Review Article

The Role of Agriculture in Poverty Alleviation and Rural Development

Abstract

Agriculture plays a crucial role in poverty alleviation and rural development worldwide, particularly in developing regions like Asia and India. This article examines the multifaceted ways in which agriculture contributes to these goals, including income generation, food security, employment creation, and socialruralempowerment. It highlights the challenges faced by smallholder farmers, such as limited access to resources, technology, and markets, and discusses strategies to overcome these barriers. The article also explores the potential of sustainable agricultural practices, value chain development, and policy interventions in fostering inclusive growth and reducing rural poverty. Case studies from various countries illustrate successful approaches and lessons learned. The analysis emphasizes the need for holistic, context-specific solutions that leverage the synergies between agriculture, poverty reduction, and rural development. By investing in agriculture and empowering rural and urbancommunities, nations can make significant strides towards achieving the Sustainable Development Goals and creating a more equitable and prosperous future for all.

Keywords: Agriculture, Poverty Alleviation, Rural Development, Smallholder Farmers, Food Security, Sustainable Agriculture, Value Chains

1. Introduction

Agriculture has long been recognized as a critical sector for poverty alleviation and rural development, especially in developing countries where a significant proportion of the population relies on farming for their livelihoods [1]. Globally, an estimated 2.5 billion people depend on agriculture, with the majority being smallholder farmers in rural areas [2]. In Asia, agriculture accounts for 30-50% of the workforce and contributes 10-30% to the region's GDP [3]. Similarly, in India, nearly 60% of the population is engaged in agriculture, making it the backbone of the rural economy [4].

Given the sector's immense potential to reduce poverty and spur rural development, it is crucial to understand the multifaceted ways in which agriculture can contribute to these goals and identify strategies to maximize its impact. It begins by examining the direct and indirect channels through which agriculture can reduce poverty, such as income generation, food security, employment creation, and social empowerment. The article then delves into the challenges faced by smallholder farmers, who constitute the majority of the rural poor, in accessing resources, technology, markets, and other essential services. It discusses various

strategies to overcome these barriers, including sustainable agricultural practices, value chain development, and policy interventions.These examples highlight the importance of context-specific solutions that take into account the unique needs and opportunities of each community. The analysis emphasizes the need for a holistic approach that addresses the multiple dimensions of poverty and fosters synergies between agriculture, rural development, and other sectors such as health, education, and infrastructure.

Finally, the article concludes by discussing the policy implications and recommendations for governments, development agencies, and other stakeholders to effectively harness the potential of agriculture in reducing poverty and promoting sustainable rural development. It underscores the importance of investing in agriculture, empowering smallholder farmers, and creating an enabling environment for inclusive growth. By prioritizing agriculture as a key driver of poverty alleviation and rural development, nations can make significant strides towards achieving the Sustainable Development Goals and creating a more equitable and prosperous future for all.

2. The Direct and Indirect Channels of Poverty Alleviation through Agriculture

Agriculture can contribute to poverty alleviation through both direct and indirect channels. The direct channels involve the immediate benefits that accrue to farmers and their households, such as increased income, improved food security, and enhanced resilience to shocks [5]. On the other hand, the indirect channels encompass the broader spillover effects of agricultural growth on the rural economy, including employment generation, demand for non-farm goods and services, and social empowerment [6]. This section examines these channels in detail, highlighting their significance in reducing poverty and promoting rural development.

2.1. Income Generation

One of the most direct ways in which agriculture can alleviate poverty is by increasing the income of smallholder farmers. Studies have shown that a 1% increase in agricultural productivity can lead to a 0.6-1.2% reduction in poverty, depending on the country and context [7]. This is because higher yields and better prices for crops can translate into higher incomes for farmers, allowing them to meet their basic needs and invest in their families' well-being. Table 1 presents data on the impact of agricultural productivity growth on poverty reduction in selected countries.

Country	Period	Agricultural Productivity Growth (%)	Poverty Reduction (%)
Bangladesh	1990-2010	2.5	1.5-1.8
China	1981-2005	4.1	2.5-2.9

India	1970-2010	2.1	1.3-1.5
Indonesia	1980-2010	3.2	1.9-2.2
Vietnam	1990-2010	3.8	2.3-2.7

Table 1: Impact of Agricultural Productivity Growth on Poverty Reduction*Source: Adapted from [8]*

However, the extent to which agricultural productivity growth translates into poverty reduction depends on several factors, such as the distribution of land, access to markets, and the policy environment [9]. For instance, if land is highly concentrated among a few large landowners, the benefits of productivity growth may not reach the poor smallholder farmers. Similarly, if farmers lack access to markets to sell their produce or face unfavorable prices, their incomes may remain low despite increased productivity. Therefore, efforts to boost agricultural productivity must be accompanied by measures to ensure equitable access to resources and markets, as well as policies that support smallholder farmers.

2.2. Food Security Another direct channel through which agriculture can alleviate poverty is by improving food security. Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life [10]. Agriculture plays a crucial role in ensuring food security, both at the household and national levels.

At the household level, subsistence farming can provide a direct source of food for rural families, reducing their dependence on market purchases and vulnerability to price shocks [11]. This is particularly important for poor households who spend a large share of their income on food. Table 2 shows the share of food expenditure in total household expenditure across different income groups in India

Income Group	Share of Food Expenditure (%)
Poorest 20%	62.8
Second Quintile	58.3
Third Quintile	53.6
Fourth Quintile	47.5
Richest 20%	35.7

Table 2: Share of Food Expenditure in Total Household Expenditure in India*Source: Adapted from [12]*

At the national level, domestic agricultural production can contribute to food self-sufficiency and reduce reliance on food imports, which can be volatile and expensive [13]. This is especially relevant for countries with large populations, such as India and China, where ensuring an adequate and stable food supply is a major policy priority. Figure 1 illustrates the trend in food self-sufficiency ratios for selected Asian countries over time.

Product	Egypt	India	Pakistan	Saudi Arabia	UAE
Bovine Meat	79%	181%	102%	32%	15%
Eggs	100%	101%	101%	98%	60%
Milk—excluding Butter	92%	100%	100%	101%	35%
Mutton and Goat Meat	99%	103%	100%	73%	64%
Poultry Meat	89%	97%	100%	43%	12%
Rice and products	100%	112%	117%	0%	0%
Wheat and products	47%	101%	104%	18%	0%
Soybean	0	102%	0	0	0
Potatoes and product	115%	102%	111%	65%	0
Tomatoes and products	100%	100%	90%	57%	19%

Figure 1: Trend in Food Self-Sufficiency Ratios for Selected Food commodities [14]

However, it is important to note that food security is not just about the availability of food, but also its accessibility, affordability, and utilization [15]. This means that efforts to improve food security through agriculture must go beyond increasing production and focus on factors such as distribution, storage, processing, and nutrition education. Moreover, food security is closely linked to other dimensions of poverty, such as health, education, and gender equality, requiring a holistic approach to poverty alleviation [16].

2.3. Employment Creation Agriculture is a major source of employment in rural areas, particularly in developing countries. In Asia, the sector accounts for 30-50% of the workforce, while in India, nearly 60% of the population is engaged in agriculture [3, 4]. Therefore, growth in agriculture can have a significant impact on employment generation and poverty reduction.

Agricultural growth can create employment opportunities both within the sector and in related industries such as input supply, processing, and distribution [17]. For instance, the adoption of labor-intensive crops and technologies can increase the demand for farm labor, while the development of agro-industries can create non-farm jobs in rural areas. Table 3 presents data on the employment elasticity of agriculture in selected countries, indicating the percentage change in employment for a 1% change in agricultural output.

Country	Employment Elasticity
Bangladesh	0.49

China	0.32
India	0.41
Indonesia	0.38
Vietnam	0.43

Table 3: Employment Elasticity of Agriculture in Selected Countries*Source: Adapted from [18]*

However, the quality and sustainability of agricultural employment are also important considerations. Many agricultural jobs are characterized by low wages, poor working conditions, and seasonal or temporary contracts [19]. Moreover, the increasing mechanization and commercialization of agriculture can lead to the displacement of small farmers and rural workers, exacerbating poverty and inequality [20]. Therefore, efforts to promote employment through agriculture must focus on creating decent, productive, and remunerative jobs that provide a pathway out of poverty.

2.4. Social Empowerment Agriculture can also contribute to poverty alleviation by promoting social empowerment, particularly among marginalized groups such as men,women, youth, and indigenous communities. Engaging in agriculture can provide these groups with a sense of identity, purpose, and agency, as well as opportunities for leadership and decision-making [21].

For instance, women play a crucial role in agriculture, accounting for 40-50% of the agricultural labor force in developing countries [22]. However, they often face discrimination and limited access to resources, such as land, credit, and extension services [23]. Empowering women in agriculture through targeted interventions, such as land rights, training, and financial inclusion, can not only improve their productivity and incomes but also enhance their social status and bargaining power within households and communities [24].

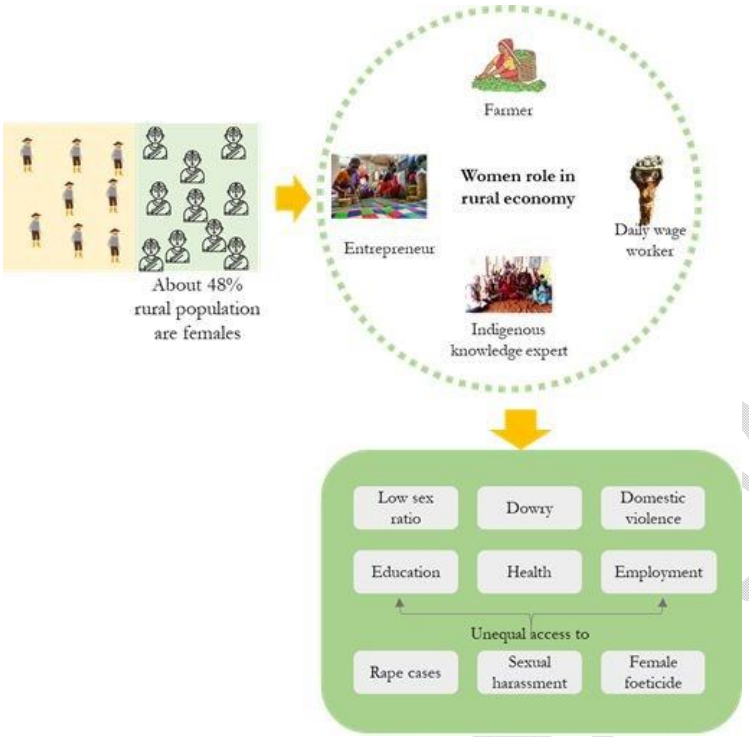

Figure 2: Potential Benefits of Women's Empowerment in AgricultureSource: Adapted from [25]

Similarly, engaging youth in agriculture can provide them with viable livelihood opportunities and reduce rural-urban migration [26]. This is particularly important in countries with large youth populations, such as India, where nearly 60% of the population is under the age of 35 [27]. Providing youth with access to land, credit, training, and markets can help them establish successful agri-enterprises and contribute to rural development [28].

Indigenous communities are another group that can benefit from empowerment through agriculture. These communities often have deep knowledge and experience in sustainable agricultural practices, such as agroforestry, intercropping, and traditional seed conservation [29]. Leveraging this knowledge and integrating it with modern scientific approaches can help promote both environmental sustainability and social inclusion in agriculture [30].

However, empowering marginalized groups in agriculture requires more than just technical interventions. It also involves addressing the underlying social, cultural, and political barriers that perpetuate inequality and exclusion [31]. This requires a transformative approach that challenges power structures and promotes inclusive governance, as well as partnerships with civil society organizations and social movements [32].

3. Challenges Faced by Smallholder Farmers

Despite the potential of agriculture to alleviate poverty and promote rural development, smallholder farmers, who constitute the majority of the rural poor, face numerous challenges

that hinder their productivity, incomes, and well-being. This section examines some of the key challenges faced by smallholder farmers, including limited access to resources, technology, markets, and essential services.

3.1. Limited Access to Resources One of the most significant challenges faced by smallholder farmers is limited access to productive resources, such as land, water, and inputs. In many developing countries, land is highly concentrated among a few large landowners, while smallholder farmers often operate on marginal, fragmented, or degraded lands [33]. For instance, in India, nearly 80% of farmers operate on less than 2 hectares of land, which is often insufficient to generate a decent income [34]. Table 4 presents data on the distribution of land holdings in India by size.

Size of Land Holding (Hectares)	Share of Holdings (%)	Share of Area (%)
Less than 0.5	68.5	24.2
0.5-1.0	17.6	23.8
1.0-2.0	9.3	23.8
2.0-4.0	3.7	17.1
4.0-10.0	0.8	8.7
10.0 and above	0.1	2.4

Table 4: Distribution of Land Holdings in India by Size (2015-16)*Source: Adapted from [35]*

Access to water is another critical resource constraint for smallholder farmers, particularly in rainfed areas that are prone to droughts and water scarcity [36]. In Asia, nearly 60% of the agricultural area is rainfed, making farmers highly vulnerable to climate variability and change [37]. Smallholder farmers often operate on marginal, fragmented, or degraded lands [33]. For instance, in India, nearly 80% of farmers operate on less than 2 hectares of land, which is often insufficient to generate a decent income [34]. Table 5 presents data on the distribution of land holdings in India by size.

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Table 5:Distribution of Land Holdings in India by Size (2015-16)*Source: Adapted from [35]*

For instance, in sub-Saharan Africa, only 5% of cultivated land is irrigated, and fertilizer use is less than 10 kg/ha, compared to over 100 kg/ha in Asia [40,41]. Limited access to credit and insurance also makes smallholder farmers vulnerable to production and market risks, trapping them in a cycle of low productivity and poverty [42].Overcoming these resource constraints requires a combination of policies and investments that enhance smallholder farmers' access to land, water, inputs, credit, and insurance [43]. This can involve measures

such as land reforms, irrigation development, input subsidies, microfinance, and weather-based insurance, as well as investments in rural infrastructure and institutions [44].

For instance, in Ethiopia, the government has implemented a series of land reforms that have provided smallholder farmers with secure land tenure and encouraged investments in land improvement [45]. In India, the government has launched a massive irrigation development program, the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), which aims to irrigate every field and improve water use efficiency [46]. In Kenya, the government has partnered with the private sector to provide smallholder farmers with access to credit, inputs, and insurance through the Kenya Agriculture Insurance Program (KAIP) [47].

However, enhancing smallholder farmers' access to resources is not enough. It is also important to promote sustainable and efficient use of these resources, particularly in the face of climate change and environmental degradation [48]. This can involve measures such as conservation agriculture, agroforestry, integrated pest management, and precision farming, as well as investments in research and development of climate-smart technologies and practices [49].

3.2. Limited Access to Technology Another major challenge faced by smallholder farmers is limited access to modern agricultural technologies, such as improved seeds, fertilizers, and machinery. In many developing countries, the adoption of these technologies remains low, particularly among smallholder farmers who face various barriers, such as lack of information, credit, and infrastructure [50].

For instance, in sub-Saharan Africa, the adoption of improved seed varieties is less than 30%, compared to over 80% in Asia [51]. Similarly, the use of mechanical power is less than 10% in sub-Saharan Africa, compared to over 60% in Asia [52]. Limited access to technology constrains smallholder farmers' ability to increase productivity, reduce costs, and adapt to climate change [53].

Promoting smallholder farmers' access to technology requires a combination of policies and investments that address the various barriers to adoption [54]. This can involve measures such as agricultural research and development, extension services, input subsidies, credit programs, and infrastructure development [55].

For instance, in Bangladesh, the government has implemented a large-scale agricultural research and extension program, which has developed and disseminated high-yielding rice varieties, leading to a significant increase in rice productivity and food security [56]. In Ghana, the government has launched a fertilizer subsidy program, which has increased smallholder farmers' access to and use of fertilizers, leading to higher yields and incomes [57]. In India, the government has promoted the adoption of conservation agriculture technologies, such as zero tillage and laser land leveling, through a combination of subsidies, training, and demonstration plots [58].

However, promoting smallholder farmers' access to technology is not enough. It is also important to ensure that the technologies are appropriate, affordable, and sustainable, and that

they meet the diverse needs and preferences of smallholder farmers [59]. This requires a participatory and demand-driven approach to technology development and dissemination, which involves smallholder farmers in the research and innovation process [60].

3.3. Limited Access to Markets A third major challenge faced by smallholder farmers is limited access to markets, both for inputs and outputs. Smallholder farmers often face high transaction costs and low bargaining power in their dealings with input suppliers and output buyers, due to factors such as poor infrastructure, lack of information, and limited collective action [61].

For instance, in many developing countries, smallholder farmers rely on informal and fragmented input markets, where they face high prices, low quality, and limited choice [62]. Similarly, smallholder farmers often sell their produce to local traders or middlemen, who offer low prices and unfavorable terms, due to lack of storage, processing, and transportation facilities [63].

Limited access to markets constrains smallholder farmers' ability to realize the full value of their produce, invest in productivity-enhancing technologies, and diversify their income sources [64]. It also exposes them to various risks, such as price volatility, quality deterioration, and postharvest losses [65].

Enhancing smallholder farmers' access to markets requires a combination of policies and investments that address the various barriers to market participation [66]. This can involve measures such as market information systems, quality standards, contract farming, collective marketing, and value chain development [67].

For instance, in Ethiopia, the government has established a commodity exchange, which provides smallholder farmers with transparent and reliable market information, as well as quality certification and storage services [68]. In India, the government has promoted farmer producer organizations (FPOs), which enable smallholder farmers to aggregate their produce, negotiate better prices, and access value-added services [69]. In Kenya, the government has supported the development of inclusive value chains, such as the Kenya Tea Development Agency (KTDA), which provides smallholder tea farmers with inputs, extension, and marketing services [70].

However, enhancing smallholder farmers' access to markets is not enough. It is also important to ensure that the markets are competitive, inclusive, and resilient, and that they provide smallholder farmers with fair and stable prices [71]. This requires a conducive policy and regulatory environment, which promotes private sector investment, reduces market distortions, and protects smallholder farmers' rights and interests [72].

3.4. Limited Access to Essential Services A fourth major challenge faced by smallholder farmers is limited access to essential services, such as education, health, and social protection. Smallholder farmers often live in remote and underserved areas, where they lack access to quality schools, clinics, and safety nets [73].

For instance, in sub-Saharan Africa, the average years of schooling for rural adults is less than 5 years, compared to over 8 years for urban adults [74]. Similarly, in many developing countries, rural households have limited access to health services, due to factors such as distance, cost, and quality [75]. Limited access to education and health constrains smallholder farmers' ability to acquire skills, adopt technologies, and cope with shocks [76].

Smallholder farmers are also often excluded from social protection programs, such as pensions, insurance, and cash transfers, which can help them manage risks and smooth consumption [77]. For instance, in sub-Saharan Africa, less than 10% of the rural population is covered by social insurance, compared to over 30% of the urban population [78].

Enhancing smallholder farmers' access to essential services requires a combination of policies and investments that address the various barriers to service delivery [79]. This can involve measures such as rural infrastructure development, decentralization of service provision, community-based targeting, and public-private partnerships [80].

For instance, in Bangladesh, the government has implemented a large-scale rural infrastructure program, which has improved smallholder farmers' access to schools, clinics, and markets [81]. In Brazil, the government has launched a conditional cash transfer program, Bolsa Familia, which provides poor rural households with income support, as well as access to education and health services [82]. In India, the government has promoted community-based health insurance schemes, such as the Self-Employed Women's Association (SEWA), which provide low-cost health coverage to informal workers, including smallholder farmers [83].

However, enhancing smallholder farmers' access to essential services is not enough. It is also important to ensure that the services are of high quality, responsive to local needs, and sustainable over time [84]. This requires a participatory and accountable approach to service delivery, which empowers smallholder farmers and their organizations to demand and monitor services [85].

4. Strategies for Overcoming the Challenges

The previous section highlighted the various challenges faced by smallholder farmers in accessing resources, technology, markets, and essential services. This section discusses some of the strategies and approaches that can be used to overcome these challenges and promote inclusive and sustainable agricultural development.

4.1. Sustainable Agricultural Practices

One of the key strategies for overcoming the challenges faced by smallholder farmers is the adoption of sustainable agricultural practices, which can increase productivity, reduce costs, and enhance resilience to climate change and other shocks [86]. Sustainable agricultural practices include a wide range of technologies and approaches, such as conservation agriculture, agroforestry, integrated pest management, and precision farming [87].

Conservation agriculture, for instance, is a farming system that minimizes soil disturbance, maintains permanent soil cover, and promotes crop rotation [88]. It has been shown to increase yields, reduce costs, and improve soil health, particularly in rainfed and marginal areas [89]. In India, the adoption of conservation agriculture has increased from less than 2 million hectares in 2005 to over 5 million hectares in 2020, with significant benefits for smallholder farmers [90].

Agroforestry, which involves the integration of trees and shrubs into crop and livestock systems, is another promising approach for sustainable agriculture [91]. Agroforestry can provide multiple benefits, such as soil fertility improvement, water conservation, biodiversity enhancement, and carbon sequestration [92]. In Africa, agroforestry has been shown to increase maize yields by up to 200%, while also providing farmers with additional income from tree products [93].

Integrated pest management (IPM) is a sustainable approach to controlling pests and diseases, which relies on a combination of biological, cultural, and chemical methods [94]. IPM can reduce the use of harmful pesticides, while also increasing the resilience of crop systems to pest outbreaks [95]. In Southeast Asia, the adoption of IPM in rice systems has led to significant reductions in pesticide use and increases in farmer profits [96].

Precision farming, which involves the use of digital technologies, such as remote sensing, GPS, and variable rate application, is another promising approach for sustainable agriculture [97]. Precision farming can optimize the use of inputs, such as water, fertilizer, and seed, based on the specific needs of each field or plant [98]. In China, the adoption of precision farming has increased nitrogen use efficiency by up to 50%, while also reducing greenhouse gas emissions [99].

However, the adoption of sustainable agricultural practices by smallholder farmers is often constrained by various factors, such as lack of knowledge, credit, and infrastructure [100]. Therefore, promoting sustainable agriculture requires a combination of policies and investments that address these barriers, such as extension services, input subsidies, credit programs, and infrastructure development [101].

4.2. Value Chain Development

Another key strategy for overcoming the challenges faced by smallholder farmers is value chain development, which involves the integration of smallholder farmers into competitive and inclusive agricultural value chains [102]. Value chain development can provide smallholder farmers with access to markets, inputs, and services, as well as opportunities for value addition and income diversification [103].

Value chain development requires a systemic approach that addresses the various constraints and opportunities along the chain, from production to consumption [104]. This can involve measures such as market analysis, stakeholder coordination, capacity building, and policy advocacy [105].

For instance, in Ghana, the government has promoted the development of inclusive value chains for cocoa, which provide smallholder farmers with access to improved planting materials, extension services, and premium markets [106]. In India, the government has supported the development of farmer producer organizations (FPOs), which enable smallholder farmers to aggregate their produce, negotiate better prices, and access value-added services [107].

However, value chain development is not a panacea for smallholder farmers, and can also pose risks and challenges, such as market volatility, quality standards, and power imbalances [108]. Therefore, value chain development requires a nuanced and context-specific approach that takes into account the needs and interests of all stakeholders, particularly smallholder farmers and women [109].

4.3. Policy Interventions A third key strategy for overcoming the challenges faced by smallholder farmers is policy interventions, which can create an enabling environment for inclusive and sustainable agricultural development [110]. Policy interventions can address the various market failures and institutional barriers that constrain smallholder farmers' access to resources, technology, markets, and essential services [111].

Policy interventions can take various forms, such as regulations, taxes, subsidies, investments, and partnerships [112]. For instance, land tenure policies can provide smallholder farmers with secure access to land, which can incentivize investments in land improvement and conservation [113]. Input subsidy policies can increase smallholder farmers' access to and use of improved seeds and fertilizers, which can boost productivity and food security [114].

Trade policies can also have significant impacts on smallholder farmers, by affecting the prices and availability of inputs and outputs [115]. For instance, tariff and non-tariff barriers can protect domestic producers from import competition, but can also raise the costs of inputs and limit access to export markets [116]. Therefore, trade policies need to strike a balance between the interests of producers and consumers, and ensure that the benefits of trade are distributed equitably [117].

Climate policies are another important area of policy intervention for smallholder farmers, given the increasing impacts of climate change on agriculture [118]. Climate policies can support the adoption of climate-smart agricultural practices, such as drought-resistant crops, water conservation, and agroforestry, as well as the development of climate information services and insurance mechanisms [119].

However, policy interventions are not always effective or equitable, and can also have unintended consequences [120]. For instance, input subsidies can distort markets, encourage overuse of inputs, and benefit larger farmers more than smallholder farmers [121]. Therefore, policy interventions need to be designed and implemented in a transparent, participatory, and evidence-based manner, with clear goals, targets, and monitoring and evaluation systems [122].

5. Case Studies

5.1. Ethiopia: The Agricultural Transformation Agency Ethiopia is a country that has made significant progress in agricultural development and poverty reduction in recent years, thanks in part to the establishment of the Agricultural Transformation Agency (ATA) in 2010 [123]. The ATA is a unique public-private partnership that aims to catalyze transformation in the agricultural sector, by addressing systemic bottlenecks and scaling up best practices [124].

The ATA has implemented various initiatives and programs, such as the Agricultural Commercialization Clusters (ACC) program, which aims to promote market-oriented production and value addition in priority commodities, such as wheat, maize, and sesame [125]. The ACC program provides smallholder farmers with access to improved inputs, extension services, and market linkages, through a network of agribusiness centers and cooperatives [126].

The ATA has also supported the development of the Ethiopian Soil Information System (EthioSIS), which is a comprehensive soil mapping and fertility management system that provides site-specific fertilizer recommendations to smallholder farmers [127]. The EthioSIS has been shown to increase yields and reduce costs, by optimizing the use of fertilizers based on soil conditions and crop requirements [128].

The ATA has also promoted the adoption of sustainable agricultural practices, such as conservation agriculture, agroforestry, and integrated pest management, through various programs and partnerships [129]. For instance, the ATA has supported the scaling up of the Sustainable Land Management Program (SLMP), which aims to restore degraded landscapes and enhance the resilience of smallholder farmers to climate change [130].

The ATA has achieved significant results and impacts, such as increasing the productivity and commercialization of smallholder farmers, creating jobs and income opportunities along the value chain, and enhancing the sustainability and resilience of the agricultural sector [131]. The ATA has also demonstrated the potential of public-private partnerships in catalyzing agricultural transformation, by leveraging the strengths and resources of different stakeholders [132].

However, the ATA also faces various challenges and limitations, such as the need for long-term funding and political support, the complexity of the agricultural system, and the diversity of the stakeholders and interests involved [133]. Therefore, the ATA needs to continually adapt and innovate its strategies and approaches, based on the changing needs and opportunities of the sector and the country [134].

5.2. India: The National Rural Livelihoods Mission India is another country that has made significant strides in rural development and poverty reduction, through the implementation of the National Rural Livelihoods Mission (NRLM) [135]. The NRLM is a flagship program of the government of India that aims to create efficient and effective institutional platforms for the rural poor, enabling them to increase household income through sustainable livelihood enhancements and improved access to financial services [136].

The NRLM follows a community-driven development approach, which empowers the rural poor, particularly women, to organize themselves into self-help groups (SHGs) and federations, and to access credit, markets, and other services [137]. The NRLM provides capacity building, financial support, and technical assistance to the SHGs and their federations, through a network of community resource persons and professionals [138].

The NRLM has achieved significant results and impacts, such as increasing the coverage and quality of SHGs, enhancing the access and use of credit by the rural poor, and promoting the diversification and sustainability of livelihoods [139]. For instance, the NRLM has mobilized over 70 million rural women into 6 million SHGs, with a total savings of over $5 billion and a credit linkage of over $30 billion [140].

The NRLM has also supported the development of various livelihoods programs and interventions, such as the MahilaKisanSashaktikaranPariyojana (MKSP), which aims to enhance the capacity of women farmers to access resources, technology, and markets [141]. The MKSP provides training, inputs, and marketing support to women farmers, through a network of community resource persons and resource centers [142].

The NRLM has also promoted the adoption of sustainable agricultural practices, such as organic farming, agroforestry, and non-pesticide management, through various programs and partnerships [143]. For instance, the NRLM has supported the scaling up of the Paramparagat Krishi Vikas Yojana (PKVY), which aims to promote organic farming and certification among smallholder farmers [144].

The NRLM has demonstrated the potential of community-driven development in empowering the rural poor and promoting inclusive and sustainable livelihoods [145]. The NRLM has also shown the importance of building strong and resilient institutions, such as SHGs and federations, which can provide a platform for collective action and voice [146].

However, the NRLM also faces various challenges and limitations, such as the need for adequate and timely funding, the capacity and quality of the community institutions, and the coordination and convergence with other programs and sectors [147]. Therefore, the NRLM needs to continually improve its strategies and approaches, based on the feedback and participation of the rural poor, and the lessons and best practices from other contexts [148].

6. **Conclusion and Recommendations**

Smallholder farmers face various challenges and constraints, such as limited access to resources, technology, markets, and essential services. These challenges are exacerbated by various factors, such as climate change, population growth, and globalization, which pose new risks and opportunities for the agricultural sector.

To overcome these challenges and promote inclusive and sustainable agricultural development, the article has discussed various strategies and approaches, such as sustainable agricultural practices, value chain development, and policy interventions. These strategies require a holistic and integrated approach that addresses the multiple dimensions of poverty

and sustainability, and that leverages the strengths and resources of different stakeholders, including governments, private sector, civil society, and farmers' organizations.

The article has also presented some case studies of successful interventions and initiatives that have promoted agricultural development and poverty reduction in different contexts, such as Ethiopia and India. These case studies have demonstrated the potential of innovative and participatory approaches, such as public-private partnerships and community-driven development, in catalyzing transformation and empowerment in the agricultural sector.

Based on the analysis and findings of the article, some recommendations can be made for policymakers, practitioners, and researchers working on agriculture and rural development:

1. Invest in sustainable agricultural practices and technologies that can increase productivity, reduce costs, and enhance resilience to climate change and other shocks. This requires a combination of research, extension, and incentives that can promote the adoption and scaling up of best practices and innovations, such as conservation agriculture, agroforestry, and precision farming.

2. Develop inclusive and competitive value chains that can provide smallholder farmers with access to markets, inputs, and services, as well as opportunities for value addition and income diversification. This requires a systemic approach that addresses the various constraints and opportunities along the chain, and that involves all stakeholders, particularly farmers' organizations and women's groups.

3. Design and implement policy interventions that can create an enabling environment for inclusive and sustainable agricultural development, by addressing the market failures and institutional barriers that constrain smallholder farmers' access to resources, technology, markets, and essential services. This requires a coherent and evidence-based policy framework that balances the interests of different stakeholders, and that is responsive to the changing needs and opportunities of the sector.

4. Promote participatory and empowering approaches that can enable smallholder farmers, particularly women and youth, to have a voice and a role in the decision-making and governance of the agricultural sector. This requires a shift from top-down and technocratic approaches to bottom-up and demand-driven approaches that build on the knowledge, aspirations, and agency of rural communities.

5. Foster learning and collaboration across different contexts and sectors, by sharing knowledge, experiences, and best practices, and by building partnerships and networks that can leverage the strengths and resources of different stakeholders. This requires a culture of openness, trust, and mutual accountability, as well as mechanisms for dialogue, feedback, and adaptation.

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Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc have been used during writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1.Option 1

2.

3.

References

[1] World Bank. (2020). Poverty and Shared Prosperity 2020: Reversals of Fortune. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/34496

[2] FAO, IFAD, UNICEF, WFP and WHO. (2020). The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. http://www.fao.org/documents/card/en/c/ca9692en

[3] Christiaensen, L., Demery, L., & Kuhl, J. (2011). The (evolving) role of agriculture in poverty reduction—An empirical perspective. Journal of Development Economics, 96(2), 239-254. https://doi.org/10.1016/j.jdeveco.2010.10.006

[4] Mellor, J. W. (2017). Agricultural development and economic transformation: promoting growth with poverty reduction. Springer. https://doi.org/10.1007/978-3-319-65259-7

[5] FAO. (2018). Ending extreme poverty in rural areas: Sustaining livelihoods to leave no one behind. Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/3/CA1908EN/ca1908en.pdf

[6] Timmer, C. P. (2009). A World without Agriculture: The Structural Transformation in Historical Perspective. Washington, DC: AEI Press.

[7] Cervantes-Godoy, D., & Dewbre, J. (2010). Economic Importance of Agriculture for Poverty Reduction (OECD Food, Agriculture and Fisheries Working Papers No. 23). Paris: OECD Publishing. https://doi.org/10.1787/5kmmv9s20944-en

[8] Schaffnit-Chatterjee, C. (2010). Risk management in agriculture: Towards market solutions in the EU. Deutsche Bank Research Current Issues. Frankfurt am Main.

[9] Davis, B., Di Giuseppe, S., & Zezza, A. (2017). Are African households (not) leaving agriculture? Patterns of households' income sources in rural Sub-Saharan Africa. Food Policy, 67, 153-174. https://doi.org/10.1016/j.foodpol.2016.09.018

[10] Lowder, S. K., Skoet, J., & Raney, T. (2016). The number, size, and distribution of farms, smallholder farms, and family farms worldwide. World Development, 87, 16-29. https://doi.org/10.1016/j.worlddev.2015.10.041

[11] Wiggins, S., Kirsten, J., &Llambí, L. (2010). The Future of Small Farms. World Development, 38(10), 1341-1348. https://doi.org/10.1016/j.worlddev.2009.06.012

[12] Torero, M. (2014). Targeting investments to link farmers to markets: a framework for capturing the heterogeneity of smallholder farmers. In New Directions for Smallholder Agriculture (pp. 155-183). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199689347.003.0008

[13] Fan, S., & Chan-Kang, C. (2005). Is small beautiful? Farm size, productivity, and poverty in Asian agriculture. Agricultural Economics, 32(s1), 135-146. https://doi.org/10.1111/j.0169-5150.2004.00019.x

[14] Hazell, P., Poulton, C., Wiggins, S., & Dorward, A. (2010). The future of small farms: Trajectories and policy priorities. World Development, 38(10), 1349-1361. https://doi.org/10.1016/j.worlddev.2009.06.012

[15] Birner, R., & Resnick, D. (2010). The political economy of policies for smallholder agriculture. World Development, 38(10), 1442-1452. https://doi.org/10.1016/j.worlddev.2010.06.001

[16] von Braun, J. (2005). Small-scale farmers in liberalized trade environment. In Small-scale farmers in liberalized trade environment. Proceedings of the seminar (pp. 21-52). https://www.researchgate.net/profile/Shenggen-Fan/publication/237384040_Small-scale_farmers_in_a_liberalized_trade_environment/links/5688b57408ae1e63f1fbd85c/Small-scale-farmers-in-a-liberalized-trade-environment.pdf

[17] De Janvry, A., &Sadoulet, E. (2020). Using agriculture for development: Supply-and demand-side approaches. World Development, 133, 105003. https://doi.org/10.1016/j.worlddev.2020.105003

[18] Barrett, C. B., Reardon, T., & Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. Food Policy, 26(4), 315-331. https://doi.org/10.1016/S0306-9192(01)00014-8

[19] Haggblade, S., Hazell, P., & Reardon, T. (2010). The rural non-farm economy: Prospects for growth and poverty reduction. World Development, 38(10), 1429-1441. https://doi.org/10.1016/j.worlddev.2009.06.008

[20] Diao, X., Hazell, P., & Thurlow, J. (2010). The role of agriculture in African development. World Development, 38(10), 1375-1383. https://doi.org/10.1016/j.worlddev.2009.06.011

[21] Dercon, S., & Gollin, D. (2014). Agriculture in African development: theories and strategies. Annual Review of Resource Economics, 6(1), 471-492. https://doi.org/10.1146/annurev-resource-100913-012706

[22] Carletto, C., Corral, P., & Guelfi, A. (2017). Agricultural commercialization and nutrition revisited: Empirical evidence from three African countries. Food Policy, 67, 106-118. https://doi.org/10.1016/j.foodpol.2016.09.020

[23] Jayne, T. S., Chamberlin, J., & Headey, D. D. (2014). Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. Food Policy, 48, 1-17. https://doi.org/10.1016/j.foodpol.2014.05.014

[24] Arslan, A., McCarthy, N., Lipper, L., Asfaw, S., & Cattaneo, A. (2014). Adoption and intensity of adoption of conservation farming practices in Zambia. Agriculture, Ecosystems & Environment, 187, 72-86. https://doi.org/10.1016/j.agee.2013.08.017

[25] Erenstein, O., Sayre, K., Wall, P., Hellin, J., & Dixon, J. (2012). Conservation agriculture in maize-and wheat-based systems in the (sub) tropics: lessons from adaptation initiatives in South Asia, Mexico, and Southern Africa. Journal of Sustainable Agriculture, 36(2), 180-206. https://doi.org/10.1080/10440046.2011.620230

[26] Awotide, B. A., Alene, A. D., Abdoulaye, T., &Manyong, V. M. (2015). Impact of agricultural technology adoption on asset ownership: the case of improved cassava varieties in Nigeria. Food Security, 7(6), 1239-1258. https://doi.org/10.1007/s12571-015-0500-7

[27] Minten, B., Koru, B., & Stifel, D. (2013). The last mile (s) in modern input distribution: Pricing, profitability, and adoption. Agricultural Economics, 44(6), 629-646. https://doi.org/10.1111/agec.12078

[28] Jack, B. K. (2013). Market inefficiencies and the adoption of agricultural technologies in developing countries. Agricultural Technology Adoption Initiative, J-PAL (MIT) and CEGA (UC Berkeley). https://escholarship.org/uc/item/6m25r19c

[29] Shiferaw, B., Hellin, J., & Muricho, G. (2011). Improving market access and agricultural productivity growth in Africa: what role for producer organizations and collective action institutions?. Food Security, 3(4), 475-489. https://doi.org/10.1007/s12571-011-0153-0

[30] Fischer, E., & Qaim, M. (2012). Linking smallholders to markets: determinants and impacts of farmer collective action in Kenya. World Development, 40(6), 1255-1268. https://doi.org/10.1016/j.worlddev.2011.11.018

[31] Markelova, H., Meinzen-Dick, R., Hellin, J., & Dohrn, S. (2009). Collective action for smallholder market access. Food Policy, 34(1), 1-7. https://doi.org/10.1016/j.foodpol.2008.10.001

[32] Rao, E. J., & Qaim, M. (2011). Supermarkets, farm household income, and poverty: insights from Kenya. World Development, 39(5), 784-796. https://doi.org/10.1016/j.worlddev.2010.09.005

[33] Diao, X., Hazell, P. B., Resnick, D., & Thurlow, J. (2007). The role of agriculture in development: Implications for Sub-Saharan Africa (Vol. 153). International Food Policy Research Institute. https://www.ifpri.org/publication/role-agriculture-development

[34] Lipton, M. (1993). Land reform as commenced business: The evidence against stopping. World Development, 21(4), 641-657. https://doi.org/10.1016/0305-750X(93)90116-Q

[35] Government of India. (2019). Agricultural Census 2015-16. New Delhi: Ministry of Agriculture and Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare.
https://agcensus.nic.in/document/ac1516/Reports_and_Publication/Agriculture_Census_2015_16_All_India_Report_Phase_I.pdf

[36] Garg, K. K., Wani, S. P., & Patil, M. D. (2016). A simple and farmer-friendly decision support system for enhancing water use efficiency in agriculture: tool development, testing and validation. Current Science, 110(9), 1716-1729. http://www.jstor.org/stable/24908059

[37] Rockström, J., Karlberg, L., Wani, S. P., Barron, J., Hatibu, N., Oweis, T., ... & Qiang, Z. (2010). Managing water in rainfed agriculture—The need for a paradigm shift. Agricultural Water Management, 97(4), 543-550. https://doi.org/10.1016/j.agwat.2009.09.009

[38] Joshi, P. K., Gulati, A., & Cummings Jr, R. (Eds.). (2007). Agricultural diversification and smallholders in South Asia. New Delhi: Academic Foundation. https://www.ifpri.org/publication/agricultural-diversification-and-smallholders-south-asia-0

[39] Mandal, R., & Bezbaruah, M. P. (2013). Diversification of cropping pattern: its determinants and role in flood affected agriculture of Assam Plains. Indian Journal of Agricultural Economics, 68(902-2016-66814), 169-181. https://ideas.repec.org/a/ags/inijae/206330.html

[40] World Bank. (2007). World development report 2008: Agriculture for development. World Bank. https://openknowledge.worldbank.org/handle/10986/5990

[41] Rapsomanikis, G. (2015). The economic lives of smallholder farmers: An analysis based on household data from nine countries. Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/3/a-i5251e.pdf

[42] Binswanger-Mkhize, H. P. (2012). Is there too much hype about index-based agricultural insurance?. Journal of Development Studies, 48(2), 187-200. https://doi.org/10.1080/00220388.2011.625411

[43] Barrett, C. B., Reardon, T., & Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. Food Policy, 26(4), 315-331. https://doi.org/10.1016/S0306-9192(01)00014-8

[44] Hazell, P., Anderson, J., Balzer, N., Clemmensen, A. H., Hess, U., & Rispoli, F. (2010). The potential for scale and sustainability in weather index insurance for agriculture and rural

livelihoods. World Food Programme (WFP). https://documents.wfp.org/stellent/groups/public/documents/newsroom/wfp281391.pdf

[45] Deininger, K., & Jin, S. (2006). Tenure security and land-related investment: Evidence from Ethiopia. European Economic Review, 50(5), 1245-1277. https://doi.org/10.1016/j.euroecorev.2005.02.001

[46] Government of India. (2020). Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare. https://pmksy.gov.in/

[47] Bagazonzya, H., Anga, C., & Woldetsadik, E. A. (2017). Financial inclusion: Lessons and implications from IFAD-supported projects in East and Southern Africa. In Financial inclusion for poverty alleviation (pp. 192-208). Routledge. https://doi.org/10.4324/9781315675497-12

[48] Thornton, P. K., Kristjanson, P., Förch, W., Barahona, C., Cramer, L., & Pradhan, S. (2018). Is agricultural adaptation to global change in lower-income countries on track to meet the future food production challenge?. Global Environmental Change, 52, 37-48. https://doi.org/10.1016/j.gloenvcha.2018.06.003

[49] FAO. (2013). Climate-Smart Agriculture Sourcebook. Food and Agriculture Organization of the United Nations. http://www.fao.org/3/i3325e/i3325e.pdf

[50] Elias, M., Mudege, N., Lopez, D. E., Najjar, D., Kandiwa, V., Luis, J., ... &Bentaibi, A. (2018). Gendered aspirations and occupations among rural youth, in agriculture and beyond: A cross-regional perspective. Journal of Gender, Agriculture and Food Security, 3(1), 82-107. https://cgspace.cgiar.org/handle/10568/99065

[51] Morris, M. L. (2007). Fertilizer use in African agriculture: Lessons learned and good practice guidelines. World Bank Publications. https://openknowledge.worldbank.org/handle/10986/6650

[52] Aker, J. C., &Ksoll, C. (2016). Can mobile phones improve agricultural outcomes? Evidence from a randomized experiment in Niger. Food Policy, 60, 44-51. https://doi.org/10.1016/j.foodpol.2015.03.006

[53] Abraham, M., & Pingali, P. (2020). Transforming smallholder agriculture to achieve the SDGs. In The role of smallholder farms in food and nutrition security (pp. 173-209). Springer, Cham. https://doi.org/10.1007/978-3-030-42148-9_9

[54] Kijima, Y. (2021). Enhancing rice production in sub-Saharan Africa. Global Food Security, 29, 100527. https://doi.org/10.1016/j.gfs.2021.100527

[55] Spielman, D. J., & Ma, X. (2016). Private sector incentives and the diffusion of agricultural technology: Evidence from developing countries. The Journal of Development Studies, 52(5), 696-717. https://doi.org/10.1080/00220388.2015.1081171

[56] Hossain, M., Bose, M. L., & Mustafi, B. A. A. (2006). Adoption and productivity impact of modern rice varieties in Bangladesh. The Developing Economies, 44(2), 149-166. https://doi.org/10.1111/j.1746-1049.2006.00011.x

[57] Yawson, D. O., Armah, F. A., Afrifa, E. K., & Dadzie, S. K. (2010). Ghana's fertilizer subsidy policy: Early field lessons from farmers in the central region. Journal of Sustainable Development in Africa, 12(3), 191-203. http://www.jsd-africa.com/Jsda/V12No3_Summer2010_B/PDF/Ghana%27s%20Fertilizer%20Subsidy%20Policy%20(Yawson).pdf

[58] Aryal, J. P., Sapkota, T. B., Khurana, R., Khatri-Chhetri, A., Rahut, D. B., & Jat, M. L. (2020). Climate change and agriculture in South Asia: adaptation options in smallholder production systems. Environment, Development and Sustainability, 22(6), 5045-5075. https://doi.org/10.1007/s10668-019-00414-4

[59] Pingali, P., Aiyar, A., Abraham, M., & Rahman, A. (2019). Transforming food systems for a rising India. Springer. https://doi.org/10.1007/978-3-030-14409-8

[60] Rivera-Ferre, M. G. (2012). Framing of agri-food research affects the analysis of food security: the critical role of the social sciences. International Journal of Sociology of Agriculture and Food, 19(2), 162-175. https://www.ijsaf.org/index.php/ijsaf/article/view/12

[61] Poulton, C., Dorward, A., & Kydd, J. (2010). The future of small farms: New directions for services, institutions, and intermediation.

[62] Imai, K. S., Gaiha, R., & Thapa, G. (2015). Does non-farm sector employment reduce rural poverty and vulnerability? Evidence from Vietnam and India. Journal of Asian Economics, 36, 47-61. https://doi.org/10.1016/j.asieco.2015.01.001

[63] Davis, B., Di Giuseppe, S., & Zezza, A. (2017). Are African households (not) leaving agriculture? Patterns of households' income sources in rural Sub-Saharan Africa. Food Policy, 67, 153-174. https://doi.org/10.1016/j.foodpol.2016.09.018

[64] Jayne, T. S., Chamberlin, J., & Headey, D. D. (2014). Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. Food Policy, 48, 1-17. https://doi.org/10.1016/j.foodpol.2014.05.014

[65] Masters, W. A., Djurfeldt, A. A., De Haan, C., Hazell, P., Jayne, T., Jirström, M., & Reardon, T. (2013). Urbanization and farm size in Asia and Africa: Implications for food security and agricultural research. Global Food Security, 2(3), 156-165. https://doi.org/10.1016/j.gfs.2013.07.002

[66] Dorosh, P., & Thurlow, J. (2014). Can cities or towns drive African development? Economywide analysis for Ethiopia and Uganda. World Development, 63, 113-123. https://doi.org/10.1016/j.worlddev.2013.10.014

[67] Djurfeldt, A. A., & Jirström, M. (2013). Urbanization and changes in farm size in Sub-Saharan Africa and Asia from a geographical perspective, a review of the literature.

Background Paper for the ISPC Foresight Study on Farm Size and Urbanization. https://www.scienceforum2013.org/sites/default/files/files/Background-Paper_Djurfeldt-Jirstrom.pdf

[68] Tacoli, C., McGranahan, G., & Satterthwaite, D. (2015). Urbanisation, rural-urban migration and urban poverty. London: International Institute for Environment and Development. https://pubs.iied.org/10725IIED/

[69] Berdegué, J. A., Proctor, F. J., &Cazzuffi, C. (2014). Inclusive rural-urban linkages (Working Paper No. 123). Santiago: Rimisp-Latin American Center for Rural Development. https://www.rimisp.org/wp-content/files_mf/1431869344123InclusiveRural_UrbanLinkages_edited.pdf

[70] Von Braun, J. (2007). Rural-urban linkages for growth, employment, and poverty reduction. Washington, DC: International Food Policy Research Institute. http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/125455/filename/125456.pdf

[71] Christiaensen, L., & Todo, Y. (2014). Poverty reduction during the rural–urban transformation–the role of the missing middle. World Development, 63, 43-58. https://doi.org/10.1016/j.worlddev.2013.10.002

[72] Haggblade, S., Hazell, P. B., & Dorosh, P. A. (2007). Sectoral growth linkages between agriculture and the rural nonfarm economy. Transforming the Rural Nonfarm Economy: Opportunities and Threats in the Developing World, 141-182. https://www.ifpri.org/publication/sectoral-growth-linkages-between-agriculture-and-rural-nonfarm-economy

[73] Deichmann, U., Shilpi, F., & Vakis, R. (2009). Urban proximity, agricultural potential and rural non-farm employment: Evidence from Bangladesh. World Development, 37(3), 645-660. https://doi.org/10.1016/j.worlddev.2008.08.008

[74] Parra-Peña, R. I., Ordóñez, L. A., & Acosta, C. A. (2012). Policies for bridging the urban–rural gap in Colombia. The International Policy Centre for Inclusive Growth (IPC-IG) Policy Research Brief, 27. https://ipcig.org/pub/IPCPolicyResearchBrief27.pdf

[75] Duranton, G. (2015). Growing through cities in developing countries. The World Bank Research Observer, 30(1), 39-73. https://doi.org/10.1093/wbro/lku006

[76] Imai, K. S., & Malaeb, B. (2018). Asia's rural-urban disparity in the context of growing inequality (IFAD Research Series No. 27). Rome: International Fund for Agricultural Development. https://www.ifad.org/documents/38714170/40697094/27_Research_Series_Issue_rurual_urban_disparity_in_Asia.pdf/5df11c39-fe72-4cdb-b0b2-ecc41585e9ef

[77] Ravallion, M., & Datt, G. (2002). Why has economic growth been more pro-poor in some states of India than others?. Journal of Development Economics, 68(2), 381-400. https://doi.org/10.1016/S0304-3878(02)00018-4

[78] Fan, S., & Chan□Kang, C. (2008). Regional road development, rural and urban poverty: Evidence from China. Transport Policy, 15(5), 305-314. https://doi.org/10.1016/j.tranpol.2008.12.012

[79] Gibson, J., & Olivia, S. (2010). The effect of infrastructure access and quality on non-farm enterprises in rural Indonesia. World Development, 38(5), 717-726. https://doi.org/10.1016/j.worlddev.2009.11.010

[80] Binswanger-Mkhize, H. P., & Savastano, S. (2017). Agricultural intensification: The status in six African countries. Food Policy, 67, 26-40. https://doi.org/10.1016/j.foodpol.2016.09.021

[81] Alston, J. M., & Pardey, P. G. (2014). Agriculture in the global economy. Journal of Economic Perspectives, 28(1), 121-46. https://doi.org/10.1257/jep.28.1.121

[82] Laborde, D., & Martin, W. (2018). Agricultural trade: What matters in the Doha Round?. Annual Review of Resource Economics, 10, 297-317. https://doi.org/10.1146/annurev-resource-100517-022901

[83] Anderson, K., Rausser, G., & Swinnen, J. (2013). Political economy of public policies: Insights from distortions to agricultural and food markets. Journal of Economic Literature, 51(2), 423-77. https://doi.org/10.1257/jel.51.2.423

[84] Brooks, J. (2014). Policy coherence and food security: The effects of OECD countries' agricultural policies. Food Policy, 44, 88-94. https://doi.org/10.1016/j.foodpol.2013.10.006

[85] Clapp, J. (2017). Food self-sufficiency: Making sense of it, and when it makes sense. Food Policy, 66, 88-96. https://doi.org/10.1016/j.foodpol.2016.12.001

[86] de Gorter, H., & Drabik, D. (2016). The distinct economic effects of the ethanol blend wall, RIN prices and ethanol price premium due to the RFS. AgBioForum, 19(2), 138-152. https://agbioforum.org/the-distinct-economic-effects-of-the-ethanol-blend-wall-rin-prices-and-ethanol-price-premium-due-to-the-rfs/

[87] Drabik, D., De Gorter, H., & Just, D. R. (2014). The economics of Brazil's ethanol-sugar markets, mandates, and tax exemptions. American Journal of Agricultural Economics, 97(5), 1433-1450. https://doi.org/10.1093/ajae/aau109

[88] de Gorter, H., Drabik, D., & Just, D. R. (2015). The economics of biofuel policies: Impacts on price volatility in grain and oilseed markets. New York: Palgrave Macmillan. https://doi.org/10.1057/9781137414854

[89] Swinnen, J. (2011). The right price of food. Development Policy Review, 29(6), 667-688. https://doi.org/10.1111/j.1467-7679.2011.00552.x

[90] Pinstrup-Andersen, P. (2015). Food price policy in an era of market instability: A political economy analysis. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198718574.001.0001

[91] Wise, T. A. (2020). Failing Africa's farmers: An impact assessment of the Alliance for a Green Revolution in Africa. Global Development and Environment Institute Working Paper, 20(01). https://sites.tufts.edu/gdae/files/2020/07/20-01_Wise_FailureToYield.pdf

[92] Pingali, P. L. (2012). Green revolution: Impacts, limits, and the path ahead. Proceedings of the National Academy of Sciences, 109(31), 12302-12308. https://doi.org/10.1073/pnas.0912953109

[93] Jayne, T. S., & Rashid, S. (2013). Input subsidy programs in sub□Saharan Africa: A synthesis of recent evidence. Agricultural Economics, 44(6), 547-562. https://doi.org/10.1111/agec.12073

[94] Morris, M., Kelly, V. A., Kopicki, R. J., &Byerlee, D. (2007). Fertilizer use in African agriculture: Lessons learned and good practice guidelines. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/6650

[95] Jayne, T. S., Mason, N. M., Burke, W. J., & Ariga, J. (2018). Review: Taking stock of Africa's second-generation agricultural input subsidy programs. Food Policy, 75, 1-14. https://doi.org/10.1016/j.foodpol.2018.01.003

[96] Shively, G., &Sununtnasuk, C. (2015). Agricultural diversity and child stunting in Nepal. The Journal of Development Studies, 51(8), 1078-1096. https://doi.org/10.1080/00220388.2015.1018900

[97] Sibhatu, K. T., Krishna, V. V., & Qaim, M. (2015). Production diversity and dietary diversity in smallholder farm households. Proceedings of the National Academy of Sciences, 112(34), 10657-10662. https://doi.org/10.1073/pnas.1510982112

[98] FAO. (2013). Climate-smart agriculture sourcebook. Rome: FAO. http://www.fao.org/3/i3325e/i3325e.pdf

[99] Tacoli, C. (2003). The links between urban and rural development. Environment and Urbanization, 15(1), 3-12. https://doi.org/10.1177/095624780301500111

[100] Haggblade, S., Hazell, P. B., & Reardon, T. (Eds.). (2007). Transforming the rural nonfarm economy: Opportunities and threats in the developing world. Baltimore: Johns Hopkins University Press. https://www.ifpri.org/publication/transforming-rural-nonfarm-economy-opportunities-and-threats-developing-world

[101] Douglass, M. (1998). A regional network strategy for reciprocal rural-urban linkages: An agenda for policy research with reference to Indonesia. Third World Planning Review, 20(1), 1. https://doi.org/10.3828/twpr.20.1.f2827602h503k5j6

[102] Reardon, T., Berdegué, J., & Escobar, G. (2001). Rural nonfarm employment and incomes in Latin America: Overview and policy implications. World Development, 29(3), 395-409. https://doi.org/10.1016/S0305-750X(00)00112-1

[103] Satterthwaite, D., &Tacoli, C. (2003). The urban part of rural development: The role of small and intermediate urban centres in rural and regional development and poverty reduction. London: International Institute for Environment and Development. https://pubs.iied.org/9226IIED/

[104] Tacoli, C. (2007). Bridging the divide: Rural-urban interactions and livelihood strategies. London: International Institute for Environment and Development. https://pubs.iied.org/sites/default/files/pdfs/migrate/10556IIED.pdf

[105] Fan, S., Hazell, P., & Thorat, S. (2000). Government spending, growth and poverty in rural India. American Journal of Agricultural Economics, 82(4), 1038-1051. https://doi.org/10.1111/0002-9092.00101

[106] Zhang, X., & Fan, S. (2004). Public investment and regional inequality in rural China. Agricultural Economics, 30(2), 89-100. https://doi.org/10.1111/j.1574-0862.2004.tb00179.x

[107] Berdegué, J. A., Bebbington, A., & Escobal, J. (2015). Conceptualizing spatial diversity in Latin American rural development: Structures, institutions, and coalitions. World Development, 73, 1-10. https://doi.org/10.1016/j.worlddev.2014.10.015

[108] Scott, A. J. (2002). Regional push: Towards a geography of development and growth in low-and middle-income countries. Third World Quarterly, 23(1), 137-161. https://doi.org/10.1080/01436590220108216

[109] Khandker, S. R., &Koolwal, G. B. (2010). How infrastructure and financial institutions affect rural income and poverty: Evidence from Bangladesh. The Journal of Development Studies, 46(6), 1109-1137. https://doi.org/10.1080/00220380903108330

[110] Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2010). Handbook on impact evaluation: Quantitative methods and practices. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/2693

[111] Pray, C. E., & Nagarajan, L. (2014). The transformation of the Indian agricultural input industry: Has it increased agricultural R&D?. Agricultural Economics, 45(S1), 145-156. https://doi.org/10.1111/agec.12138

[112] Rashid, M. A., Gauchan, D., & Sharma, B. (2012). Strengthening rice research and production in South Asia. SAARC Agriculture Centre, Dhaka, Bangladesh. http://www.sac.org.bd/archives/publications/Rice%20Research%20Book.pdf

[113] Hazell, P. B. (2010). The Asian Green Revolution (IFPRI Discussion Paper 00911). Washington, DC: International Food Policy Research Institute. http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/29462/filename/29463.pdf

[114] Khandker, S. R., & Samad, H. A. (2018). Bangladesh's achievement in poverty reduction: The role of microfinance revisited. In Economic and Social Development of Bangladesh (pp. 177-198). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-63838-6_11

[115] Spielman, D. J., Malik, S. J., Dorosh, P., & Ahmad, N. (2016). Agriculture and the rural economy in Pakistan: Issues, outlooks, and policy priorities. Philadelphia: University of Pennsylvania Press. https://doi.org/10.9783/9780812294217

[116] World Bank. (2021). World Development Indicators. Washington, DC: World Bank. https://databank.worldbank.org/source/world-development-indicators

[117] Bangladesh Bureau of Statistics. (2019). Poverty and extreme poverty rate estimation using Household Income and Expenditure Survey (HIES) 2016 and 2018 data. Dhaka: Bangladesh Bureau of Statistics. http://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/5695ab85_1403_483a_afb4_26dfd767df18/2019-12-17-16-30-706562d328e08e6486d53980c328a55e.pdf

[118] Banerjee, A., Karlan, D., & Zinman, J. (2015). Six randomized evaluations of microcredit: Introduction and further steps. American Economic Journal: Applied Economics, 7(1), 1-21. https://doi.org/10.1257/app.20140287

[119] Duvendack, M., & Mader, P. (2020). Impact of financial inclusion in low□and middle□income countries: A systematic review of reviews. Journal of Economic Surveys, 34(3), 594-629. https://doi.org/10.1111/joes.12367

[120] Islam, A., Maitra, C., Pakrashi, D., & Smyth, R. (2016). Microcredit programme participation and household food security in rural Bangladesh. Journal of Agricultural Economics, 67(2), 448-470. https://doi.org/10.1111/1477-9552.12151

[121] Banerjee, A. V., & Duflo, E. (2011). Poor economics: A radical rethinking of the way to fight global poverty. Public Affairs.

[122] Ton, G., Vellema, W., Desiere, S., Weituschat, S., &D'Haese, M. (2018). Contract farming for improving smallholder incomes: What can we learn from effectiveness studies?. World Development, 104, 46-64. https://doi.org/10.1016/j.worlddev.2017.11.015

[123] Gehrke, E., & Grimm, M. (2018). Do cows have negative returns? The evidence revisited. Economic Development and Cultural Change, 66(4), 673-707. https://doi.org/10.1086/697414

[124] Khera, R. (Ed.). (2011). The battle for employment guarantee. Oxford University Press.

[125] Narayanan, S. (2020). The continuing relevance of MGNREGA. The India Forum. https://www.theindiaforum.in/article/continuing-relevance-mgnrega

[126] Ravallion, M. (2019). Guaranteed employment or guaranteed income?. World Development, 115, 209-221. https://doi.org/10.1016/j.worlddev.2018.11.013

[127] Muralidharan, K., Niehaus, P., &Sukhtankar, S. (2018). General equilibrium effects of (improving) public employment programs: Experimental evidence from India (NBER Working Paper No. w23838). National Bureau of Economic Research. https://doi.org/10.3386/w23838

[128] Narayanan, R., Dhorajiwala, S., & Golani, R. (2019). Analysis of payment delays and delay compensation in MGNREGA: Findings across ten states for financial year 2016–2017. The Indian Journal of Labour Economics, 62(1), 113-133. https://doi.org/10.1007/s41027-019-00164-x

[129] Narayanan, S., Das, U., Liu, Y., & Barrett, C. B. (2017). The "discouraged worker effect" in public works programs: Evidence from the MGNREGA in India. World Development, 100, 31-44. https://doi.org/10.1016/j.worlddev.2017.07.024

[130] Misra, K. (2019). Does historical land inequality attenuate the positive impact of India's employment guarantee program?. World Development, 124, 104662. https://doi.org/10.1016/j.worlddev.2019.104662

[131] Sukhtankar, S. (2017). India's National Rural Employment Guarantee Scheme: What do we really know about the world's largest workfare program?. In India Policy Forum (Vol. 13, pp. 231-286). National Council of Applied Economic Research. https://www.ncaer.org/IPF2017/IPF-Vol-2016-17-Papers/Sukhtankar-231-286.pdf

[132] Liu, Y., & Barrett, C. B. (2013). Heterogeneous pro-poor targeting in the National Rural Employment Guarantee Scheme. Economic and Political Weekly, 46-53. https://www.jstor.org/stable/23391253

[133] Bhattacharya, S., Falcao, V. L., & Puri, R. (2018). The public distribution system in India: Policy evolution and Program delivery trends. In The 1.5 Billion People Question: Food, Vouchers, or Cash Transfers? (pp. 43-105). Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-1087-9_ch2

[134] Rahman, A. (2014). Revival of rural public distribution system: Expansion and outreach. Economic and Political Weekly, 49(20), 62-68. https://www.jstor.org/stable/24479603

[135] Kishore, A., & Chakrabarti, S. (2015). Is more inclusive more effective? The 'New Style' public distribution system in India. Food Policy, 55, 117-130. https://doi.org/10.1016/j.foodpol.2015.06.006

[136] Khera, R. (2011). India's public distribution system: Utilisation and impact. Journal of Development Studies, 47(7), 1038-1060. https://doi.org/10.1080/00220388.2010.506917

[137] Drèze, J., Khera, R., & Pudussery, J. (2015). Food security. Economic and Political Weekly, 50(34), 45-52. https://www.jstor.org/stable/24482302

[138] Fan, S., Gulati, A., & Thorat, S. (2008). Investment, subsidies, and pro□poor growth in rural India. Agricultural Economics, 39(2), 163-170. https://doi.org/10.1111/j.1574-0862.2008.00328.x

[139] Gulati, A., Sharma, P., & Samantara, A. (2018). Agriculture extension system in India: Review of current status, trends and the way forward. Indian Council for Research on International Economic Relations Discussion Paper No. 367.

https://icrier.org/pdf/Agriculture-Extension-System-in-India-Review-of-Current-Status-Trends-and-the-Way-Forward.pdf

[140] Zhang, X., Yang, J., & Wang, S. (2011). China has reached the Lewis turning point. China Economic Review, 22(4), 542-554. https://doi.org/10.1016/j.chieco.2011.07.002

[141] Cai, F., & Wang, M. (2010). Growth and structural changes in employment in transition China. Journal of Comparative Economics, 38(1), 71-81. https://doi.org/10.1016/j.jce.2009.10.006

[142] Yang, D. T. (1999). Urban-biased policies and rising income inequality in China. American Economic Review, 89(2), 306-310. https://doi.org/10.1257/aer.89.2.306

[143] Haggblade, S., Hazell, P., & Reardon, T. (2010). The rural non-farm economy: Prospects for growth and poverty reduction. World Development, 38(10), 1429-1441. https://doi.org/10.1016/j.worlddev.2009.06.008

[144] Mukherjee, A., & Zhang, X. (2007). Rural industrialization in China and India: Role of policies and institutions. World Development, 35(10), 1621-1634. https://doi.org/10.1016/j.worlddev.2006.11.008

[145] Ravallion, M., & Chen, S. (2007). China's (uneven) progress against poverty. Journal of Development Economics, 82(1), 1-42. https://doi.org/10.1016/j.jdeveco.2005.07.003

[146] Lin, J. Y. (1992). Rural reforms and agricultural growth in China. The American Economic Review, 82(1), 34-51. https://www.jstor.org/stable/2117601

[147] Ravallion, M. (2009). A comparative perspective on poverty reduction in Brazil, China, and India (Policy Research Working Paper No. 5080). Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/4289

[148] National Bureau of Statistics of China. (2020). China Statistical Yearbook 2020. Beijing: China Statistics Press. http://www.stats.gov.cn/tjsj/ndsj/2020/indexeh.htm

[149] Mellor, J. W. (2017). Agricultural development and economic transformation: Promoting growth with poverty reduction. Springer. https://doi.org/10.1007/978-3-319-65259-7

[150] Diao, X., Hazell, P., & Thurlow, J. (2010). The role of agriculture in African development. World Development, 38(10), 1375-1383. https://doi.org/10.1016/j.worlddev.2009.06.011

[151] Christiaensen, L., Demery, L., & Kuhl, J. (2011). The (evolving) role of agriculture in poverty reduction—An empirical perspective. Journal of Development Economics, 96(2), 239-254. https://doi.org/10.1016/j.jdeveco.2010.10.006

[152] Ravallion, M., & Datt, G. (2002). Why has economic growth been more pro-poor in some states of India than others?. Journal of Development Economics, 68(2), 381-400. https://doi.org/10.1016/S0304-3878(02)00018-4

[153] Fan, S., Gulati, A., & Thorat, S. (2008). Investment, subsidies, and pro□poor growth in rural India. Agricultural Economics, 39(2), 163-170. https://doi.org/10.1111/j.1574-0862.2008.00328.x

[154] Agrawal, T., & Agrawal, A. (2017). Vocational education and training in India: A labour market perspective. Journal of Vocational Education & Training, 69(2), 246-265. https://doi.org/10.1080/13636820.2017.1303785

[155] Dhingra, T., & Ghatak, M. (2021). How has Covid-19 affected India's economy?. Economics Observatory. https://www.economicsobservatory.com/how-has-covid-19-affected-indias-economy

[156] Narayanan, S. (2021). How India can strengthen its social safety net post Covid-19. Hindustan Times. https://www.hindustantimes.com/opinion/how-india-can-strengthen-its-social-safety-net-post-covid19-101614183602923.html

[157] Drèze, J., &Somanchi, A. (2021). The Covid-19 crisis and people's right to food (Working Paper No. 30). Centre for Sustainable Employment, Azim Premji University. https://cse.azimpremjiuniversity.edu.in/wp-content/uploads/2021/06/Dreze_Somanchi_Covid19_Right_to_Food_June21.pdf

[158] Verick, S. (2021). Labour market policies for a human-centred recovery from COVID-19 in India (ILO Asia-Pacific Working Paper Series). International Labour Organization. http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new_delhi/documents/publication/wcms_814937.pdf

[159] Gupta, A., Malani, A., & Woda, B. (2021). Inequality in India declined during COVID. University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2021-101. http://dx.doi.org/10.2139/ssrn.3915046

[160] Gardner, B., & Lerman, Z. (2006). Agricultural cooperative enterprise in the transition from socialist collective farming. Journal of Rural Cooperation, 34(886-2016-64647), 1-18. https://doi.org/10.22004/ag.econ.59692