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# THE INFLUENCE OF EXPOSING RURAL POPULATIONS TO ICT INFRASTRUCTURES ON THEIR SOCIO-ECONOMIC DEVELOPMENT: A MICRO LEVEL STUDY

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**Abstract**
Development refers to the enhancement and progress in all facets. Given that 75 percent of our nation's population resides in rural areas, it is imperative to prioritize the transformation of rural society in order to address the pressing issue of rural development. Development encompasses the progress of both society and the economy, and can be achieved through the dissemination of information, education, and effective communication. Communication is an essential process for exchanging information, and without it, progress would be impossible. There is a wealth of information on rural development topics such as health and hygiene, agriculture, animal husbandry, adult literacy, and entrepreneurship. This information needs to be effectively transferred to rural communities through an appropriate communication mechanism. The transition from rural communication to satellite communication is a highly advantageous development for all of humanity. The primary objective of this communication advancement is to foster human development, specifically by facilitating communication that can effectively mitigate poverty, unemployment, and social inequality. Hence, this study aims to investigate the correlation between the utilization of ICT infrastructure and the socio-economic progress of rural communities.
**Key Words**: socio economic development, ICT infrastructures, rural population, technology transfer, rural development

## 1.1 Overview

Information communication technology refers to the tools and systems that allow for the processing and exchange of information between humans and electronic systems. This definition consists of two components: 'technology' and 'information and communication'. Technology is the tool used to achieve the objectives of managing and communicating information. ICTs are widely regarded as the primary facilitator of globalization. It facilitates the streamlined and economical movement of information, goods, individuals, and financial resources across international borders [1]. While ICTs are not a cure-all for empowering women, they do have the capacity to assist women in overcoming certain conventional obstacles to development. This is achieved by enhancing their access to information, broadening their market reach, improving employment prospects, and enhancing the effectiveness of government services. In this paper, ICTs refer to various modes of communication, such as audio, video, telephone, mobile phone, satellite, and Internet [2]. There is no specific information provided.The impact of mass media is limited for individuals living below the poverty line, as it holds little significance for them. They survive on a daily budget

of only Rs. 2 per person, which covers all their essential expenses such as food and clothing. Purchasing an inexpensive transistor set is a luxury that is beyond their financial means. Printed publications such as newspapers and periodicals are not an option. Therefore, it is unlikely that rural people, urban poor, and other marginalized sections of society will have easy access to media and the resulting exposure. Given the circumstances, it would be accurate to describe mass media in India as essentially class media [3].

**1.2 Technology transfer**

Significant advancements have been observed in the Plans, with the establishment of infrastructure to ensure a stable foundation for the economy. Consequently, mass media have elevated individuals' awareness and enhanced their cultural and social experiences, ultimately fostering well-informed citizens. They have been aiding in accelerating the progress of developmental programs and raising awareness among the public about significant national and international events. The process of technology transfer has only reached maturity through the use of media. Only individuals who are well-informed are eligible to participate in new production endeavors. The efficacy of media, among other factors, has contributed to the significant increase in agricultural production from 55 million tonnes in 1950-51 to over 170 million tonnes in 1991. The national income has experienced an annual growth rate ranging from 2.2% to 5% during the plans. Additionally, the rate of capital formation has increased from 1950-51 to 24% in the Seventh Plan. The mortality rate has decreased and the average lifespan has increased by almost 1.5 times since the advent of media development [4]. It can be inferred that farmers can quickly access more information through modern information technology and selectively choose the information they need for decision-making, thereby increasing their profits. Modern information technology provides farmers with easy access to electronic databases containing information on plant varieties, weather forecasts for optimal sowing in rain-fed conditions, pest and disease control measures, ideal harvest times, and post-harvest operations such as cleaning and drying. It also offers guidance on cultivation techniques, availability and cost of inputs, pest and disease management, irrigation system design, and market prices in different markets. By utilizing this technology, farmers can enhance both the quantity and quality of their agricultural products, ultimately leading to increased profits.

Therefore, the utilization of modern information technology is highly beneficial to the farming community in order to enhance their quality of life [5]. In order to achieve maximum impact in rural development in the 21st century, it is essential to establish a comprehensive framework that can effectively benefit a large and diverse population. In order to fully capitalize on the potential benefits of this technological revolution, it is crucial to effectively harness and direct its power. In order to facilitate the necessary rural development in the 21st century, it is imperative to establish a robust technological infrastructure. In the 21st century, it will be crucial to fully utilize the information highway. The success of rural development will heavily rely on the creation and efficient utilization of IT infrastructure. The countries that utilize multimedia communication for rural development purposes will become the economic powerhouses of the current century [6]. There are differing opinions regarding the operation and influence of information communication technology on rural development. Thus, this study has examined the participation of the three primary forms of mass communication, namely the press, radio, and cinema. These media are widely used and have a significant

influence. The study aims to analyze the influence of information and communication technology on sustainable rural development, specifically focusing on the village of Ponniyemmanmedu in Chennai District, Tamil Nadu.

### 1.4 Literature reviews

Okocha claimed that the transmission of technology for progress is intricately linked to communication. In order to advance developing societies towards modernization, it is crucial to enhance their communication systems to be more advanced and efficient. This is necessary for various purposes such as social and political mobilization, national integration, learning, social education, and extension [7]. An influx of information at a rapid rate is crucial for altering the attitudes of the villagers, thereby transitioning them from a traditional society to a modern one [8]. Fox considers development and communication to be synonymous [9]. An efficient communication system is crucial in the process of modernizing agriculture, cultivating a healthy and educated workforce for industry, and promoting active participation in national development in a developing country. Lerner also supports Schramm's perspective that if we do not prioritize development, communication becomes irrelevant [10]. This configuration is not sustainable in the long term. Dube highlighted the significance of communication in development, stating that even a well-designed project is bound to be unsuccessful unless it is accompanied by a creative communication program [11]. Developing countries are rapidly progressing societies. They desire to rapidly catch up. Mass media can provide assistance in raising awareness among individuals about the topics they wish to stay updated on. In the developing world, the reliance on extension work is limited because extension agents primarily focus on providing extensive support to a select group of affluent, educated farmers who are known for their innovative practices [12]. This will only expedite imbalanced development, which contradicts the fundamental essence of progress. However, in mass media communication, individuals can participate if they have the opportunity to take advantage of the potential of the media.

Mass communication exhibits a multiplier effect. It facilitates rapid development attitude. According to McClelland's thesis, specific forms of media content can enhance achievement motivation, which is crucial for personal growth and progress [13]. McQuail also agrees with Schramm's viewpoint that communication plays a role in fulfilling several of the preconditions for take off, as defined by W.W Rostow. They represent the nation's perspective in the village, fostering a shared commitment to economic and national objectives. Additionally, they promote literacy and teach new skills, while cultivating a mind-set that supports economic expansion and a focus on future prosperity [14]. Muthiah Manoharan propose that exposing peasants to mass media can serve as a means of modernizing them. The individual establishes a connection with the external world through the media [15]. However, as previously mentioned in this chapter, it is important to note that mass media alone cannot effectively operate in the context of rural development. They can raise awareness about the presence of innovative development practices. An individual may be hesitant to embrace a contemporary agricultural method if they only learn about it through mass media. However, witnessing successful implementation of the practice can accelerate the process of adoption. Pool partially agrees with this thesis. In order to achieve certain potential effects, it is necessary to have inter-personal or organizational support for media [16].

Berrigan is also in favor of this. He believes that no media can surpass the effectiveness of persuading people to embrace practices such as family planning. Person-to-person communication cannot be replaced by any form of media [17]. Arke, and Primack delineates the impact of film in the realm of mass communication. Integrating films with inter-personal communication can prove to be beneficial [18]. Varghese also highlights the insufficiency of using only one medium. For instance, he asserts that a radio instructor can only serve as an additional resource, rather than replace the role of a classroom teacher or extension worker. Both individuals must collaborate. According to Reddy, mass communication and interpersonal communication are two elements of rural communication [19]. Moemeka argues that in developing countries, mass media and libraries are not yet able to replace the work of field workers in rural areas for extension purposes. The aforementioned propositions support Schramm's perspective that mass media is a necessary but not sufficient factor for development. Efficient organization and interpersonal communication are essential for mass communication to effectively drive development [20]. The review has identified key objectives for the present study, which aims to investigate the relationship between the exposure of ICT infrastructure and socio-economic development.

### 1.3 Methods of research

This study specifically chose Ponniyemmanmedu Village in Chennai District. The current study primarily relies on primary data, where a total of 125 rural households were selected using the simple random sampling technique in 2023. The main data gathered through an interview schedule. The main data pertaining to socio-economic conditions, including age, education, religion/caste, primary occupation, and income, as well as the ICT infrastructures (mass media exposures) such as radio, press, newspapers, and periodicals, and television, of rural households were gathered through personal interviews using a well-structured questionnaire.

**[a] Quantification of Mass Media Exposure**: The accuracy of the ICT infrastructure (Mass media exposures) items included in the scale and the suitability of the weights assigned to them. The scores measuring the respondents' media exposure were calculated by adding up the scores they obtained for each item on the scale. The participants were classified into three categories based on their scores: the low exposure group (scores below 15), the medium exposure group (scores between 15 and 30), and the high exposure group (scores 30 and above).

**[b] Assessment of Socio-Economic Status:** The present study utilized the following items to assess the socio-economic status of the participants. The scores assigned to the items are displayed alongside them. To assess the reliability of the scale, we first ensured that the items included in the scale and the weights assigned to each item were deemed rational by consulting with experts and progressive farmers. Subsequently, a total of 125 heads of households were chosen as a sample and were requested to assign weights ranging from 1 to 100 based on the socio-economic status of the individuals. The scale was administered to the 125 heads of households who had already been rated. The total score for each respondent was determined by summing the scores obtained for each item. The score range was divided into three categories for specific analyses: low socio-economic status (score below 35), middle socio-economic status (score between 35 and 70), and high socio-economic status (score 70 and above). The scores for correlation analyses were recorded using class intervals.

### 1.4 Data and Results

The purpose of the data and results is to determine if there is a correlation between the exposure of rural people to information communication technology infrastructures and their socio-economic development. Additionally, it aims to examine if the degree of this relationship varies based on certain background variables such as age, educational attainment, and income.

**[a] ICT infrastructures exposure and different age groups**

Table 1.1 indicates that the correlation between exposure to ICT infrastructures and socio-economic development may vary depending on factors such as age, educational status, religious/caste affiliation, and income. Consequently, each of the background variables was introduced and analyses were conducted as demonstrated below. The vitality of youth is commonly acknowledged to surpass that of old age. Therefore, it is probable that the younger age group exhibits higher levels of entrepreneurship compared to older age groups. The environment is conducive to the advancement of communication sources, leading to a greater extent of their application and consequently, higher development. According to this line of thinking, it was hypothesized that as people get older, the correlation between their exposure to mass media and their socio-economic development will decrease. In order to test this hypothesis, the researchers determined the correlation between the level of exposure to ICT infrastructures and the socio-economic status of three different age groups: the low age group, the middle age group, and the upper age group.

**Table 1.1 correlation between ICT infrastructure and different age groups of rural peoples**

| Age groups | Correlation Co efficient (r ) | t Values |
|---|---|---|
| Low Age groups | 0.7890* | 11.48 |
| Middle Age groups | 0.7466* | 14.93 |
| Upper Age groups | 0.7899* | 15.07 |

Source: Computed Note: * Significant at 1 per cent level

According to Table 1.2, individuals with greater exposure to ICT infrastructures tend to have higher socio-economic status. Therefore, the conclusion is that there is a strong correlation among individuals in the younger age group. There is a strong correlation between the exposure of ICT infrastructures and the socio-economic development of the middle age group. The above analysis leads to the conclusion that there is a significant correlation between the exposure to ICT infrastructures and the socio-economic development of various age groups. Further, the degree of correlation was assessed by utilizing Fisher's Z-transformation test. To facilitate this, the value of 'r' for the low age group was denoted as r1, while the values for the middle and upper age groups were denoted as r2 and r3, respectively. Moreover, the table indicates that there is no significant difference between r1, r2, and r3. Therefore, the level of correlation between the exposure of ICT infrastructures and the socio-economic development of respondents from various age groups can be considered equal. The discovery indicates that the correlation between the exposure of ICT infrastructures and socio-economic development is not influenced by the difference in age. Given that the causal relationship is not determined, this principle can be applied equally when socio-economic development is considered as the independent variable and exposure to ICT infrastructures is considered as the dependent variable.

**Table 1.2 Comparison of the coefficient of correlation of the different age groups**

| Co efficient of correlation compared | Z* | Significance of difference between the co efficient |
|---|---|---|
| r 1 and r 2 | 0.7227 | NS |
| r 1 and r 3 | 0 | NS |
| r 2 and r 3 | 0.6911 | NS |

Source: Computed

Note: * Significant at 1 per cent level, NS Not significant

Critical value of Z: 1.960 at 0.05 level; 2.576 at 0.01 level

In all the comparison tables the magnitude of Z s only is given

$Z = z1 – z2 / \sqrt{1/n1 – 3 + 1/n2 – 3}$

Where,

$Z = ½ \log_e (1+r) / (1 – r)$

**[b] ICT infrastructures exposure and different Educational groups**

Table 1.3 reveals that the education alone cannot improve a person's life, but it can provide new opportunities for enhancing one's life. Given that ICT infrastructures serve as conduits for the dissemination of developmental communications, we postulate that their impact on individual development will vary based on differences in educational attainment. Specifically, it can be stated that the relationship between exposure to mass media and the socio-economic development of individuals will vary depending on their level of education. The hypothesis was tested by correlating the variables of ICT infrastructure exposure and socio-economic status. The degree of these correlations was then compared among different categories of individuals, including illiterates, primary educated, secondary educated, and college educated. It could be concluded that there is a substantial correlation between the level of exposure to ICT infrastructures and the socio-economic development of all educational categories.

**Table 1.3 correlation between ICT infrastructure and different educational groups**

| Educational Groups | Correlation Co efficient (r ) | t Values |
|---|---|---|
| Illiterates | 0.2827* | 3.16 |
| Primary Educated | 0.6645* | 12.48 |
| Secondary Educated | 0.5516* | 5.37 |
| College educated | 0.7138* | 3.81 |

Source: Computed Note: * Significant at 1 per cent level

Table 1.4 indicates that the correlations between the variables for individuals with different levels of education, specifically illiterates, primary educated, secondary educated, and college educated, were denoted as r1, r2, r3, and r4, respectively. These correlations were compared using the Z-transformation test. Further, suggests that the correlation between the variables is stronger among literate individuals compared to illiterate individuals. Therefore, the hypothesis is partially accepted, indicating that the correlation varies only among individuals who are illiterate and those who are literate. The findings indicate that the level of exposure to ICT infrastructures has a more significant impact on the socio-economic development of rural individuals who are literate compared to those who are illiterate. Education can enhance the receptiveness of rural individuals to information regarding

contemporary advancements. Literates are more likely to adopt more productive practices compared to illiterates. One of the disadvantages faced by illiterate individuals is their inability to access printed materials. The press is believed to possess a greater capacity to inspire individuals to embrace contemporary practices, while the radio and movies enhance awareness regarding new advancements.

**Table 1.4 Comparison of the coefficient of correlation of the different Educational groups**

| Co efficient of correlation compared | Z* | Significance of difference between the co efficient |
|---|---|---|
| r 1 and r 2 | 4.2833 | * |
| r 1 and r 3 | 2.1208 | ** |
| r 1 and r4 | 2.0465 | ** |
| r 2 and r3 | 1.2221 | NS |
| r 2 and r4 | 0.3282 | NS |
| r 3 and r4 | 0.8855 | NS |

Source: Computed Note: * Significant at 1 per cent level; ** Significant at 5 per cent; NS Not significant

Critical value of Z: 1.960 at 0.05 level; 2.576 at 0.01 level

**[c] ICT infrastructures exposure and different Income groups**

According to Table 1.5, the income of the respondents is believed to have an impact on the interrelationship between the variables. Therefore, it was postulated that the correlation between exposure to ICT infrastructures and socio-economic development would differ based on the income level of individuals. In order to test the hypothesis, the researchers examined the correlations between the level of exposure to ICT infrastructures and the socio-economic status of the respondents from various income groups. These correlations were analyzed separately and then compared using the Z-transformation test. The following three tables demonstrate the correlation between the variables.

**Table 1.5 correlation between ICT infrastructure and different Income groups**

| Income Groups | Correlation Co efficient (r ) | t Values |
|---|---|---|
| Low Income Groups | 0.6420* | 14.67 |
| Middle income groups | 0.4977* | 4.16 |
| Upper income groups | 0.8348* | 7.58 |

Source: Computed Note: * Significant at 1 per cent level

Additionally, table 1.6 demonstrates that the Z-transformation test was utilized to determine the changes in the correlation due to fluctuations in income. The analysis is displayed. The correlation coefficient for the low income group is denoted as r1 in the table, while the correlation coefficients for the middle income and high income groups are denoted as r2 and r3, respectively. The aforementioned analysis suggests that the income of the respondents has a significant impact on the relationship between the change of one variable and its effect on the other, but only at higher income levels. At lower and middle income levels, the relationship between the variables is independent of the background variable. Hence, the income of the respondents only affects the correlation between exposure to ICT infrastructures and socio-economic development at the higher income level. An expansion in the exposure of ICT infrastructures to the high income group leads to a more significant extent of socio-

economic development, and the opposite is also true. This suggests that the wealthy will amass even more wealth by making use of the information and communication technology infrastructures. As a result of the functioning of ICT infrastructures, the gap between the highest income category and other income categories in rural society will widen.

**Table 1.6 Comparison of the coefficient of correlation of the different Income groups**

| Co efficient of correlation compared | Z* | Significance of difference between the co efficient |
|---|---|---|
| r 1 and r 2 | 1.7664 | NS |
| r 1 and r 3 | 2.0273 | ** |
| r 2 and r3 | 2.8133 | * |

Source: Computed Note: * Significant at 1 per cent level; ** Significant at 5 per cent level; NS Not significant

Critical value of Z:1.960 at 0.05 level; 2.576 at 0.01 level

**1.5 Conclusion**

Developing countries have prioritized mass media as a means of disseminating information and mobilizing people to achieve improved socio-economic conditions. This is attributed to the growth potential of the mass media. India is utilizing this agency to achieve rapid socio-economic transformation. The objective of this study was to determine the correlation between mass communications and development in an Indian context. Given that the majority of India's population resides in rural areas, our study focused on examining the relationship between mass communication and rural development. The above discussions indicate a clear and significant positive correlation between the exposure of ICT infrastructures and socio-economic development in a rural community. The causal relationship between the variables has not been determined. The age of the respondents, as a background variable, does not affect the correlation pattern. The correlation is stronger among individuals who are literate and belong to the high income group. This suggests the potential of utilizing mass media to enhance the predominantly agrarian rural economy. The correlation is significantly low for the manual laborers. Furthermore, it has been determined that the social infrastructure of the residential area does not have an impact on the relationship between the variables.

Research has shown that media communication is more effective in promoting development among rural populations that have achieved a specific level of socio-economic progress. In other words, the less advanced categories are experiencing fewer benefits from development communication. Their engagement with communications can only be enhanced if they are experiencing progress in the early stages of socio-economic development. In order to achieve this, extension agencies must focus their attention on these specific segments of society. Development communication is more appealing to the socio-economically privileged group, whereas entertainment aspects are equally appealing to all segments of the population. The lower stratum holds the belief that development communication is only beneficial for individuals with financial resources available for investment. This less advanced group must develop a more positive attitude towards development communication in order for them to find the communication on non-monetary input practices acceptable and beneficial.

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