

THE ROLE OF ICT IN POVERTY ALLEVIATION IN INDIA

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Abstract

This study examines the role of Information and Communications Technology (ICT) in combating poverty in a developing country like India. ICT includes a wide range of appliances and applications that facilitate access to information. Over the last couple of decades, quick access to relevant and reliable information has transformed the way the world lives and transacts business, transforming lives in the process. In this study, we examine the current and potential role such access to information has in speeding up India's fight against poverty.

The traditional view of Poverty describes it as an economic phenomenon, measured in monetary terms. Such a description facilitates its quantification and tracking across time. With the broadening of understanding, poverty has evolved into a multi-dimensional concept, that goes beyond material deprivation to include, among others, illiteracy, vulnerability, powerlessness, gender inequality, social exclusion and a lack of opportunity to fulfil one's potential.

With these broad definitions, the present study answers the following questions: 1) What is the role of ICT in economic empowerment of the poor including employment and income generation? 2) What is the role of ICT in combating social exclusion especially for women?

Keywords: *ICT, Poverty, multidimensional poverty, education, gender inequality, social exclusion.*

1. Introduction

Last two decades have witnessed technology pervade every aspect of our lives like never before. At the forefront of this technological revolution is the information explosion, made possible, in large part, through exponential growth in the ICT sector. While there are several fields where the developmental role of ICT is but obvious, there is an equal number of those where such a causative relationship is less evident on the surface. The role of ICT in poverty eradication is one area with direct as well as the indirect causal relationship. This study examines the different ways in which growth in the ICT sector influences a reduction in the incidence of poverty in India.

The concept of Poverty is dynamic and complex. Poverty is not a single identifiable condition, but a fluctuating set of circumstances [29]. The term 'poverty' can be considered to have a cluster of different overlapping meanings depending on the subject area or discourse [11]. There is a consensus among scholars that poverty is multidimensional in nature and any meaningful discourse on poverty must address it so. Consequently, this study takes into consideration different dimensions of poverty like income, employment, education, vulnerability, powerlessness, gender

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inequality, social exclusion and a lack of opportunity to fulfil one's potential, to examine the impact of ICT in poverty alleviation in India.

India is a vast and diverse country with a developing economy. While it is one of the fastest growing economies in the world, India is also home to one of the highest number of poor in the world. The IT Industry has been one of the major growth engines for the Indian economy over the last two decades and more. Curiously, this period coincides with the tremendous stride India has made in combating poverty and hunger across the country. Clearly though, much more needs to be done and much quicker to rid India of the scourge of poverty and the role of ICT will be examined in detail in the later sections.

The study is divided into three parts. Part one describes the ICT sector with particular reference to India. Part two discusses, briefly, the concept of poverty in its different dimensions. Part three examines the present and potential role of ICT in poverty eradication in India and the challenges involved. The study relies on data from secondary sources retrieved from the databases accessed through the library of the National University of Public Service, Budapest, the CEU Library, and official reports published by different departments of the Government of India and international agencies. The Indian Government agencies do not compile data for ICT as an industry or an entity. The data has to be collated after gathering facts and figures from different sources chiefly the IT/ITES Industry data and the telecommunication industry data.

2. Information and Communications Technology (ICT) in India

I begin by narrowing down to a definition of ICT, broad enough to encompass the width of this study. Simply put, ICT has been defined as “a technological means of collecting (inputting/gathering), collating (processing/analyzing), and conveying (outputting/transferring) information via technology” [1]. Furthermore, ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT) but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums [5]. These and other such definitions take more of a technology-oriented manufacturing view. In this paper, I follow the holistic definition of ICT as a combination of manufacturing and services industries that capture, transmit and display data and information electronically [18].

With 512.26 million internet subscribers, as of June 2018, India is ranked as the world's second largest market in terms of total internet users. India is also the world's second-largest telecommunications market with 1,191.40 million subscribers, as of September 2018. Over the next five years, the rise in mobile-phone penetration and decline in data costs will add 500 million new internet users in India, creating opportunities for new businesses. Furthermore, Indian IT firms generated the so far highest revenue of US\$ 167 billion in 2017-18, with an export figure of \$126 billion [13].

Impressive as these figures may seem, what is of greater significance is the fact that the above number of internet subscribers actually constitutes a mere 35% penetration overall with around 65% penetration into the urban market and just 20% rural [12], indicating a huge, still untapped potential.

3. The Concept of Poverty

Poverty as a concept makes its appearance in literature starting in the late eighteenth century, coinciding with the post-renaissance period of enlightenment, the French and the American Revolutions. However, it is around the late nineteenth century when formal studies of poverty emerged in social sciences and the references to poverty in literature peaked [22]. In the initial studies, poverty comes across as a monetary concept, defined terms of income and consumption, specifically, measured as a calorific requirement [23]. Later, eminent scholars applied this absolutist concept of basic minimum levels of income/consumption to develop a set of objective and universal human needs to define and measure [26]. In contrast, other renowned scholars took a relativistic view of poverty [30, 17]. Nevertheless, in both cases, the discourse on poverty essentially was centred on earnings and consumption.

Moving beyond income and consumption, poverty is defined as a lack of human capabilities where capabilities refer to the real opportunity that we have to, accomplish what we value [27, 28]. Sen's capability approach is widely regarded to be at once novel and of substantive importance for the conceptualization of multidimensional poverty and well-being [3].

Anand and Sen carried the argument on the multidimensional nature of poverty further. "Income-based poverty measures concentrate exclusively on deprivation in one variable in particular; viz. income. It has the advantage of simplicity in refraining from taking an interest in different aspects of deprivation. (However), when we consider several other ways in which a person can be severely deprived, we find other dimensions of disadvantage...The need for a multidimensional view of poverty and deprivation not only guides the search for an adequate indicator of human poverty, but it also clarifies why an income-based poverty measure cannot serve the same purpose" [4]. The framework of HPI (Human Poverty Index) proposed therein was broad-based to include

- i) survival deprivation,
- ii) deprivation of education and knowledge,
- iii) economic deprivation [4],
- iv) vulnerability and
- v) powerlessness and voicelessness [32].

The above variables are relevant for the developing countries, still grappling with widespread undernourishment and a general paucity of social amenities. Whereas in the developed world, where hunger is rare, literacy is widespread, health services are widespread and safe drinking water easily accessible, there is a tendency to concentrate on other variables like social exclusion and inability to take part in the life of the community [4].

The following section examines the role of ICT in poverty alleviation in India, along with the following dimensions: economic upliftment (employment and income generation), education, healthcare and combating vulnerability of women.

4. ICT in Poverty Alleviation

4.1. Economic Role of ICT

Arguably, the most widely followed prescriptive approach to tackling poverty is the one stemming out of the economic theory propounded by Keynes. This approach favours economic growth and the resultant employment generation as the key to economic wellbeing in society.

We begin by examining the output of the ICT sector in India.

	Year	11-12	12-13	13-14	14-15	15-16	16-17
Telecommunications		36.8	38.6	40.3	45.1	45.9	46.0
Cable Operators, recording, publishing etc.		9.9	10.8	12.5	14.5	15.3	16.7
Information and computer related services		49.2	55.1	63.5	75.3	97.1	106.0
Manufacture of communication equipment		2.2	2.0	3.1	2.6	7.2	8.9
IT/ BPM Industry		101	108	119	132.5	143	154
ICT Total		199.1	214.5	238.4	269.9	308.5	331.6

Table 1. Output of ICT Sector in India (in billion \$)

The data presented in Table 1 above shows a steady growth in the output of the ICT sector. These figures have been collated from more than one source and may hence serve an indicative purpose to show the importance of ICT in the Indian economy over the years. Turning our attention to the employment generation role of ICT, given below, in Table 2, is the data on the number of employees in the IT/ BPM Industry in direct and indirect employment respectively.

The figures for direct employment are understandably lower than those for indirect employment because of the industry requirement of higher education levels. However, it is in the potential of creating indirect jobs where the main role of ICT as an employer, in the reduction of poverty, is concerned. These indirect jobs involve sales of ICT hardware and software. Jobs in the BPM sector are a direct consequence of the integration of India's economy with the global economy, made possible solely by the Information and communication technology in the first place.

Year	Direct Employment	Indirect Employment
2011-12	2.8	8.9
2012-13	3	9.5
2013-14	3.29	10
2014-15	3.52	10
2015-16	3.7	10
2016-17	3.86	12

Table 2. Direct and Indirect Employment in IT/ BPM Industry in India (Source: Statista. Retrieved from <https://www.statista.com/statistics/320729/india-it-industry-direct-indirect-employment/> on 2018.12.11.)

ICT has made labour market accessibility easier; e.g. Labour Net is a Bangalore-based organisation that helps to connect, which utilises the mobile phone platform to match the skill set of people available for work with needs of those who require workers [6].

ICT is being used extensively in the agriculture and handicrafts sectors to provide information and accessibility to markets. Accessibility to information through ICT is a great enabler for markets, especially so for isolated or poor neighbourhoods [6]. For example, 'my farm info' is an agriculture information system that an Indian farmer can easily access through a mobile phone. The system utilises IOT technology, uses complex algorithms on the history of crop diseases and forewarns the farmer on such a possibility. It guides on better water management and through SMS provides weather updates and also latest mandi crop prices, to help the farmer make an informed decision at every step [19]. These steps can help a farmer, conventionally a weak link in India's fight against poverty.

4.2. Accessibility and Economic Empowerment of the poor using ICT

ICT has helped provide easy access to the poor, in particular to those living in remote or isolated areas, of the services that were, hitherto, out of reach for them. These are a bank account accessible through mobile application, credit or debit card linked through a mobile application. Making use of this location neutrality, the Government of India has launched the Pradhan Mantri Jan-Dhan Yojana (PMJDY), which ensures access to various financial services like availability of basic savings bank account, access to need-based credit, remittances facility, insurance and pension to the excluded sections i.e. weaker sections and low-income groups [20]. As a result, account ownership in India rose by more than 50%, according to the latest Global Findex Survey released by the World Bank in April 2018. As per the Global Findex Report, adult bank account holders in India increased to 80 per cent in 2017 as compared to 53 per cent in 2014. What's more, there is a sharp fall in the gender gap from 20 per cent in 2014 to 6 per cent in 2017 in bank accounts [9].

Further leveraging this financial inclusiveness by including more than 80% of adults into the banking system, Government of India has embarked upon a massive Direct Benefit Transfer Scheme, where beneficiaries of government schemes get the sum transferred directly to their bank accounts, ruling out frauds or manipulation by middlemen and ensuring hassle-free acquisition of benefits under various schemes. There are 434 welfare schemes under 56 Central ministries, totalling to a mammoth 1.67 billion transactions, amounting to 29 billion US Dollars, which have so far been included in this Direct Benefit Transfer Scheme. This translates to saving from a potential loss of over 12.9 billion US Dollars for these poor of the country [8].

5. ICT in Combating Gender Exclusion

5.1. Access to Information and Economic opportunity

One of the important dimensions of poverty as touched upon in the opening section is social exclusion. Social Exclusion is a broad concept. An individual or a group may be excluded owing to any of the factors like income, class, religion, ethnicity, caste, gender, age, level of education, physical disabilities among others. The present study discusses social exclusion from a gender perspective.

The previous section examined the role of ICT in economic growth and empowerment and in poverty alleviation. This section will focus on women's participation. There is a strong instrumental

rationale for ensuring women's participation in processes of growth: it will contribute to the inclusiveness of growth, not merely because women constitute 50% of the world's population, but also because women's access to economic resources improves distributional dynamics within the household [14].

The primary role that ICT performs in the given context is to provide women with access to information and economic opportunity. ICTs have been used by gender equality advocates the world over for putting out rights-based information. From multilateral agencies like UNIFEM to feminist activists at local levels, actors at different levels are involved in creating, collating and disseminating material on rights – legal rights, sexual and reproductive rights, women's human rights. This is done through websites, e-magazines and email. In many developed countries, websites provide assistance to women seeking help on domestic violence [16]. Self Employed Women's Association (SEWA) is an organization dedicated to creating employment opportunities for poor self-employed women workers. SEWA has a membership of 200,000 and is spread over 800 villages in the Indian state of Gujarat. It uses an interactive satellite communication and Internet-based training programme to develop a cadre of barefoot managers among the poor women workers, focusing on women in panchayats, forests, water conservation and so on. Through ICT, training is provided on issues as disaster management, leadership building, health and education, child development etc [15]. ICT can deliver potentially useful information, such as market prices for women in small and micro-enterprises. For example, use of cellular telephones illustrates how technology can be used to benefit women's lives, by saving travelling time between the market and suppliers, by allowing women to call for product prices and by facilitating the constant juggling of paid and unpaid family activities. Besides, ICT has played an important role in changing the concept of work and the workplace. New areas of employment such as teleworking, i.e. working from a distance, are becoming feasible with new technology [24].

There are other NGOs which are similarly using technology to make a difference in the lives of thousands of Indian women. Feminist Approach to Technology (FAT) is a not-for-profit organization that believes in empowering women by enabling them to access, use and create technology through a feminist rights-based framework. Established in 2008, it primarily operates in Delhi. The mission of FAT is to empower women by enhancing women's awareness, interest, and participation in technology. FAT encourages and enables women to feel capable and comfortable in working with technology and collaborating with other women's organizations to mainstream the issue of engendering technology [10].

5.2 Social Interaction, participation and Women's safety

One of the major hurdles to the empowerment of women is the issue of safety. The safety concerns come in the way of mobility and so do the restrictive timings that women are therefore bound to observe. Use of technology can help provide a safety cover. Electronic surveillance of susceptible areas can compensate for the inadequate physical presence of police. Safetipin and SafeCity are two examples of mobile-based applications which crowdsource (obtain ideas and content from other internet users) data to inform users about safer travel routes through urban environments. Similarly, the SOS emergency button on taxi service apps makes them feel safer – as one click sends the location of the taxi to pre-selected friends and allows them to track its progress [25].

Cyberspace offers a platform along with the benefit of anonymity to women to come together and voice their collective opposition to gender-related issues or issues of harassment. The *pink chaddi* campaign against the right-wing group by women in Bangalore is one such example.

6. Challenges and Limitations to extensive adoption of ICT

The previous sections enumerate the role of ICT in the alleviation of poverty and in gender inclusion in India. They exhibit the different ways in which new forms of information and communication have been capitalized upon to accelerate this process. Nevertheless, ICT can best be considered as an efficient tool, albeit with its own challenges and limitations. One of the unique characteristics of ICT is its highly dynamic nature. Innovations and changes take place in the field of Science and Technology, particularly in the field of Information Technology, at a rapid pace. Technologies become obsolete very quickly. This not only requires periodic upgradation of hardware and software involved, but also an equal measure of skill upgradation at the level of the user. Moreover, management and maintenance require a degree of technical expertise that is higher than what is conventionally required. These are some of the factors, which limit the adoption and application of ICT for poverty alleviation and social exclusion on a large scale. The challenges and limitations are described below:-

1. Different sections of the society are at different stages of readiness to imbibe digital technology. Besides, financial status determines accessibility and that can determine the former as well. Digital technology can be an equalizer in many ways as it breaks the traditional class divide, but at the same time, as per the examples cited here, it can actually end up reinforcing the traditional divisions in the society. For instance, affordability, as well as the level of education, can to a large extent determine the accessibility of the instrument as well as the skill required to handle a smartphone. Mobile Banking application that requires an Android software can, therefore, end up actually excluding a large section of the population for whose interest it may have been designed in the first place.
2. Cost is a limitation particularly when it comes to procurement, installation and maintenance of costly educational and surveillance equipment on a large scale. Here the cost refers to and includes the cost of establishing and running the network. This is of particular relevance to such remote and rural areas in a vast and developing country like India, where basic facilities like accessibility to power supply may have just about been made possible.
3. ICT impacts poverty alleviation both directly as well as indirectly. Direct impact, through job creation, is limited in scope as the high-end jobs require highly technical education and cannot be categorized as a poverty alleviation measure. In their indirect role, the lower end jobs e.g. sales and repair related jobs, suffer from a limitation of another sort, which is that they do not enhance, in sufficient measure, the tax and welfare base.
4. Another dichotomous factor is the issue of safety. While there are a number of ways in which ICT comes to the aid of women and weaker sections to enhance their safety, cyber safety is in itself a matter of concern. There are a large number of incidents of cyber crimes like cyberstalking, morphing, defamation, phishing, trolling, defamation etc. particularly against women being reported. The government has responded by tougher laws against these crimes. However, the safety concerns discourage the largescale adoption of ICT, which ironically, is a safety measure in the first place.
5. As mentioned above, ICT is just a tool. It does not, in itself, help to transcend deep-rooted societal biases. For instance, the gender bias has been reported to play out in such manner that in a village in the state of Haryana in India, the village council banned the use of mobile phones by women and young girls with an ostensible objective of preventing elopement [7]. This is an

example of how deep-rooted prejudices against women can stymie any forward movement in favour of gender equality and render the means like ICT useless in the process.

6. Privacy and Data Protection issues related to ICT are becoming increasingly relevant in view of several disclosures of invasion of privacy and unauthorized use and merchandising of data. Corporates and other organisations have been found to use this data for various ends, including commercial gains as well as targeted messaging to influence the target population. This has compelled governments to enact stringent laws to regulate the collection of and to prohibit unauthorized use of personal data of the people. This regulation, with a few exceptions related to National security, extends to governmental agencies. Such laws can be an impediment in pursuance of even the perfectly ethical objectives through the use of ICT.

To sum up, it needs to be reiterated that ICT is a vital tool for efficient and seamless exchange of information, ideas and knowledge. As with any tool, it requires expertise in proper handling to be able to provide the requisite results in any field including that of poverty reduction and gender inclusion.

7. Conclusion

Technology has become all-pervasive in the last couple of decades and more. The development in the field of ICT has opened up possibilities in every field. In this study, it has been argued that ICT can be immensely useful in winning the battle against poverty, which, for the poor in developing countries like India is an issue of survival, where hunger and malnutrition are its most obvious signs.

This study has quoted a few examples, where ICT has been used as a tool to accelerate the process of growth in the country and create better employment and earning opportunities. ICT has made a huge contribution in promoting financial inclusiveness in the country owing to the accessibility of banking and another financial service through mobile banking even in remote areas.

The targeted welfare schemes are nothing new, have, until recent past, been known for their inefficiencies primarily due to pilferage of the allocated funds. The use of ICT has enabled plugging of this gaping hole through Direct Benefit Transfer. This is an example of the use of modern technology for the neediest in the country.

It has been discussed in sufficient detail that poverty is no longer defined solely in terms of material deprivation, but deprivation in many different dimensions. Gender inequality and insecurity are important determinants of poverty. ICT has been successfully used in overcoming the obstacles to creating a more equitable world, particularly from the point of view of women. It has the potential of providing employment opportunities especially suited for women. It provides women with a forum for joint action. In addition, several applications that help to create a more secure atmosphere for women at work, at home and while travelling, are now available.

Although cost and accessibility, the so-called digital divide in a broader sense, certainly comes in the way, especially when we talk of the poorest of the poor in India, if there is one another extremely significant blockage to the full use of ICT, that is the mindset. There are instances where the existing prejudices have been allowed to persist and in fact are reinforced through ICT. Nevertheless, it is a tool, which if handled deftly can go a long way in the eradication of poverty in its several manifestations.

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