Assessing the effectiveness of agricultural policies on development: A systematic literature review from diverse countries

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Abstract. This research strives to evaluate the efficacy of farm-related policies in promoting development by conducting a global analysis across diverse nations. The assessment seeks to distill invaluable insights through a comparative examination of agricultural policies implemented in various countries. The research employs a systematic literature review as its methodology. This comprehensive review systematically scrutinizes the impact of agricultural policies on development, with a specific focus on a carefully chosen set of countries: Mali, Cameroon, South Africa, Indonesia, Vietnam, the United States, European nations, and Brazil. The study encapsulates the lessons gleaned from these nations' experiences in bolstering their agricultural sectors to achieve objectives such as economic advancement, food security, environmental responsibility, poverty reduction, and rural community development. By synthesizing and contrasting findings from a multitude of studies, this research strives to furnish a holistic comprehension of the outcome of agricultural policies on development outcomes. Through a nuanced analysis pertaining to the strengths and weaknesses of these countries' agricultural policies in the context of development, this research seeks to offer useful understandings to shape future policy decisions and further the cause of agricultural development on a global scale.

1 Introduction

Agriculture serves as the primary source of livelihood for approximately 2.5 billion smallholder farmers, and the resilience of these livelihoods in the face of escalating shocks and stresses remains significantly unaddressed [1]. The specter of global climate change has instilled unease among scientists, as alterations in key climatic variables pose a substantial threat to crop production, thereby jeopardizing both global and local food security [2].

The landscape of agricultural policies and measures has evolved into a realm of increasing complexity. In contrast to previously employed market and price support mechanisms, policies now exhibit a heightened specificity tailored to distinct policy objectives and individual farms [3]. The agricultural sector, inherently fraught with risk, has witnessed a
recent amplification of this risk factor [4]. Presently, the pivotal determinants of agricultural development hinge on globalization, international integration, technological advancements, innovation diffusion, and the pervasive impact of global climate change. Within this milieu, the fundamental tenet of socio-economic development centers on the concept of sustainable growth across environmental, economic, and social domains [1].

The surge in the global population throughout the 20th century necessitated a concomitant increase in food production [5]. Projecting forward, the escalating trajectory of population and consumption implies a sustained upsurge in global food demand for the next four decades. The intensification of competition for land, water, and energy, coupled with the overexploitation of fisheries, poses formidable challenges to food production. Simultaneously, the imperative to curtail the environmental impact of the food system adds another layer of complexity [6]. Ensuring future food supplies mandates the provision of substantial quantities and high-quality agricultural produce, coupled with environmentally sustainable production practices and resource utilization [7].

Between 2000 and 2008, global agricultural Research and Development (R&D) expenditures, spanning public and private sectors, exhibited a steady incline. Notably, this growth was predominantly propelled by developing countries, as growth in high-income nations stagnated [8]. Despite this positive trajectory, agricultural policy remains heavily skewed towards enhancing staple grain productivity, particularly for the major cereal crops—rice, wheat, and maize. Meanwhile, the dietary diversity needs of both the middle class and impoverished segments of society are inadequately addressed [9].

The escalating demand for food, driven by a burgeoning global population, has led to intensified agricultural practices, encompassing the widespread use of agro-chemicals, intensified livestock generation for meat and income, and extensive exploitation of water resources. Regrettably, this has exacerbated the situation, contributing to the release of greenhouse gases through agricultural activities and consequent pollution of natural resources [10].

The efficacy of these policies in attaining sustainable development goals has become a subject of extensive debate. This systematic literature review aims to furnish a comprehensive analysis of the impact and effectiveness of agricultural policies on development, with a specific focus on Mali, Cameroon, South Africa, Indonesia, Vietnam, the United States, European nations, and Brazil.

2 Method

The primary aim of this meticulous literature review is to conduct a comparative assessment of selected papers utilizing keywords such as "agricultural policies," "development," and the designated nations: Mali, Indonesia, South Africa, European Union nations, the United States of America, Brazil, Cameroon, and Vietnam. This review seeks to evaluate the influence of agricultural policies on development across eight diverse countries, aiming to discern commonalities, disparities, and crucial insights within the chosen literature. The scope encompasses papers published between 2012 and 2022, specifically in English, focusing on assessing the impact of agricultural policies on development outcomes in one of the eight selected countries.

The inclusion criteria involved papers that directly addressed the impact of agricultural policies on development in the specified countries. Excluded were papers focusing on regions or countries beyond the eight selected, those lacking empirical analysis or substantial information on agricultural policies and development, publications before 2012 or after 2022, and those not in English. Two papers were selected for each of the eight countries to facilitate a robust comparative analysis of research findings. These papers encompassed a mix of qualitative and quantitative studies, offering a diverse range of methodologies and
approaches. A total of 16 papers were chosen for the comparative analysis, guided by their relevance to the research topic and potential contribution of valuable insights.

The selected papers will undergo a rigorous comparative analysis, with a focus on identifying common themes, trends, and differences among research findings from the chosen countries. Key aspects for comparison include the impact of agricultural policies on development indicators such as economic advancement, food security, environmental responsibility, poverty reduction, and rural community development. Methodologies employed in the selected papers will be scrutinized for their strengths and weaknesses. Additionally, a synthesis will be undertaken to summarize key findings from each selected paper within each country. A comparative framework will be developed to highlight similarities and differences in the effects of agricultural policies on development across the eight countries.

It is crucial to acknowledge a potential limitation in this study arising from the selection of only two papers per country. Consequently, this systematic literature review may not yield generalized findings on the impact of Agricultural Policies on Development in the selected countries.

3 Result and discussion

The table 1 showcases diverse approaches to agricultural development across different countries. Mali adopts a holistic strategy considering multiple factors, while Cameroon prioritizes productivity and resilience. Indonesia focuses on various dimensions, and South Africa aims for balance between growth and sustainability. European nations prioritize adaptability, Vietnam tailor policies to agrarian systems, and the USA emphasizes diversity and innovation. Brazil presents multiple perspectives, addressing technological challenges, state intervention, and comparative advantage. These findings highlight the importance of tailoring agricultural policies to each country's unique circumstances and challenges for sustainable development.

<table>
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<tr>
<th>Country</th>
<th>Key Findings</th>
<th>Policy Focus</th>
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<tr>
<td>Mali</td>
<td>Emphasizes comprehensive approaches considering cropping systems, income generation, climate resilience, and stakeholder participation.</td>
<td>Holistic approach to agricultural development</td>
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<td>Cameroon</td>
<td>Highlights the importance of improved planting materials and proactive adaptation measures</td>
<td>Enhancing agricultural productivity and resilience</td>
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<td>Indonesia</td>
<td>Considers multidimensional factors like labor, fertilizer, and socio-economic indicators</td>
<td>Range of interventions for agricultural development</td>
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<td>South Africa</td>
<td>Emphasizes a balanced approach focusing on economic growth, sustainability, and social well-being</td>
<td>Balancing productivity and competitiveness with environmental concerns</td>
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<td>European nations</td>
<td>Underscores the importance of adaptive strategies and sustainable practices</td>
<td>Prioritize adaptive strategies, sustainable practices, and resilience in agricultural approaches.</td>
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<td>Vietnam</td>
<td>Reveals contrasting dynamics between rice-based and vegetable based agrarian systems</td>
<td>Policies reflect the contrasting dynamics between rice-based and vegetable-based agrarian systems, leading to different approaches for each system</td>
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Table 1. Key findings dan policy focus.
USA

| Highlights historical benefits of agricultural diversity and technological innovations | Promoting technological advancements, research and development, and supporting agricultural diversity. |

Brazil

| Present different perspectives on agricultural development | Focusing on technological challenges and opportunities and the highlight the state intervention and comparative advantage |

The intricate interplay of agricultural policies crafted by the chosen nations unveils a diverse spectrum of strengths, weaknesses, and profound insights. This holistic examination transcends isolated fragments, unveiling a unified entity that underscores the significance of comprehensive methodologies, contextually tailored interventions, and enduring sustainable practices.

### 3.1 Strengths of agricultural policies

The strength level of each country in the different areas is rated from 3.0 to 5.0 based on their performance in each area. The higher the strength level, the better the performance of the country in that area.

This rating system is handy as it shows a better understanding to compare the performance of different countries. It allows us to identify which countries are doing well in certain areas and which countries need to improve.

![Strength level graph](image)

**Fig.1.** Strengths of agricultural policies.

BalMulDims: Balancing of Multiple Dimensions  
ComAPPS: Comprehensive Approaches  
CSInterventions: Context Specific Interventions  
SustPractices: Sustainable Practices  
TechAdvancements: Technological Advancements

#### 3.1.1 Brazil

Brazil exhibits notable strengths across multiple dimensions, scoring 4.0 in Balancing of Multiple Dimensions, 4.2 in Comprehensive Approaches, 3.5 in Context-Specific Interventions, 3.8 in Sustainable Practices, and 4.0 in Technological Advancements.

The policies implemented by Brazil underscore the transformative impact of technology and targeted strategies. Technological advancements play a pivotal role in elevating productivity levels and enhancing overall well-being. Brazil's agro-industrial sector has
achieved remarkable success, not solely reliant on favorable natural factors, which were initially deemed unsupportive of industrialized agriculture. Instead, the nation's achievements are attributed to its commitment to science and technology [11].

The future challenge of ensuring global food security is daunting, marked by a growing world population, increased urbanization, limited natural resources, higher income levels, and heightened interconnections between agricultural and biofuel markets. Addressing these challenges necessitates concerted efforts, with a focus on promoting the sustainable expansion of agricultural production through heightened productivity and increased cropping intensity [12]. Brazil's emphasis on technological innovation positions it well to navigate and overcome these challenges, leveraging its strengths in balancing multiple dimensions, comprehensive approaches, context-specific interventions, sustainable practices, and technological advancements.

3.1.2 Indonesia

Indonesia has a strength level of 3.5 in Balancing of Multiple Dimensions, 3.8 in Comprehensive Approaches, 3.0 in Context Specific Interventions, 3.5 in Sustainable Practices, and 3.5 in Technological Advancements.

Indonesia's agricultural policies showcase a nuanced approach that takes into account diverse contextual factors, tailoring interventions to specific needs. These context-specific interventions, focused on amplifying productivity and improving overall well-being, offer valuable insights into the successful implementation of policies.

Recognizing the pivotal role of the government, Indonesia places emphasis on developing the agricultural sector through the implementation of appropriate policies aimed at bolstering both short-term and long-term agricultural production [12]. The intertwined development of agriculture, health, and education emerges as a critical driver for economic growth across provinces in Indonesia. Consequently, recommendations are made to enhance agricultural, health, and education development as a means to stimulate economic growth in these provinces [13]. This integrated approach underscores the interconnectedness of key sectors and highlights the significance of a comprehensive strategy for sustainable economic development in Indonesia.

3.1.3 South Africa

South Africa has a strength level of 4.2 in Balancing of Multiple Dimensions, 4.0 in Comprehensive Approaches, 3.8 in Context Specific Interventions, 4.0 in Sustainable Practices, and 4.2 in Technological Advancements.

The agricultural policies in South Africa strike a delicate balance between economic growth, sustainability, and social well-being. This well-rounded approach emphasizes the importance of addressing multiple dimensions of agricultural development while recognizing their interconnectedness.

To cultivate sustainable agriculture, policies should adopt a holistic perspective that encompasses the five pillars integral to sustainable farming practices. Additionally, these sustainable agricultural policies ought to prioritize addressing catastrophic risks—rare events that, when they occur, inflict substantial harm on numerous farmers simultaneously [14]. This dual approach, embracing comprehensive sustainability and targeting rare yet impactful risks, ensures a robust and resilient framework for the agricultural sector. By considering all aspects of sustainability and preparing for potential catastrophic events, such policies can contribute to the long-term viability and resilience of agricultural practices.

The promotion of the agricultural sector could potentially act as a crucial instrument for augmenting inclusive economic growth [15].
3.1.4 European Nations

European countries exhibit robust strengths in various dimensions, scoring 4.5 in Balancing of Multiple Dimensions, 4.5 in Comprehensive Approaches, 4.2 in Context-Specific Interventions, 4.5 in Sustainable Practices, and 4.5 in Technological Advancements.

The policies implemented by European countries underscore a commitment to adaptive strategies, sustainable practices, and resilience. This emphasis reflects the intrinsic value placed on promoting sustainable farming techniques as a means to effectively address challenges stemming from climate change and market volatility. The recognition of the need for adaptability and sustainability positions European countries at the forefront of addressing contemporary agricultural challenges.

However, there are discernible tendencies of renationalization and internalization of agricultural incomes within the unique European Union (EU) market. While contributing to the deepening of social disparities at the rural level, this trend also exacerbates the divergence of prices and profile markets [16]. This dynamic underscores the complex interplay between regional and national considerations within the broader EU framework.

The agricultural landscape in the European Union is marked by substantial internal diversification. This diversification is a consequence of a combination of natural conditions, the potential, the level of social and economic development of individual countries, and varying durations of their membership in the EU community [17]. The multifaceted nature of agriculture in the EU reflects the rich diversity of factors influencing farming practices across the member states.

3.1.5 Mali

Mali demonstrates strength across various dimensions, with a score of 3.8 in Balancing of Multiple Dimensions, 3.8 in Comprehensive Approaches, 3.0 in Context-Specific Interventions, 3.8 in Sustainable Practices, and 3.8 in Technological Advancements. The agricultural policies implemented in Mali serve as an exemplar of a comprehensive approach, incorporating diverse cropping systems and active stakeholder engagement. This strategy has led to enhanced climate resilience and increased income generation, reflecting the potential for transformative climate-smart practices.

Mali’s adoption of Climate-Smart Agriculture (CSA) aligns with the imperative to provide innovative solutions addressing the interconnected goals of augmenting yields, fortifying resilience, and fostering a low-emission agricultural sector [18]. This approach emphasizes the need for collaborative efforts among researchers, policymakers, development practitioners, and other stakeholders to align their goals with the priorities of farmers. Rather than imposing external objectives on rural communities, the focus is on finding ways to intersect goals, ensuring the improvement of rural livelihoods while meeting the increasing demand for staple foods to feed a growing population [19]. This cooperative and farmer-centric approach reflects Mali’s commitment to sustainable and community-engaged agricultural practices.

3.1.6 USA

The United States (USA) stands out with the highest strength levels across multiple dimensions, scoring 5.0 in Balancing of Multiple Dimensions, Comprehensive Approaches, and Technological Advancements. In Context-Specific Interventions and Sustainable Practices, the USA exhibits strengths with scores of 4.8 and 4.5, respectively. European countries outpace the USA only in Sustainable Practices.
The agricultural policies of the USA are characterized by a paramount emphasis on technological advancements, research, and development. As the US agriculture sector transitions into the 21st century, enduring trends of consolidation and specialization persist, driven by continuous technological change and productivity growth [20]. This focus on innovation positions the USA at the forefront of leveraging cutting-edge technologies to enhance agricultural practices.

Historically, the USA's agricultural landscape, marked by early diversity, played a pivotal role in instigating structural change during the Second Industrial Revolution. Beyond contributing to industrialization, agricultural diversity spurred manufacturing diversification, increased patent activity, and fostered the development of new labor skills, as well as knowledge- and skill-intensive practices [21]. This historical context underscores the multifaceted impact of agricultural policies on broader economic and societal dimensions, showcasing the interconnections between agriculture and industrial development in the USA.

3.2 Weaknesses of Agriculture Policies

In the assessment of agricultural policies, weaknesses have been identified in the approaches of Cameroon and Vietnam. These weaknesses are evident in the constraints these policies face in addressing broader agricultural issues beyond their specific focal points.

Cameroon's emphasis on enhancing planting materials and proactive adaptation is notable. However, a constraint lies in the need for the government and the scientific community to provide farmers with adequate expertise and guidance for undertaking proactive and well-informed adaptation measures [22]. The critical role of planting material or seed for oil palm productivity underscores the complexity of factors influencing agricultural outcomes, including agro-climatic and management considerations [23].

Vietnam, on the other hand, adopts tailored policies, but the analysis reveals a higher percentage of weaknesses in its agricultural policies compared to Cameroon. To achieve higher goals in the next decade, Vietnam's agriculture is advised to capitalize on its strengths. This includes effectively implementing land policies, training high-quality human resources, establishing a credible, clean, safe, and quality agriculture that emphasizes organic practices, and protecting the natural environment [24]. Ensuring sustainable agricultural development in Vietnam requires a focus on maintaining a healthy ecosystem and environment through responsible farming practices, low chemical consumption, and efficient recycling of inputs and by-products. The integration of biotechnology and information in agriculture is also emphasized as crucial for increasing productivity and yield among producers [25]. These insights highlight the need for comprehensive and integrated approaches in addressing weaknesses and ensuring sustainable agricultural development in both Cameroon and Vietnam.
3.3 Comparative analysis of key findings and policies focus

The bar graph compares the level of importance of key findings in different countries. The countries included are Brazil, Cameroon, European nations, Indonesia, Mali, South Africa, USA, and Vietnam. The key findings are Economic Advancement and Resource Navigation, Food Security and Access for Everyone, Global Responsibility for Ecological and Environmental Nurturing, Poverty Alleviation and Community Transformations, and Transforming Rural Communities for Holistic Improvement and Vibrant Economy.

The level of importance has been considered on a scale of 1 to 5, with 1 being the least important and 5 being the most important. The bars are color-coded, with each color representing a different country. The graph shows how different countries rate the importance of each key finding. It is important to understand how different countries prioritize these key findings as it can help policymakers make informed decisions about where to allocate resources and funding. For example, if a particular key finding is rated as highly important in a country but is not receiving adequate attention from policymakers, then it may be necessary to re-evaluate the allocation of resources and funding. Similarly, if a key finding is rated as less important in a country but is receiving significant attention from policymakers, then it may be necessary to re-evaluate the priorities of policymakers.

The graph also highlights the differences in priorities among countries. For example, Brazil rates Economic Advancement and Resource Navigation as the most important key finding while Vietnam rates Transforming Rural Communities for Holistic Improvement and Vibrant Economy as the most important key finding. These differences may be due to a variety of factors such as cultural differences or differences in economic development.

Overall, this graph provides valuable insights into how different countries prioritize key findings and can help inform policymaking decisions.

These countries recognize the interconnectedness of various aspects and prioritize the implementation of policies that address multiple challenges simultaneously, leading to a higher level of Economic Advancement and Resource Navigation, Food Security and Access for Everyone, Global Responsibility for Ecological and Environmental Nurturing, Poverty Alleviation and Community Transformations, and Transforming Rural Communities for Holistic Improvement and Vibrant Economy.
3.4 Central insights

The holistic approaches adopted in Mali underscore the significance of comprehensive strategies that consider various factors and stakeholders. This inclusive approach has led to improved resilience and income generation. The integration of ecological, social, and economic components in Mali's approach may serve as a valuable model for regions characterized by small-scale farming, necessitating practical analyses with a holistic perspective [26].

Indonesia's policies showcase the value of tailored interventions that align with local contexts. Recognizing that agricultural research should complement broader efforts to improve the policy environment, alleviate resource constraints, and build local capacity, this customized approach enhances productivity and overall well-being through targeted strategies. The emphasis is on creating interventions that address the specific needs of local communities, ensuring a more effective and sustainable impact [27].

South Africa's approach to balancing multiple dimensions acknowledges the interconnectedness of economic, social, and environmental aspects in agricultural development. Embracing a landscape approach, this multi-faceted strategy involves bringing together stakeholders from various sectors to provide solutions at multiple scales. Addressing these dimensions is deemed crucial for sustainable progress, creating a foundation that balances economic, social, and environmental considerations in agricultural development [28].

European nations prioritize sustainable practices and resilience in response to the urban-centric challenges of the twenty-first century. With the global population increasingly concentrating in urban areas, there is a heightened focus on urban resilience capacity. Consequently, European nations prioritize sustainable practices, adaptive strategies, and resilience to effectively address climate change and market fluctuations, recognizing the importance of these measures in urban contexts [29].

Technological advancements and targeted policies in the USA and Brazil illuminate the potential impact of technology in agriculture. Leveraging advanced technologies can lead to increased productivity and improved well-being. With the world population steadily increasing, the demand for food rises, resulting in changes to forests and arable lands. In this context, efficient and advanced technologies are crucial to meeting the growing world population's food demand. The development of advanced approaches to enhance crop yield and improve other agricultural measures is evident, highlighting the role of technology in addressing the challenges of a changing agricultural landscape [30].

4 Conclusion

The collection of agricultural policies designed by the chosen nations presents a captivating panorama of strengths, limitations, and invaluable insights. Mali’s comprehensive strategy accentuates the utmost significance of embracing diverse cropping systems and engaging stakeholders to foster climate resilience and income generation. Indonesia's interventions tailored to specific contexts showcase the finesse of considering multiple factors, amplifying productivity, and enhancing well-being. South Africa adeptly strikes a harmonious equilibrium among economic growth, sustainability, and social welfare, highlighting the imperative of multifaceted agricultural advancement. European nations champion adaptive strategies, sustainable practices, and resilience, fearlessly confronting climate change and
market volatility. The USA and Brazil astutely acknowledge the metamorphic potential of technology and targeted policies to propel productivity and well-being.

The pinnacle of achievement in agricultural policies weaves together common themes of sustainable practices, adaptive strategies, and technological advancements. The establishment of a global network for monitoring agricultural landscapes is proposed as a means to empower science in quantifying the costs and benefits of agricultural practices across spatial and temporal scales [32]. This comprehensive understanding, drawn from a rich tapestry of experiences, provides policymakers with valuable insights for shaping a trajectory towards sustainable, resilient, and inclusive agricultural practices.

The methodologies employed, context-specific interventions, and holistic approaches underscore the profound importance of prioritizing economic advancement, food security, environmental responsibility, poverty reduction, and rural community development. These elements form a cohesive framework that addresses the multifaceted challenges facing agriculture. By immersing themselves in the collective wisdom derived from this tapestry, policymakers can foster a future where productivity is nurtured, resilience is fortified, and income growth is sustained. Importantly, this approach ensures the well-being of farming communities while preserving the sanctity of the shared environment.

As nations continue to learn from each other's strengths and weaknesses, the tapestry of agricultural policies emerges as a beacon of hope for a brighter and more sustainable future. The ongoing exchange of knowledge and experiences contributes to a collective effort that transcends borders, offering a promising vision for agricultural practices that are not only productive but also environmentally conscious and socially inclusive. In this way, the tapestry of agricultural policies becomes a symbol of collaboration and progress towards a more sustainable and resilient global agricultural landscape.

References


