International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 4S, 2025
https://www.theaspd.com/ijes.php

Digital Transformation of Integrated Child Development Services (ICDS) Scheme: Potential Benefits and Roadblocks in Pulwama District of Jammu and Kashmir.

Syed Abdul Mohsin[1], Dr. Manvendra Singh[2]
[1]Ph.D Research Scholar, Department of Government & Public Administration, Lovely Professional University, Punjab. Email: mailsyedmohsin@gmail.com
[2]Professor, Department of Government & Public Administration, Lovely Professional University, Punjab.

Abstract
The Indian government initiated the Integrated Child Development Services (ICDS) scheme to meet the nutritional, health and development needs of children up to age six, pregnant women and nursing mothers. It is a major building block in India's social welfare program. To make services better, easier to watch and more transparent, the ICDS is introducing digital tools as part of India's digital move ahead. The study explores how the ICDS scheme's shift to digital technology allows rural populations easier access, quicker data updates for executives and more efficient delivery of services. It also examines ways in which data analytics, internet tools and mobile applications have contributed to managing ICDS Workers' tasks. The study does, however, also identify a number of roadblocks to effective digital integration, including problems with digital literacy, lack of trained ICDS staff infrastructure gaps, and other gaps. This paper offers a thorough understanding of how technology can transform one of the World's biggest important welfare programs for children and women while providing insights into the policy measures required to overcome its obstacles by analysing the opportunities and challenges associated with the digital transformation of ICDS.

Keywords: ICDS, Digital Transformation, Social Welfare, Technology Integration, Service Delivery.

INTRODUCTION

The Integrated Child Development Services (ICDS) has been one of India's largest national initiatives to improve the health, education, and nutrition of young children, expectant and nursing mothers, and teenage girls. For a long time, ICDS has struggled with providing services, making processes efficient and monitoring its actions, despite reaching a large number of people. Because it wants to enhance the program, the Indian government has turned to information and communication technology to improve what ICDS does. The use of ICT has shown it can make the program more transparent, move decisions toward data and add strength to its framework. Technological ways to address this problem are digital data tracking, real-time monitoring and mobile applications according to Ghosh and Chatterjee (2021).
Using digital technologies in ICDS shows that the country's sectors are all experiencing a major digital revolution. The POSHAN Abhiyaan includes the Common Application Software (CAS), allowing all Anganwadi Workers to make reporting easier and have easier access to information about the people they serve. It is clear from the latest data that these digital efforts have improved service delivery, for example by making records more reliable and services more quickly available (Sinha & Jain, 2030). Anganwadi Workers (AWWs) can more precisely monitor a child's health and nutrition indicators by using mobile applications to guarantee the prompt supply of services like vaccinations and nutritional supplements (Bhatt, Sharma, & Verma, 2020).
ICDS Workers use mobile apps to fill out the necessary data and thus minimise the chance of errors introduced by handwritten documentation. In addition to expediting necessary reporting of data, greater accuracy of the data is guaranteed by digitisation, which is essential for monitoring advancement and making wise decisions (Rani and Rathi, 2021). Delivering timely details about vaccines, nutrition from expert sources and health exams to people is made easier through digital solutions used by employees (Sharma & Thakur, 2021). Real-time updated information is made possible through ICT (Information Communication and Technology) because it makes it easy for Anganwadi staff to enter

data into central systems, reports Patel and Bansal (2022). Because of the ability of the system to detect undernourished children and pregnant women who require immediate support, the ICDS workers can react rapidly and take action.

Yet, despite all the benefits ICDS has gained from going digital, some significant challenges remain. A big problem is that AWWs, who may lack knowledge about digital tools, need to be taught fully how to use them. Due to unreliable internet access in many rural areas, the use of ICT is hindered by infrastructure problems (Patel & Roy, 2021). Many rural ICDS staff have minimal digital literacy which stops ICT from being effective in nearly half of all ICDS centres.

Most workers responsible for operating the program locally are not able to use technology well. According to Kaur and Bains, a significant number of ICDS employees cannot easily use smartphones, navigate different software or enter data on mobile applications. Since they struggle with ICT, their service is delivered less effectively and digital projects work less well. With poor infrastructure in outlying regions, ICT integration is a higher challenge. Using digital tools in ICDS requires dependable internet access and a power supply, but that is often unavailable to staff in various parts of India.

Recently, the Ministry of Women and Child Development (MWCD) pointed out that bad connectivity means data collection and reporting are delayed, slowing services for the villagers. What's more, Anganwadi centres usually lack adequate and proper technology such as smartphones, tablets and other needed devices for the digital revolution. Not all workers find using digital records easy and some get discouraged because there are no incentives or recognition. Many Anganwadi staff see digital technology as an added responsibility instead of a way to help advance their career, according to a study by Patel and Bansal (2022) shows. Persistence in this area may make it hard for ICT to be adopted and have less effect on delivery unless staff members receive good training or proper incentives.

ICDS is trying to improve how services are delivered through its digital transformation, though its staff members do not regularly benefit from funds or training. ICDS Workers can't keep up with technology changes or solve problems that come up during service delivery without frequent training sessions (Sharma and Thakur, 2021). Given how sensitive health and Because health and nutrition data can be sensitive, worries about data security and privacy make things harder. As a result, any effective use of ICT in ICDS relies on a detailed look at the benefits and barriers that need to be removed for a lasting digital shift.

The present study identifies the benefits and challenges associated with digitalisation in the ICDS. It looks at how existing ICT solutions in programs help with their effectiveness and delivery to children so that we can learn how digitalisation might be used to improve child development. Basically, the paper hopes to contribute to the talk surrounding using ICT to modernize public health by stressing what is necessary for a successful and inclusive transition.

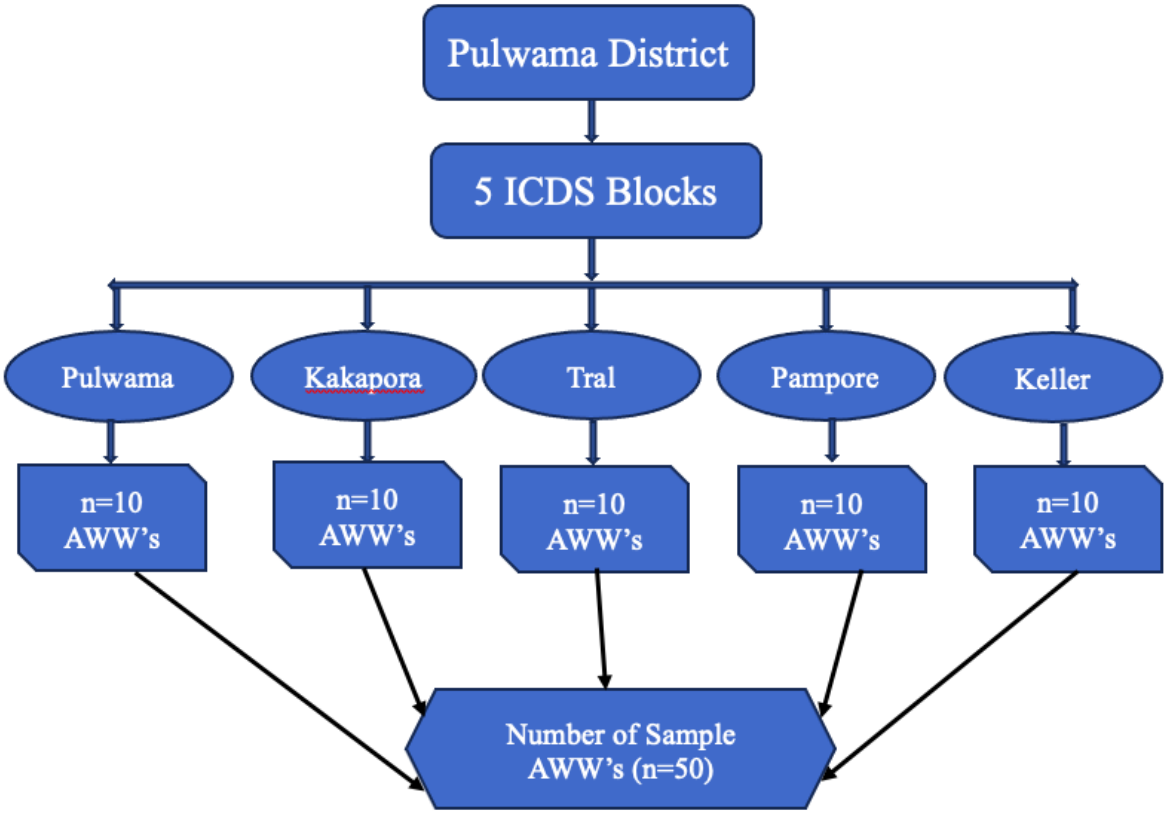
Objectives:

- To study whether using digital tools in the ICDS scheme in Pulwama would help improve both service delivery and monitoring.
- To examine the key difficulties to digital transformation of ICDS in Pulwama, involving infrastructure and literacy issues.

METHODOLOGY:

The present study was conducted in all five blocks of the Pulwama district of Jammu & Kashmir during the year 2024.

Sample Size: The project had 50 Anganwadi workers as respondents from 50 Anganwadi centres.



Sampling Technique: A convenience sampling technique was adopted for sample selection. Samples were randomly selected for the purpose.
Tools Applied: A self-devised interview schedule was used as a tool for data collection with various questions framed about the Potential Benefits of the introduction of Information Communication and Technology (ICT) in ICDS and the challenges they face while using ICT in ICDS service delivery.
Data Collection: Data was collected personally by making personal visits to Anganwadi centres. The data obtained was compiled and tabulated.
Data Analysis: Analysis of the data was done qualitatively and quantitatively using frequency distribution and percentage.

RESULTS AND DISCUSSION

Anganwadi workers (AWWs) are the foundation of the ICDS program; they serve as frontline employees in charge of providing a range of services at the local level. They are employed by Anganwadi centres (AWCs), which are maternal and childcare hubs in the community. In addition to overseeing early childhood education, AWWs also supply supplemental nourishment, organise vaccination efforts, and keep track of children's development and health. ICT is utilised by AWWs to improve data administration, monitor and evaluate work more effectively, streamline operations, and improve communication between supervisors and other stakeholders. However, obstacles such as a lack of training, insufficient funding, and manual reporting systems have limited the efficacy of AWWs. ICT tools present viable solutions in this regard to enhance the effectiveness, scope, and influence of ICDS services.

Demographic profile of Anganwadi worker

In the present study, 50 Anganwadi workers were interviewed and it is evident from Table 1 that 6% of the Anganwadi workers were under matric, 18% were matriculated, 42% had education up to higher secondary level, 22% were graduates and 12% up to post-graduate level. It was found that 30% of Anganwadi workers had a work experience of 0-10 years, while 26% of them had a work experience of 10-20 years and 44% of them had a work experience of 20-30 years. It was also found that all (100%) of

Anganwadi workers were trained and had received in-service job training which had been given by the department. None were untrained. Recently, there has been a shift towards integrating Information and Communication Technology (ICT) to enhance the efficacy of the ICDS services. This study explores the ICT knowledge, training, and perceptions of ICDS workers key who implement the scheme at the grassroots level. It was found that only 68% of workers received training through the department and 32% did not receive any training. The study also found that 12% of workers received training within the last 6 months, 10% within the last year, 34 % more than a year ago, and 32% did not receive any training.

Table 1: Demographic profile of Anganwadi worker

Parameters	**Frequency**	**Percentage**
Qualification		
Under Matric	3	6
Matric (10^{th})	9	18
Intermediate (12^{th})	21	42
Graduate	11	22
Post Graduate	6	12
Total	**50**	**100**
Work Experience		
0-10 Years	15	30
10-20 Years	13	26
20-30 Years	22	44
Total	**50**	**100**
Departmental Training Status Regarding ICDS Scheme		
Trained	50	100
Untrained	0	0
Total	**50**	**100**
Response	**Frequency**	**Percentage**
ICT Training Status		
Trained	34	68
Untrained	16	32
Total	50	100
Time line of the training of ICT tools		
Within the last 6 months	12	24
Within the last 1 year	5	10
More than a year ago	17	34
Not received any training	16	32
Total	**50**	**100**

Perception of Anganwadi worker regarding introduction of ICT in ICDS

Most workers acknowledged that ICT positively contributed to their work. However, they were concerned about the additional burden of learning new technologies and maintaining records online as well as offline and feared being held accountable for errors caused by technical issues. The perception of ICT as a "tool for surveillance" rather than support was prevalent among some, which contributed to resistance to its adoption. When asked about how ICT tools have impacted the way they carry out their work, it was found 72% positively 12 % negatively, 8% no impact and 8% were not sure how it impacted their work. When asked about the perception of communication between ICDS workers and supervisors through ICT tools, it was found that 70% thought ICT has been very effective in

enhancing the communication between workers and supervisors, 24% thought ICT has been somewhat effective in enhancing the communication between workers and supervisors, 4% thought ICT has been neutral in enhancing the communication between workers and supervisors, 2% thought ICT has been not very effective in enhancing the communication between workers and supervisors, and 0% thought ICT has been not effective at all in enhancing the communication between workers and supervisors.

The perception of Integrated Child Development Services (ICDS) workers about the impact of ICT tools on monitoring and tracking child and maternal health outcomes often varies depending on their exposure, training, and the local implementation of these tools. When workers in the Pulwama district were asked about the perception about Impact of ICT tools on the monitoring and tracking of child and maternal health outcomes in Pulwama it was found that 58 % of workers felt that ICT tools greatly improved monitoring and tracking 30% felt that ICT tools somewhat improved monitoring and tracking 12% felt no noticeable change in monitoring and tracking utilizing ICT tools 0% felt Somewhat reduced effectiveness in monitoring and tracking because of the use of ICT tools.

ICT tools have been induced in ICDS to enhance schemes' responsiveness and adaptability, ultimately improving outcomes for beneficiaries. In this study, ICDS workers were asked about the role of ICT tools in identifying and addressing the needs of beneficiaries more efficiently.

Table 2: Perception of Anganwadi worker regarding introduction of ICT in ICDS.

Response	**Frequency**	**Percentage**
Perception of ICDS workers on Impact of ICT tools on ICDS		
Positively	36	72
Negatively	2	4
No Impact	4	8
Not sure	8	16
Total	**50**	**100**
Perception about communication between ICDS workers and supervisor through ICT tools		
Very effective	35	70
Somewhat effective	12	24
Neutral	2	4
Not very effective	1	2
Not effective at all	0	0
Total	**50**	**100**
Impact of ICT tools on the monitoring and tracking of child and maternal health outcomes.		
Greatly improved monitoring and tracking	29	58
Somewhat improved monitoring and tracking	15	30
No noticeable change in monitoring and tracking	6	12
Somewhat reduced effectiveness in monitoring and tracking	0	0
Total	**50**	**100**
Role of ICT tools in identifying and addressing the needs of beneficiaries more efficiently.		
Very helpful	37	74
Somewhat helpful	8	16
Neutral	5	10
Not at all helpful	0	0
Total	**50**	**100**

ICT related problems faced by Anganwadi worker

The inception of Information and Communication Technology (ICT) in the Integrated Child Development Services (ICDS) program has created new challenges for ICDS workers, many of whom are not well-versed in digital technologies. Although ICT can help to improve data accuracy, efficiency, and service delivery, workers on the ground must overcome several major obstacles to properly apply it. This study explores the primary issues faced by ICDS workers in their attempt to integrate ICT into their daily tasks, including technical challenges, resource constraints, and other barriers. ICDS workers run the mechanism on the mobile phones provided by the department, these mobile phones have different issues. It was found that only 24% of workers never faced hardware malfunction, 6% workers rarely faced problems regarding hardware, 26% faced hardware problems sometimes, 14% often faced hardware problems and 30% often faced issues of hardware very often. These cell phones also exhibit problems connected to software. Thirty percent of the employees never encountered any software problems; twelve percent of them hardly encountered any; eight percent occasionally encountered software problems; eighteen percent often encountered software-related problems; and thirty percent faced very often software-related issues.

Introduced by the Ministry of Women and Child Development in India, the Poshan Tracker is a digital tool meant to improve the delivery and monitoring of services under the Integrated Child Development Services (ICDS) scheme by means of the Prime Minister's Overarching Scheme for Holistic Nourishment. Real-time data entering and monitoring made possible by the tracker helps to accurately track beneficiaries including children under six years of age, lactating mothers, and pregnant women. It is accessible via a mobile application used by ICDS workers to input details on key metrics like health assessments, service delivery, and nutritional support provided at Anganwadi centres. In this study we found that the ICDS workers faced issues with the application, it was found that 0% of workers never faced issues with the Poshan tracker, 14% of workers rarely faced issues with the Poshan tracker, 16% of workers sometimes faced issues with to Poshan tracker, 46% workers often faced issues with Poshan tracker, 24% workers very often faced issues with Poshan tracker. The workers also faced network problems, it was found that 26% of workers never faced network-related problems, 38 % of workers rarely faced network-related problems, 18% of workers faced network-related problems sometimes, 10% % of workers often faced network-related problems, and 8% workers very often faced network related problems. Kashmir Valley has a very harsh winter and a tough terrain and electricity is often hampered due to harsh climate and tough terrain. Workers face problems due to power cuts as they are unable to charge their devices. It was found 22% of the workers never faced electricity-related problems, 36% of the workers faced electricity-related problems rarely, 14% of the workers faced electricity-related problems sometimes, 18% of the workers often faced electricity related problems, and 10% of the workers very often faced electricity related problem.

Table 3: ICT related problems faced by Anganwadi worker.

Response	Frequency	Percentage
Hardware-related problems		
Never	12	24
Rarely	3	6
Some times	13	26
Often	7	14
Very often	15	30
Total	**50**	**100**
Software-related problems		
Never	15	30
Rarely	6	12
Some times	4	8
Often	9	18

Very often	16	32
Total	**50**	**100**
Poshan Tracker related problems		
Never	0	0
Rarely	7	14
Some times	8	16
Often	23	46
Very often	12	24
Total	**50**	**100**
Network related problems		
Never	13	26
Rarely	19	38
Some times	9	18
Often	5	10
Very often	4	8
Total	**50**	**100**
Electricity related problems		
Never	11	22
Rarely	18	36
Some times	7	14
Often	9	18
Very often	5	10
Total	**50**	**100**

Perception of ICDS workers regarding ICT implementation in the ICDS scheme

According to the gathered data, ICT (Information and Communication Technology) has been rather important for data collecting and monitoring inside the ICDS (Integrated Child Development Services) system. Though there are still some challenges to overcome, ICDS (Integrated Child Development Services) workers have a generally good view of the deployment of ICT (Information and Communication Technology) in the Pulwama area. According to the gathered data, ICDS workers in the Pulwama area clearly know the support they need to raise their ICT competency and apply ICT tools in their daily operations. 42% of the respondents emphasised the need for improved software to enable their use of ICT tools in their work. This suggests that highly useful software would be more advanced or specialised ones. 30% of respondents emphasized the importance of improved hardware to support their work, suggesting that better devices could enhance their ability to use ICT tools effectively. 24% expressed the need for more structured training to enhance their ICT skills, highlighting that continuous learning would be valuable in keeping up with technological advancements. 4% mentioned that increased support from colleagues or supervisors could improve their use of ICT tools, implying that collaboration and guidance are key. Only 2% identified a need for more opportunities to explore ICT tools independently, indicating that most workers are comfortable with guided learning rather than self-exploration.

The majority of ICDS workers believe that access to better software and hardware is crucial for improving their ICT skills and overall effectiveness. While training opportunities are also important, there is less demand for additional support from colleagues or supervisors, and very few workers seek more experimental opportunities. According to the data, a focus on training and software and hardware upgrades would greatly increase workforce ICT proficiency. ICT (Information and Communication Technology) is well-integrated into the ICDS (Integrated Child Development Services) program in the surveyed area, according to data gathered from ICDS workers who were asked how much ICT is currently integrated into the ICDS program in their area.. 58% of respondents believe ICT is fully

embedded in the program, 26% report that ICT plays a major role but is not yet fully optimized, 16% feel that ICT is present but not extensively used and 0% of respondents indicated a lack of ICT integration. The collected data reflects a largely positive perception among ICDS workers regarding the impact of ICT integration on service delivery efficiency: 68% believe ICT has greatly enhanced the efficiency of ICDS service delivery, 20% report noticeable improvements due to ICT, 12% feel that ICT integration has not made a major difference and 0% indicated any negative impact.

In the study, ICS workers were asked how the ICT contributed to data collection and monitoring within the ICDS program 66% of respondents found ICT to be highly effective, 26% considered it effective, 8% felt it was only partially effective and 0% reported limited usage or inefficiency. The results strongly suggest that ICT integration in ICDS has been overwhelmingly positive, with 92% (Highly Effective + Effective) of responses favouring its role. No respondents reported inefficiency or lack of usage, highlighting ICT's critical contribution to monitoring and data collection in the program.

The Pulwama district's ICDS program has successfully included ICT, and the majority of employees recognise its benefits for data collecting, monitoring, and service provision. The vast majority of people believe that ICT is very effective or efficient, and they either totally or considerably integrate technology into their work. Furthermore, the vast majority of employees think that ICT has increased the effectiveness of service delivery, proving its worth in improving communication and expediting procedures.

But there are still certain difficulties. Employees acknowledge the advantages of ICT, but obstacles include a lack of training, subpar technology, and software restrictions. To fully utilise ICT, several employees underlined the need for better digital tools, more training opportunities, and more robust technical support. ICT is generally seen by ICDS employees as an important and generally effective contribution; however, further infrastructure, training, and support system upgrades are required to guarantee that its full potential is achieved in every region.

Table 4: Perception of Anganwadi worker regarding different issues.

Response	**Frequency**	**Percentage**
Response regarding the support that would be helpful in improving ICDS workers ICT skills and using ICT tools effectively for ICDS Workers at work.		
More training opportunities	12	24
Access to better hardware	15	30
Access to better software	21	42
More support from colleagues or supervisors	2	4
More opportunities to experiment and explore with ICT tools	1	2
Total	**50**	**100**
Response regarding the extent is ICT currently integrated into the ICDS in Pulwama		
Not integrated at all	0	0
Slightly integrated	0	0
Moderately integrated	8	16
Significantly integrated	13	26
Fully integrated	29	58
Total	**50**	**100**
Response regarding how the integration of ICT has improved the efficiency of ICDS service delivery		
Significantly improved	34	68
Improved	10	20

No significant impact	6	12
Worsened	0	0
Significantly worsened	0	0
Total	**50**	**100**
Response regarding how ICT has contributed to data collection and monitoring within the ICDS program		
Highly effective	33	66
Effective	13	26
Partially effective	4	8
Limited usage	0	0
Inefficient or not used	0	0
Total	**50**	**100**

CONCLUSION

The Integrated Child Development Services in the Pulwama district are being brought up to date, improving data management, the way its services are given and health results for children and their mothers. Adding digital methods such as automatic report systems, continuous monitoring and a mobile app can greatly boost how effective and open the ICDS program is. They may help make Anganwadi workers' jobs easier, reduce paperwork and make helping beneficiaries quicker. Even so, switching over to a virtual structure presents some difficulties. Low understanding of computers among frontline staff, poor training, trouble with hardware and software, bad internet connections in rural areas and little infrastructure lead to obstacles.

It is important to use a wide approach to get the most from digital transformation. Since capacity-building, upgraded digital resources and stronger partnerships within communities can improve things, ICDS projects should focus on these areas. Adjusted policies and effective public-private work can help move the area forward more rapidly. In conclusion, digitalisation offers the chance to greatly improve the ICDS program in Pulwama, but its progress will depend on clearing logistical problems The district can create a child development framework that is more effective, responsive, and significant by implementing a strategic, phased approach backed by sufficient training, technology investment, and policy alignment.

REFERENCES:

- Bhatt, R., Sharma, S., & Verma, K. (2020). Digital Transformation in Public Health: Implications for India's ICDS. *Journal of Health Informatics in Developing Countries, 14*(3), 101-115.
- Ghosh, A., & Chatterjee, S. (2021). Enhancing Efficiency in Child Development Services through ICT: An Indian Perspective. *Asian Journal of Social Welfare, 13*(1), 45-60.
- Patel, T., & Roy, A. (2021). Bridging Digital Gaps in Rural Health Programs: A Focus on ICDS. *Journal of Digital Health Policy, 11*(2), 90-112.
- Sinha, P., & Jain, D. (2023). POSHAN Abhiyaan's Digital Transformation: Impact on ICDS Delivery. *Indian Journal of Social Development, 24*(1), 23-39.
- Kaur, G., & Bains, G. (2021). *Digital literacy challenges faced by ICDS workers in rural India*. Journal of Social Welfare & Technology, 23(3), 70-83.
- Patel, P., & Bansal, P. (2022). *ICT in ICDS: Enhancing monitoring and decision-making.* Indian Journal of Public Policy, 15(2), 78-92.
- Rani, S., & Rathi, R. (2021). *The role of ICT in improving efficiency of ICDS workers*. Indian Journal of Social Welfare, 25(1), 37-50.

- Sharma, R., Singh, S., & Thakur, R. (2022). *ICT tools in ICDS: Transforming service delivery in rural India*. Journal of Digital Education and Development, 18(2), 85-102.
- Ministry of Women and Child Development (MWCD). (2020). *Report on the status of ICT integration in the ICDS scheme*. Government of India.
- Patel, P., & Bansal, P. (2022). *Resistance to digital change in public welfare schemes: Insights from ICDS workers*. Indian Journal of Public Policy, 15(1), 50-65.
- Sharma, R., & Thakur, R. (2021). *Challenges and opportunities in digital training for ICDS workers: A case study*. Journal of Digital Education, 18(2), 95-109.