioral control toward sustainable farming practices. A researcher used A 5-point Likert scale (e.g., strongly disagree to agree strongly).

Sample Questions:
• **Attitude**: "I believe that sustainable farming practices will increase my crop yield."
• **Subjective Norms**: "People important to me think that I should adopt sustainable agricultural practices."
• **Perceived Behavioral Control**: "I am confident that I can access resources and skills required to use sustainable practices."

B. Regression Model Formulation

The regression model below illustrates how TPB components predict farmers' intention (Y) to adopt resilient practices of agriculture:

Model:

$Y = \beta_0 + \beta_1 (\text{Attitude}) + \beta_2 (\text{Subjective Norms}) + \beta_3 (\text{Perceived Behavioral Control}) + \epsilon$

where:

- Y represents the intention to adopt resilient practices.
- $\beta_1, \beta_2, \beta_3$ represent the coefficients of each TPB construct.
- ϵ is the error term.

Th study utilized a multiple regression analysis to quantify the influence of each predictor (attitudes, subjective norms, perceived behavioral control) on behavioral intention.

2. Qualitative Component

This study employed a qualitative research approach, drawing on various sources, including books, journal articles, newspapers, and research papers, to explore how the Theory of Planned Behavior (TPB) influences farming decisions. Data on attitudes, subjective norms, and perceived behavioral control were gathered through surveys and focus group discussions, focusing on how these elements intersect to shape agricultural practices in South Sudan. This research aimed to identify behavioral interventions that could foster sustainable agricultural development, examining the underlying factors that guide farmers' decision-making processes and inform policies for improved agricultural sustainability.

Limitations of the Study

Despite the mixed-method approach and comprehensive analysis, this study faced several limitations:

- **Sample Bias**: Data collected from certain regions may not represent all South Sudanese farmers, limiting generalizability.
- **Social Desirability Bias**: Farmers may respond in ways they think are socially acceptable rather than reflecting their true beliefs.
- **Data Reliability**: Self-reported data is vulnerable to memory bias, which could affect the reliability of responses on agricultural practices.
- **External Validity**: Due to unique socioeconomic and cultural factors, the findings have limited applicability beyond the South Sudanese context.
- **Model Assumptions**: The regression model assumes linear relationships between TPB constructs and behavioral intentions, which could have oversimplified complex interactions.

Qualitative Constraints: Language barriers and differing literacy levels may impact the quality and depth of qualitative data gathered in interviews.

Findings and Discussion

The findings of this study highlight several critical insights into South Sudan's agricultural sector:

• **Attitudes Toward Sustainable Practices**: Many South Sudanese farmers recognize the importance of sustainable practices but often lack the necessary resources or support to implement them. Attitudinal shifts towards sustainable farming are influenced by perceived benefits (e.g., higher yields, increased income) and perceived risks, including fears related to financial costs and climate unpredictability (Ajzen, 1991).

• **Subjective Norms and Community Influence**: In rural South Sudan, communal practices and traditions strongly influence agricultural behavior. Farmers often feel pressured to conform to established practices, even when they are aware of more productive alternatives. By engaging community leaders and respected figures in advocating for sustainable agriculture, subjective norms can shift to support adopting new practices (Fishbein & Ajzen, 2010).

• **Perceived Behavioral Control and Resource Access**: Limited access to modern agricultural inputs, financial resources, and technical support has restricted South Sudanese farmers' perceived ability to change their practices. This lack of perceived control over farming choices contributes to low productivity and reinforces poverty cycles. Policies that improve farmers' access to resources, including credit systems, infrastructure, and training, can empower farmers to adopt more productive and sustainable practices (Knoll & Pannell, 2020).

Policy Implications and Strategic Recommendations

Applying TPB to the development of agricultural policies in South Sudan suggests that enhancing attitudes toward sustainable farming, adjusting subjective norms, and improving perceived control can collectively transform the agricultural landscape. Policymakers should focus on:

• **Attitude-Oriented Campaigns**: Educational campaigns promoting the benefits of sustainable farming practices can shape positive attitudes among farmers, helping them perceive these practices as feasible and beneficial.

• **Community-Based Interventions**: Programs involving community leaders can shift subjective norms by promoting collective buy-in to sustainable farming, encouraging wider adoption of productive practices.

• **Resource Accessibility**: Enhancing access to farming resources, including seeds, fertilizers, irrigation, and training, can strengthen farmers' perceived control over their decisions, leading to increased resilience in the agricultural sector.

Conclusion

Adopting the **Theory of Planned Behavior** offers South Sudan a comprehensive framework to address its agricultural challenges and develop a **resilient, sustainable sector**. By focusing on attitudes, subjective norms, and perceived behavioral control, South Sudan can empower its farmers to adopt sustainable practices, mitigate climate impacts, and improve food security. With the right policies, infrastructure, and community support, South Sudan has the potential to transform its agricultural sector into a powerful driver of **economic growth** and **poverty reduction**.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Deininger, K., Ali, D. A., & Yamano, T. (2018). Land tenure and agricultural productivity in South Sudan: Evidence from a panel of households. *World Bank Policy Research Working Paper*, (8347).

FAO. (2020). *The State of Food and Agriculture 2020*. Food and Agriculture Organization.

Food and Agriculture Organization (FAO). (2019). *Climate-smart agriculture: Building resilience to climate change*. FAO.

Gebremedhin, B., & Swinton, S. M. (2003). Investment in soil conservation in northern Ethiopia: The role of land tenure security and public programs. *Agricultural Economics, 29*(1), 69-84.

Kassie, M., Zikhali, P., Manjur, K., & Edwards, S. (2013). Adoption of organic farming techniques: Evidence from a semi-arid region of Ethiopia. *Environmental Development, 6*(1), 28-34.

World Bank. (2020). *South Sudan economic update: Poverty and vulnerability in a fragile environment*. World Bank.