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Agricultural Extension among the Farming Community in Sri Lanka

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Abstract

Conventional agricultural extension approaches are insufficient to assist farmers in dealing with increasingly complex challenges in the agriculture sector. As part of the process of community development, this study aims to identify challenges among farmers and provide support for developing high-quality technologies adoption mechanisms through the community development process. This paper presents the help of conceptual applications for developing an innovative agricultural extension mechanism in Sri Lanka. It is mainly based on the following objectives; (1) to identify the structural performance of agricultural extension systems, (2) to identify achievements and constraints to improve the innovation-friendly extension process, and (3) to provide suggestions on the extension process. Preliminary results from previous studies show that the novel process influences adaptive group thinking rapidly. The integrated approach provides lessons for development and food security, and sustainability improvement. The lessons learned from this initiative can be applied to efficient participatory extension and training models. Long-term sustainable development of agricultural communities necessitates the establishment of new innovative development strategies based on a comprehensive analysis and evaluation of development resources while considering the characteristics of socio-demographic territories and strong policy development to fill gaps and expose critical information to policymakers.

Keywords: Technology Dissemination, Agricultural Extension System, Poverty Alleviation, Farmers, Sustainable Agriculture

Introduction

Sri Lanka is a small island with a rich agro-based- cultural heritage that extends over a recorded history of 2600 years. Rural peoples represent 75 % of the total population in Sri Lanka, and their main occupation is agriculture, as it is a sole income generation in their life. Farmers accounted for the vast majority of the rural population in Sri Lanka and had a

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prosperous and peaceful civilisation. The Sri Lankan way of life was village-based, self-sufficient, integrated, friendly, and environmentally sustainable. However, it has changed dramatically in recent decades (Daskon, 2015; Jayaweera, 1999; Weerasekara et al., 2021). Rural communities now expose to the global economy through an open-economic structure. At the same time, most people are no longer involved in agricultural activities for a variety of reasons such as lack of land availability, lack of opportunities to use modern technology, lack of productivity per land, lack of resource availability (water, equipment, fertiliser, chemicals, and so on), lack of reasonable price for their products, lack of proper marketing strategies, high postharvest losses, lack of opportunities to produce value-added products, lack of attractive for youth, and so on. These are the key issues in developing agriculture among Sri Lanka's rural communities to alleviate poverty and promote long-term community development (FAO, 2018; Meyers et al., 2012).

The overall number of working people in Sri Lanka is estimated to be about 8.0 million in the first quarter of 2020. Agriculture accounts for around 26.5 % of the total. The service sector has the highest employment share, which is valid for both men and women. In contrast, the agriculture sector has the lowest employment (26.5 %) share. The agriculture sector employs 27.7% of employed females, compared to 25.9% of employed males. In 2020, the number of unemployed individual is expected to be 483,172. For the first quarter of 2020, the unemployment rate is 5.7% (Statistics Sri Lanka, 2020). Additionally, as a result, the poverty rate, calculated using per-capita income (PCI), shows that approximately 11% of the population is poor (Jayasinghe et al., 2016). Therefore, Jayasinghe et al (2016) discuss that it focuses on the impact of income on food consumption economies of scale and the consequences of this phenomenon for poverty estimates in Sri Lanka like as a developing country.

Methodology

This article mainly focuses onto identify the agricultural Extension System in Sri Lanka that is working toward Sustainable Agricultural Development and to propose suggestions for extension system development. This is a review study of secondary sources related to the themes highlighted in the article. Researchers used Google Scholars, Science Direct, and Scopus to find the most relevant academic publications primarily centred on Sri Lanka to investigate the themes of this article. Because there is limited access to other databases and the study is an exploratory study, the researchers primarily focus on the aforementioned internet search engine. As a result, the usage of the databases provided is regarded sufficient.

As a result of this search, various journal articles, books, book chapters, conference papers, and other types of study were discovered, and materials were critically read to decide which secondary sources could be suitable to the themes of the current review article. The previous research article search is carried out using keywords and principles from various disciplines of academia that deal with the relationship between technology adoption and sustainable agriculture development with highlighting their opportunities and challenges. The following keywords were considered to cover the main themes of current review discussion as; "technology dissemination", "agricultural extension system", "poverty alleviation", "farmer" and "sustainable agriculture". The study reviewed all collected scientific research articles based on proposed themes.

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Agriculture sector in Sri Lanka

However, agriculture contributes significantly to the national economic growth and development. It is linked to other sectors of the economy both directly and indirectly. Its main goal is to promote economic development in Sri Lanka at the micro, mezzo, and macro levels (Wanigasundera, 2015). Agriculture, along with its related sectors, is the most important source of employment in the country. Therefore, Sri Lanka is an agriculture-based country. Most people work in the agricultural industry to make a better living. As a result, smart agricultural activities should be introduced to the rural community to encourage them to work in the farming sector, especially for the youth generation (Goel et al., 2021).

In this scenario, extension workers play a critical role in implementing a rural development strategy through their extension activities. It is vital for reducing poverty and improving people's living conditions to achieve long-term sustainability (Athukorala, 2017; Kazbekov & Qureshi, 2011; Wanigasundera, 2015). Based on this situation, Wanigasundera (2015) further elaborate that poverty still exists in many rural farming communities in Sri Lanka. Extension and advisory services (EAS) have the potential to make significantly minimise poverty. Indeed, technology adoption is a critical element in the extension system to understanding how communities achieve a sustainable living status based on a Sustainable Livelihood Approach (Brocklesby & Fisher, 2003). Bendul (2015) also highlights that for decades, technology transfer has been understood as a process of poverty alleviation.

Sustainable Agriculture through Livelihood Approach (SATLA)

Sustainable agriculture is a process that includes a productive, competitive, and effective method of producing sustainable agricultural products while also preserving and enhancing the natural environment and social-economic conditions of the rural community (Braga, 2015; Osumba et al., 2021). The many definitions can be identified on Sustainable development, as development that meets present needs without affecting the ability of future generations to provide their needs for themselves. The environment, society, and economics were introduced as three interconnected, mutually inclusive themes or domains in the concept of sustainable development (Omar et al., 2011). According to the FAO (Food and Agriculture Organization of the United Nations - 1995), sustainable agriculture development is described as "the management and conservation of the natural resource base, as well as the direction of technical and institutional progress in order to assure the achievement and continuing fulfilment of human needs for current and future generations" (Uziak & Lorencowicz, 2017). Meanwhile, Jayaratne & Acker (2003) discuss challenges and opportunities to promoting sustainable agricultural practice through the agricultural extension process in Sri Lanka as a positive manner of dealing with the problems that come with conventional agriculture.

Many previous studies have examined the strategies and usefulness of agricultural intervention extension in the establishment of sustainable agriculture among the rural community (Bendul et al., 2015; Braga, 2015; Jayaratne & Acker, 2003; Omar et al., 2011; Tonda & Susan, 2015). Moreover, Omar et al (2011), Braga (2015); Uziak & Lorencowicz (2017) discusses that the Sustainable Agriculture Strategy Framework (SASF) established sustainable agriculture concepts and practices based on three key pillars (Table 1) such as; (1) Economy; (2) Social; and (3) Environment.

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Technological development has been the primary driver of rising agricultural production and enhancing agricultural productivity among the agricultural community in Sri Lanka. The aim of identifying and implementing technologies in the past was to improve productivity, production, and farm income. Agriculture, trade, research and development, education, training, and advice policies have had a significant impact on the choice of technology, the level of agricultural production, and agricultural practices for several decades. Sustainable agriculture technologies cover the entire range of agricultural systems. The potential is to be locally sustainable from intensive traditional farming to modern farming (Ibrahim et al., 2017). In practice, farmers must use suitable technology and management methods while operating within the appropriate policy framework and agro-ecological setting. Sustainable development cannot be defined by a single method, and there is no single pathway to achieving sustainable life. However, it's important to understand that the majority of sustainable farming systems, including extensive systems, require a high degree of farmer knowledge, skill, and management (Figure 01) (Braga, 2015). In fact, technology dissemination is critical in this context in order to achieve sustainable development in the agriculture sector in Sri Lanka by balancing all pillars.

Table 1
The Sustainable Agriculture Strategy Framework

Main pillars	Main elements
Economy	At the local farm level, agriculture should ensure the economic viability of farming systems. A sufficient net farm income is needed to maintain a reasonable standard of living for farmers, to fund the annual investments required to increase the productivity of land, water, and other resources over time like; cost-effective cultivation and processing, increased production, Integrated Pest Management (IPM), pesticides stored safely & securely, effective market mechanisms, adequately available resources, sufficient infrastructure facilities, access to the international market, and so on.
Social (People)	The well-being of farmers and rural communities is inextricably linked to agricultural performance and profitability. Poor social structures and poverty will make it difficult for farmers to produce their inputs and put their skills to use. Empowering and growing their self-reliance by creating attractive farming livelihoods and prosperous, adaptable rural communities are the core value here and focusing on developing social relations among farmers and rural communities, establish strong rural social infrastructure facilities, and ensuring generating entrepreneurship opportunities.
Environment	Sustainable agriculture favours the use of renewable inputs and has as its overarching goal the preservation of environmental resources. The following factors are some of the more general considerations: maintain soil fertility/soil loss, integrated water usage with other inputs, protect biodiversity, and effectively use re-renewable energy sources and waste management to keep a clean environment for the community.

Source: Omar et al. (2011), Braga (2015), and Uziak & Lorencowicz (2017)

Technology information has increased productivity (Fischer & Qaim, 2012), environmental friendly (Dayaratne & Gunawardana, 2015), accelerated economic development (Muzari et

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al., 2012), allowing for the exchange of knowledge and information (Hailu et al., 2014), and improved access to basic services (Palmer, 2007). Various agricultural technologies are promoted for increasing yields and incomes, saving time, improving food security, and empowering farming communities (Theis et al., 2018). Therefore, the dissemination of technological information is the main key actor in the agricultural extension system in Sri Lanka. A large proportion of these poor farmers' productivity, domestic food security, and profits may be significantly increased through the use of systematic extension strategies (Friis-Hansen Esbern, 2005).

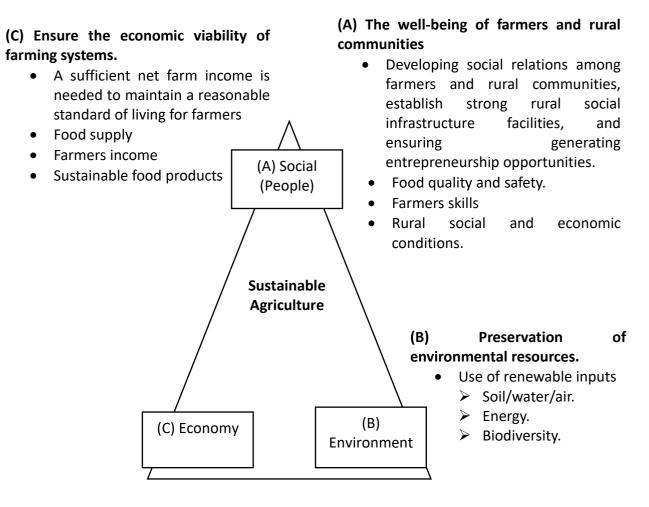


Figure 1: The three main pillars of sustainable agriculture as developed by the Sustainable Agriculture Initiative framework.

Source: Braga (2015)

Agriculture Extension

Extension programs mainly consist of disseminating research-based technical know-how, guidance, and hands-on training. The extension defines as designed to deliver on formal, nonformal, and collaborative ways the required and demand-based knowledge and skills for rural men, women, and youth, with the aim of improving farming capacity to improve productivity and the quality of life (Kazbekov & Qureshi, 2011; Waddington et al., 2014). Meanwhile, Mahaliyanaarachchi & Bandara (2010) discusses that Agricultural Extension is a non-formal educational method that takes place over time and aims to improve the living standards of farmers and their families by increasing productivity/ profitability of their farming operations.

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To achieve the above goals, this activity expects farmers to develop their knowledge, skills, and attitudes in agricultural technology, farming practices, and agricultural marketing (Mahaliyanaarachchi & Bandara, 2010).

Extension, community development, and consultancy programs are critical in getting new knowledge and technology to all key actors in the agriculture industry, such as; farmers, collectors, transporters, primary and secondary processors, marketers, and consumers. Governments and international development institutions have spent a lot of effort and money planning, implementing, maintaining, and monitoring agricultural extension programs around the world, including Sri Lanka (Madan & Maredia, 2021; Worl Bank, 2007).

Many research institutes focus on developing useful technologies for the increase of production, whereas technology dissemination programmes (extension) focus on implementing user acceptance technologies among relevant stakeholders. For the work in field-focused methods, applied research institutes need to provide strong extension services, and the extension services need to retain strong applied agricultural research institutions in order to serve the agricultural communities effectively (Qamar, 2005). Furthermore, numerous extension models, strategies, and programs have been funded and introduced by national governments and international development institutions over the last few decades. Many of these projects have been fruitful and have had a significant effect on agricultural productivity and livelihood opportunities to enhance their living status towards sustainable development among the agricultural community in Sri Lanka (Madan & Maredia, 2021).

Evaluate the Structure and Performance at the National and Grassroots Levels of Agricultural Extension Systems

Key Players in Agricultural Extension Services

There is a diverse range of agricultural extension service providers in Sri Lanka, including the public sector (represented by agriculture ministry/departments, research institutes, universities), non-profit organisations (e.g., INGOs, Local NGOs, commodity foundations), international research institutions, farmer cooperatives and the private sector (privet universities, micro-credit firms, marketing firms, processing firms, trade associations) (Kazbekov & Qureshi, 2011; Omar et al., 2011). Furthermore, based on observations from the FAO and other researchers, Kazbekov & Qureshi (2011) highlight that around the world, the Ministry of Agriculture or Department of Agriculture at the national, state, provincial, and grass-root levels is responsible for approximately 81 % of extension activities. Globally, approximately 600,000 extension workers are involved in the provision of agricultural information to actors in the agriculture sector, with public extension services performing 95 % of the work. It is common in the extension service in Sri Lanka, too, based on the researcher's experience and closed working skills.

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Table 2
The Structure and Performance of Agricultural Extension Systems

Key sector	Key	Responsible	Interventions
	institutions	area	
Government	Department of Agriculture- DOA	Food crop- field crops, fruits, vegetables, and other crops. Address micro, mezzo, and national level.	All kinds of agricultural activities, especially pre- harvesting process via agro- enterprise development and information service, research- extension- farmer linkage programs, cyber extension programs.
	Department of Export Agriculture- DOEA	Export- oriented crops; spices. Address to micro, mezzo, and national level.	The relevant agricultural practices from land preparation to marketing through their extension system
	National Institute of Post-Harvest Management- NIPHM	All agricultural crops. Address to micro, mezzo, and national level.	The best postharvest management practices from harvesting to consuming. Introduce novel technologies
	Mahaweli Authority of Sri Lanka Mahaweli	All agricultural crops which crops grow in the Mahaweli area. Mainly focus on the Mahaweli area.	Facilitate the different types of extension programs to their farmers, from land preparation to marketing
	HADABIMA Authority (Haritha Danaw Bim Sanwardena Madyama Adikariya)	Mainly focus on soil conservation and land management.	Facilitate the activities to transform non-productive land into production units with the participation of poor farmers while minimising soil erosion and soil degradation.
Plantations sector	Tea Small Holdings Development Authority- TSHDA	Tea- enhances productivity, especially manage manufactures	The production-oriented approach based on the commodity is concerned only with the production of tea.

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	Tea Research Institute of Sri Lanka- TRI	Tea research and development activities.	Development and dissemination technologies on tea growing and processing technologies to the industry, especially research findings.
	Rubber Research Institute	Rubber- research and development activities.	Development and dissemination of rubber growing and processing technologies to the industry, especially research findings
	Coconut Research Institute- CRI	Coconut research and development activities.	Development and dissemination of coconut growing and processing technologies to the industry, especially research findings
	The Coconut Cultivation Board- CCB	Coconut- enhances productivity, especially manage manufactures	The production-oriented approach based on the commodity is concerned only with the production of Coconut.
Sugarcane sector	Sugarcane Research Institute- SRI	Sugarcane research and development activities.	The majority of technology transfer activities are carried out in partnership with businesses.
Extension services by the universities	All government universities- 12 faculty of agriculture	Knowledge and skill sharing activities under vast disciplining area.	Farmers and school children receive ad-hoc training programmes for the surrounding farming communities from agriculture and allied faculty in the state universities.
The Non-government sector extension services	Involvement of private sector (Hayleys Agriculture Holdings Ltd, Cargills, Keells Food Products, etc)	Agriculture and plantation sector	Farm Advisory Services- crop advisory and farmer services, as well as input supplies and output procurement.
	NGOs	All agricultural crops which grow in project areas.	Farm Advisory Services- crop advisory and farmer services, as well as input supplies and output procurement.

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Agricultural cooperatives and farmer organisations

Agriculture and plantation sector.

A major contribution for small farmers, allowing them to face the risks and uncertainties of agricultural production

Source: Wanigasundera (2015)

Identify Achievements and Constraints to Improve the Innovation-Friendly Extension Efficiency

Extension programs in the agricultural sector are primarily responsible for the dissemination of knowledge, skills, and attitude change towards positively. As well, it also provides direct or indirect contributions to community development efforts aimed at improving living conditions. In Sri Lanka, extension services are primarily offered free of charge by public institutions to encourage novel technologies developed at research centres in order to increase farm productivity (Wanigasundera, 2015). Agricultural extension services in Sri Lankan's food supply chains (plantation crops, export-oriented crops, fruits, vegetables, and OFC) have developed over the years. Various extension techniques, models, and programs have been used in this field, including traditional technology transfer, training and visits, integrated agricultural extension, and block demonstration, as well as the implementation of information and communication technology (ICT) interventions in the recent past (Table 3).

Table 3
Main Agricultural Extension Services in Sri Lanka; Technologies and Services

Model/ Approach

Intervention to Enhance Community Life

The Training and Visit (T&V) strategy

Systematic training programs for village extension staff, including daily visits to family farms in villages, were established and implemented under the T&V model. It is a top-down approach. The T&V concept promoted relevant technology for farmers in the village in order to offer the latest advanced technologies. Each extension program has a single line of command and a well-defined geographical boundary of service. The extension agents learned and delivered how to provide farmers with skills and knowledge to assist them in adopting best crop management practices, assessing production constraints, and providing guidance. As well, make ensure deliver the feedbacks of farmers to the research institute for further action.

The Farmer Field School (FFS) approach of agricultural extension It's a group-oriented philosophy based on adult experiential learning concepts. Farmer Field School (FFS) technique is a bottom-up approach focused on the philosophy of "farmer first." Farmers met regularly to create experiments, learn, and share their skills and knowledge with other farmers in a village as part of the FFS model, which was an intense, season-long program focusing on experiential learning. In rural farming communities, it was a driving force in community involvement, rural participation, information sharing, skill development, and technology adoption i.e., IPM (Integrated Pest Management, IFM: Integrated Fertilizer Management).

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NGO-Operated Extension Programs

It helps them easily distribute information, technologies, equipment and machinery, and other related resources. Extension and advisory services provided by NGOs have proven to be successful. This model believes that in order to provide extension and outreach programs, NGOs and government agencies should collaborate.

Private Extension Services & Crop Consultants These services are provided by private extension specialists, businesses, consultancies, and product suppliers which services are dependent on a fee or free. High yield planting material, modern equipment, and machinery, ICT based information sharing mechanisms are the leading factors in this model.

e-Extension: ICT-Based extension

In the development of agricultural extension and consultation services, ICTs play a key role. Farmers to farmers, farmers to extension specialists and scientists, and farmers to input suppliers and markets have all advantages from the use of ICT platforms. ICT is a booming sector in agriculture extension service to deliver effective service. Electronic and social media, cell phones, e-mail, video and audio, and other information technology are examples of ICT.

Self-Help Groups: Community-Based Organisations/Farmers Based Cooperatives A Self-Help Group (SHG) is a small group of people who get together to help one another on a community level for common benefit. Farmers' groups, savings groups, and women's groups are prominent examples of SHGs, and each has its own set of goals and objectives. Bottom to top and participatory community development approaches use to learn towards empowerment themselves. Most governments and other institutions link their programs to these communities.

Farmer Business School Model of Extension (FBS) The FAO has created a new model of agricultural extension services called the Farmer Business School (FBS) from lesion learning of the FFSs model. The FBS model facilitates farmers in developing their farm business capacities and knowledge, as well as decision-making and entrepreneurship skills. This model is for smallholder and marginal farmers who want to operate their farms professionally and profitably.

Source: (Kaur & Kaur, 2018; Wanigasundera, 2015)

Opportunities to Deliver Better Service in Order to Ensure Sustainable Agricultural Development among the Agricultural Community

The significance of technological dissemination in economic development has long been established (Tonda & Susan, 2015). Actually, different sources of technology may account for domestic productivity growth, according to a review of empirical studies (Alawattage et al., 2019). In Sri Lanka's agriculture sector, the following opportunities are common.

- **Economic development:** In society, the spread of suitable technology is a strong key driver of economic growth, leading to increased investment, employment, knowledge, capacities, skills, productive capacity, and transactional effectiveness.
- **New marketing Access:** Agricultural technologies enable producers to produce products and services that meet social and economic needs while also allowing them to enter markets with specific customer demands.

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- **Capital investment:** Agricultural technology adoption usually results in both investment and novel properties, such as improved machinery and equipment, assisting countries in moving up the value chain in their agro-industry sectors, and attracting foreign direct investment (an export market for value-added products).
- Resource productivity: Prices are expected to rise in the future as natural resource scarcity grows, leading to increased demand and lower supply. Agricultural technologies allow communities to increase their resource efficiency, which means that more economic value can be extracted with less energy and materials supply, resulting in real cost savings for the economy and lower environmental impacts per unit of production generated.
- **Environmental improvement:** With ecosystems subject to increasing economic development pressure, the adoption of environmental technology allows societies to reduce their impact on their environment, reduce the risks and costs of degradation and collapse of their ecosystems, and adapt to environmental adjustment.
- Collaborative partnerships: It is just as necessary to build social capital as it is to develop economic or technical capital. Technology creation and dissemination usually take a multi-stakeholder approach that aims to increase confidence and credibility in society while also achieving more long-term effects through a wider range of markets, communities, and even nations.
- **Poverty alleviation:** Many technological innovations also bring important social benefits, including improved access to income generation, improved livelihood, reduced poverty, and lower vulnerability as a result of cleaner technologies replacing low-quality products and processes.

The Challenges in Agriculture Extension in Sri Lanka to Deliver Effective Technologies and Services among the Agricultural Community

Agricultural extension is significant for agricultural development and improving the living conditions of the agricultural community, but it has yet to be fully utilised in Sri Lanka's agricultural knowledge and information system. Wanigasundera (2015) argue that generally, extension and advisory service face new challenges continuously, extension and advisory services seem to lose their effectiveness due to affecting many factors.

The agricultural extension in Sri Lanka faces a series of challenges today as agriculture is quickly commercialised. Agriculture isn't just agriculture anymore. It's an enterprise. Today, agriculture includes not only production but also harvesting, collecting, processing, marketing, branding and promoting markets, ICT, etc. New, improved technology, a major factor in high productivity, is inevitable in commercialised farming. Thus, all these activities need to manage well through exposure to a novel technology. As a result, all of these operations must be well-managed by exposure to new technologies (Mahaliyanaarachchi & Bandara, 2010). As a result, these elements must be identified in order to overcome challenges.

As discussed above, agricultural extension in Sri Lanka faces significant challenges such as; (a) the lack of a comprehensive national agricultural extension policy, (b) insufficient recognition of agricultural extension service at all levels (micro, mezzo, and macro), (c) weak linkages between research, extension, and other agro-support services, (d) a shortage of qualified extension professionals, (e) inadequate extension research, (f) inadequate capacity building

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opportunities for extension workers, (i) week handling of extension service activities, (j) insufficient funding and other resources.

Suggestions for Strengthening the Extension Process and Developing Policies

Finding a single blueprint recommendation is really challenging that can be applied to successful agricultural extension programs in order to achieve community-wide sustainable growth (Kazbekov & Qureshi, 2011). Each country has chosen an innovative extension system to develop the agriculture sector that it will create. As a result, this section tries to generalise and propose some general principles, but only after close consideration of local requirements and a comprehensive review of existing extension systems.

- Diagnosis of the opportunities and limitations of farmers' socio-economic and agroecological conditions.
- Researchers need to receive feedback on farmers' reactions to new technologies in order to fine-tune the research agenda for the future.
- Development of linkages with researchers, government planners, NGOs, farmers' organisations, banks and the private commercial sector. In rural remote areas, extension agents have taken on a number of these functions directly.
- At the farm stage, establish and maintain a good monitoring and evaluation mechanism for the extension method.
- New perspectives on public funding and private actors, as well as new regulatory frameworks, are needed.
- Members of the community should create voluntary groups in partnership with extension staff in their area to address all of their needs in a cooperative and comprehensive manner (practice top to bottom, bottom to top, and participatory approaches).
- Enhancing the ability of all stakeholders in the community development initiative to use ICT would make operations easier and allow for the achievement of goals in the shortest time period.

Thus, the government focus on extension service programs would benefit the technology dissemination in Sri Lanka. As a result, increased investment in agricultural research and development that enables extension services to continue can help to ensure the long-term sustainability of technological innovations that stimulate economic development among the community.

Conclusion

In conclusion, it is clear that rural development is not an event take-alone work event. A well-structured community-centered, organized, and coordinated work is required, honestly, to comply with familiar with extension and rural community development approaches in the world. The extension work must start from top to bottom, negotiations with bottom to top, and participatory approach by sharing responsibility among the community for the operation. If members of the community are well-educated and well-known, they can function in a satisfied and productive manner. The role of government institutes in handling rural community development via well-managed extension mechanisms is of vital importance, and the community needs to be supported with reliable, technical, and realistic capacity-building exercises. Clearly, it can conclude that collective effort, with the "efficient" involvement of the government and in a rural area of Sri Lanka, the community will make a significant difference in the field of poverty alleviation.

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A successful project is only practicable if the organizational strategy and the delivery process of the programs are built and operated. The past experience of rural extension programs gives us an insight into what needs to be done and what needs not to be done; poverty affected directly or indirectly the role and responsibilities of every rural person. The implementation of the extension approaches may contribute to minimizing or avoiding the effects of poverty, or any incidents that affect the overall structure of a rural society or human life. Therefore, an extension approach can be highly recommended to implement a rural community development situation in a community-centered with the full support of the community concerned.

References

- Alawattage, C., Graham, C., Wickramasinghe, D., Tanima, F. A., Brown, J., Dillard, J., Alawattage, C., Graham, C., & Wickramasinghe, D. (2019). Microaccountability and biopolitics: Microfinance in a Sri Lankan village. *Accounting, Organizations and Society*, 72, 38–60. https://doi.org/10.1016/j.aos.2018.05.008
- Athukorala, W. (2017). Identifying the role of agricultural extension services in improving technical efficiency in the paddy farming sector in Sri Lanka. *Sri Lanka Journal of Economic Research*, *5*(1), 63–77. https://doi.org/10.4038/sljer.v5i1.58
- Bendul, J., Rosca, T., & Hoffmann, T. (2015). Sustainable technology transfer for poverty alleviation: a unified framework for challenges and transdisciplinary solution approaches. *Sustainable Development and Planning VII*, 1(May), 823–834. https://doi.org/10.2495/sdp150691
- Braga, F. (2015). The sustainable agriculture initiative platform: The first 10 years. *Journal on Chain and Network Science*, *15*(1), 27–38. https://doi.org/10.3920/JCNS2014.x015
- Brocklesby, M. A., & Fisher, E. (2003). Community development in sustainable livelihoods approaches An introduction. *Community Development Journal*, *38*(3), 185–198. https://doi.org/10.1093/cdj/38.3.185
- Daskon, C. D. (2015). Significance of cultural values in securing asset portfolios of rural communities. *Sri Lanka Journal of Social Sciences*, *38*(1), 31–50.
- Dayaratne, S. P., & Gunawardana, K. D. (2015). Carbon footprint reduction: A critical study of rubber production in small and medium scale enterprises in Sri Lanka. *Journal of Cleaner Production*, 103, 87–103. https://doi.org/10.1016/j.jclepro.2014.09.101
- FAO. (2018). Country gender assessment Of agriculture and the rural sector in sri lanka. Food and Agriculture Organization of the United, regional office for Asia and the Pacific
- Fischer, E., & Qaim, M. (2012). Gender, agricultural commercialization, and collective action in Kenya. *Food Security*, *4*(3), 441–453. https://doi.org/10.1007/s12571-012-0199-7
- Friis-Hansen Esbern. (2005). Agricultural development among poor farmers in Soroti district, Uganda: Impact assessment of agricultural technology, farmer empowerment and changes in opportunity structures. *Impact Assesment Workshop*, 1–26.
- Goel, R. K., Yadav, C. S., Vishnoi, S., & Rastogi, R. (2021). Smart agriculture Urgent need of the day in developing countries. *Sustainable Computing: Informatics and Systems*, 30(January), 100512. https://doi.org/10.1016/j.suscom.2021.100512
- Hailu, B. K., Abrha, B. K., & Weldegiorgis, K. A. (2014). Adoption and Impact of Agricultural Technologies on Farm Income: Evidence From Southern Tigray, Northern Ethiopia. *International Journal of Food and Agricultural Economics*, 2(4), 91–106. https://doi.org/10.22004/ag.econ.190816
- Ibrahim, M. B., Hassan, S., & Sanyang, D. (2017). Social Capital in Agricultural Community

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- Development: A Review. *IOSR Journal of Agriculture and Veterinary Science*, 10(07), 07–10. https://doi.org/10.9790/2380-1007010710
- Jayaratne, K. S. U., & Acker, D. G. (2003). Going Forward In Agricultural Extension: Problems and Alternatives in Diffusing Sustainable Agricultural Practices in Sri Lanka. *AIAEE 2003 Proceedings of the 19th Annual Conference, September*, 325–333. Raleigh, North Carolina, USA
- Jayasinghe, M. S., Smith, C., Chai, A., & Ratnasiri, S. (2016). The implications of income dependent equivalence scales for measuring poverty in Sri Lanka. *International Journal of Social Economics*, 43(12), 1300–1314. https://doi.org/10.1108/IJSE-03-2015-0061
- Jayaweera, S. (1999). *Women in Sri Lanka.* (Issue May). Asian Development Bank. Programs Department (West).
- Kaur, K., & Kaur, P. (2018). Agricultural Extension Approaches to Enhance the Knowledge of Farmers. *International Journal of Current Microbiology and Applied Sciences*, 7(2), 2367–2376. https://doi.org/10.20546/ijcmas.2018.702.289
- Kazbekov, J., & Qureshi, A. S. (2011). Agricultural extension in Central Asia: Existing strategies and future needs. In *IWMI Working Papers* (Vol. 145). https://doi.org/10.5337/2011.211
- Madan, S., & Maredia, K. (2021). Global Experiences in Agricultural Extension, Community Outreach & Advisory Services. Case Studies of Global Experiences in Agricultural Extension Training & Visit Model of Extension in Developing Counties. In *innovations in agricultural extension* (pp. 1–16). Michigan State University.
- Mahaliyanaarachchi, R. P., & Bandara, R. (2010). Commercialization of Agriculture and Role of Agricultural Extension. *Sabaragamuwa University Journal*, 6(1), 13–22. https://doi.org/10.4038/suslj.v6i1.1686
- Meyers, W. H., Ziolkowska, J. R., Tothova, M., & Goychuk, K. (2012). Issues Affecting the Future of Agriculture and Food Security for Europe and Central Asia. *FAO Regional Office for Europe and Central Asia*, *3*(1), 100–173.
- Muzari, W., Gatsi, W., & Muvhunzi, S. (2012). The Impacts of Technology Adoption on Smallholder Agricultural Productivity in Sub-Saharan Africa: A Review. *Journal of Sustainable Development*, 5(8), 69–77. https://doi.org/10.5539/jsd.v5n8p69
- Omar, J. A., Bakar, A. H. A., Jais, H. M., & Ibraik, F. M. (2011). A Reviewed Study of the Impact of Agricultural Extension Methods and Organizational Characteristics on Sustainable Agricultural Development. *International Journal of Engineering Science and Technology* (IJEST), 3(6), 5160–5168.
- Osumba, J. J. L., Recha, J. W., & Oroma, G. W. (2021). Transforming Agricultural Extension Service Delivery through Innovative Bottom—Up Climate-Resilient Agribusiness Farmer Field Schools. *Sustainability*, *13*(7), 1–24. https://doi.org/10.3390/su13073938
- Palmer, R. (2007). Skills for work?: From skills development to decent livelihoods in Ghana's rural informal economy. *International Journal of Educational Development*, *27*(4), 397–420. https://doi.org/10.1016/j.ijedudev.2006.10.003
- Qamar, K. . (2005). Modernizing National Agricultural Extension Systems: A practical guide for policy- makers of developing countries. Research, Extension and Training Division Sustainable Development Department, Food and Agriculture Organization of the United Nations
- Statistics Sri Lanka. (2020). *Sri Lanka Labour Force Survey 1st Quarter* (Issue 88). Sri Lanka Labour Force Statistics Quarterly Bulletin, Department of Census and Statistics, Ministry of Finance, Economy and Policy Development

Vol. 11, No. 11, 2021, E-ISSN: 2222-6990 © 2021

- Theis, S., Lefore, N., Meinzen-Dick, R., & Bryan, E. (2018). What happens after technology adoption? Gendered aspects of small-scale irrigation technologies in Ethiopia, Ghana, and Tanzania. *Agriculture and Human Values*, 35(3), 671–684. https://doi.org/10.1007/s10460-018-9862-8
- Tonda, E., & Susan, C. (2015). Technology Challenges and tools for the implementation of the water- related sustainable development goals and targets. *Water and Sustainble Development*, c, 1–18.
- Uziak, J., & Lorencowicz, E. (2017). Sustainable Agriculture Developing Countries Perspective. *IX International Scientific Symposium "Farm Machinery and Processes Management in Sustainable Agriculture"*, Lublin, Poland, November, 389–394. https://doi.org/10.24326/fmpmsa.2017.70
- Waddington, H., Snilstveit, B., Hombrados, J., Vojtkova, M., Phillips, D., Davies, P., & White, H. (2014). Farmer Field Schools for Improving Farming Practices and Farmer Outcomes:

 A Systematic Review. *Campbell Systematic Reviews*, 10(1), 217–336. https://doi.org/10.4073/csr.2014.6
- Wanigasundera, W. A. D. P. (2015). *Status of Extension & Advisory Services in Sri Lanka* (Issue 001). Department of Agricultural Extension, University of Peradeniya, Sri Lanka
- Weerasekara, S., Wilson, C., Lee, B., Hoang, V., & Managi, S. (2021). The impacts of climate induced disasters on the economy: Winners and losers in Sri Lanka. *Ecological Economics*, 185(July 2020), 107043. https://doi.org/10.1016/j.ecolecon.2021.107043
- World Bank. (2007). Reviving Sri Lanka 's Agricultural Research and Extension System: Towards More Innovation and Market Orientation.