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SMART VILLAGE CONCEPT FOR RURAL AREA DEVELOPMENT IN SRI LANKA: A STUDY ON IMPLEMENTATION, BENEFITS, AND CHALLENGES

I.V.M. Ayodyani[1], F.S. Nazeer[2] and A.M.L. De Alwis[3]

ABSTRACT

The Smart Village (SV) concept can be mentioned as a potential enabler for rural area development by integrating smart technologies. Many developed countries adopted the Smart Village concept to develop their countryside for example "Digital Village" in Germany, the "Cowocat rural" project in Catalonia, etc. This has brought a key advantage called improved quality of rural life and public services. But in the Sri Lankan context, the evidence of the successful implementation of Smart Village for the development of rural areas is almost nil in parallel there is no significant development seen in rural areas. Thus, the study aimed to investigate the implementation, benefits, and challenges of using the Smart Village concept for rural area development in Sri Lanka. The mixed research approach was undertaken to accomplish the aim. A comprehensive literature review followed by semi-structured interviews was carried out with 07 experts knowledgeable in the Smart Village concept. The data were analyzed through the RII method and the manual content analysis. The results demonstrate, that the most implemented Smart Village feature in Sri Lanka is smart education, however, the most required Smart Village features are listed as smart connectivity and smart agriculture. Further, the technologies like ICT, AI, IoT, GIS, 5G, and smart grid can be adapted to raise the Smart Village concept covering agriculture, education, transportation, health, and infrastructure was presented. However, lack of network cooperation, difficulties in raising funds, and transitioning to low-carbon economies, were found to be the top key challenges in implementing Smart Village in Sri Lanka.

Keywords: *Rural Area Development; Smart Village; Smart Village Features.*

1. INTRODUCTION

Nowadays, cities are with an additional burden to provide essential infrastructures such as transportation, healthcare, housing, and utilities due to the uncontrolled migration from rural to urban, this uncontrolled migration happened due to the unavailability of basic services, limited economic growth and fewer job opportunities in villages (Singh & Patel, 2018). Therefore, the initiation of rural development allows a country to provide equal

[1] Undegraduate, Department of Building Economics, University of Moatuwa, Sri Lanka, vishmiayodyani@gmail.com
[2] Lecturer, Department of Facilities Management, University of Moatuwa, Sri Lanka, shabrinan@uom.lk
[3] Lecturer, Department of Facilities Management, University of Moatuwa, Sri Lanka, madinialwis@gmail.com

facilities for all the residents; timely it can progress to districts, provinces, or federal units before reaching the entire country (Jabbar & Sajeetha, 2015). Further, it was revealed that, if a country fails to develop its rural areas, it will not be considered as developed because the growth of the country is dependent on the development of its communities.

The balanced development of the world in the era of the 4th industrial revolution called Industry 4.0, promotes smart cities and Smart Village (SV) concepts in different countries to narrow the gap between city and village (Park & Cha, 2019). As an approach to rural development, the concept of SV has emerged as a way to improve people's quality of life in rural areas (Aziiza & Susanto, 2020). Although it was revealed, two Indian researchers called Viswanadham and Vedula created the SV concept in 2010 by describing the ecosystem for a village and mapping integrated design procedures for developing SV. In addition to that, the concept of SV was presented by European institutions as one of the most recent approaches to rural development (European Commission, 2018).

SV is an ecosystem compromise with various features to enhance the quality of community life and the village environment by connecting different stakeholders such as government, private, academics, and elements of village communities (Syaodih, 2018). As Somwanshi et al., (2016) raised the features of the SV are,

> "Smart security, efficient public transportation system, improving sanitation conditions, solid and liquid waste management, rain harvesting, safe drinking water facilities, use of renewable energy, energy conservation, functional bank account, facilities regarding the agriculture, latest and affordable medical facilities, e-governance, use of modern technologies for improvement of locality, an improvement on women empowerment, educational facilities" (p.397).

In terms of the Sri Lankan context, there are some SV features appeared in several ICT-based projects conducted in Sri Lanka namely, the "E- Sri Lanka program" which executes "Nenasala" centres in all districts by facilitating ICT services for the rural community to provide access internet as well as information technology education and English literacy for rural area students (Madhubhashini et al., 2013). In addition to those features, the existing research concludes that smart and climate-smart agriculture (CSA) have significant value in developing SV projects (Adesipo et al., 2020). Because climate-smart practices on the cluster village development project could be identified as one of the SV features, which is implemented across 11 districts to increase farmers' income, the climate-SV area farmers are cultivating the same crop or combination by using climate-smart practices and also provide technical inputs for the project beneficiaries (Climate Smart Irrigated Agriculture Project [CSIAP], n.d.).

The concept of SV is more complicated, it encompasses a more extensive range of opportunities (Chetty, 2016). And the objective behind developing "smart villages" is to offer rural communities access to clean water, sanitation, nutrition, modern information, and communication technologies, sustainable energy, good education, and health care, as well as the development of social and industrial enterprises to increase incomes (Holmes & Thomas, 2015). Mishbah et al., (2018) mentioned 7 areas that should focus on SV development including economy, ICT, people, governance, environment, living, and energy. Even though as identified above the existing research provide evidence mostly on agricultural and education features development project in Sri Lanka. Therefore, this study focuses on the current implementation of the SV concept in the Sri Lankan context, discovering the benefits and possible challenges.

2. LITERATURE REVIEW

2.1 CONCEPT OF SMART VILLAGE

The term SV holds the rural areas and rural communities development strategy, which is based on new digital technologies, networks, and services, In addition to that it improves the use of knowledge and creative solutions of individuals for their businesses, and society (Adamowicz & Zwolinska-Ligaj, 2020). The SV concept defines as a bundle of services delivered to its residents and businesses effectively and efficiently (Viswanadham & Vedula, 2010). Further, it was revealed, Dozens of services including construction, farming, electricity, health care, water, retail, manufacturing, and logistics are included in SV.

2.2 TECHNOLOGIES USE IN SMART VILLAGES

The concept of SV was primarily based on social innovation, later on, technological innovation was raised due to the community becoming more familiar with the technology (Guzal-Dec, 2018). Digital technologies are the most considered tools for SV (European Commission, 2018). Accordingly, digital technologies will be used in many cases to achieve the goals of SV efficiently and effectively (Ecorys & Origin For Sustainability, 2019). The key technologies of the SV concept are IoT, AI, cloud, blockchain, GIS, computing, smart grid, 5G, and ICT (Wang et al., 2022). A variety of technology tools, such as sensors, actuators, cameras, drones, robots, medical devices, and agro-devices, can be used to automate decision-making in SV components such as smart energy, smart agriculture, and smart healthcare (Ram et al., 2021). In particular, SV must undergo a digital transformation that brings out the distinct potential of a specific area, and the entire digital ecosystem should include several cloud-hosted solutions that connect devices and collect, combine, or manage data for various rural services like mobility, health, care, and education (European Network for Rural Development [ENRD], 2018).

2.3 SMART FEATURES IN SMART VILLAGE DEVELOPMENT

SV refers to a bundle of features such as smart education, smart infrastructure, smart environment, smart agriculture, smart health, smart connectivity, and smart security that are delivered effectively and efficiently to its residents and businesses (Gangani et al., 2018). Numerous identified features in SV are listed in table 1.

Table 1: Smart Features of a Smart Village

Smart feature	Reference			Frequency
	1	2	3	
Organized settlement	**x**		**x**	II
Smart agriculture	**x**	**x**	**x**	III
Smart infrastructure (Road, Water, Sanitization	**x**	**x**	**x**	III
Smart Education	**x**	**x**	**x**	III
Disaster Management	**x**			I
Smart energy		**x**	**x**	II
Smart connectivity		**x**		I

Smart health	**x**	**x**	II
Smart environment	**x**		I
Smart security		**x**	I
Management of solid and liquid waste.		**x**	I
Rain Harvesting		**x**	I
References: [1] (Ranade et al., 2015), [2] (Sahu & Ghosh, 2018), [3] (Somwanshi et al., 2016)			

According to the above table smart agriculture, smart infrastructure, and smart education were found to be the most listed features under the SV concept. Moreover, organized settlement, smart energy, and smart health also have a significant impact. When considering the Sri Lankan context, smart agriculture also should be prioritized due to the agricultural economy.

2.4 NEED OF A SMART VILLAGE FOR SRI LANKAN RURAL AREA

Karunanayake & Abhayaratna, (2002) state that, the regional development of Sri Lanka has two perspectives called political and developmental that operated simultaneously. As further pointed out by the above author, the areas of the developmental process are infrastructure development, land settlement, irrigation development, village settlement expansion, and district-integrated rural development, and the political process includes decentralization of centre functions, which was followed by devolution aimed at greater regional power-sharing. Additionally, the authors have highlighted, the two systems' main weakness in regional development is the two processes operated as separate processes without proper integration. Therefore to revitalize rural areas, rural area issues must be addressed within the concept of SVs (Jezic et al., 2021). Especially the idea of smart development is implemented based on the social and economic characteristics of a specific geographic location (Wolski & Wójcik, 2019). The authors further mentioned that, addressing the issues in the relevant area while changing stakeholders' perspectives on the implementation of ideas that could improve the quality of rural life.

2.5 BENEFITS OF A SMART VILLAGE FOR SRI LANKAN RURAL AREA

SV is a rural development approach that demonstrates the direction of the development processes (Naldi et al., 2015). The civilizational challenges can be mitigated by implementing tailored solutions to its economic, social, cultural, and natural conditions (Satoła & Milewska, 2022). In SV, the networks and services are enhanced through the use of digitalization, telecommunication, innovation, and knowledge utilization (Szpor, 2021). Further, it was revealed, the benefit of SV can be highlighted as improving the quality of life, raising the standard of living, providing improved public services to citizens, making better use of resources, having a lower environmental impact, and providing new opportunities for rural value chains in terms of products and improved processes. As stated by Aditya A. et al., (2016), benefits the SV will lead to achieving smart infrastructure, smart service delivery, smart technology and innovation, smart institutions, and optimal mobilization and utilization of available resources, resulting in faster and more inclusive growth.

2.6 CHALLENGES OF IMPLEMENTING SMART VILLAGE

The implementation of the SV concept has the greatest challenges due to the inadequacy of supportive background (Satoła & Milewska, 2022). The literature-based challenges to implementing SV are listed in table 2.

Table 2: Challenges to implementing smart village

Challenges	Reference			Frequency
	1	2	3	
Less access to resources and market	**x**	**x**	**x**	III
Significant differences exist in terms of social structures and socioeconomic characteristics and the low communication accessibility	**x**		**x**	II
Residents with low educational levels	**x**			I
Negative migration balance	**x**	**x**		II
Depopulation		**x**		I
Lack of funding		**x**	**x**	II
Transitioning to low-carbon circular economies		**x**		I
Promoting digital transformation of rural areas		**x**		I
Low engagement or awareness of inhabitants impeding the creation of smart communities			**x**	I
Low level of openness to change in rural communities			**x**	I
Lack of network cooperation and transfer of innovation from scientific research institutions to practical practices			**x**	I

Reference: [1] (Satoła & Milewska, 2022), [2] (Jezic et al., 2021), [3] (Gosnell & Abrams, 2011, as cited in Satoła & Milewska, 2022)

As per table 2, less access to resources and the market is the most listed challenge for the smart village implementation. Apart from that, significant differences exist in terms of social structures and socioeconomic characteristics, negative migration balance and lack of funding also can be identified as the most frequent challenges for SV implementation.

3. RESEARCH METHODOLOGY

A comprehensive literature review was conducted to achieve in-depth knowledge about the research area. The literature review assisted in identifying the concept of SV, possible technologies, features, benefits, and challenges in common. In terms of that to achieve the research aim, the researcher has to evaluate experts' opinions and perceptions about SV in Sri Lankan context. Accordingly, the mixed approach was preferred for this study to achieve a more comprehensive examination of the research problem. Because of the most appropriate method for obtaining a multi-dimensional understanding of the research area and validating both internal and external attributes is a mixed approach (Fellows & Liu, 2015). According to Jentoft & Olsen, (2019), Interviews are commonly used as a primary data collection method to learn about other people's opinions, descriptions, and perspectives on the problems under consideration. Moreover, the semi-structured interview is typically conducted face-to-face, allowing the researcher to ask questions, seek out additional information, and evaluate phenomena from various perspectives (Sileyew, 2020). And snowball sampling under non-probability sampling was selected

for this research study. Hence SV is a novel concept, it is difficult to identify resource persons, therefore through snowball sampling seven experts are identified for the data collection. Accordingly, semi-structured expert interviews were utilised with the 7 experts who have at least 5 years of experience in smart-related projects in both global and Sri Lankan contexts to proceed deeply into a topic and fully comprehend the responses provided. Since the current applications of the SV concept are relatively low in Sri Lanka, drawing a large sample of respondents is challenging. The profiles of experts are given in table 3.

Table 3: Profile of Experts

Expert	Designation	Working experience	Working experience in smart village concepts
E1	Senior lecturer - Town and country planning	15 years	5 years
E2	Senior lecturer - Town and country planning	10 years	5 years
E3	Senior lecturer - Town and country planning	8 years	5 years
E4	Senior lecturer- Town and country planning	7 years	5 years
E5	Senior lecturer - Town and country planning	7 years	5 years
E6	Senior Lecturer – Dean	17 years	6 years
E7	Director – ICT department	23 years	10 years

Manual content analysis and the Relative Importance Index (RII) were utilised to illustrate and analyse the data acquired through expert interviews. RII can be used to rank attributes and results from a 5-point Likert scale were converted to prioritised lists using RII (Hisham & Yahaya, 2007).further to the author, RII was calculated using the following equation

$$\text{Relative Importance Index (RII)} = \frac{\sum w}{A \times N}$$

Where W = Weighting given for each factor by respondents
A = Highest weight on the scale
N = Total number of respondents

According to Akadiri (2011) and Hamdoun (2021), five impact and importance levels are identified from the RII value as given in Table 4.

Table 4: RII Value for impact level

Value	Impact/Importance
$0.8 \leq RII \leq 1$	High
$0.6 \leq RII < 0.8$	High-Medium
$0.4 \leq RII < 0.6$	Medium
$0.2 \leq RII < 0.4$	Medium- Low

Considering identified features, benefits and barriers in SV, the above-mentioned scale in Table 4 was used for ranking the responses of experts.

4. RESEARCH FINDINGS

4.1 PROJECTS AND IMPLEMENTATION UPDATES OF THE SMART VILLAGE CONCEPT IN SRI LANKA

All the experts agreed that the whole concept of SV is not implemented in Sri Lanka. But some projects for rural development consist of smart features and could be used when developing smart villages.

Table 5: Projects and implementation updates of the smart village concept in Sri Lanka

Experts	Relevant projects and implementation updates	Year implemented
E1	• Mahaveli settlements for rural agriculture	Initiated in 1961
E2	• Batticaloa farming	2018-2024
E3	• Nanasala projects	2004
E4 E5 E6 E7	• In 2014 there is a research project for a weather station to identify the water issues related to the agriculture sector such as water releasing time with the contribution of an international water management institute, however, it was not successful or not complete.	2014
	• Smart city project for Gampaha district (not complete due to financial issues)	2022
	• GIS-related projects (projects of the world food organisation)	2002
	• UNDP project for smart agriculture in Polonnaruwa, Maderigriya, and Walapane areas.	2017

The Mahaveli development project aims to produce a network of facilities such as roads, schools, hospitals, townships, and other amenities. The CSA project is designed to address climate changes, especially drought and floods. Nenasala implemented the E-Sri Lanka initiatives to spread ICT services among rural and semi-urban populations. The “4 times open and non-conventional technology for sensing the environment” project was carried out based on open source technologies and to develop an experimental low-budget weather station to measure rainfall, temperature, atmospheric pressure, humidity, solar radiation, wind direction, and soil radiation. The smart city Gampaha project aims to meet environmental sustainability, net zero, and socially inclusive technology governance. UNDP project included climate smart and non-chemical agriculture practices for farmers. Sri Lanka uses GIS for the planning and management of irrigation systems through this project. The Department of agrarian development of Sri Lanka implemented GIS to select a tank that will be renovated in the future and to evaluate how renovated small irrigation system impacts low-income farmer families and also GIS used to monitor the sustainability of the rehabilitation process and measure the changes in agriculture patterns.

4.2 THE EXISTENCE OF SMART VILLAGE FEATURES IN SRI LANKAN RURAL AREA DEVELOPMENT

The existing level of the smart village features in Sri Lanka is measured based on the identified smart village features through literature findings. RII analysis is used to rank the existence of those features based on the experts' opinions, as shown in table 6.

Table 6: Existence level of the smart village features in the Sri Lankan context.

Smart village feature	RII	Rank
Smart Education	0.771	1
Smart connectivity	0.743	2
Smart energy	0.714	3
Organised settlements	0.686	4
Smart health	0.600	6
Smart agriculture	0.543	7
Smart infrastructure	0.371	8

Most of the interviewees (6 out of 7) raised smart education is implanted to some extent in Sri Lankan rural areas. Further, they have elaborated that, the reasons for the existence of smart education are the "work from home" and "online education" concepts raised during the COVID-19 outbreak. Moreover, the interviewees' pointed out that, there is a considerable level of existence in smart connectivity, due to the increment in internet usage and mobile device usage in day-to-day activities like education, shopping, and so on within the past two years.

4.3 THE SIGNIFICANCE OF SMART VILLAGE FEATURES FOR THE SRI LANKAN RURAL AREA DEVELOPMENT

The significance of smart village features to the Sri Lankan context was evaluated using RII analysis, based on experts' opinions as shown in table 7.

Table 7: Significance level of the smart village features in the Sri Lankan context.

Smart village feature	RII	Rank
Smart connectivity	1.000	1
Smart agriculture	1.000	1
Smart energy	0.971	2
Smart Education	0.943	3
Smart infrastructure	0.943	3
Organized settlements	0.943	3
Smart health	0.886	4

As per the results, smart connectivity and smart agriculture are the most significant smart village features in Sri Lanka. In terms of connectivity, it should be there to adapt to technological upgrades. On the other hand, agriculture should be prioritized when developing rural areas of the country, because the economy of the Sri Lankan rural community highly depends on agriculture. Further advancements which will be adapted to agriculture can raise more harvesting and income.

4.4 THE POSSIBLE SUPPORTING TECHNOLOGIES TO IMPLEMENT THE SMART VILLAGE CONCEPT IN THE SRI LANKAN CONTEXT

The experts' opinion on possible supporting technologies for the proper implementation of SV was collected under several sectors such as agriculture, education, public transportation, public health, and infrastructure. The results are presented in tables 8 to 12.

- Agriculture sector

Table 8: Supportive technologies for creating smart agriculture

Technology	Possible Applications
AI	Forecasting yield, Control pests, and diseases, Monitoring the environmental conditions,
	Identify soil conditions and decide the suitable crops for the land
IoT	Gather real-time climate data and make decisions based on that, Smart watering system (automated irrigation system), Remote Monitoring (crop monitoring)
ICT	E-marketing

- Education sector

Table 9: Supportive technologies for creating smart education

Technology	Possible Applications
IoT	Smartboard, Monitoring, and controlling facilities within the educational institutions
ICT	E-learning platforms (including online and distance learning) using ICT tools to improve the productivity of both teaching and learning procedures
5G	Reduce low latency of internet connectivity, Use AR/VR tools for education purposes

- Transportation

Table 10: Supportive technologies for creating smart transportation

Technology	Possible Applications
GIS	Road maintenance, Accident analysis, Planning new routes

- Health

Table 11: Supportive technology for creating smart health

Technology	Possible Applications
IoT	Remote patient monitoring
ICT	E-health services, Telemedicine

- Infrastructure

Table 12: Supportive technologies for creating smart infrastructure

Technology	Possible Applications
IoT	Smart meters, Real-time data about the asset
ICT	Powerful internet connectivity
Smart Grid	Street lighting system, Energy conservation

4.5 THE KEY BENEFITS OF IMPLEMENTING THE SMART VILLAGE CONCEPT IN THE SRI LANKAN CONTEXT

Seven possible benefits of implementing SV were identified through the literature related to the global context and experts were requested to give their opinion on the relevancy of those benefits to the Sri Lankan context. The analyzed experts' opinions on the relevancy of those benefits to the Sri Lankan context are shown in table 13.

Table 13: Benefits of implementing smart village in Sri Lanka

Benefits	RII	Rank
Improve the quality of life	0.971	1
Expand access the public services	0.971	1
Make better use of resources	0.943	2
Provide new opportunities for rural value chains	0.914	3
Provide long-term social, economic, and environmental welfare	0.886	4
Address to unplanned urbanization, village underdevelopment, migration for economic pursuits, higher standard of living,	0.829	5
Reduce the negative impact on the environment	0.686	6

Through the results, the RII value of all identified benefits of SV implementation fell within the range of 0.972 to 0.686, indicating that all the benefits identified through the literature review create a significant influence on the Sri Lankan context.

4.6 CHALLENGES IN IMPLEMENTING THE SMART VILLAGE CONCEPT IN SRI LANKA

Eleven possible challenges of implementing SV were identified through the literature related to the global context and experts were requested to give their opinion on those challenges, and how they affect the Sri Lankan context. Table 14 shows the result of the impact level of the challenges.

Table 14: Challenges in implementing smart village in Sri Lanka

Challenges	RII	Rank
Lack of network cooperation and transfer of innovations from scientific research institutions to practical practice.	0.943	1
Difficulties in developing innovative projects and raising funds for these projects	0.886	2
Transitioning to low-carbon circular economies	0.800	3
Poorly developed transportation and communication networks	0.771	4
Depopulation/migration of the young population	0.743	5

Promoting digital transformation of rural areas	0.714	6
Exploiting connections with cities in all ways,	0.686	7
Less access to resources and markets compared to suburban areas	0.657	8
Significant differences in social structures and socioeconomic characteristics (low communication accessibility, negative migration balance, residents with low educational levels)	0.629	9
Low engagement or awareness of inhabitants impeding the creation of smart communities	0.572	10
Low level of openness to change in rural communities	0.543	11

Through the result of the collected data "lack of network cooperation and transfer of innovations from scientific and research institutions to business practice" was ranked as the highest impact challenge. It is also revealed by experts when discussing the smart village's current implementation. ID stated that "most of the projects were under the research, not complete successfully". And the second challenge is "Difficulties in developing innovative projects and raising funds for these projects". IE revealed that most of the smart-related development projects were unable to complete due to financial issues. Therefore, this result indicated transfer of innovations from practice and funding for the development projects will be the most difficult challenge to face when implementing smart villages in Sri Lanka. On the other hand, "Low engagement or awareness of inhabitants impeding the creation of smart communities" and "Low level of openness to change in rural communities" have the lowest RII values and are ranked as the lowest impact challenges. It could be supported by the present situation in the country, for example, when QR codes (National fuel passes) were introduced as a solution for fuel queues, people had some concerns with it at first, but after a short time, people adjusted to it, and the same experience was had when initiating online education and work from home concepts. Therefore, compared to other difficulties, these two have a lower level of impact and can be easily mitigated. Experts have pointed out some additional challenges. IE recognized administrative difficulties, including a preference not to change institutional setup practices like manual working processes and a top-to-bottom workflow for the development plan without considering the needs of communities. Additionally, IG provided some other challenges, the authorities' tendency to operate in silos and not consider facts and figures when identifying development opportunities.

5. CONCLUSIONS

As observed, the majority of the Sri Lankan population still lives in rural areas with significant development imbalances compared to urban areas. SV is an effective approach for rural area development, that provides solutions for the issues faced by rural communities. It utilizes modern digitalized technologies and services to enhance rural inhabitants' lives by considering the characteristics of a village. Therefore, informative research is required to reveal the implementation of the SV concept for Sri Lankan rural areas to revitalize the rural community. As an initial step, this research focuses on the current implementation of the SV concept in the Sri Lankan context, discovering the benefits and possible challenges. The key findings revealed that the highly existence smart village feature in Sri Lanka is smart education, while smart connectivity is highlighted as the most significantly required smart village feature because when applying smart technologies to develop SV stable connectivity is a key factor. Moreover, supportive technologies such as AI, IoT, ICT, 5G, GIS, and smart grid play a major role

in creating smartness in different sectors such as agriculture, education, transportation, health, and infrastructure. In terms of the major benefits of implementing the SV concept in Sri Lanka, it will enhance the quality of life in rural areas while providing expanded access to public services. The most considerable challenge attached to the SV implementation in the local context is the lack of network cooperation in the transfer of innovations from scientific research institutions to practical practice. As per the findings, the concept of SV is not implemented successfully in Sri Lankan context. In contrast, there are some smart concept-related projects available in Sri Lanka for example, the Mahaweli settlement project, Smart city projects, Smart agriculture projects, and so on. But those projects were not recorded with positive progress. Hence the identified benefits of implementing SV will encourage the implementation of the SV concept in the Sri Lankan context. Further, knowing the possible challenges priory will ensure the smooth implementation of the SV concept. Although the scope of this research is limited to only for few features of the SV that could be implemented in SV projects in Sri Lanka. Since the "SV" is a new concept for the Sri Lankan context, the data collection and resource persons could be limited and most of the literature findings which were related to the global context were used to analyze the suitability of the SV concept in Sri Lanka. Furthermore, data collection is only based on expertise rather than on rural inhabitants, so could be quite a difference between the expert and rural communities' ideas that would not be analyzed in this research. Accordingly, this study will be an eye-opener to enhance the consideration of implementing the concept of SV for rural area development in Sri Lanka.

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