RESEARCH ARTICLE
Journal of Extension Education
Vol. 34 No.1, 2022
DOI: https://doi.org/10.26725/JEE.2022.1.34.6774-6783

E-connectivity Infrastructure and Usage of Software Applications by *Gram Panchayats*

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ABSTRACT

The study was conducted to assess the e-connectivity infrastructure available in the Gram Panchayat (Village council) and analyze the software applications adopted by the Gram Panchayats. The study area was three blocks of Coimbatore district, Tamil Nadu viz., Karamadai, Periyanaickenpalayam and Thondamuthur. A total of 36 Gram Panchayat presidents formed the sample. The study revealed that all the Gram Panchayats from three blocks were well equipped with e-connectivity, Because of this the respondents were able to adopt the software applications for reducing paper work in the Gram Panchayat.

Keywords: *Gram panchayat ; Village Council; e-connectivity; Software application; Tamil Nadu*

INTRODUCTION

Panchayati Raj Institutions (PRIs) play a significant role as grass-root units of democratic decentralization and self-governance in rural India. They are instrumental in bringing governance and decision-making closer to the local communities, fostering socio-economic transformation in the rural areas. In recent times, the integration of e-connectivity and software applications has further amplified the effectiveness and impact of PRIs. E-governance involves the utilization of information and communication technologies by the public sector to enhance the dissemination of information and improve service delivery. It also aims to encourage citizen participation in decision-making processes and promote transparency, accountability, and effectiveness in government operations.

The e-Panchayat project holds great promise for the rural masses as it aims to transform the Panchayati Raj Institutions (PRIs) into symbols of modernity, transparency and efficiency. This is a one of its kind nationwide IT initiative introduced by Ministry of Panchayati Raj that endeavors to ensure people's participation in programme decision making, implementation and delivery. The project aims to automate the functioning of 2.45 lakh Panchayats in the country. The project addresses all aspects of Panchayats' functioning including Planning, Monitoring, Implementation, Budgeting, Accounting, Social Audit and delivery of citizen services like issue of certificates, licenses etc. (Mahi pal, 2015)

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Received : 04.01.22 **; Accepted :** 02.06.23

Department of Panchayat has implemented PRIASoft for financial and inventory management of the department upto the Gram Panchayat Level. The initial level product framework has been prepared under the sponsorship of Ministry of Panchayati Raj, Government of India. The State Auditor General (State AG) would define the mapping of State Scheme and creation of object heads. It follows the cash-basis of accounting and single-entry system of book keeping. This software will be used for complete inventory / stock register management of the Gram Panchayats.Gram Manchitra for promote digitalisation and e-governance at the grass root level.*ActionSoft* is one of the modules of Panchayat Enterprise Suite(PES) being prepared as a part of ePanchayat Mission Mode Project. It aims at monitoring and keeping record of the progress of the works being undertaken as part of the finally approved plans (Action Plan) of various ULB, RLB and Line departments as available in *PlanPlus* . It facilitates proper recording of the Financial and Physical progress of the works. It will act as a tool to support the monitoring of the status and the expenditure incurred in works undertaken under various central and state schemes by various governments.

Tamil Nadu has bagged the e-Panchayat Puraskar award for 2014 for developing a set of application for better administration of panchayat raj institution.The state has won the award,which carries a cash prize of Rs 20 lakh,for developing application like PRIA Soft,local government Directory,National Panchayat raj Portal,National Asset Directory and plan plus. It had spent about Rs 80 Crore on hardware at Panchayats towards implementation of the application. (TN bags e-panchayat award, 2015). Despite the remarkable progress, challenges remain in achieving comprehensive e-connectivity in Tamil Nadu. Some rural and remote areas still lack reliable internet access and face connectivity gaps. The government, in collaboration with private players, continues to focus on expanding digital infrastructure and addressing the digital divide to ensure equitable access to e-connectivity across the state. Overall, the state's efforts in promoting e-connectivity have contributed to creating an Information Society, wherein people can access and share information and knowledge, driving sustainable growth and an improved quality of life for individuals, communities, and society as a whole.

Rural connection is critical for rural development and poverty reduction in India. Recent advancements in digital technology in the telecommunications sector have significantly improved people's lives by enabling them to connect to any part of the globe much quicker and also by centralizing common services. Telecommunications are at the heart of the information economy and provide the infrastructure for it. We are on the verge of establishing an Information Society in which everyone may produce, access, use, and share information and knowledge, allowing individuals, communities, and people to maximize their potential for sustainable growth and improved quality of life. (P.Satishchandra et al,2013)

However, there are limited research studies on Gram Panchayats' performance. Hence this study was conducted with the following objectives;

- *Assess the e-connectivity available in the Gram Panchayat*
- *Analyze the software application system adopted by the Gram Panchayat*

METHODOLOGY

The study was conducted in Coimbatore district, Tamil Nadu, India which was selected due to its favorable characteristics such as easy accessibility and well-developed transport facilities. Coimbatore district comprises a total of 12 blocks, with Kinathukadavu having the highest number of Gram Panchayats (34) and Madukkarai and Perinayakkanpalayam having the lowest number (9) of Gram Panchayats. The three selected blocks, namely Karamadai, Periyanayakkanpalayam, and Thondamuthur, were chosen specifically because they host both a model Gram Panchayat and an award-winning Gram Panchayat. This study adopts a Descriptive Research Design. The sampling method adopted for the study was multi-cluster sampling method as it involves selecting large sample unit such as states, districts, block, Gram Panchayats and village. From the total of 229 Gram Panchayats in Coimbatore district, 36 Gram Panchayats were selected specifically for the study and total 36 ex-Gram Panchayats presidents were selected for the study based on their experience and insights into the functioning of Gram Panchayats during their tenure. To conduct the study, the researchers first established a friendly rapport with the ex-Gram Panchayat presidents. Subsequently, they obtained authorization from three administrative blocks. Following this, a questionnaire was designed to collect data from the ex-presidents. Primary data were collected through the survey. The information gathered through the questionnaire was meticulously examined and analyzed using percentages and t-tests. Percentage analysis was employed to assess the e-connectivity facilities and network availability in the Gram Panchayat, as well as to identify the challenges encountered while adopting software applications. On the other hand, the t-test was utilized to investigate the correlation between the software applications adopted by the Gram Panchayats and their e-connectivity.

FINDINGS AND DISCUSSION

Information about E-Connectivity of the Gram Panchayat Office

Panchayat e-connectivity is a significant initiative aimed at assessing and comprehending the availability of tele-connectivity/internet services in Panchayat offices. It has been introduced to monitor and evaluate the overall state of Panchayat connectivity. The Panchayat office's facilities, the Gram Panchayats network infrastructure and the software utilized by them are all characterized in terms of their e-connectivity. Table 1 provides detailed information regarding the e-connectivity available in the Panchayat office.

Table 1. Details on E-Connectivity available in Gram Panchayats (N=36*)

Sl No.	E-connectivity	Karamadai(17)				PN Palayam(9)				Thondamuthur(10)			
		Yes		No		Yes		No		Yes		No	
		No	%	No	%	No	%	No	%	No	%	No	%
1	Place used for E-connectivity												
	Conference Hall	17	100	-	-	9	100	-	-	10	100	-	-

2	Equipment for E-connectivity											
	Electricity	17	100	-	-	9	100	-	-	10	100	-	-
	Telephone	12	71	-	-	3	33	6	66	5	50	5	50
	Xerox	16	94	-	-	5	55	4	44	7	70	3	30
	Computer	17	100	-	-	8	88	1	11	6	60	4	40
3	Number of Computers available												
	One	7	41	-	-	7	77	-	-	4	40	-	-
	Two	6	35	-	-	1	12	-	-	2	20	-	-
	More than two	4	24	-	-	1	12	-	-	-	-	-	-
	Laptop	12	71	5	29								
4	Number of laptops available												
	One	9	53	-	-	2	22	-	-	4	40	-	-
	Two	3	18	-	-	-	-	-	-	3	30	-	-

** Multiple Responses*

Table 1 provides insight into the availability of e-connectivity in the Gram Panchayat offices. Notably, all Gram Panchayat presidents from Karamadai, P.N Palayam, and Thondamuthur blocks reported having a conference hall in their respective offices.

Seventy-one percent of the presidents from Karamadai block, fifty percent of the presidents from Thondamuthur block and thirty-three percent of the presidents from PN Palayam block stated that telephone was available in Gram Panchayats office, it was observed that only a minority of Gram Panchayats had this facility. This could be attributed to the prevalence of mobile phones, which have become the preferred mode of communication in recent times. Ninety-four per cent of the *Gram Panchayat* presidents from Karamadai block, fifty-five percent of the presidents from P.N Palayam block and seventy percent from Thondamuthur block presidents said that xerox machine was available in the Gram Panchayat office. 100 per cent of presidents from Karamadai block, eighty-eight percent of the presidents from P.N Palayam block and sixty percent of the presidents from Thondamuthur block stated that computer was available in the Gram Panchayat office. Seventy-seven percent of the presidents from PN Palayam block,forty-one percent of the presidents from Karamadai block and forty percent of the president from Thondamuthur block stated that one computer was available in the Gram Panchayats. Seventy-one percent of the presidents from Karamadai block, seventy percent of the presidents from Thondamuthur block and 22 percent of the presidents from P.N Palayam block stated that laptop is available with the Gram Panchayat. On the other hand, the availability of a Photocopier (Xerox) machine and computer in the Gram Panchayat offices was relatively high across all three blocks. However, there were variations

in the percentages, with Karamadai having the highest availability of computers, and P.N Palayam having the highest availability of photocopier machines.

Fifty-three percent of the presidents from Karamadai block, twenty-two percent of the presidents from P.N Palayam and forty percent of the presidents from Thondamuthur block stated that one laptop was available in the Gram Panchayat. Eighteen percent of the presidents from Karamadai block and thirty percent of the presidents from Thondamuthur block stated that two laptop was available in the Gram Panchayat. Furthermore, the presence of laptops in the Gram Panchayat offices was also notable, with a significant proportion of P.N Palayam and Thondamuthur block presidents reporting its availability.

E-connectivity aims at equipping rural India with all the updates. Rural connectivity assumes a significant position as far as rural development and poverty alleviation are concerned in India. The above table demonstrates that all Gram Panchayats offices are well equipped with e-connectivity. This may be one of the elements influencing the successful performance of the Gram Panchayats.

Network Facility Available in Gram Panchayats

The availability of network facilities in Gram Panchayats is a crucial aspect of rural development and connectivity. Having reliable network infrastructure enables seamless communication, access to digital services, and overall socio-economic growth in rural areas. Table 2 presents the availability of network facilities in Gram Panchayats. It illustrates the extent to which communication infrastructure, such as mobile and internet connectivity, is accessible to the rural communities.

Table 2. Network Facility Available in Gram Panchayats (N=36*)

Sl No.	Network availability	Karamadai(17)				PN Palayam(9)				Thondamuthur(10)			
		Yes		No		Yes		No		Yes		No	
		No	%	No	%	No	%	No	%	No	%	No	%
1	Wi-Fi	4	23	-	-	1	11	-	-	2	20	-	-
2	Basic Internet	12	71		-	8	80	-		7	70	-	-
3	Broadband	16	96			7	77			9	90		

** Multiple Responses*

Table 2 depicts the Network facility available in the Gram panchayats. Seventy-one percent of the presidents from Karamadai block, eighty percent of the presidents from PN Palayam block and seventy percent of the presidents from Thondamuthur block said that internet connection was available in the Gram Panchayats office. This availability of network facilities is crucial for improving governance, service delivery, and overall development in rural India.

Twenty three per cent of the presidents from Karamadai block, eleven percent of the presidents from PN Palayam block and twenty percent of the presidents from Thondamuthur block said that Wifi was available in the Gram Panchayats offices. The availability of wifi in Gram Panchayat offices is an essential aspect of enhancing e-connectivity and enabling efficient communication and data access. Wifi allows for wireless internet connectivity, which facilitates real-time information exchange and access to online resources. With Wi-Fi in place, Gram Panchayat offices can easily connect with government portals, access important data, and communicate with stakeholders effectively. Having wifi available in the Gram Panchayat offices is especially crucial in rural areas where traditional wired internet infrastructure might be limited. It opens up opportunities for increased access to information, improved service delivery, and enhanced citizen engagement in decision-making processes.

Ninety-six per cent presidents from Karamadai block and ninety per cent presidents from Thondamuthur block stated that broadband was available in Gram panchayats. Furthermore, the availability of broadband connectivity in Gram Panchayats enhances communication and data exchange between government authorities and citizens. It facilitates e-governance initiatives, streamlines administrative processes, and improves transparency and accountability. This might be the reason that Government of India has launched an ambitious programme of Bharat net for rural India to adjust in modern era. Initiatives like BharatNet and other digital infrastructure development efforts play a vital role in bringing rural areas into the modern era, empowering communities, and fostering inclusive development in the country . While progress has been made in increasing network facility availability in Gram Panchayats, challenges remain. Ensuring consistent and reliable internet connectivity, addressing the digital literacy gap, and making services more affordable for rural communities are critical areas that require attention.

Software Applications Used By Gram Panchayats

Government has launched various software and application to reduce burden of Gram Panchayat functionaries. Software and application reduce energy as well as the time of presidents. PRIA soft gathers revenue and expenditure details via voucher entries and generates cash books, registers, and other documents automatically. Panchayats, Urban Local Bodies, and line departments use Plan Plus to create strategic, annual and action plans. SAMM (Social Audit and Meeting Management) records information from statutory meetings held at the ZP/BP/GP levels and creates social audit reports. The topographical, demographic, infrastructural, socioeconomic and natural resource profiles of a village/panchayat are captured in the area profile. The Action Soft application makes it easier to track the physical and financial outcomes/outputs of numerous programmes. Local Government Directory records all information on local governments and assigns a unique code to each one. *Gram Manchitra* is a geospatial planning tool for Gram Panchayat users to better visualize the numerous developmental tasks to be undertaken across multiple sectors and to give a decision support system for the Gram Panchayat Development Plan.

Table 3. Relationship of e-connectivity of the Gram Panchayats with use of Software Applications

Sl no.	Software	Unstandardized Coefficients	Standardized Coefficients	T	Sig.
1	Plan Plus	1.711	.125	.907	.367
2	Panchayati Raj Institutions Account (PRIA Soft)	-2.084	-.213	-2.458	.024**
3	Local Government Directory	-1.109	-.145	-1.326	.184
Application					
1	Action Soft	2.597	.278	3.998	.000*
2	Social Audit and Meeting Management (SAMM)	1.391	.146	1.684	.095
3	Area Profiler	3.017	.389	3.578	.001*
4	Gram Manchitra (GISApplication)	3.219	.412	5.189	.000*

***. – Significant at 0.01 level. NS –non-significant*

Table 3 expresses the relationship between software application adopted by the Gram Panchayats with e-connectivity. *Gram Manchitra* (GIS Application), *action soft*, area profiler was found to be 0.01 percent level of statistically significant. *PRIA* soft was found to be statistically significant at the 0.05 percent level of significance. This might be the reason that Gram Panchayats were provided with all of the necessary e-connectivity capabilities, making it simpler for presidents to adopt the software and application necessary to carry out their responsibilities.

Panchayat e-connectivity is an ambitious effort taken to see and comprehend the availability of Panchayat connectivity via Tele-connectivity/ Internet. Panchayats e-connectivity has been implemented to monitor and understand the state of Panchayat connectivity. The Panchayat office's facilities, the Gram Panchayats network infrastructure and the software used by the Gram Panchayat were all characterized by e-connectivity.

Software application reduce costs and energy to improve overall resource utilization. The combination of e-connectivity and software applications empowers Gram Panchayat presidents to make informed decisions, enhance transparency, and provide better services to citizens. By embracing digital solutions, Gram Panchayats are better equipped to meet the evolving needs of their communities and contribute to the overall development of rural areas.

Challenges Faced by the Presidents While Utilizing Software Applications

To reduce the workload of the Gram Panchayat president Government has launched various software and application. When presidents and government officials adopt new software and applications, several challenges are being faced related to network issues, computer literacy, and software training.

Table 4. Challenges Faced by the Presidents While Utilizing Software Applications (N=36)

Sl. No.	Challenges	Karamadai (17)		P.N Palayam(9)		Thondamuthur (10)	
		F	%	F	%	F	%
1	Network issue	6	35	3	33	4	40
2	Lack of Computer-based knowledge and infrastructure	3	18	2	22	3	30
3	Lack of knowledge of software and application	5	29	2	22	2	20
4	No training was conducted related to software and application	2	12	3	33	1	10
5	Slow connection while using software and application	1	6	-	-	-	-

Table 4 reveals the challenges faced by the presidents while adopting software and applications in different blocks of Gram Panchayats. According to the data, Thirty-five percent of the presidents from the Karamadai block, thirty-three percent from the P.N Palayam block, and forty percent from the Thondamuthur block reported facing challenges related to network issues. This observation is attributed to the fact that some of the Gram Panchayats are located in remote areas, which have limited or unreliable network infrastructure. In today's world, access to a reliable network system has become a fundamental necessity for individuals, including those residing in rural areas. Providing internet access to rural communities is considered a crucial milestone towards the broader objective of digital inclusion as envisioned by the Government of India.

Furthermore, the data also indicated that 18 per cent of presidents from the Karamadai block, twenty two percent from P.N Palayam block and thirty percent from Thondamuthur block faced challenges due to a lack of computer-based knowledge and infrastructure. This variation suggests that computer literacy and infrastructure readiness might be relatively lower in the Thondamuthur block compared to the other blocks. Whereas, twenty nine percent from Karamadai block, twenty two percent from PN Palayam block and twenty percent from Thondamuthur block faced lack of knowledge regarding software and applications. This indicates that there might be a higher level of familiarity with software and applications in the Thondamuthur block compared to the other blocks. This finding suggests that a significant portion of the presidents may be older individuals who might not be familiar with operating computers and software. Consequently, they may rely on assistance from others to navigate these technologies effectively.

Interestingly, thirty three percent of the president from P.N Palayam block, twelve percent from Karamadai block and ten percent from the Thondamuthur block stated that no training was conducted related to software and applications. This difference suggests that presidents in the

P.N Palayam block might have had less exposure to software and application training compared to the other blocks. This implies that a majority of the presidents in this block might have received some form of training, which could potentially contribute to their better understanding and adoption of software and applications.

Only six percent of the presidents from the Karamadai block reported facing issues with slow internet connection while using software and applications, the slow connection may have hindered their ability to access online resources, update records, communicate with stakeholders, and utilize software functionalities seamlessly. This finding suggests that the Karamadai block might have relatively better internet connectivity compared to the other blocks, where this challenge was less prevalent. Thus, the finding suggests that a relatively small proportion of the presidents in this block encountered challenges related to the speed and reliability of their internet connection when utilizing various software and applications.

Thus, addressing these challenges would empower the presidents and enhance their capabilities in utilizing technology effectively for improved governance and better public service delivery.

CONCLUSION

The Gram Panchayat plays a crucial role in rural development and the performance of Gram Panchayat presidents is vital for its success. The adoption of e-connectivity, including internet access and digital technologies, has become instrumental in empowering Gram Panchayat presidents to implement software applications effectively. E-connectivity enables them to access information, communicate, and utilize software tools efficiently, thereby improving governance and service delivery at the grassroots level. By adopting software and applications, the Gram Panchayat can provide easy access to information about its functioning and the Panchayat Raj system to the people. This accessibility enhances transparency and accountability in the system, allowing citizens to stay informed about the decisions and initiatives taken by the Panchayat.

In all three blocks, a majority of the Gram Panchayats have embraced software applications for various administrative and accounting purposes. This shift towards digital solutions not only streamlines processes but also strengthens transparency and accountability within the Gram Panchayat. By reducing paperwork and manual procedures, software applications improve efficiency and accuracy in record-keeping and decision-making. The study reveals that all thirty-six Gram Panchayats exhibited satisfactory e-connectivity, with the majority being in the Karamadai block, which had the highest level of satisfaction. All the Gram Panchayat adopted Government launched software and application to reduce their workload. While adopting the software and application they faced various challenges such as network issue, lack of computer knowledge, Lack of training etc. This study will provide data on e-connectivity and software application adopted by 36 Gram Panchayats in Coimbatore District without the need for conducting a survey. As there are no existing research studies on this subject, this study will be valuable for policymakers as a reference for future decisions. Additionally, it will serve as a guide for researchers in the future, offering insights into the status and trends of e-connectivity and software application implementation in Gram Panchayats.

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