

ICT Imperatives to Bridge the Digital Divide: Gender Perspective

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Dr. Shashi Bala



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Preface

The information society is developing rapidly with the advent of information and communication technology (ICT). ICT includes usage of computer, internet and mobile phones. In recent years, more developing Asian countries are leading technological and business innovation in the ICT industry and more and more Internet users in these countries access the Internet and participate in online activities. Many people use the Internet, not only to search information but also to share their information, knowledge, ideas and views with other people. ICT seems neutral with respect to gender, race, location, and socioeconomic status, but in reality, some people, in terms of ICT, are disadvantaged and there is a disparity in equal access and ability to use such technologies that create a new kind of inequality named as the digital divide. Among various aspects of the digital divide, the gender inequality of ICT is a significant issue in enhancing the satisfaction of a woman's life, rights, and social well-being. In developing country like India females have very limited access to ICTs and they are lagging behind men in using ICTs and reported to have a relatively high gender digital divide in addition to the large gender discrepancies in education and social status. Therefore, it is necessary to "engendering ICTs" which is "the process of identifying and removing gender disparities in the access to and use of ICT, as well as that of adapting ICT to the special needs, constraints, and opportunities of women.

Digital technologies are tangible tools for women to overcome lasting inequalities. ICT can help women to gain employment, obtain cost-effective health services and education (through online courses or MOOCs) and to increase their income (through e-business channels and online transactions). Due to entrenched patriarchal attitude of society in less developed countries, women are at a natural disadvantage to benefit from the digital revolution and add a new dimension to the already existing vicious circle between discrimination and women's backwardness. Therefore, UNESCO also considers the gender divide as "one of the most significant inequalities to be amplified by the digital revolution"

The purpose of this report is to explore the digital gender gap in terms of accessing and competency of using ICTs and how this gap can be bridged by using appropriate ICT policies. For this purpose, study was conducted in UP state of India. This project report has been designed in seven chapters. Chapter -I principally gives a brief idea about importance of ICT in economic development, nation building, sustainable development, inclusive growth of nation. It also explains the concept of digital divide

and gender digital divide. The objectives and research methodology of the study has been given in this chapter.

Chapter-II reviews global changes in level of ICT, ICT Development Index (IDI), regional IDI analysis, Women's Access to the Internet, Achieving gender equality in access to broadband by 2020, Gender Development Index (GDI), Gender Inequality Index (GII), Gender and ICT: Global level initiatives. This chapter also deals with challenges of Information Society including Socio-cultural and institutional barriers, Access, control, and effective usage of education, training and skills development, Content and language, trafficking, violence against women and censorship, Gender segregation in employment, Indigenous knowledge and intellectual property rights, ICT Policy and Governance, Absence from decision-making structures, Privacy, security, and surveillance, Right to communicate, Women place-based activism and virtual politics.

Chapter -III Presents the concept of Gender Inequalities including economic, educational, health, Occupational and Political inequalities. This chapter also reviewed the Concept of Digital and Gender digital divide in India and also checked the position of India in ICT development index and Network Readiness index. Information about Mobile Internet Users in India: Urban vs Rural, Barriers to Internet Access for Women in Developing Countries is also included in this chapter.

Chapter -IV This chapter focuses on the findings of the field survey. To explore the socio-economic and educational factors influencing GDD, six districts of Uttar Pradesh including GautamBuddh Nagar, Ghaziabad, Sitapur, Gorakhpur, Rae Bareli and Sultanpur and out of each district one rural and one urban region were surveyed. Findings are based on the response given by the sample households. Data on social, economic and educational factors including Religion and Caste Wise Distribution of Respondents, Family Responsibility of working People, Access to Resources, Barriers in the employment, Genderwise Account Penetration, ATM Usage, Internet Usage for bill payment, Genderwise Educational distribution, Barriers in IT Stream and other important findings are presented in tabular form in this chapter.

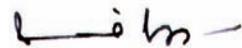
Chapter-V This chapter explores the usage of ICT for entrepreneurs in selected six districts of UP. For this purpose sample male female entrepreneurs of all the six districts were surveyed and provide the data on Family Characteristics of Respondents, Family Responsibility of Respondents, Gender wise Business details of respondents, Change in Life style of people after adopting entrepreneurship are included. A case study

is also given in this chapter to show that how ICT can change the life style of people.

Chapter -VI This chapter provides the Comparison of ICT and NON ITC and present the data related to Affirmative policies, Work life Balance policies, Child care programs, Night Shift Working, Female position in ICT and Non-ICT Companies, Steps for increasing Women participation in ICT Sector.

Chapter -VII The summary, findings and recommendations are discussed in this chapter. To bridge this gender gap of digital divide addressing gender in policy and programme intervention is imperative because, even with improved communications and networking infrastructure, women are likely to be ignored. However, very few government initiatives at policy and programme levels like Digital India, Make in India, actually address digital divide issues within the Digital Society .There is an urgent need for governments to build ICT policy with a strong gender perspective, to devise strategies with clear goals, and to put in place legislative and administrative measures to ensure these are achieved. Policy needs to cover universal access, regulatory frameworks, licensing, spectrum allocation, infrastructure, ICT industry development and labour issues, and draw upon available expertise, frameworks and tools that provide relevant guidelines. Last but not the least there is need of Collaborative and innovative partnership to tackle the issue of Gender digital divide.

I hope the study would be useful to the researchers, the policy makers, and other academicians who can contribute towards successful handling the challenging pertaining to gender disparity in ICT usage.



Manish Kumar Gupta
Director General

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Chapter - I

INTRODUCTION

Vasudhaiva Kutumbakam (whole world is one family) the concept of Indian philosophy, can be experienced and realized through leveraging Information and Communication Technologies (ICT), as it has enormous potential to unify humanity in order to surmount various daunting social and economic issues like education and knowledge enhancement in rural communities, poverty elimination in poor economies, environmental protection in all the nations and ultimately to bridge the digital gender divide across the whole world. In addition to spurring the economy, ICT have created number of 'spin-off' benefits that are tangibly integrated into various aspects of our daily activities so deeply that it is impossible for society to function without it. Transformation of earth into global neighborhoods is only possible by the use of this technique only. Great range of real time information and knowledge can be obtained by the advancement of ICT which can be utilized in weather forecasting or in global positioning system (GPS) of airplanes and vehicles, and can protect various lives and property not only in one nation or country but entirely in whole world. In the field of communication also with the assistance of ICT it becomes easier to transmit vast amount of data, information and knowledge from one part of the earth to other within fractions of seconds. Today ICT has come to occupy prominent position in life of common man.

1.1.1 ICT as a Catalyst of Economic Growth and Development

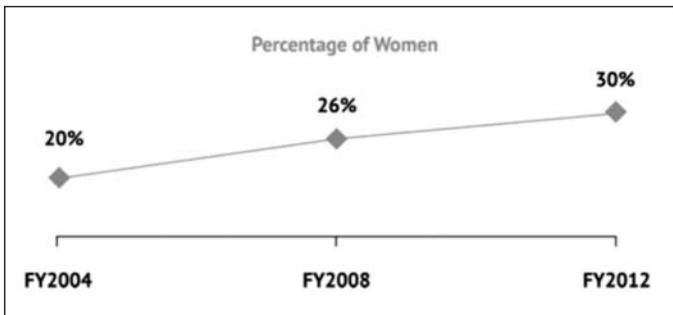
Across the globe, various economies have realized the potential of ICT as a catalyst of economic growth and development. The extend of ICTs have also had widespread societal impact like farmers can take the advantage of real-time information about commodity prices and weather, money transfer .Youth can take the advantage of this technology not for entertainment but also for acquiring new skills and transform themselves from mere information recipient to active participant for policy and decision making process of the nation. By providing citizen centric services and involving more and more citizens in governance the efficiency and effectiveness of governments can be enhanced. ICTs have immense potential to unlock the scope for entrepreneurs and businesses and are helpful in bridging the gap of geographical divide. Availability of various online jobs also reflects the power of ICTs as key enablers of employment creation and of productivity growth. For these reasons, ICTs have considerable prospective

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for sustaining inclusive growth. The World Bank (2009) also estimates that every 10% increase in access to broadband results in 1.38% growth in Gross Domestic Product (GDP) for developing countries.

Inclusive growth of a country cannot be attained until the benefits reach to every sector of the society. As measured in official data women’s work participation in India is much lower than that of man and there has been no significant reduction in gender gaps in work participation over the last few decades. IMF Report (2015) states that female labor force participation (FLFP) rate in India is around 33 percent (implies that only 125 million of the roughly 380 million working-age Indian females) at the national level in 2012, which is 50 percent below at global level and around 63 percent below from East Asia average . But, this socio-economic inequality would not be resolved by these statistics alone. A Herculean task lies ahead to uplift the position of Indian working women. Here new technologies can play a vital role in nurturing gender empowerment. NASSCOM study on Gender inclusivity (2009) states that due to various factors the number of women in IT industry has been increasing. One of the important reason in increasing number of women graduating from engineering colleges .In the mid ’80s, only 5-8 per cent of students in engineering colleges and approximately 25-30 per cent of the population entering the IT industry were women. The dramatic growth of the IT industry in the mid ’90s inspired a larger percentage of women to obtain higher education, and by 2005, 40.4 per cent of the entrants into institutions of higher education were women. This trend has had a direct impact on the positions filled by women in IT. Second reason was the acceptance of the concept of spouse working and third most important reason revealed by the study was the safe and friendly work environment provided by a knowledge-intensive sector IT-BPO industry. Recent study of NASSCOM (Building a Gender Diverse Workforce, 2013) shows that approximately 800,000 women currently working in the sector account for over 30 per cent of the existing hires and this will increase in future.

Figure 1: Women in IT workforce



Source: NASSCOM study: “Building a Gender Diverse Workforce”, 2013

1.1.2 Concept of Digital Divide

For sustainable development in developing countries like India strong need is felt towards leveraging ICT for women development. These technologies expedite economic, social and political empowerment of women. Even in care economy where women have to perform lot of unpaid care work like care of children, elderly and sick, as well as where they are responsible of water and energy supplies, better access of ICTs can reduce or redistribute their work (OECD, 2011). Even time management problem of women can be better resolved by providing them easy access of public services like education, health clinics, transport etc. The authors (Mbarika, et al, 2007; Terry & Gomez, 2011) in ITU report explains that: *“neglecting to give women access to ICTs not only deprives them and their families of income, but reduces the skill-level of a nation’s human resource, limits national productivity, and bars a country from being competitive in the global market”*. Curtis Kularski (2012) revealed the circular relationship between skill gap and a gap of physical access to IT are the two important components of digital divide. Intel report (2013) *“Women and the Web”* states that getting 600 million additional women and girls online could enhance global GDP up to US\$13-18 billion. Despite knowing the role of IT for women, unfortunately the problem of *“digital divide”* has set in across the world and societies has set in, implying uneven distribution of the technologies which creates imbalance of gender equality. This is mainly influenced by the factors like exclusion from technology education, high cost of technologies, financial/institutional constraint, lack of conventional skills, isolation of locations, language restrictions etc. However, accessible and affordable IT infrastructure can bridge this digital gender divide to a wide scale, provided every socio-economical benefits are straightforwardly associated to these emerging technologies. Along with this, it is imperative to integrate all the sectors like civil society, academia, governments, private sector, entrepreneurs, international and women organizations to face the challenges coupled with the use of new technologies which require cooperative action and innovative partnerships. Considering the above stated background and facts it will be meaningful to explore the ICT imperatives effecting women.

1.1.3 Historical Overview

The 21st century is passing through numerous innovations and transformations impacting the economy due to globalization, increasing citizens’ awareness, demanding society and inevitable progress of ICT. Alvin Toffler (1980) in his book *“The Third Wave”* identifies three waves of evolution of human society. He called first wave (8000 BC to 1750 AD) as agriculture revolution, second wave (1750 to 1955) as industrial revolution and third wave (mid 1950s) as information age. In the transition to third

wave, development of ICT infrastructure played vital role for accessibility of information.

Traditional economy functions are driven by resources. Its limited nature and uneasy availability puts a constraint on its usability. Opposite to this, Knowledge economy is not characterized by scarcity, rather by abundance of resources. Knowledge cannot be depleted with its usage rather it grows through its application. The need of physical presence is diminished in knowledge driven information economy and virtual marketplaces and organizations are getting common in such economy. New growth theory is based on the work by the Stanford economist, Paul Romer and others. Following from the work of economist, such as Schumpeter, Robert Solow and others Romer proposed a change in the neo-classical model by considering technology as an essential part of the economic system. Knowledge has become the third factor of production in principal economies (Romer, 1986; 1990). In order to identify the need of knowledge, World Bank organized a forum called "Voices of Poor", which received response from 60,000 persons in 60 countries, indicated that people required access to knowledge and opportunities instead of charity to fight problems leading to poverty (World Bank, 2000).

Public knowledge forum can be widen with the help of spread of new technologies which could be helpful for equal and universal access of knowledge in Knowledge societies (UNESCO, 2005). The term Knowledge society which was first used by Peter Drucker in 1969, is based on the concept of a public good -knowledge, so nobody should be excluded and it should be available to each and every individual. A UNESCO report (2003) points out that the capability of women to effectively utilize information acquires through ICT is clearly dependent on many social causes, including regional position, education, portability etc. Gurumurthy, A. (2006) also identified ICT as an enabler for women to support new forms of information exchange, organization, and empowerment. NSS 68th round (2011-12) data signified the relevance of this concept by stating that, approximately 30.4 percent of urban females got there formal vocational training in computer trades work. The spread of new technologies, along with an increase in an educated workforce, can fill the gap of digital divide and were likely to transfer the employment to the service sectors. This can also create positive impact in labour market and women can take the advantage of this new situation (Freeman, 2002).

ICT Applications

Structure of Workforce is also influenced by ICTs which ultimately changed working conditions and occupational patterns. In recent years

these technologies also affected the status of the workers. According to the study of Federal Ministry of Labour and Social Affairs, 1999, in the medium term, hardly any jobs will remain unaffected by it. Social networking sites like 'LinkedIn', 'Google plus', 'Facebook' are playing important role in creating balance between demand and supply side of labour market by improving coordination and information flows. World Bank (2012) also identifies similar types of services like Babajob (India), Assured Labor (United States), LabourNet (India), and Souktel (Palestine) which can fill the gap between haves and have not's. Under National-e-Governance Plan (NeGP) of India, employment exchanges are providing support to all State Governments in the country by making efficient utilization of ICT in diverse activities of employment services like amplifying the rate of employability of the youth through effective employment counselling and automated skill match exercise etc. All these services work on the availability of ICT infrastructure, which can also provide the needed impetus in maintaining healthy work-life balance for working women. Some of the facilities like flexible working hours, online jobs, work from home etc. can create a balance between professional and personal responsibilities of women where they can take care of their children and elder one along with their job and reduces the importance of location and physical presence.

ICT interventions are imperative for economic empowerment of women as these technologies have immense potential to provide networking and knowledge tools for women as manufacturers and marketer of goods and services. These networking tools act as a bridge between women and new virtual market which expand their social network and impart valuable information that unlocks significant economic prospect. In Gujarat, women dairy producers are taking advantage of these technologies with the help of Dairy Information System Kiosk (DISK), which maintains the database of all milk cattle and provide access to dairy portal with information about important and useful services. In the same way Since 1972, Self Employed Women's Association (SEWA) has been working for mainstreaming marginalized, poor women in the informal sector. It was one of the first organizations internationally to understand the potential of using IT in providing capacity development, supporting cooperative efforts by escalating access to information. It was one of the main promoters of the process which led to ILO Convention 177 (1996) on the rights of home-based workers (OECD, 2011). By integrating new technologies in providing information to powerless, these types of organization are uplifting the nation from the problem of 'digital divide'.

One of the major innovations in the New Economy is the Internet. It is a source of novel thoughts and prospects, modernization and innovation.

To harness the complete potential of Internet for comprehensive growth, women need to have the knowledge and liberty to efficiently use new technologies. ITU (2013) estimates that globally men have more access to internet than women, about 37% of women are online, instead of 41% of men. This results into 1.3 billion women and 1.5 billion men. The gender gap in the use of Internet is more evident in developing economy, which is about 16% and in developed world it is only 2%. India is a major contributor and developed nation in terms of ICT Infrastructure. IAMAI-KPMG (2015) report states that India has the second leading internet user base in the world with approximately 350 million internet users till June 2015 and in rural areas 50% of the Active Internet User (AIU) accessed Internet by means of mobile phones, Community Service Centers and Cyber Cafes, 38% of the AIU use mobile phone as the main access point. Estimate about internet users in India is given by IAMAI Report- “Internet in India 2015”, which is shown as follows:

Figure 2: Internet Users in India

Internet Users	Urban	Rural	Total Users
Male	62%	88%	71%
Female	38%	12%	29%

Source: IAMAI Report- Internet in India 2015(Nov 2015)

Report also revealed that access to mobile phones is an untapped resource that increases women’s welfare, empowerment and social inclusion and in Urban India Mobile Internet user base reach to 197 million in October 2015 while in Rural India it is expected to reach 87 million by December 2015 and 109 million by June 2016.

An economy that wants to attain Sustainable development, Inclusive Growth and wants to build globally equitable information society, cannot afford to ignore the significance of new technologies in mainstreaming of gender that paves the way for equitable opportunities enabling women to grow. Worldwide, Gender mainstreaming is a well established approach, to promote gender equality (Khosla , 2009). ICT has provided a new landscape of development for everyone and women should get equal benefit provided by the technology. Moreover, the advantages generated from the intertwining of Knowledge and ICT should not be limited to higher class of the society and should work on the concept of Global Technologies for Local use (*New York Times, 2000*). Unfortunately, Women still struggle with the disparity in access, approach and affordability of these new information technologies,

which lead to widen the gap of 'digital divide', so this is the need of the hour that attention is being intended for digital divides, among which the gender divide is a key concern. We are already conducting a study on "Gaps in Education and The World of Work: Gender Perspective". This research work would be a next step to highlight the emerging issues likely to enhance the women in the world of work and to look into how IT has enabling environment for better integration of women in the workforce, within this context the present study is proposed with following objectives:-

1.2 OBJECTIVES OF THE STUDY

1. To study social, economic and educational barriers that prevents the entry of women workforce in ICT industry.
2. To review availability of ICT infrastructure in providing employment or business opportunities to women in rural and urban areas.
3. To analyses the problems of women working in ICT industry like managing work life balance, health impact, working in night shifts etc.
4. To suggest ICT policies or strategies , this could be helpful for mainstreaming gender in development of India.

1.2.1 HYPOTHESIS OF THE STUDY

- I. Age is inversely related to ICT usage.
- II. Place of residence (Rural/Urban) has significant impact on ICT usage.
- III. Males are spending more time on internet in comparison to that of females.
- IV. ICT entrepreneurship has a significant impact on the level of stress at work
- V. ICT eases the life of entrepreneur and able to provide more time for exercise, meditation, hobbies to entrepreneur.
- VI. There is large variation in affirmative policies provided by ICT and Non-ICT companies.
- VII. Regarding night shift working females are more satisfied in ICT companies than in Non-ICT companies.
- VIII. Increasing awareness among society is the main factor to increase female participation in the ICT sector.

1.3 METHODOLOGY

1.3.1 Selection of the Area

Multistage area sampling followed by purposive random sampling method is used in the study since the study would be conducted in six districts of Uttar Pradesh (UP). i.e. Gautam Budh Nagar, Ghaziabad, Sitapur, Gorakhpur, Rae Bareli and Sultanpur and out of each district one rural and one urban region would be selected for the study. The six districts of the UP state have been chosen because Uttar Pradesh is considered as the 'IT- Hub' of North India contributing about 38% of the region's export of software and services, second in terms of number of ITIs/ITCs in India (UP IT Policy vision, 2012) but still TRAI (2014) data reveal that internet penetration in UP is only 11.9 % (as on 31/6/14). The districts have been selected on the basis of percentage of households having computer/laptop with and without internet along with mobile telephone (Census 2011). Three of the selected Districts have households with computer and internet penetration more than 2% while the remaining three have less than 2%. Another decisive factor kept in mind while selecting the Districts is that the selected Districts should have female literacy more than 50% and should not be too rural. Further, to tap regional variations across households, the Districts are preferred from different geographical regions. These districts are also selected as E-Districts in online project under the e-governance by UP State Govt.

Selection of Districts for the Primary Survey in Uttar Pradesh

State	Districts	Geographical Regions	Female Literacy rate			Percentage of households having		
			Total (%)	Urban(%)	Rural(%)	Computer/laptop-With Internet(%)	Computer/laptop-Without Internet (%)	Mobile Telephone (%)
Uttar Pradesh			57.2	69.2	53.7	1.9	6.2	61.2
	Gautam Buddh Nagar	Western UP	70.8	77.2	61.7	16.81	10.75	69.55
	Ghaziabad	Western UP	69.8	73.9	61.0	9.41	12.22	69.54
	Gorakhpur	Eastern UP	59.4	76.5	55.4	2.1	7.3	71.73
	Sultanpur	Eastern UP	58.3	77.2	57.2	0.95	6.06	64.72
	Rae Bareli	Central UP	56.3	73.3	54.6	0.84	4.82	54.87
	Sitapur	Central UP	50.7	67.4	48.3	0.49	3.87	43.7

Source: Calculated from Census of Uttar Pradesh, 2011

1.3.2 Selection of Sub-Districts/tehsils from the districts of Uttar Pradesh

After the selection of six districts from Uttar Pradesh two sub districts have been chosen from each selected district of Uttar Pradesh. The indicator which has been chosen for this is, percentage of households having computer/laptop with internet which can provide the information about available ICT infrastructure in that particular Sub-district. In this

study one sub-districts is selected whose percentage of households having computer/laptop with internet is highest among sub-districts of that district and other sub-district is that whose percentage is less among other sub-districts. This data has been taken from census 2011.

State	Districts	Sub-District/tehsils	Percentage of households having Computer/ laptop-With Internet
Uttar Pradesh	Gautam Budh Nagar	Dadri	20.33%
		Gautam Budh Nagar	12%
		Jewar	1.35%
	Ghaziabad	Modinagar	3.45%
		Ghaziabad	13.83%
		Hapur	2.47%
		Garhmukteshwar	1.28%
	Gorakhpur	Campierganj	0.75%
		Sahjanwa	1.01%
		Gorakhpur	3.93%
		Chauri Chaura	1.05%
		Bansgaon	1.03%
		Khajni	.9%
		Gola	1.12%
		Sultanpur	Musafirkhana
	Gauriganj		.67%
	Amethi		1.25%
	Sultanpur		1.41%
	Jaisinghpur		.64%
	Lambhua		.73%
	Kadipur		.69%
	Rae Bareli	Maharajganj	.41%
		Tiloi	.51%
		Rae Bareli	1.39%
		Lalganj	.82%
		Dalmau	.57%
		Unchahar	1.47%
		Salon	.43%
	Sitapur	Misrikh	.5%
		Sitapur	.97%
		Laharpur	.22%
		Biswan	.34%
		Mahmudabad	.36%
Sidhauli		.39%	

Source: Calculated from Census of Uttar Pradesh, 2011

1.3.3 Selection of Cities and Villages from the Sub-Districts/tehsils of Uttar Pradesh

To select specific region to be surveyed from selected 12 Sub-districts, population is considered as base indicator. So after the selection of 12 sub-districts from 6 districts of Uttar Pradesh one city and one village has been selected. City has been selected from that Sub-district which is urban in nature and village has been selected from that sub-district which is rural in nature. The city whose population is highest among more than one lakh population will be considered for survey. In the same way that village will be considered for survey whose population is highest among less than 1 lakh population which can be analysed from following table.

	Sub-District/ tehsils	Cities and Villages	Population
Gautam Buddh Nagar	Dadri	Noida (highest among more than 100,000 population)	6.4 lakh
	Jewar	Dayantpur Village (highest among less than 100,000 population)	9722
Ghaziabad	Ghaziabad	Ghaziabad Municipal Corporation (more than 100,000 population)	16.5 lakh
	Garhmukteshwar	Bahadur Garh Village(less than 100,000 population)	13586
Gorakhpur	Gorakhpur	Gorakhpur Municipal Corporation(more than 100,000 population)	6.7 lakh
	Campierganj	Basntpur Village(less than 100,000 population)	7887
Sultanpur	Sultanpur	Sultanpur Nagar Palika Parishad(more than 100,000 population)	1.1 lakh
	Jaisinghpur	Phtahpur Village(less than 100,000 population)	6560
Rae Bareli	Rae Bareli	Bareilly Municipal Corporation(more than 100,000 population)	9 lakh
	Maharajganj	Bachhrawan village(less than 100,000 population)	9692
Sitapur	Sitapur	Sitapur Nagar Palika Parishad (more than 100,000 population)	1.8 lakh
	Laharipur	Nabi Nagar Village(less than 100,000 population)	8055

Source: Calculated from Census of Uttar Pradesh, 2011

1.3.4 Selection of ICT Industries from Noida

Overview of IT sector				
ICT Industry	IT Industry	IT services sector	IT services sector	IT Consulting; Systems Integration; Custom Application Development (CAD); Software Deployment and Support; Infrastructure Management Consulting and Integration; Infrastructure Management Operations; Software Testing; IT Education and Training; Services Oriented Architecture (SOA); Application Management; Information System Outsourcing; Hardware deployment and support; Web Services;
		IT Enabled Services (ITES)	BPO services sector	Customer Interaction & Support (CIS); Customer Care; Finance & Accounting (F&A); Research and Analytics; Human Resource Management (HRM); Procurement Services / Supply Chain Management; Knowledge Services (KPO / Knowledge Process Outsourcing); Legal Services (LPO / Legal Process Outsourcing);
			Engineering Services	Research and Development (R&D) services; Hardware and software technologies; Development of software running on embedded systems; Computer-aided design (CAD);
			Packaged Software	Software Products; Offshore Product Development;
	Communication	Communication Technology	Digital Communication Technology	Wired telecommunications activities Wireless telecommunications activities Satellite telecommunications activities Other telecommunications activities

Source: Prepared by Author from IT-ITES Sector Skills Council, NASSCOM, 2012

To analyse the problems of working women in ICT industry, IT companies which are registered with NASSCOM are selected for the study. By checking the website of NASSCOM (http://memberdirectory.nasscom.in/mms_company_free_search/city/Noida) it has been noticed that out of all selected sub-districts only Noida region has registered IT companies with NASSCOM. This region has total 129 registered IT companies which are providing different range of IT services. For the purpose of this study approximately 60% of registered companies will be surveyed i.e. 80 companies. To compare the working condition of ICT and Non-ICT companies, from other regions those non ICT companies will be selected where % of women are higher. For the identification of Non ICT companies NSS report no. 534 is considered as base.

Statement 5.12: Per 1000 distribution of workers in usual status (ps+ss) by broad occupation division of NCO 2004 during 2011-12

broad occupation division	all-India			
	rural		urban	
	male	female	male	female
(1)	(2)	(3)	(4)	(5)
1	42	20	170	108
2	19	11	81	116
3	18	19	60	95
4	10	3	49	50
5	56	27	154	115
6	388	479	41	64
7	110	100	190	199
8	41	6	108	27
9	314	333	145	225
X	1	1	1	1
all (incl. n.r.)	1000	1000	1000	1000

Source: Employment and Unemployment Situation in India: NSS 68th round

Above table of NSS report provides the per 1000 distribution of persons employed in usual status (ps+ss) by broad occupation divisions during 2011-12. It can be seen from the table that among the *usual status (ps+ss)* workers, 48 % of rural female workers were engaged in division 6 'skilled agricultural and fishery', nearly 33 per cent were engaged in division 9 'elementary occupations', while another 10 per cent was employed in division 7 'craft and related trades workers'. Among the female workers

category in the urban areas, the share of division 9 (elementary occupations) was the highest (23 per cent) followed by division 7 (about 20 per cent). It is observed that most of the women are engaged in elementary occupations, which includes following Description of Occupation Divisions.

Description of Occupation Divisions and sub-divisions of National Classification of Occupations-2004

Division	Subdivision	Description
9		Elementary Occupations
	91	Sales and Service Elementary Occupations
	92	Agricultural, Fishery and Related Labourers
	93	Labourers in Mining, Construction, Manufacturing and Transport

Source: Employment and Unemployment Situation in India: NSS 68th round

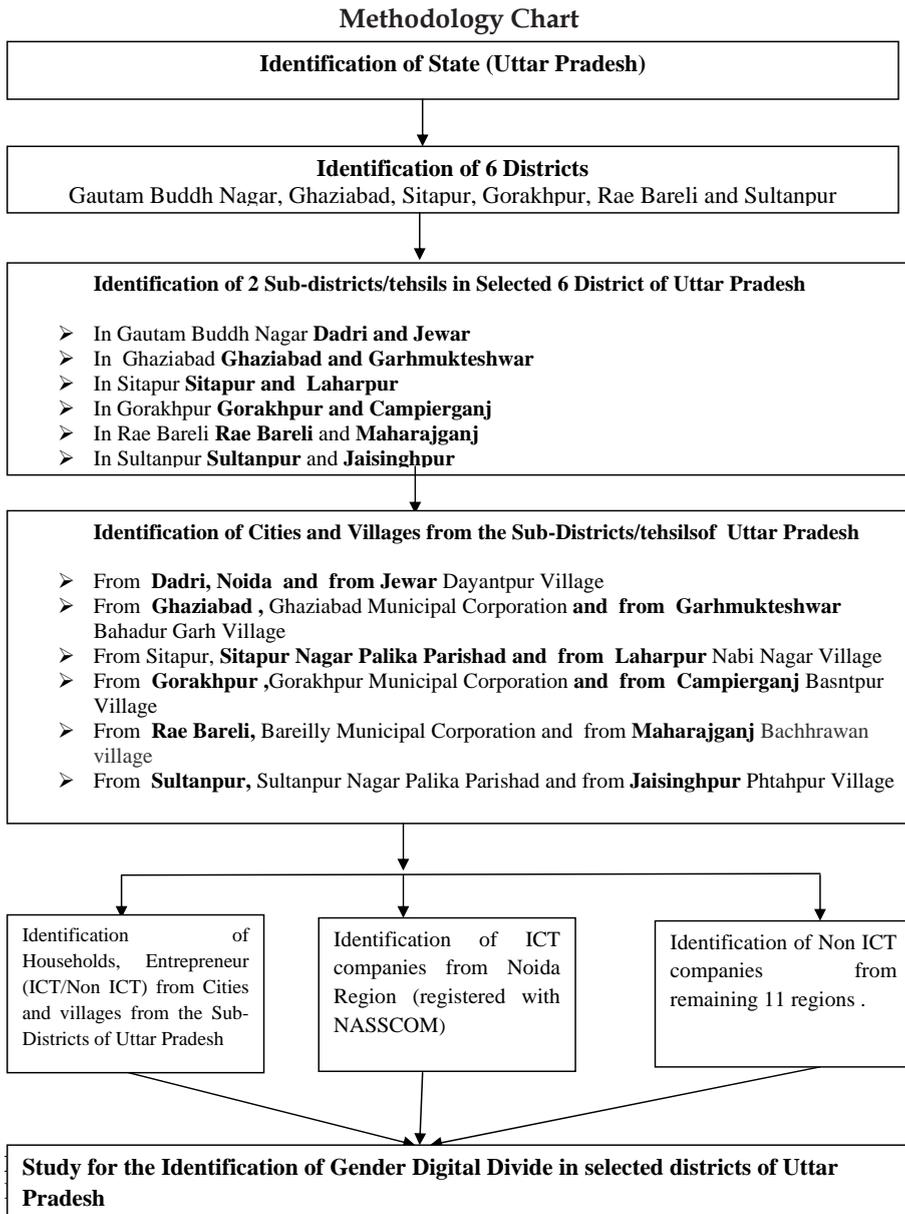
Considering the importance of the skill development and start-up policy of Government, the present study focuses on the manufacturing and construction companies as Non ICT companies from remaining 11 sub-districts. For the purpose of comparison of ICT and Non ICT companies similar number of registered manufacturing and construction companies from 11 sub districts had been considered for survey i.e. 80 Non ITC companies .Purposive random sampling method is followed in the survey. Based on the of above methodology Sample size has been drawn for the study in following manner and it capture both demand and supply perspective:-

1.4 Sample size

Questionnaire	Area	M/F	Size	Actual
Household	50 per region@12	25 + 25	600 Households	591* Households
Entrepreneurs (ICT)/(Non ICT)	8 per region @12 (4 ICT+ 4 Non ICT)	2M+2F	96 Entrepreneurs	96 Entrepreneurs
ICT employee	80 companies from Noida	5M+5F	800 ICT employees	800 ICT employees
ICT employer	80 companies from Noida	1 from HR Department	80 ICT employers	80 ICT employers
Non ICT employee	80 companies from remaining 11 region	5M+5F	800 Non ICT employees	800 Non ICT employees
Non ICT employer	80 companies from remaining 11 region	1 from HR Department	80 Non ICT employers	80 Non ICT employers

* Considering the incomplete information in nine questionnaires, nine surveys were excluded and the total numbers of usable surveys were 591 Households.

Flow Chart of Methodology



Data Sources – The study would use both the qualitative and quantitative methods by consulting primary and secondary data sources respectively.

1.5.1 Primary Data

The primary data is collected using different techniques such as field surveys, interviews both by using standard-structured and unstructured questionnaires to elicit necessary information related to the study. The questionnaire were prepared on all aspects of socio-economic background of the respondent, their family constraints, demographic details, education, income generation activities, benefits provided by Govt. etc.

1.5.2 Secondary Data

Besides primary data, the secondary data is collected from the Corporation Commissioner's Office, Department of Information and Technology, Various Offices / Organizations of Ministry of Labour and Employment, Labour Bureau, Directorate General of Employment and Training, Telecom Regulatory Authority of India, National University of Educational Planning and Administration, HRD Department, about the government sponsored schemes for promoting women participation in ICT based services and jobs. The information about different programs linked to ICTs were gathered through personal interviews with planners and beneficiaries of these programs. The study also referred Annual Reports and research conducted by World Bank, IMF, UNDP and Books, Articles and Websites on related issues.

1.6 Data Analysis

The research team used combination of statistical techniques and tools like correlation, regression to quantify and analyze the data in a systematic manner to draw the meaningful interpretation. Data collected from the interviews and field surveys, it was analyzed through research software like Statistical Package for Social Science (SPSS), excel, and other software packages. These packages converted complex analytical problem into simpler one as well as it saves our time which is crucial aspect of research.

Chapter - II

GENDER INEQUITIES IN THE INFORMATION SOCIETY: GLOBAL PERSPECTIVE

A century and more after the industrial revolution, we are in the throes of another major shift in human civilization – the information revolution that has given birth to the “information society”. The “information society” is among the most discussed phenomena in recent times. As participants in this information age, our life is touched by the ICT in one or the other form. However, many of us also feel that there are disconcerting aspects to the times we live in. While considerable optimism is vested in the promise of information and communication technologies for human progress, it is also true that the information age is not all rosy – the benefits of this new age have not touched all of humanity, and all its outcomes are not necessarily positive.

ICTs are understood to include computers, the rapidly changing communications technologies (including radio, television, mobile telephony and Internet), networking and data processing capabilities, and the software for using the technologies. ICTs provide us with the capacity to harness, access and apply information and disseminate knowledge in all kinds of human activities, thus giving rise to the information- or knowledge-based economies and societies. These have the potential to create new types of economic activity and employment opportunities, thereby improving the quality of daily life. For example, ICTs are changing the way business operates through e-commerce applications, and have brought improvements in health-care delivery. As an information and knowledge-based tool, ICTs can enhance networking, participation, and advocacy within society. They also have the potential to improve interaction between governments and their citizens, fostering transparency and accountability in governance. Information and communication technologies could give a major boost to the economic, political and social empowerment of women, and the promotion of gender equality. But that potential will only be realized if the gender dimensions of the Information Society – in terms of users’ needs, conditions of access, policies, applications and regulatory frameworks – are properly understood and adequately addressed by all stakeholders. Poverty, illiteracy, lack of computer literacy and language barriers are among the major factors impeding access to the ICT infrastructure, especially in developing countries, and these problems are particularly acute for women. But women’s access to ICTs is constrained by factors that go beyond issues of technological infrastructure and socio-economic environment. Socially and culturally constructed gender roles and relationships remain a cross-cutting element in shaping (and in this case, limiting) the capacity of women and men to participate on equal terms in the Information Society.

2.1 Global changes in levels of ICT

The period since the conclusion of the World Summit on the Information Society (WSIS) in 2005 has seen rapid growth in access to and use of information and communication technologies (ICTs) throughout the world. However, the potential impact of ICTs is still constrained by digital divides. Figure 1 illustrates the long-term trend in penetration rates for various ICTs since 2005. It shows that the steep rise in mobile-cellular subscriptions worldwide, which began early in this century, is now tailing off, as the global penetration rate approaches 100 subscriptions per 100 inhabitants. At the same time, there has been a gradual decline in the penetration rate for fixed-telephone subscriptions, owing to fixed-mobile substitution and the tendency for new users to prefer mobile over fixed lines.

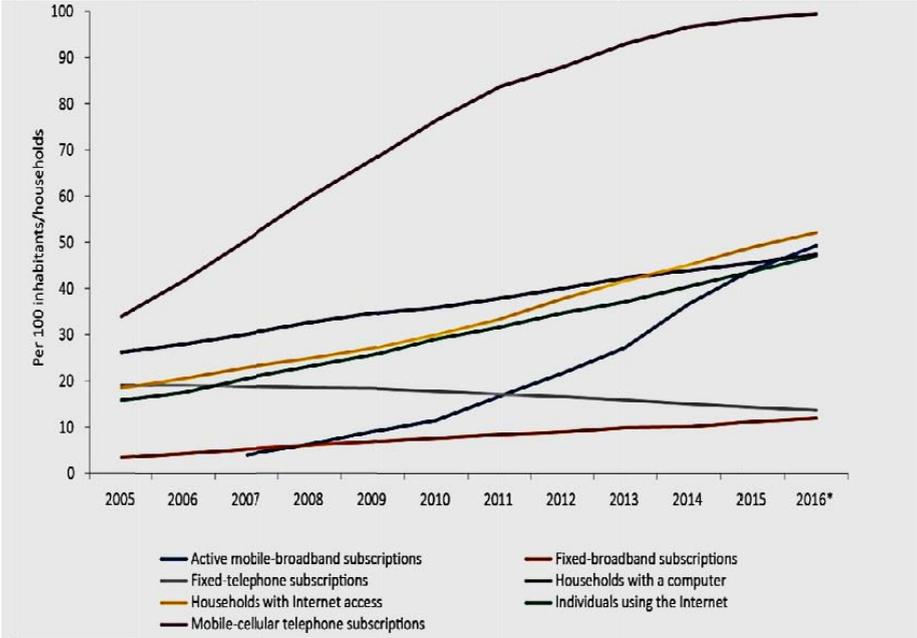
The growth in mobile-broadband subscriptions worldwide has also been marked, and has paralleled that of mobile-cellular subscriptions in the last five years, albeit at a lower level, rising from one fifth to one half of the penetration rate for mobile-cellular subscriptions between 2011 and 2016. This has helped to drive steady growth in the percentage of individuals using the Internet (defined as those who have used the Internet at least once in the last three months) and of households with Internet access. The latter indicator has now overtaken the percentage of households with a computer.

These global figures, however, mask substantial differences between countries in different regions and with different levels of development. Figure 2 compares the 2016 figures for the seven ICT penetration indicators in figure 1 between the ITU's six geographic regions, while figure 3 compares the figures for developed countries, developing countries and least developed countries (LDCs).

These figures illustrate the continued and significant digital divide between regions, between developed and developing countries, and between the majority of developing countries and LDCs. While penetration rates for mobile-cellular subscriptions are now high in all regions, and exceed 100 subscriptions per 100 inhabitants in four of them, they are still significantly lower in the Asia-Pacific and Africa regions, and in LDCs. Internet and computer access as well as penetration rates for broadband networks are also higher in the Europe, CIS and Americas regions, which are predominantly composed of developed countries and middle-income developing countries, than in the other regions.

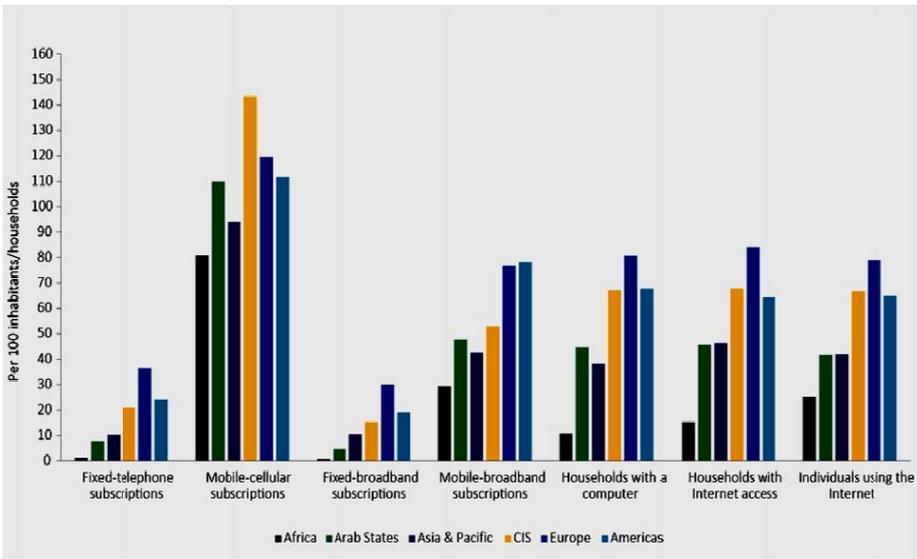
The results for LDCs on these ICT indicators are particularly poor, especially where fixed-telephone and fixed-broadband subscriptions are concerned. The lowly position of LDCs reflects the substantial digital divide between LDCs and other countries, which remains an important issue and has particular significance for efforts to use ICTs to support achievement of the Sustainable Development Goals (SDGs) adopted by the UN General Assembly in 2015.

Figure 2.1: Global changes in levels of ICT uptake per 100 inhabitants, key ICT indicators, 2005-2016



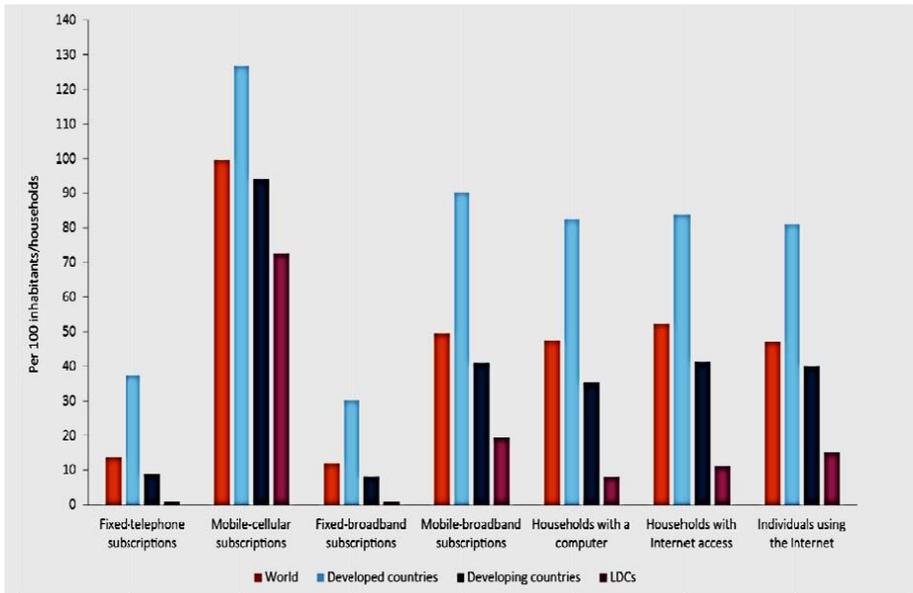
Source : Measuring the Information Society Report 2016, ITU

Figure 2.2: ICT penetration levels, 2016, by geographic region



Source : Measuring the Information Society Report 2016, ITU

Figure 2.3: ICT penetration levels, 2016, by level of development



Source : Measuring the Information Society Report 2016, ITU

2.2 The ICT Development Index (IDI)

The IDI is a composite index that combines 11 indicators into one benchmark measure which can be used to monitor and compare developments in ICT between countries and over time. The IDI was developed by ITU in 2008 in response to ITU Member States’ request to establish an overall ICT index, was first presented in the 2009 edition of the *Report* (ITU, 2009), and has been published annually since then. Following table shows IDI rankings of top ten countries including India.

Table 2.1: IDI rankings and values, 2016 and 2015

Economy	Rank 2016	IDI 2016	Rank 2015	IDI 2015
Korea (Rep.)	1	8.84	1	8.78
Iceland	2	8.83	3	8.66
Denmark	3	8.74	2	8.77
Switzerland	4	8.68	5	8.50
United Kingdom	5	8.57	4	8.54
Hong Kong, China	6	8.46	7	8.40
Sweden	7	8.45	6	8.47
Netherlands	8	8.43	8	8.36
Norway	9	8.42	9	8.35
Japan	10	8.37	11	8.28
India	138	2.69	135	2.50

Source : ITU 2016

The top performing country in the 2016 IDI, as in IDI 2015, is the Republic of Korea, followed by two Nordic countries, Iceland and Denmark, which have exchanged places during the year. The Republic of Korea has consistently ranked as one of the most connected countries in the IDI. New initiatives and developments in 2015 have further improved its ICT environment, reinforcing its position among the top performers in the Index. The government is actively promoting use of the Internet across the entire population in order to extend the benefits of its high ICT development to currently unconnected groups. Government initiatives, such as the “Development and Supply of IT Assistance Devices”, “Supply of Green PCs of Love” and “Telecommunication Relay Service”, designed for hearing- and speech-impaired people, are examples of responses to ensure that disadvantaged groups have equal opportunity to access information (KISA, 2015).

While use of the Internet is increasing among women and girls, household data collected by the Ministry of Science, ICT and Future Planning (MSIP) and the Korea Internet and Security Agency (KISA) still show that there is a gender gap in Internet use in the Republic of Korea. This contrasts with many European countries, where the gender differences are minor, resulting in a higher overall Internet uptake.

2.3 Regional IDI analysis

ITU Member States are divided into six regions – Africa, the Americas, Arab States, Asia and the Pacific, Commonwealth of Independent States (CIS) Europe. The distribution of countries between regions differs in a number of respects from the regional distributions used in other UN data series, most notably where the Europe and Africa regions are concerned, and this should be borne in mind when undertaking comparative analysis with other data sets.

Following table sets out the results of IDI 2016 for each of the six ITU regions, and compares them with the results for IDI 2015. As in previous years, the Europe region records the highest regional average IDI value, at 7.35, includes only one country, Albania, just below the global average of 4.94. The regional average value for the CIS region, at 5.74, is significantly higher than the global average (although it should be noted that two lower-income countries in this region are not included in the Index). The average for the Americas slightly exceeds the global average, at 5.13, while the average IDI values for the Arab States and Asia-Pacific regions, at 4.81 and 4.58, respectively, fall somewhat below. As in previous years, the Africa region records by far the lowest average IDI value, at 2.48, little more than half that of the next lowest region.

There is much greater variation in some regions than in others. The CIS region has the smallest range between its highest and lowest IDI values, 3.27 points, reflecting its relative economic homogeneity. Europe also has a relatively narrow range, of 3.91 points, a figure which drops to 3.14 if the region's two lowest-ranking countries (Albania and Bosnia and Herzegovina) are excluded.

Table 2.2: IDI results of six ITU regions, 2016 and 2015

Region	Number of economies	IDI 2016						IDI 2015						Difference 2015-2016		
		Max.	Min.	Range	Average*	StDev	CV	Max.	Min.	Range	Average*	StDev	CV	Range	Average*	CV
Europe	40	8.83	4.92	3.91	7.35	0.97	13.23	8.77	4.62	4.15	7.19	1.03	14.36	-0.24	0.16	-1.14
CIS	10	7.26	3.99	3.27	5.74	1.10	19.15	7.02	3.76	3.26	5.56	1.12	20.10	0.01	0.18	-0.94
The Americas	34	8.17	2.73	5.44	5.13	1.39	27.09	8.06	2.64	5.42	4.89	1.35	27.55	0.01	0.25	-0.46
Arab States	18	7.46	1.82	5.64	4.81	1.87	38.79	7.42	1.73	5.69	4.63	1.89	40.74	-0.05	0.18	-1.95
Asia & Pacific	34	8.84	1.73	7.11	4.58	2.19	47.87	8.78	1.62	7.16	4.35	2.23	51.14	-0.05	0.23	-3.27
Africa	39	5.55	1.07	4.47	2.48	1.14	46.06	5.27	1.00	4.27	2.30	1.07	46.57	0.20	0.18	-0.51

Note: *Simple averages. StDev = Standard deviation, CV = Coefficient of variation.

Source : ITU 2016

Asia and the Pacific is the most diverse region in terms of ICT development, reflecting the marked differences in levels of economic development between OECD member countries and other high-income economies in East Asia and Oceania, on the one hand, and a number of low-income countries in the region, including LDCs, on the other. IDI values and rankings for this region are given in table 3 and figure 4.

The top ten positions in the regional rankings for 2016 are almost identical to those for 2015, with China just displacing Thailand in tenth position.

The top seven economies in the region – the Republic of Korea, which is the global top performer, Hong Kong (China), Japan, New Zealand, Australia, Singapore and Macao (China) – all have IDI values above 7.5 and sit in the high quartile of the IDI rankings. They are all high-income economies which have maintained high IDI performance throughout the period since the Index was first published. The average improvement in IDI value for these economies during the year was just below 0.1 point, reflecting their position near the top of the Index, where there is limited scope for further improvement as the IDI is currently constituted. Of these economies, only one – New Zealand – improved its IDI value by more than the world average. There is a significant gap in IDI values and rankings between these seven economies and others in the region. Other five countries – Malaysia, Brunei Darussalam, China, Thailand and Maldives – rank in the top half

of the IDI, while two more – the Islamic Republic of Iran and Mongolia – occupy places just below half-way. Significantly greater improvements in IDI values, however, were achieved by a number of middle- and lower-ranking countries than by those at the top of the regional rankings. The most substantial improvement was made by Bhutan (up 0.62 points), followed by Myanmar (up 0.59), Malaysia (up 0.58), Mongolia (up 0.41) and China (up 0.39).

One of these countries, Myanmar, is among the nine countries in the region which fall within the lowest (LCC) quartile in the rankings. These regional LCCs also include three of the most populous countries in the region – India, Bangladesh and Pakistan. With the exception of Myanmar, countries from the region within the LCC quartile averaged an improvement of only 0.13 points in overall IDI value, with one country, Kiribati, recording a marginal fall.

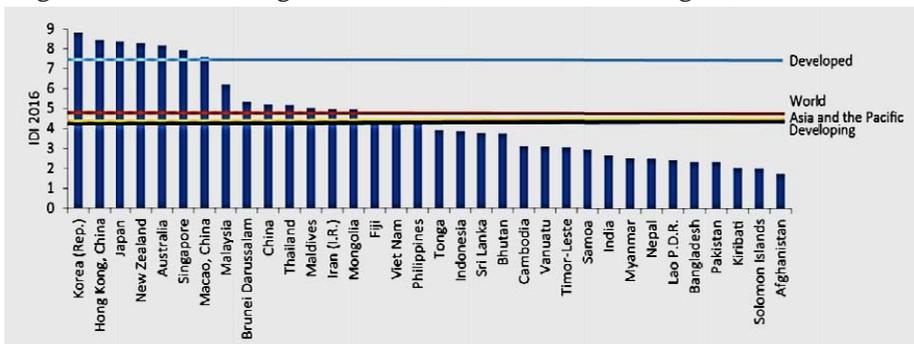
Table 2.3: IDI rankings and values, Asia and Pacific region, 2016 and 2015

Economy	Regional rank 2016	Global rank 2016	IDI 2016	Global rank 2015	IDI 2015	Global rank change 2016-2015
Korea (Rep.)	1	1	8.84	1	8.78	0
Hong Kong, China	2	6	8.46	7	8.40	1
Japan	3	10	8.37	11	8.28	1
New Zealand	4	13	8.29	16	8.05	3
Australia	5	14	8.19	12	8.18	-2
Singapore	6	20	7.95	19	7.88	-1
Macao, China	7	28	7.58	26	7.47	-2
Malaysia	8	61	6.22	66	5.64	5
Brunei Darussalam	9	77	5.33	74	5.25	-3
China	10	81	5.19	84	4.80	3
Thailand	11	82	5.18	79	5.05	-3
Maldives	12	86	5.04	88	4.68	2
Iran (I.R.)	13	89	4.99	90	4.66	1
Mongolia	14	90	4.95	93	4.54	3
Fiji	15	102	4.41	102	4.16	0
Viet Nam	16	105	4.29	104	4.02	-1
Philippines	17	107	4.28	106	3.97	-1
Tonga	18	114	3.93	114	3.63	0
Indonesia	19	115	3.86	115	3.63	0
Sri Lanka	20	116	3.77	116	3.56	0
Bhutan	21	117	3.74	122	3.12	5
Cambodia	22	125	3.12	127	2.78	2
Vanuatu	23	127	3.08	131	2.73	4
Timor-Leste	24	128	3.05	125	2.92	-3
Samoa	25	130	2.95	128	2.78	-2
India	26	138	2.69	135	2.50	-3

Myanmar	27	140	2.54	153	1.95	13
Nepal	28	142	2.50	142	2.32	0
Lao P.D.R.	29	144	2.45	144	2.21	0
Bangladesh	30	145	2.35	143	2.27	-2
Pakistan	31	146	2.35	145	2.15	-1
Kiribati	32	152	2.06	147	2.07	-5
Solomon Islands	33	153	2.04	150	1.99	-3
Afghanistan	34	164	1.73	162	1.62	-2
Average		4.58		4.35		

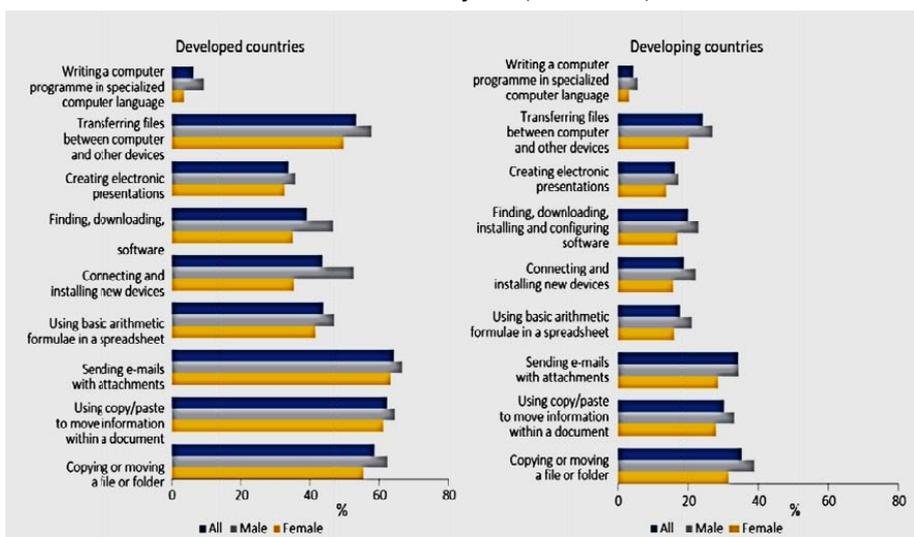
Source: ITU 2016

Figure 2.4: IDI rankings and values, Asia and Pacific region, 2016 and 2015



Source: ITU 2016

Figure 2.5: Proportion of individuals with ICT skills, by type of skill, by sex, developed (left) and developing (right) countries, latest available year (2012-2015)



Source: ITU 2016

In 25 out of the 41 countries reporting data for this indicator, a higher proportion of men than women had acquired ICT skills in all of the skill categories concerned. The discrepancy between men and women was more marked in hardware and software skills (installing and configuring devices and software) than in usage skills (such as e-mail, spreadsheets and presentations). At the most basic level, only one country (Slovenia) recorded a higher proportion of women than men able to move files and folders. At the more advanced level, only one country (Qatar) recorded a higher proportion of women than men with skills in connecting and installing new devices, installing and configuring software, or computer programming. No country recorded a higher proportion of women with skills in transferring files and folders between devices of different types.

2.4 The Digital Divide

The divisions between winners and losers in the global ICT arena are stark. This subsection offers some statistical analysis to illustrate inequities in access to ICTs. It also shows how the control of the ICT arena by powerful corporations, and the power relations between rich and poor countries, the state and citizen, men and women, determine access to benefits in the ICT arena. It highlights how, in the process of globalisation, the potential of ICTs is captured for furthering the interests of the powerful. In the information economy, wealthy countries and sections of society with the orientation, skills, income and time to access ICTs reap the benefits. Access to and strategic control of the ICT arena confer on powerful nations, corporations, groups and individuals alike, the privilege to influence the arena and gain from the innovation and change occurring at an extraordinary pace in the larger ICT environment. On the other hand, a disproportionate burden of challenges is borne by the majority. The digital divide, referring to the uneven distribution of benefits of ICTs within and between countries, regions, sectors, and socio-economic groups, signifies the uphill task facing developing countries and disadvantaged groups and sections in society (even in the developed countries) in their attempts to reap the benefits of the ostensibly level playing field that ICTs are supposed to provide.

2.5 Inequities in Access

'The so-called digital divide is actually several gaps in one. There is a technological divide – great gaps in infrastructure. There is a content divide. A lot of web-based information is simply not relevant to the real needs of people. And nearly 70 per cent of the world's websites are in English, at

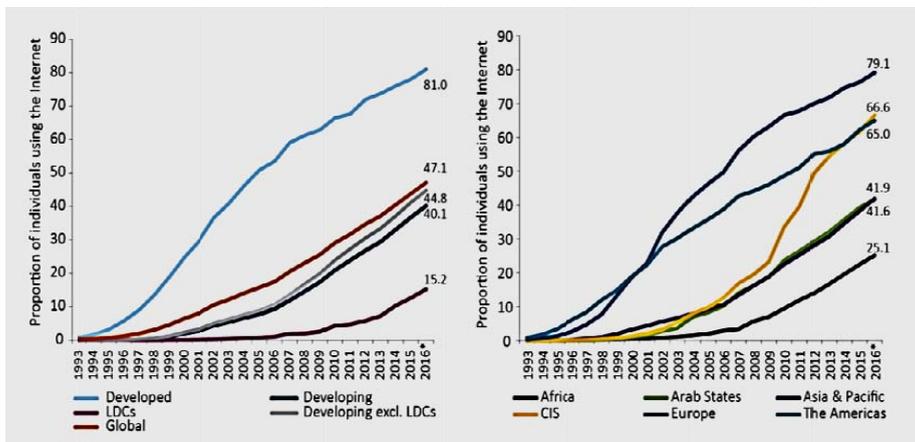
times crowding out local voices and views. There is a gender divide, with women and girls enjoying less access to information technology than men and boys. This can be true of rich and poor countries alike.

UN secretary General, Kofi Annan

Although the number of Internet users is increasing continuously in all regions and countries of the world, major differences remain. In the world’s developed countries about 80 per cent of the population is online, as against only about 40 per cent in the developing countries and less than 15 per cent in LDCs (figure 6). Globally, 47 per cent of the world’s population is using the Internet.

Available data show that although Internet usage in LDCs has tripled in the past five years, Internet penetration levels in LDCs today have reached the level enjoyed by developed countries in 1998, suggesting that the LDCs are lagging nearly 20 years behind the developed countries. At the same time, the LDC average itself hides large differences, with some LDCs doing much better than others.

Figure 2.6: Proportion of individuals using the Internet by level of development (left) and by region (right)



Source: ITU 2016

2.6 Women’s Access to the Internet

The gender divide within the digital divide can be seen in the lower numbers of women users of ICTs compared to men. One illustration of this is the number of women Internet users. The majority of the world’s women do not use the Internet. They are excluded from the World Wide Web. The digital divide within countries broadly reflects the gender divide. Women are in the minority of users in almost all developed and

developing countries. The trend for differentiation in use starts early, as seen in the United States where boys are five times more likely than girls to use home computers and parents spend twice as much on ICT products for their sons as they do for their daughters (UNDP 1999: 62).

The gender divide

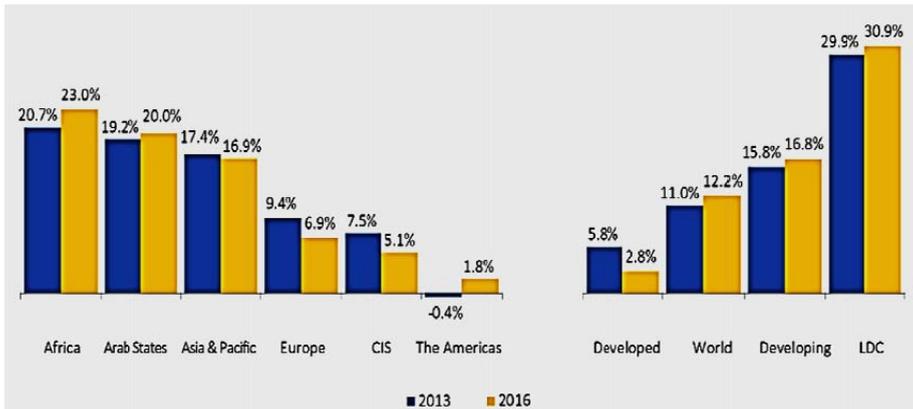
Data on Internet usage broken down by gender points to a very clear gender divide. In the vast majority of countries, the proportion of men using the Internet is higher than the proportion of women. These findings are reflected at global level, where ITU reports a 2016 Internet user gender gap of 12 per cent. Only in certain select countries, in Europe and the Americas in particular, are more women than men online, proportionally. Data also point to significant differences between developed and developing countries (Figure 7).

Differences in levels of education and school enrolment are important factors that could explain why more men than women use the Internet. Some of the countries in which more women than men are Internet users, including the Bahamas, Jamaica, New Zealand and Sweden, are also countries that do well on the gender parity index (GPI), which measures parity between girls and boys in terms of school enrolment ratios. The gender equality in these countries is also reflected by a high proportion of women in the labour force.

Gender parity in tertiary education can also explain some of the differences in regional gender gaps. The smallest Internet user gender gap is observed in the Americas, where countries also score highly on GPI in tertiary education. While Internet penetration among men and women is roughly the same in several countries of North and South America, such as Brazil, Canada, Paraguay, Uruguay and the United States, the link between gender parity in Internet usage and gender parity in tertiary education is especially strong in Caribbean countries. In the Caribbean, there are an average of two females for every male attending tertiary education, and in several Caribbean countries, such as Cuba and Jamaica, Internet usage is higher among women than among men.

This is in contrast with other regions with large gender gaps in Internet usage, especially in Africa and Asia and the Pacific, where many countries suffer from lower gender parity at higher levels of education. Among developing countries, the largest Internet gender gaps are found in countries with low levels of gender parity in tertiary education, such as Bangladesh, Burundi and Ghana.

Figure 2.7: Internet user gender gap (2013 and 2016)



Source: ITU 2016

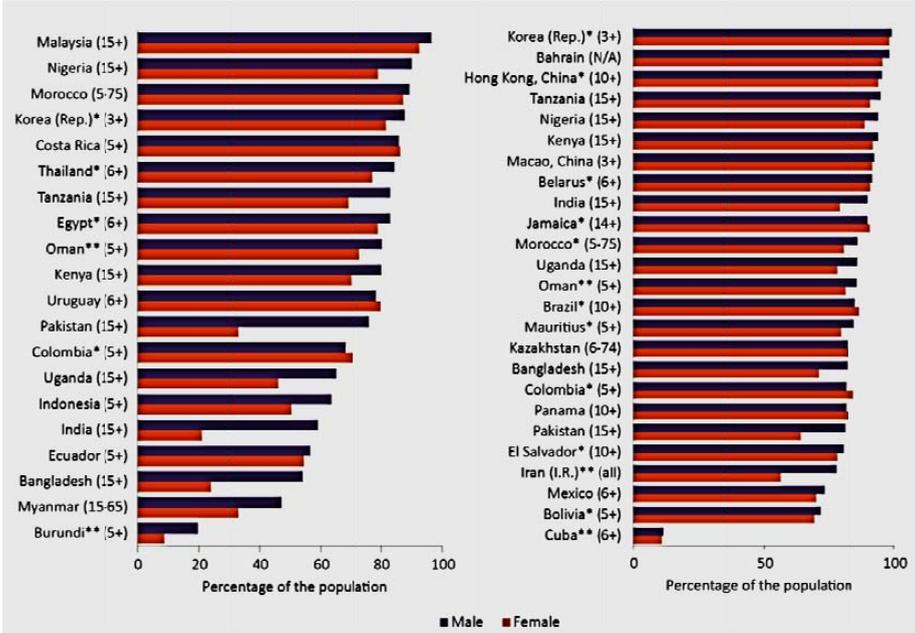
Individuals who own a mobile-cellular telephone (left) and using a mobile-cellular telephone (right), broken down by gender, 2015 or latest available year

Data show larger gender gaps in mobile-phone ownership than in mobile-phone usage. Indeed, in all countries with large gender gaps in mobile-phone usage the gap is even larger in mobile-phone ownership (e.g. men are twice as likely as women to own a mobile phone in Bangladesh, India and Pakistan). Other countries with large gender gaps in mobile-phone ownership include Burundi, Indonesia and Myanmar (more than 10 percentage points), and sizeable gender gaps exist in the Republic of Korea, Oman and Thailand (more than 5 percentage points). The fact that countries with very different income levels display significant differences in mobile-phone ownership between men and women suggests that low mobile-phone ownership among women may not only be an issue in poorer countries.

Because of the limited data available, only cautious conclusions can be drawn on the current gender gap in mobile uptake in the low-income countries and LDCs. However, data for the four LDCs with data available (Bangladesh, Burundi, Myanmar and Uganda) show that women are far less likely to own a mobile phone than men.

All these findings coincide with the results of recent research in low- and middle-income countries pointing to the fact that in these countries over one billion women do not own a mobile phone (GSMA, 2015).

Figure 2.8: Gender wise distribution of Individuals who own a mobile-cellular telephone (left) and using a mobile-cellular telephone (right), 2015 or latest available year



Note: The age scope of each survey is indicated in brackets. * 2014 data. ** 2013 data. The percentages of female/male mobile-phone users/owners are calculated as a proportion of total female/male population in each age group.

Source: ITU for all countries except Bangladesh, India, Kenya, Nigeria, Pakistan, Tanzania and Uganda, for which data are sourced from Financial Inclusion Insights, and Myanmar, sourced from LIRNEasia.

According to a recent Pew Global Survey,(2015) “There are gender gaps on many aspects of technology use. For example, in 20 nations, men are more likely than women to use the internet. The largest gap among all countries surveyed occurs in Nigeria, where 48% of men say they use the internet versus only 29% of women. Double-digit gender gaps also appear in Kenya, Ghana, Vietnam, Tanzania, Pakistan, the Palestinian territories, Japan, Burkina Faso, India and Uganda. But there are also statistically significant gender differences in internet access in prominent European nations, such as France, Germany and the UK. Along with this large gender gaps also appear on reported smartphone ownership (men are more likely to own a smartphone) in many countries, including Mexico (+16), Nigeria (+13), Kenya (+12) and Ghana (+12).

Table 2.4: Gender Divide in Internet access
In many countries, men are more likely than women to use the internet

Adults who use the internet at least occasionally or report owning a smartphone

	Women	Men	Diff
	%	%	
Nigeria	29	48	+19
Kenya	31	49	+18
Ghana	18	33	+15
Vietnam	44	57	+13
Tanzania	15	28	+13
Pakistan	9	22	+13
Palest. ter.	67	78	+11
Japan	64	75	+11
Burkina Faso	12	23	+11
India	17	27	+10
Uganda	6	16	+10
France	71	80	+9
Mexico	50	59	+9
Peru	48	57	+9
Germany	81	89	+8
Ukraine	56	64	+8
Ethiopia	4	12	+8
South Africa	39	46	+7
Senegal	27	34	+7
UK	85	91	+6

Note: Percentages based on total sample. Only statistically significant differences shown.

Source: Spring 2015 Global Attitudes survey. Q70 & Q72.

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Table 2.5: Gender Divide in Smartphone Ownership**Gender divide in many nations on smartphone ownership***Adults who report owning a smartphone*

	Women	Men	Diff
	%	%	
Mexico	28	44	+16
Nigeria	21	34	+13
Kenya	20	32	+12
Ghana	15	27	+12
Spain	66	75	+9
Canada	63	72	+9
Burkina Faso	9	18	+9
Pakistan	6	15	+9
Germany	56	64	+8
France	45	53	+8
Vietnam	31	39	+8
Peru	21	29	+8
India	13	21	+8
UK	65	72	+7
Russia	41	48	+7
Venezuela	42	48	+6
Ukraine	24	30	+6
Tanzania	8	14	+6
Uganda	3	6	+3

Note: Percentages based on total sample. Only statistically significant differences shown.

Source: Spring 2015 Global Attitudes survey. Q71 & Q72.

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2.7 Achieving gender equality in access to broadband by 2020

Gender equality in access to broadband is essential for empowering women and girls through equal access to new technologies to acquire ICT skills and better-paid jobs, to access information, to redress some of the inequalities women face in their everyday lives, and to enjoy the same opportunities as their male counterparts. Gender equality was recognized in the MDGs, and is recognized as both a principle and a stand-alone goal

in the SDGs (SDG #5), as well as being integrated into all other SDGs as a vital enabler of true and equitable development. In low- and middle-income countries, women are 21% less likely to own a mobile phone than men. Likewise, across the developing world, nearly 25% fewer women than men have Internet connectivity, and this gap rises to nearly 50% in some parts of sub-Saharan Africa. These gaps limit the potential of ICTs for women and girls and perpetuate inequalities between boys and girls, some of which start from a very young age. If women and girls are unable to enjoy the same access to broadband and ICTs, including the availability of relevant content, they will find themselves at a serious disadvantage in becoming fully literate, accessing skilled jobs, learning about and exercising their rights, and participating as citizens in public and policy-making processes. Sex-disaggregated data are not yet widely available for broadband connectivity, but based on Internet usage data as a proxy indicator, ITU (2013) estimated there were 1.3 billion female Internet users by 2013, compared with 1.5 billion men and boys online, equivalent to a global digital gender gap of some 200 million fewer women and girls online in 2013. This gender gap was more pronounced in the developing world, where 16% fewer women than men used the Internet, compared with only 2% fewer women than men in the developed world (ITU, 2013:20). ICTs have the potential to alleviate some of the barriers faced by women, including illiteracy, poverty, time scarcity, lack of mobility, cultural and social norms, and limits on participation in decision-making. In some countries, cultural norms can include surveillance of women's physical and social mobility or preventing women from accessing and using ICTs, including relevant content. To achieve equality and combat these restraints, more girls and women need to be involved both as consumers and creators of technology. It is critical to find ways to mobilize and empower girls and women to participate in designing, building and leading our shared digital future.

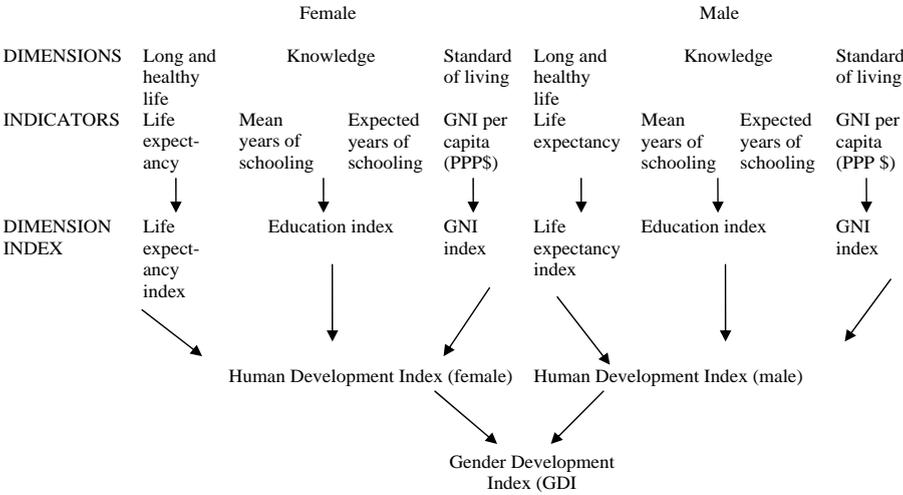
2.8 Gender Development Index (GDI)

The new GDI measures gender gaps in human development achievements by accounting for disparities between women and men in three basic dimensions of human development - health, knowledge and living standards using the same component indicators as in the HDI. The GDI is the ratio of the HDIs calculated separately for females and males using the same methodology as in the HDI. It is a direct measure of gender gap showing the female HDI as a percentage of the male HDI.

The GDI is calculated for 161 countries. Countries are grouped into five groups based on the absolute deviation from gender parity in HDI values. This means that grouping takes equally into consideration gender gaps favoring males, as well as those favoring females.

The GDI shows how much women are lagging behind their male counterparts and how much women need to catch up within each dimension of human development. It is good for understanding the real gender gap in human development achievements and is useful to design policy tools to close the gap.

Figure 2.9: Dimensions and Indicators of GDI



Source: <http://hdr.undp.org/en/content/gender-development-index-gdi>

Table 2.6: GDI and HDI values of OECD, Developing and LDC countries (2014)

	Gender Development Index		Human Development Index (IDI)		Life expectancy at birth		Expected years of schooling		Mean Years of Schooling		Estimated Gross National Income Per capita (2011 PPP\$)	
	value	GDI Group	Value		Years		Years		Years		Female	Male
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Country	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
Developing countries	0.899	-	0.617	0.686	71.7		11.6	11.9	5.4	7.3	5.926	12.178
Arab States	0.849	-	0.611	0.719	72.7	68.8	11.6	12.3	4.9	6.9	5.686	24.985
East Asia and the Pacific	0.948	-	0.692	0.730	76.0	72.2	13.0	12.8	6.9	8.0	9.017	13.780
Europe and Central Asia	0.945	-	0.719	0.760	76.1	68.5	13.5	13.8	9.0	10.0	8.238	17.607
Latin America and the Caribbean	0.976	-	0.736	0.754	78.2	71.7	14.4	13.7	8.0	8.1	10.194	18.435
South Asia	0.801	-	0.525	0.655	69.9	67.1	10.8	11.3	3.7	6.9	2.198	8.827
Sub-Saharan Africa	0.872	-	0.480	0.550	59.7	57.1	9.1	10.3	4.2	6.0	2.626	4.148
Least developed countries	0.866	-	0.465	0.537	64.8	61.9	8.9	10.0	3.2	4.9	1.783	3.005
Small island developing states		-			72.6	67.8	13.4	12.6			5.045	8.849

Organisation for Economic Cooperation and Development	0.973	-	0.862	0.887	82.7	77.5	16.0	15.5	11.0	11.5	28.430	47.269
World	0.924	-	0.670	0.725	73.7	69.5	12.2	12.4	6.2	7.9	10.296	18.373

Source: UNDP 2015

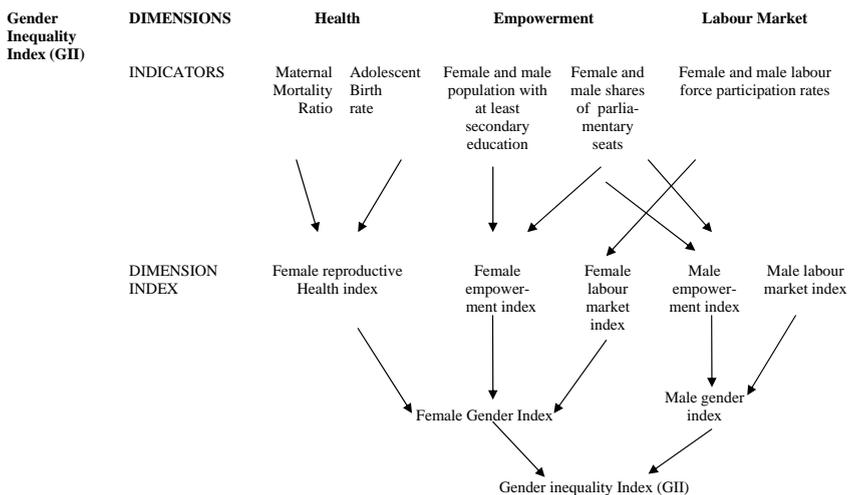
2.9 Gender Inequality Index (GII)

Gender inequality remains a major barrier to human development. Girls and women have made major strides since 1990, but they have not yet gained gender equity. The disadvantages being faced by the women and girls are a major source of inequality. All too often, women and girls are discriminated against in health, education, political representation, labour market, etc – with negative repercussions for development of their capabilities and their freedom of choice.

The GII is an inequality index. It measures gender inequalities in three important aspects of human development—reproductive health, measured by maternal mortality ratio and adolescent birth rates; empowerment, measured by proportion of parliamentary seats occupied by females and proportion of adult females and males aged 25 years and older with at least some secondary education; and economic status, expressed as labour market participation and measured by labour force participation rate of female and male populations aged 15 years and older. The GII is built on the same framework as the IHDI – to better expose differences in the distribution of achievements between women and men. It measures the human development costs of gender inequality, thus the higher the GII value the more disparities between females and males and the more loss to human development.

The GII sheds new light on the position of women in 155 countries; it yields insights in gender gaps in major areas of human development.

Figure 2.10: Dimensions and Indicators of GII



Source: <http://hdr.undp.org/en/content/gender-inequality-index-gii>

Table 2.7: GII values and rank of OECD, Developing and LDC countries (2014)

	Gender Inequality Index		Maternal mortality ratio	Adolescent birth rate	Share of seats in parliament	Population with at least some secondary education		Labour force participation rate	
	Value	Rank				Female	Male	(%ages 15 and older)	
			(deaths per 1,000 Live births)	(births per 1,000 women ages 15-19)	(% held by women)			Female	Male
Country	2014	2014	2013	2010/2015	2014	2005-2014	2005-2014	2013	2013
Developing Countries	0.478	-	225	51.5	20.2	44.2	58.4	49.5	78.7
Regions									
Arab States	0.537	-	155	45.4	14.0	34.7	47.6	23.2	75.3
East Asia and the Pacific	0.328	-	72	21.2	18.7	54.7	66.3	62.6	79.4
Europe and Central Asia	0.300	-	28	30.8	19.0	70.8	80.6	45.6	70.0
Latin America and the Caribbean	0.415	-	85	68.3	27.0	54.3	55.2	53.7	79.8
South Asia	0.536	-	183	38.7	17.5	29.1	54.6	29.8	80.3
Sub-Saharan Africa	0.575	-	506	109.7	22.5	22.1	31.5	65.4	76.6
Least developed countries	0.566	-	439	97.0	20.4	17.2	26.4	65.7	82.6
Small island developing states	0.474	-	220	61.5	22.8	51.1	55.1	53.0	73.3
Organisation for Economic Co-operation and Development	0.231	-	21	25.4	26.9	82.9	86.3	50.9	68.9
World	0.449	-	210	47.4	21.8	54.5	65.4	50.3	76.7

Source:<http://hdr.undp.org/en/composite/GII>

2.10 Gender and ICT: Global level initiatives

In 1996, the Division for the Advancement of Women, in collaboration with United Nations and NGO partners, organized an Expert Group Meeting on “Global Information through Computer Networking Technology in the Follow-Up to the Fourth World Conference on Women”. The Division also published an issue of *women2000* entitled, “Women and the Information Revolution”. A “Canon on Gender Partnerships and ICT Development”, developed primarily by women participants at the first international conference on ICT, the Global Knowledge Partnership Conference in 1997, outlined key principles for the development and design of ICT, prioritizing equal participation and gender-aware assessments and evaluations of ICT

projects and programmes. At the second Global Knowledge Partnership Conference held three years later, a specific Women's Forum developed a comprehensive set of recommendations. The major recommendations included:

- Mainstreaming and monitoring of a gender perspective in all ICT initiatives;
- Collecting sex disaggregated data on the use of ICT and women's participation in policy-making as well as developing targets, indicators and benchmarks to track the progress of women's and girl's access to the benefits of ICT;
- Identifying and promoting good practices and lessons learned on the ways women and girls are using ICT;
- Capacity-building towards gender equality in education and employment;
- Enhancing democracy and women's participation through electronic connectivity; and
- Developing research and policies on health and environmental hazards of ICT industries.

In 1998, the ITU Task Force on Gender Issues was established within the ITU Development Sector. Currently known as the Working Group on Gender Issues, the group has been a consistent advocate of women's empowerment and gender equality within the ITU and in the preparations for the World Summit on the Information Society. In 2002, ITU adopted two resolutions on gender mainstreaming – one on Mainstreaming Gender in ITU-D Programmes – which recognized that a “gender dimension in telecommunications” is critical to the attainment of the goal of universal access; and another one on Gender Mainstreaming in IT – which called for gender mainstreaming in all programmes of the ITU. As a result of these resolutions, ITU created a gender unit with the support of the Norwegian Government to advance the work in preparation for WSIS. Advocacy for women's improved access to ICT, and attention to gender perspectives in the development and use of ICT has significantly increased in the United Nations in the context of preparations for the WSIS. The United Nations Inter-Agency Network on Women and Gender Equality (IANWGE) established a Task Force on Gender and Information and Communication Technologies to coordinate the activities of all United Nations entities working on gender equality and ICT in preparation for WSIS. The Task Force produced fact sheets on gender and ICT for WSIS Phase I, with contributions from a broad range of United Nations entities. Information on specific activities of other entities of the United Nations can be accessed through the inter-agency website, Women Watch.

2.11 WSIS: Potential for addressing the gender divide

Phase I of the World Summit on the Information Society

Gender equality advocates from civil society organizations, Governments, United Nations bodies and international agencies participated in regional and global preparatory meetings and made a strong case for including recommendations on gender equality and women's empowerment in the WSIS Declaration of Principles and Plan of Action. In meetings held in many parts of the world over a two-year period from early 2002, including in Bamako, Budapest, Tokyo, Bavaro, Paris and Geneva, gender equality advocates organized their efforts through the Gender Caucus and the NGO Gender Strategies Working Group. One major success of these efforts was the development of partnerships and collaboration between Member States, intergovernmental agencies and other stakeholders which resulted from the increased networking, awareness-raising and knowledge sharing in the WSIS process. While the work of gender advocates is reflected directly in both the WSIS Declaration of Principles and Plan of Action, a number of the objectives relating to attention paid to gender perspectives in the outcome documents were met.

One strong paragraph was included in the first section of the Declaration of Principles which stated, "[w]e affirm that development of ICT provides enormous opportunities for women, who should be an integral part of, and key actors in, the Information Society. We are committed to ensuring that the Information Society enables women's empowerment and their full participation on the basis of equality in all spheres of society and in all decision-making processes. To this end, we should mainstream a gender equality perspective and use ICT as a tool to that end".

The Plan of Action contains references to the special needs of women in relation to capacity-building (removing the gender barriers to ICT education and training); enabling environment (promotion of participation of women in formulating ICT policies); ICT applications (e-health and employment); cultural diversity and identity (strengthening programmes focused on gender-sensitive curricula in formal and non-formal education and media literacy); media (balanced and diverse portrayal); follow-up and evaluation (gender-specific indicators on ICT use and needs and measurable performance indicators to assess the impact of funded ICT projects on the lives of women and girls should be developed). A factor inhibiting adequate attention to gender equality perspectives was the lack of delegations at the Summit with expertise or experience with gender equality and women's empowerment issues. Many delegations were comprised of trade and telecommunications ministry staff. Another major

challenge of gender equality advocacy in WSIS was the assumption that gender advocacy is primarily women's work. Gender equality advocates often had to lobby for attention to gender perspectives in the context of the regional and thematic caucuses within civil society (for example, in relation to media, network security and human rights).

1.12 Phase 2 of the World Summit on the Information Society

The Declaration of Principles from WSIS 2003 in Geneva outlined a "common vision" for the information society "premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights". The WSIS Plan of Action articulates concrete actions to advance the achievement of the internationally agreed development goals, including those in the Millennium Declaration, the Monterrey Consensus and the Johannesburg Declaration and Plan of Implementation. The second phase of WSIS will focus on the monitoring and implementation of the "progress of feasible actions laid out in the Plan of Action", including developing a core set of benchmarks or indicators which can be used to evaluate ICT for Development initiatives; surveying and presenting ICT "good practices" and "lessons learned"; and presenting the recommendations of two working groups on Financing Mechanisms and Internet Governance established by the Secretary-General of the United Nations. Gender equality advocates have focused on networking to address the broad range of issues during the preparations for the second phase of the WSIS from a gender perspective. Priority areas for intervention have included lobbying for the incorporation of gender awareness in the development of national level ICT policies and "e-strategies"; and developing ICT indicators and targets as a tool for achieving the development goals of the Millennium Declaration. Financing ICT for Development is a critical gender equality issue. Several briefing and position papers have been commissioned by UNDP which have been based on consultations with organizations active in gender and ICT advocacy. The findings and conclusions of the Task Force make reference to the importance of integrating ICT policies into poverty reduction strategies; of funding civil society community networks because of their effectiveness in expanding ICT access to rural low-income populations; and of identifying further ways and means of lowering the costs of delivery to under-served markets and promoting community access. Ensuring adequate funding for ICT initiatives for women, and replication and up scaling of positive innovations and pilot projects, remains a challenge which needs to be addressed in the context of financing mechanisms. In the formation of the United Nations Working Group on Internet

Governance, gender equality was one of the primary criteria used in the selection of candidates. Out of the 39 members, seven are women, with a stakeholder balance of Government (18), private sector (6) and civil society (15). Two members of the WSIS Gender Caucus and NGO Gender Strategies Working Group are also on the Working Group. The broad definition of Internet governance utilized by the Working Group includes issues related to content (such as spam and “illegal and harmful content”), and use (such as use of the Internet for fraud or criminal activities). The Working Group has prioritized the importance of Internet governance in relation to developmental aspects of the Internet, such as universal and affordable access to infrastructure, content, cultural and linguistic diversity, training and capacity building. Gender equality issues were covered in the developmental aspects of Internet governance, in particular capacity-building in developing countries and other access concerns. There has been active and visible gender advocacy in the work on Internet governance. However, constraints in identifying clear points for intervention and action on gender equality are faced when Internet governance is viewed from a largely technical perspective. Issues such as access to infrastructure, content and use, as well as intellectual property rights and developmental aspects, provide gender advocates with clearer entry points for intervention. Opportunities need to be identified for ensuring that recommendations for future governance arrangements address the need to create more effective means for women to participate in governance processes. A Forum on Gender and ICTs for the World Summit on the Information Society 2005 was held in Seoul.

Republic of Korea, from 24-25 June in 2005, with participants from 36 countries, representing academia, NGOs, Governments, international organizations and the private sector. The Seoul-Gyeonggi Declaration on Equal Participation of Women in the Information Society⁴⁵ prepared by participants at the Forum emphasized the need to ensure integration of gender perspectives in the ICT financing discussions, including through gender-sensitive budgeting and specific interventions for women, taking into account the needs of marginalized women. In relation to ICT governance mechanisms, the Declaration recommends establishment of multi-stakeholder mechanisms at both the global and national levels, with opportunities for participation of women. Other issues emphasized in the Declaration included the need for sex disaggregated data, capacity-building in gender analysis of ICT policies and programmes, increased employment opportunities for women, enhanced opportunities for women’s involvement in ICT decision-making, and investment in infrastructure and services specifically for women.

Advocacy for Gender Issues in New ICTs – Some Critical Milestones

Name	Year	Agenda
The Association for Progressive Communications (APC) Women’s Networking Bureau	1992	Set up after the United Nations Conference on Environment and Development. Women from various member organisations of the APC got together to address the networking and advocacy needs of organisations in the international women’s environment and development movement.
The APC Women’s Networking Support Programme (APC WNSP)	1993	In May 1993, at the Vienna Conference on Human Rights, ideas were developed for an information and communications strategy towards the Fourth World Conference on Women. WNSP was set up to address global networking needs in the run-up to the Beijing Conference. Supported by regional partner organisations and community-based women’s groups in the South, APC WNSP successfully mobilised the participation of women from the South through electronic networking.
The Fourth World Conference on Women, Beijing	1995	The Beijing Platform for Action made explicit reference to computer technology and to satellite and cable television as opportunities for the participation of women in communications.
World Telecommunications Development Conference, organised by ITU, Valletta, Malta.	1998	UNIFEM, United Nations University Institute on New Technologies and the Canadian International Development Agency were key actors. Policy-related papers on gender and ICTs were presented by governments and the ITU Gender Task Force was established
United Nations General Assembly Special Session (UNGASS) to review the status of the Beijing Platform for Action	2000	An online women-media consultation was organized by the UN Internet initiative Women Watch and facilitated by Women Action. Perspectives emerging from here were put forward into the proposals relating to media and communication issues. State actors at Beijing+5 were, however, resistant to the gender and ICTs agenda, and some countries also resisted references to even democratic forms of regulating the ICT industry.

Gender and the Digital Divide Seminar Series	2000	The Seminar Series is being sponsored by the Gender and Development and Girls' Education Thematic Groups, and the Bridging the Digital Divide through Education Task Force of the World Bank. The series looks at the impact of ICTs on gender relations and innovative ways that ICTs are being used to overcome gender inequalities and bridge the digital divide.
United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) Study of Regional ICT Policy Framework and Legislation Environment	2001	The study demonstrated the lack of attention to gender equality goals and women's advancement in national ICT development frameworks and strategies.
United Nations / United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) Virtual Seminar Series on Gender and ICTs	2002	Discussions were pegged around key theme papers - 'Are ICTs Gender Neutral?', 'Women and ICTs: Enabling and Disabling Environments', 'Engendering Management and Regulation of ICTs', and 'ICTs as Tools for Bridging the Gender Digital Divide and Women's Empowerment.'
UN Division for the Advancement of Women (UNDAW), Ministerial Roundtable, Bucharest, Rumania	2002	2002 This was a Pan-European Regional Ministerial Meeting titled 'Building a Gender-sensitive Information Society'
UNDAW, Expert Group Meeting on Gender and ICTs, Seoul, Republic ofn Korea	2002	2002 The meeting focused on ICTs and their impact on and use as an instrument for the advancement and empowerment of women. An online conference was held from 17 June to 19 July 2002 to serve as a transitional forum for the Expert Group Meeting.
UNDAW, Expert Group Meeting on Gender and Media, Beirut, Lebanon	2002	2002 The meeting focused on 'Participation and Access of Women to the Media, and the Impact of Media on and its Use as an Instrument for the Advancement and Empowerment of Women'.

WSIS Gender Caucus	2002	The WSIS Gender Caucus was formed during the WSIS African regional preparatory conference which took place in Mali from 25- 30th May 2002. It is a multi-stakeholder group consisting of women and men from national governments, civil society organizations, non-governmental organizations, the private sector and the United Nations system. The Caucus sought to facilitate women’s participation in the WSIS process and ensure that gender equality and women’s rights are integrated into WSIS and its outcome processes.
NGO Gender Strategies Working Group (GSWG)	2002	The NGO GSWG was formed at the first WSIS PrepCom at Geneva in July 2002 as one of the sub-committees of the Civil Society Coordinating Group. The groups involved in the NGO GSWG are the African Women’s Development and Communication Network (FEMNET), the Association for Progressive Communications Women’s Networking Support Programme (APC WNSP), ISIS International-Manila, and Agencia Latino Americana de Información.
47th Session of the UN Commission on the Status of Women, New York, US	2003	The session discussed the ‘Participation and Access of Women to the Media, and Information and Communications Technologies and their Impact on and Use as an Instrument for the Advancement and Empowerment of Women.’
WSIS	2003	Declaration of Principles and Plan of Action adopted by multiple stakeholders. The Declaration does not affirm gender equality as it is laid out in the Beijing Declaration. The Plan of Action makes piecemeal references to women and girls.

Source: Gurumurthy A., 2004, Gender and ICT, Institute of Development Studies, University of Sussex, Brighton, BRIDGE publications

2.13 Gendered Dimensions of the Information Society: The Challenges

For those women with the resources to access and use the new information and communication technologies, there are real benefits. For society as a whole, ICTs offer immense possibilities for reducing poverty, overcoming

women's isolation, giving women a voice, improving governance and advancing gender equality. But this potential will only be realized if the factors that contribute to the current gender digital divide are recognized and addressed. Women's access to ICTs is not a simple question of whether there is a computer connected to the Internet that women can use. Numerous other issues are just as important in determining whether women can access technology. Women, because of their biological and social roles, are generally more rooted than men in their communities. Hence women are often more aware than men of the social, economic and environmental needs of their own communities. In most societies, including in poorer ones, the advent of ICTs opens up possibilities of access to a global pool of knowledge, so long as potential users have access to adequate infrastructure and possess relevant skills. Information about reproductive health over the Internet can, for example, save or improve lives of many women (and men) facing the hazards of AIDS in Asian and African countries.

1.14 Socio-cultural and institutional barriers

Socio-cultural barriers refer to those factors that subtly or explicitly impel certain groups to censor their speech and behaviour, or exclude themselves from particular activities, in the belief that these are not intended for them. In terms of ICTs, these factors can range from ideas about the nature and role of technology and machines, to perceptions about the accessibility of the technology, to insecurities based on social markers of identity like gender, race, age, and so forth. Generally, women have less access than men to ICT facilities where they exist. Numerous invisible barriers limit women's and girls' participation in the Information Society. One of the more pervasive but intractable problems is "technophobia," or fear of technology. Women often have complex relationships with technology and machines as a result of being socialized over time to believe that machines and technology are a man's domain and not for women and girls, thus generating a gender bias in attitudes towards studying or using information technology. Once girls enter school, they are discouraged from studying science and technology, either consciously or unconsciously, by parents' and teachers' biases. The steady attrition of girls and women throughout the formal science and technology system, from primary education to decision-making level, has been characterized as a "leaky pipeline". In some countries in Africa and the Pacific, girls are encouraged to get married or get a job rather than pursue further education. In many of these countries, there is a social preference for boy children, and decisions to invest in boys' education are often made at the expense of girls, who are required to help with domestic chores at home for all or part of the school day. The "leaky pipeline" phenomenon

means that fewer women enter into the science and technology fields, limiting the number of women scientists and technologists in academia, research and development, and at senior positions in the ICT arena. Gender biases against women in the cultures of university and research institutes also strongly influence the level of women's participation in university and research institutions. Women have greater difficulty finding employment in science and technology professions, receive fewer promotions, and have less access to supervisory positions. The social factors that produce these gender differences operate in both institutional and informal settings. In some societies, cultural norms discourage interaction between women and men outside the family, and women may be uncomfortable in situations where men are present either as trainers or as peers. Even in countries where women and men mix freely, women who are learning to use computers – in particular older women – may be uneasy if a man is in charge of the training. An awareness of these socio-cultural and institutional barriers is essential if decision-makers are to shape remedial programmes and design facilities that encourage women's participation.

1.15 Access, control, and effective use

Women's access to and control over ICTs is not equal to that of men. Here access refers to the ability to make use of the technology as well as the information and knowledge it provides, while control refers to the ability to decide how ICTs are used and who can have access to them. Effective use refers to the ability of women and girls to use ICTs strategically to advance social development goals. There is a huge gap between women's and men's access to telecommunications infrastructure. Infrastructure is largely concentrated in the urban areas, while the majority of women in the developing world, particularly in Africa, are located in remote and rural areas. Simply stated, if the technology is not there, women cannot have access to it. The development of infrastructure includes many choices that involve decisions about locations of facilities, the nature and choice of technology, costs and pricing decisions. If these decisions on location, technology choice and costs do not explicitly consider providing access to (women in) remote and rural areas, but favour urban areas with high-end and expensive communication services and technologies, women will have less access than men. "The most basic point is that the communications infrastructure in Africa is a gender issue. At present, a huge gender gap exists in access to communications. Infrastructure is concentrated in urban areas, and the bulk of women live in rural areas [...] if [technology/infrastructure choices] are made that have an urban bias and high cost, few women will have access. In building infrastructure, the starting point is policy. Thus, women advocates have to get involved in policy areas where they otherwise might not ... We need to ask constantly whether the

infrastructure choices being made are ones that will benefit the majority of women. Universal access is a burning gender issue." The dimensions of this infrastructure divide stretch over international boundaries, and across developing and developed countries: one-third of the world's population has yet to make a phone call, and less than one-fifth has experienced the Internet. These figures illustrate the lack of telecommunications service to largely poor and predominantly rural peoples in different countries, of whom a great number are women. The ability of women to use information and knowledge is dependent on many factors, among which are literacy and education, geographic location (North or South, rural or urban), and social class. Thus, as the information revolution develops and accelerates migration to the Internet, those without access will suffer greater exclusion. There is a rising recognition that connectivity is not enough, and that the knowledge and resources to translate that access into effective use is equally important. Criticism has developed over ICT development programmes that concentrate excessively on access to technology and information sources in the mistaken belief that this will solve communities' development problems. The truth is rather that ICT initiatives will not be appropriated unless they also deliver information that is useful and relevant to the end-users, and where the end-users (women and men, girls and boys) have the capacity to act on it. While ICTs can deliver potentially useful information, like market prices for women in small and micro-enterprises, for example, it is only one aspect of a longer chain of resources necessary to effect sustainable development. Where there is no access to roads, transport or credit, and other development inputs cannot be obtained (as is often the case for women), access to and use of ICTs will be limited in its impact. It is therefore equally important to support the provision of ICT facilities by providing additional services and training that will also build men and women's capacities to act on their newfound information and knowledge. The way in which ICTs are used in developing countries is also a gender issue. Research has shown that most women in developing countries make limited use of ICTs, restricting themselves to email and email discussion lists, generally for advocacy and networking purposes. ICT usage is affected by factors like cost, limited bandwidth, and technical skills. Till date, very few African women have used ICTs for business development, entertainment, educational purposes, or for information relating to the quality of life of either themselves or their families (such as health and nutritional information).

2.16 Education, training and skills development

Two-thirds of the world's 870 million illiterate people are women, and the world's lowest literacy rates among women are found in thirteen African countries. In some African countries, literacy is less than 30 percent in local

languages. Women face challenges in pursuing education at all ages due to lack of time to attend classes, family and domestic responsibilities, and socio-cultural practices that rate girls' education as less important than boys'. While the gender gap in primary and secondary school enrolment has begun to narrow in recent years, girls still represent 60 percent of the 100 million school age children in the developing world who grow up without access to basic education. Sub-Saharan Africa, southern Asia and the Arab States are home to 95 percent of these out-of-school children. In 35 countries around the world – 18 of them in sub-Saharan Africa, the rest in Asia and the Arab States – girls' net enrolment at secondary level is at least 6 percentage points lower than that of boys. In Central and Eastern Europe, there is less concern with girls' enrolment in primary and secondary school. Rather, the concern is with limited access to higher education due to prohibitive costs, and with training for IT occupations.

Literacy, language, computer skills and information literacy are critical skills for drawing some benefit from ICTs for development initiatives. Women and girls are less likely to have these requisite skills and therefore more likely to be excluded from local initiatives. Given the dominance of English on the Internet (though that is slowly eroding), women and girls are also less likely to know the international languages used on the Internet. The predominance of women in rural areas in developing country contexts means that they are also less likely than men to access computers, which are concentrated in urban settings. Information literacy is essentially the ability to evaluate different sets of information against each other, and apply it to real-life contexts. The isolation and limited exposure of women in developing countries means that women are less likely than men to have these skills. While software is being developed and used in ICT projects targeted at illiterate women, these initiatives are pilot projects that occur few and far between, and are relatively expensive to implement. Literacy and basic education for girls and women are central concerns for UNESCO. Following the World Education Forum (Dakar, 2000), UNESCO has placed the six Dakar goals – which include a 50 percent reduction in female illiteracy and the elimination of gender disparities at primary and secondary levels – at the heart of its work during 2002-2007. Efforts to ensure the access of women and girls to technical, vocational and scientific education have also been intensified.

2.17 Content and language

In the twenty-first century, most of the world's population remains in Internet silence, while the rich and powerful, most of them men, and predominate in the new medium. The excluded range from women to non-English speaking nations, national, religious and ideological minorities,

the poor in poor countries as well as the poor in rich countries, and the majority of the world's children. Individuals with access to the Internet are able to access information and meet with people they would otherwise not know. At an individual level, Internet users are getting rich. But the lack of diverse content means that as a global society we are becoming more impoverished. The dominance of Western men, largely located in the Northern developed countries, as users of, designers of, decision-makers about, and content producers for the Internet also raises questions about what kind of content will prevail on the Internet. Furthermore, what will be the cultural biases of this knowledge, and how will women be portrayed in cyberspaces generally, including the Internet, video games, and virtual reality? One of the reasons given by women to explain their low attendance at telecentres in Africa is language and content that does not 'speak to them⁴¹,' noting in this sense the 'mode of address' rather than a lack of proficiency in a foreign language. For a great number of women, however, lack of proficiency in international languages is a major problem, even for educated women in Eastern Europe, Latin America and Francophone Africa, excluding them or limiting the benefits they are able to draw from using ICTs. The majority of poor women in the world do not speak the languages that dominate the Internet - English, French, German, Japanese, and Chinese. Women's viewpoints, knowledge, experiences and concerns are inadequately reflected on the Internet, while gender stereotypes predominate. These concerns around content relate both to issues of sexism and the portrayal of women in media generally, as well as to the need for women to systematize and develop their own perspectives and knowledge, and to ensure that they are reflected in these spaces. Speaking of the absence of women's voices in Zapatista discourses on the struggle of indigenous peoples in the Chiapas region of Mexico, Marisa Rius notes: There are methodologies to deal with the translation and expropriation of the Zapatista discourse inside cyberspace, such as the deconstruction or meta-ideologization but what do you do with silence? How do we deal with the absence inside national projects, nationalist discourse, and transnational technologies? The battle over the nature of the Internet is not closed or lost. Women and women's projects that have a presence on the Internet and seek to advance gender empowerment have started to think about where the silences are, and what can be done about them. There are a growing number of projects that have begun grappling with the issues of women's access to ICTs and the creation and sharing of relevant content for women's empowerment. As some women activists caution: The technology is only a tool, and only as useful as the information it carries. Thus we must continually be aware of the need for [diverse and relevant] content. We cannot become so entranced by the magic of how we put information into cyberspace as to forget that what we put there is actually delivering an

impact. The medium is not the message. To improve women's access and relevant use of ICTs, there needs to be a massive investment of time and other resources into content development at the local level, based on local information needs. The relevance of ICT initiatives also falls short where the focus is on "plugging in" women and other marginalized groups into existing global information flow, without any attention to local knowledge systems and content. This flawed approach reinforces marginalized groups as consumers of the Internet and information, and concomitantly neglects the local knowledge that may be of more relevance to women and other marginalized groups. There should therefore be greater attention paid to recognizing women and the poor as information producers, and providing relevant training in collecting, packaging and disseminating local knowledge, based on an understanding of local information needs, and that of women specifically. Such information may well be more useful for local communities in meeting their everyday challenges than "foreign" information available on the Internet.

2.18 Pornography, trafficking, violence against women and censorship

The picture that emerges from most analyses of new information and communication content is of a masculinist rhetoric, and a set of representations which are frequently sexualized and often sexist. Pornography, e-mail harassment, "flaming" (abusive or obscene language), and cyber-stalking are well documented. It is estimated that 10 percent of sales via the Internet are of a sexual nature, whether in the form of books, video-clips, photographs, online interviews, or other items. New technical innovations facilitate the sexual exploitation of women and children because they enable people easily to buy, sell and exchange millions of images and videos of sexual exploitation of women and children. These technologies enable sexual predators to harm or exploit women and children efficiently, and anonymously. As a result of the huge market on the web for pornography and the competition among sites, pornographic images have become rougher, more violent, and degrading. Affordable access to global communications technologies allows users to carry out these activities in the privacy of their homes. Even more disturbing is the use of the Internet as a tool in the prostitution and trafficking of women. In 1995 an estimated 1.8 million women and girls were victims of illegal trafficking, and the numbers are growing. The Internet is used in multiple ways to promote and engage in the sexual exploitation and trafficking of women. Pimps use the Internet to advertise prostitution tours to men from industrialized countries. The men then travel to poorer countries to meet and buy girls and women in prostitution. Traffickers recruiting women from the Baltic States use the Web to post advertisements for unlikely jobs

in Western Europe (such as waitress or nanny). Information on where and how to find girls and women in prostitution in cities all over the world is posted on commercial Web sites and non-commercial newsgroups. In 2001, the Council of Europe established a working group to study the impact of new information technologies on trafficking in human beings for the purpose of sexual exploitation. There are numerous organizations working on the issues of women's trafficking and have done much to raise concern over the use of the Internet for trafficking women and children, and the explosion of pornography on the Internet. While recognizing that traffickers and pornographers have moved their businesses to the Internet, women's organizations have also been aware of the dilemma of calling for government measures to curb this. One of the fiercest debates in the area of Internet Rights regards the issue of freedom of expression and censorship. Some organizations have used the presence of pornography on the Internet to call for stricter policies for monitoring and censoring content on the Internet, including the development of software devices that would track down the creators and consumers of pornographic materials. Other women's organizations have been at the forefront of pointing out the danger of inviting censorship measures that could very easily be extended to other content areas, and limit freedom of expression far beyond the realms of pornography and trafficking. Legislation can be interpreted widely, leaving it open for states to decide what they would consider "illegal" or "harmful practices." Above all else, women should be informed, made aware and included in the discussions and debates taking place around these trends, and consulted in the development of any policies and practices that are advocated by state agencies and other bodies. In this spirit, UNESCO is already carrying out a number of research and awareness-raising projects to combat trafficking in women and children in the Asia-Pacific region, and has been collaborating with the Open Society Institute in the creation of the "Stop Trafficking" network in Central and Eastern Europe, as well as in Central Asia. In December 2002, UNESCO also co-hosted an international symposium on the theme of freedom of expression in the Information Society, where discussion focused on three issues: the new possibilities for freedom of expression generated by cyberspace; the obstacles limiting freedom of expression in cyberspace; and regulation of content in cyberspace. The participants concluded that: We must resist the temptation to demonize the Internet. The offences committed on the Internet are not particularly original (apart from attacks by hackers); they reflect behaviours that are specific to social life, and which have already found carriers in the traditional media. Thus we need to look at the Internet as a tool for democracy, and not from the angle of its real or potential failings. Cost, time and mobility In many developing countries there is a limited supply of national and international connectivity,

a situation shaped and compounded by a number of intersecting shortages: optical fibre may not be available, satellite links are limited and expensive, while internal telecommunication infrastructures are typically concentrated in few main cities and betray severe shortcomings in rural areas. In rural and remote areas, the combination of low population densities, poverty and geographical distance from established telecommunications networks and markets mean that there is little commercial incentive for undertaking the huge investments required to extend the technical infrastructure. These technical challenges, together with telecommunications policies and regulations that promote state monopolies and limit competition, lead to highly priced services which severely hinder the ability of poor communities, and especially women, to access and appropriate these technologies. Equipment and connection costs are prohibitive for all but the wealthy in most developing countries. Monthly Internet access charges amount to 1.2 percent of average monthly income for the typical user in the USA, compared with 278 percent in Nepal, 191 percent in Bangladesh and 60 percent in Sri Lanka. Similarly, the 2001 figures for average costs for 20 hours of Internet access as a percentage of GDP per capita reveal huge disparities between more developed and less developed countries: whereas in Sweden the proportion is 0.12 percent, it is 81.07 percent for Bangladesh. Currently, the average total cost of using a local dial-up Internet account for 20 hours a month in Africa is about US\$60 (telephone line rental costs excluded). The Organization for Economic Cooperation and Development reports costs for 20 hours of Internet access a month, in 2000, of US\$22 including telephone charges in the United States. While costs in Europe were higher (US\$33 in Germany, US\$39 across the EU), these countries have per capita incomes that are at least ten times that of the African average. Practically all communications facilities cost money. Due to a range of intersecting factors, women are less likely to have money to buy televisions, radios, or to access them when they wish, particularly when the household technology is controlled by someone else (typically a husband or father). Women are also less likely to have the disposable income needed to pay for information services, especially when other needs (food, education, etc.) have higher priority. Furthermore, women have less time available to seek out ICT connections or spend time online than men, as suggested by the findings of time use surveys conducted in a number of countries, which showed that women use ICTs for communication (mainly email) and electronic banking, while men spend time browsing the Internet, downloading software, and reading newspapers. Women's greater family and nurturing responsibilities mean that they usually have less time, and less choice, when it comes to spending their money. Even community access, often seen as the key to Internet diffusion in the developing world, may be outside the financial reach of many women.

Nor can it be assumed that women will have access through associations or NGOs. In most cases where women in developing country contexts have access, they are typically part of a highly educated group of professional elite women who access ICTs through corporate networks. For almost all women, time is in short supply. They are less likely than men to have the leisure to use ICTs – whether at home, work, or in public Internet centres. This problem is particularly acute for poor women in developing countries, but it is also a phenomenon in more affluent societies, and has important implications for the kind of content that women are likely to perceive as useful and worthwhile. As most facilities in rural areas are shared public access, women's ICT access will be further inhibited when the operating hours of community access facilities do not take account of women's time use and target them for ICT access, and/or when facilities are located in settings and institutions that women are unable or unlikely to frequent. Operators of public access facilities need to accommodate women's schedules and adapt their own schedules to ensure gender equality in access to and use of ICTs. In most countries, women's mobility is much more restricted than that of men. This may be the result of social customs that forbid women to travel unaccompanied, or because of family and caring responsibilities that make it difficult for women to move far from home, or the effect of unaffordable public and/or private transport in the context of women's limited earnings (compared to that of men in similar socio-economic levels). This lack of mobility is fundamental given the absence of connectivity in rural areas, where women account for up to 70 percent of the population.

2.19 Gender segregation in employment

Telecommunications and teleworking are opening up many new opportunities for employment of women, especially in the service industries. Patterns of gender segregation, however, are already being reproduced in employment within this comparatively young sector. Stereotyped views of women's skills and abilities have made them preferred employees for certain kinds of work, particularly in banking, telecommunications industries, and insurance. Men are more likely to be found in the high-paying, creative work of software development or Internet start-ups, whereas employees in single-tasked ICT jobs, such as cashiers or data-entry workers, are predominantly female and low-paid. Countries where women have made inroads into skilled jobs as software programmers or computer analysts include Brazil, India and Malaysia, where national policies have promoted science and education for all. But many of these women are from privileged backgrounds, and the numbers remain relatively low. The standardization and miniaturization

of telecommunications components have spurred the physical separation of components design (taking place in the North) from components manufacturing (located mainly in the South). Thus large factories have been able to decentralize their manufacturing operations to take advantage of cheaper labour in developing countries. Similarly, service industries have been able to take advantage of developments in telecommunications by relocating low-skill, often repetitive jobs (such as invoicing, payroll administration, routine accounting) away from headquarters to low cost locations – a phenomenon that has become known as “teleworking” or “distant working”. Many of these operations are located in Free Trade Zones in developing countries, where they benefit from a range of concessions (or incentives to move there) conferred by governments. In many Free Trade Zones, such as Jamaica and Barbados, workers are denied the rights to organize. ICT developments also reproduce gender inequalities present in the broader fabric of society. Teleworking – work done from home or at a site that is separated from the central office – is sometimes promoted as being convenient for women with child-care and household responsibilities. The danger is that women must combine simultaneously two jobs – the professional and the domestic. Surveys have shown that women in Malaysia and India are reluctant to opt for home-based work, even when it is skilled. Teleworking, especially when conducted at home, tends to reinforce the historical gender division of labour. Call centres are one of the most important sources of employment in the next decade. In the United Kingdom, 67 percent of call centre employees are women. Call centres have become widespread in Malaysia and India, and are making inroads in the Philippines. By 2007, it was predicted that India will have a million jobs in Call centres, largely filled by women. The physical separation of these jobs from headquarters has also had implications for the bargaining powers of women doing telework. Most of these jobs are non-unionized, and feature stringently enforced productivity targets that are designed to encourage competition between workers and discourage a collective work ethic and/or collective bargaining. As a consequence, many Gender Issues in the Information Society 50 teleworkers in developing countries have very little input into determining skills and additional training. On average, women are paid 30 to 40 percent less than men for comparable work. In its employment report released during January 2001, the ILO reveals a “digital gender gap” with women under-represented in new technology employment in both developed and developing countries. The ILO report also finds that patterns of gender segregation are being reproduced in the information economy. The report adds: Although pay inequality exists between those who have ICT skills and those who do not, pay polarization also exists within ICT use itself. This polarization is often gender-based.

2.20 Indigenous knowledge and intellectual property rights

In many rural and indigenous communities across the world, members create knowledge over long periods of time, drawing on their local experiences and influenced by the natural, socio-economic, and human resources that constitute their local ecology. Such knowledge – often referred to as “local,” “indigenous,” or traditional – belongs to the community, and not to any particular individual in that community. It is also a body of knowledge that develops over long periods of time, the product of many generations within a community. Since the primary social differentiation is often based on gender, specific activities and the knowledge that guides those activities are often gendered. Thus the local knowledge of men is frequently different to that of women. Intellectual property rights (IPRs), on the other hand, are more often focused on protecting corporate and individual knowledge, and have left a variety of cultural products and forms of community knowledge open to exploitation. The critical issue for women in indigenous communities, as shown by the debate over IPRs, involves their control over, access to, and potential compensation for the knowledge they have acquired. The fact that most of their knowledge is considered “old” places it outside the scope of protection by industrial property laws. Under current international legal mechanisms, local and indigenous women’s knowledge are at increasing risk of exploitation in the race for genetic resources (which in terms of plant-based herbal remedies, for example, has traditionally been the realm of women’s knowledge) and the hunt for profit maximization. In the information or knowledge society, a new legal instrument is needed that would recognize and protect knowledge created, developed and enhanced by communities of people, and which acknowledges that men and women have differential access to the structures that shape knowledge systems. Such an instrument needs to be developed with the full participation of all parties who hold such knowledge, including men and women.

2.21 ICT Policy and Governance

Global and national ICT policy can either foster full participation in the information society, or inhibit people’s access to technology, information and knowledge. Many countries are implementing programmes to attend to these issues, but concerns remain over the inclusion of remote and marginalized groups, especially women. These concerns are particularly acute for developing countries. In most developing countries, women are predominantly located in rural areas that have poor infrastructure. The poverty of rural residents makes these areas less lucrative for private telecommunications operators seeking to maximize profits by offering more sophisticated, high-end telecommunications services. Little investment is

therefore directed to the expansion of basic telephony, let alone public ICT access infrastructure, that would link women and others in remote and rural areas to information resources and populations in urban areas. As a result, these women's isolation and silence are reinforced. ICT policy and regulatory frameworks keep tight control over telecommunications services in some developing countries, with the result that use of ICTs is negatively affected. This is particularly true where policies and regulations limit the implementation of valued-added services that could bring down the cost of telecommunications services, like voice-over IP and wireless connectivity. The desire to maintain state telecommunications monopolies means that competition is reduced, resulting in inflated costs for services that are unaffordable for the poor, most of whom are women. Governments and telecommunications policy makers in developing countries need to consider how to introduce regulatory measures that will require themselves and private telecommunications operators to invest in rural connections in addition to those in more lucrative urban areas, and not just focus on money-spinning services. Service requirements can be attached to the licenses of private or state-run operators to ensure a minimum level of telecommunications development across the country. These can be in the form of rollout targets for public and private lines, along with conditions regarding the quality and speed of such services. Alternatively, the license-tendering process can incorporate rollout targets as a criterion for evaluating different bids. In such cases, telecommunications policy and government departments must explicitly state that women and other marginalized groups are included in the targets. Without such explicit references to gender issues in ICT policy, the chances that women and girls will reap developmental benefits from the information age are slim. Experience so far has shown that even where policies have been gender-aware, women's and girls' needs are likely to be neglected or ignored when it comes to policy implementation. Where governments have claimed that an overall gender policy is sufficient and that no specific mention of gender is required in ICT policy, the evidence so far suggest that "policy-making in technological fields often ignore the needs, requirements and aspirations of women unless gender analysis is [explicitly] included." There is a large body of evidence showing that when women's needs and aspirations have been included in policy and programmes, projects implemented within these frameworks have had greater success in meeting the needs of their target audiences and have proved more sustainable in the longer term. In social development sectors such as health, agriculture and rural development, projects that include gender analyses rarely fail. Yet gender analysis rarely extends to technology and information projects. A study of hundreds of development projects with substantial ICT components showed that more than 33 percent had a high awareness of gender issues,

but that the gender sensitivity carried over to the ICT components in only about 10 percent of them. Typically there are three dimensions to ICT policies – infrastructural, vertical, and horizontal – where:

- Vertical information policies address sectorial needs like education, health and industry;
- Infrastructural information policies address issues related to national communications infrastructure; and
- Horizontal information policies are those that impact on broader social concerns like freedom of information, tariffs and pricing and security.

Each of these information policy dimensions has implications for women, and failure to take account of these effects will certainly harm women more than men. It is also important to ensure that the social goals in each of the information policy dimensions cohere with those in others, thereby positively reinforcing the potential developmental impacts of ICTs. The challenge of incorporating gender issues into ICT policy requires an advocacy campaign on two fronts: sensitizing ICT policy-makers to gender issues, and sensitizing gender advocates to ICT policy issues. It is imperative that both ICT policy makers and gender advocates understand the systems that are proposed in policies and the implications for access, content, affordability and so forth for men and women in their particular countries. Women have to become knowledgeable about the technology as well as the policies if they are to advocate real access for all. Women activists must get beyond the myth that technology is a domain for predominantly male specialists, and tackle the complexities of ICT policy and technology.

2.22 Absence from decision-making structures

Although the number of women in jobs involving ICT expertise is constantly rising, the same is not necessarily true of women's access to decision-making and control of these resources. Whether at the global or national level, women are under-represented in all ICT decision-making structures, including policy and regulatory institutions, ministries responsible for ICTs, and boards and senior management of private ICT companies. One problem is that at both the global and national levels, decision making in ICTs is generally treated as a purely technical area (typically for male experts), where civil society viewpoints are given little or no space, rather than as a political domain. Deregulation and privatization of the telecommunications industry is also making decision-making in this sector less and less accountable to citizens and local communities, further

compounding women's exclusion from decision-making and control of resources. The under-representation of women in senior decision-making and politically influential positions in the ICT sector worldwide is striking given that the sector is fairly new, and is expected to be less burdened by historical practices of gender discrimination. In spite of these expectations, in 2001 women held only 9 percent of senior management jobs and 9 percent of positions in the supervisory bodies of the telecommunications industry across 18 countries in Europe. In the United States in 2001, women held 13 percent of top executive positions, and made up just 9 percent of board members of major telecommunications and e-companies. The result is that decisions and policies that lead to particular technology outcomes are not gender-neutral. In 2001 there were female ministers of communication or telecommunication in just three countries - Mali, South Africa and Colombia - and deputy ministers in six others: Angola, Belarus, Czech Republic, Ghana, the Kyrgyz Republic, and Tanzania. The reasons for women's slow progress up the ladder into decision making positions can in part be explained by differences in experience and education between men and women in the sector. Women have also been slower to understand and grasp the organizational cultures that operate in the male-dominated sector, and which work to their disadvantage. Until a critical number of women reach senior management positions, it will be difficult to counter gender-based discriminatory practices effectively. Of the 19 countries responding to questions about gender equality in the 1999 ITU Regulatory Survey, 12 had no women in their national telecommunications regulatory body. Leading the way were Canada, Sweden and South Africa, which according to the survey was the only country with a specific policy to increase women's participation in the telecommunications field. Its 1996 Telecommunications Act includes provisions for the promotion of women's empowerment and advancement in all aspects of the telecommunications industry.

2.23 Privacy, security, and surveillance

The Internet has introduced new risks alongside the promise of enhanced cross-boundary communication. In particular, it has increased the opportunities for surveillance of interactions between targeted groups and individuals, and for harassment. Privacy, security and Internet rights are important thematic areas for women. Women's concerns include having secure online spaces where they can feel safe from harassment, enjoy freedom of expression and privacy of communication, and are protected from electronic snooping. A corollary of this is the need for campaigns against ICT legislation that can threaten human rights. While many developing countries are grappling with basic access and IT

infrastructure issues, some countries in the global North are now defining the basic rights framework for Internet use and governance. The Internet has created private online spaces across national boundaries, enabling oppressed peoples to share their experiences. It also allows people living under undemocratic regimes to communicate safely and privately, with a view to advancing struggles for democracy for women and men. Nevertheless, governments and states are earnestly seeking to end private communication on the Internet. Legislation, such as the Regulation of Investigatory Powers (RIP) Act in Britain and the Wiretapping Act in Japan, is being put in place together with the necessary technical resources to pave the way for state interception and monitoring of private Internet communication. International agreements are being made between states to combat “cybercrime” by intercepting private email correspondence. The danger of this kind of legislation and deployment of technical resources lies in the ease with which it can be used to monitor private conversations that fall outside the definition of cybercrime, and which may involve civil society activism in supposed democratic states. Another justification for interception of Internet communications often presented to the general public is that it is needed to combat the sexual exploitation of women, and particularly children, and to combat the activities of racist groups. But the fact is that the creation of private spaces, where victims of abuse can discuss amongst themselves and with others they trust and have chosen to talk to, has proven to be the most powerful weapon against both sexual exploitation and racial oppression. For women seeking to build cross-boundary, cross-cultural communication spaces, the growing incidence of surveillance on the Internet, sometimes involving state institutions, is a source of concern. Even so, many believe that privacy issues will be forgotten dimensions of the debate on digital futures once we have our own self-encryptors, preventing anyone from reading other people’s communications without authorization.

2.24 Right to communicate

There can be no doubt that advocacy for a new information and communication environment should fully integrate gender concerns and women’s advancement. The challenge is to ensure that individuals, communities, nations, and the international community gain access to, and are able to use effectively, the information and knowledge they need to address their development concerns. At the core of this new environment is the democratization of people’s access to information and communication facilities and technological resources. Over fifty years ago, the Universal Declaration of Human Rights recognized the right to information as a fundamental human right. The assertion of this right has

become even more urgent at a time when technological advancement in the production of information and knowledge is reshaping the organization of our societies globally. Equally important is the call for recognition of the right to communicate as a fundamental human right. The exercise of our democratic freedoms and the full and equal participation in current economic development are the bases for the assertion of our right to information and communication. Within this domain come women's rights to equal and democratic access to information and communication technologies. The right to communicate counters the current hegemonic ownership structure of national and global information networks. Campaigns to this effect are stirring a groundswell of support from civil society worldwide, most of which has no voice in the national and international agreements and legislation on technological resources and information. Rights related to access and use of the Internet and electronic communication infrastructure allow the voices of ordinary people to be heard. The Internet has allowed the voices of ordinary citizens and organizations lacking strong financial resources to gain a much wider audience. With over 200 million users worldwide and an estimated 1 billion users by 2005, the Internet provides a unique public sphere where decisions that shape people's lives can be freely debated and considered. It allows small groups and individuals, men and women – previously working in isolation from one another – to communicate, network, share information and prepare actions in ways they have never been able to do before. ICTs must be made available to all at an affordable cost, while the development of infrastructure must ensure that marginalized groups are not further disadvantaged. This should be the strategic starting point for all concerned with gender equality and social transformation. In a globalized world that continuously undermines localized democratic institutions, the Internet provides an essential means for defending and extending participatory democracy. The Internet and ICTs can be used to strengthen diversity and provide a platform for a multitude of voices, a pluralism of ideas and opinions and a place for cross-cultural exchange. But this can only be true if developments are driven by a desire to preserve and enhance local and regional linguistic diversity, while civil society must have a voice in the policy formations regulating control and ownership of the Internet.

2.25 Women, place-based activism and virtual politics

Some argue that networks (such as women's) are the source of new political actors and promising cultural practices and possibilities – a new digital culture – that resist, transform or invent new alternatives to the dominant virtual and real worlds. But the effectiveness of networks depends on the combination of people and technology they organize

and bring together. Networks are also part of a larger world that may be indifferent or hostile to their aims and development. The capacity of virtual networks to bring about social transformation is also shaped and measured by their abilities to effect changes in physical (or place-based) spaces. Hence, while cyberspace can be the source of new knowledge about the world and of new identities, we need to be careful to ensure that the medium does not create a “terminal-citizen” alienated from the rest of the world. Thus: This cyber cultural politics can be most effective when and if it fulfils two conditions: awareness of the dominant worlds that are being created by the same technologies on which the progressive networks rely (including awareness of how power works in the world of transnational networks and flows); and an ongoing tacking back and forth between cyber politics (political activism on the Internet) and [...] place politics, or political activism in the physical locations at which the networker sits and lives⁶⁵. Social movement activists on the Internet should thus be engaged in double activism, both on the nature of the Internet and new ICTs, and on the nature of a restructured world that is being affected by ICT-led transnational capitalism. Women, environmentalists, and social movements based in developing countries are especially suited to this double activism, and many are engaged in activism that straddles and combines the real and virtual worlds, melding environmental, gender and development issues into a complex, intersecting political and cultural practice. Networks have important political effects, mainly by establishing a way of looking at the world in terms of possibilities for collaboration and coalitions, rather than fragmentation. Coalition politics – facilitated by networks – are generally based on positive notions of difference. The notion of coalitions of difference resonates strongly with the stress placed by many women’s and feminist movements on the relationship between space, place and identity. The growth of differences, evident in the proliferation of rights-based struggles in different parts of the world, raises more possibilities for coalitions and critical engagement with the dominant worldview and its practices. The challenge for all is to identify such possibilities and act upon them – both in the virtual and/or real worlds. For women, the sharing of knowledge and experiences across differences is an essential process in promoting gender transformation in real spaces and on the Internet. The Internet has particular significance for women’s struggles, in terms of both its virtual nature and its transformative effect on dominant cultural and political practices implicated in women’s subordination in real spaces. The Internet can be said to have transformed the conditions for women’s communication, that is, the circumstances within which women communicate and which shapes the possibilities for imagining alternatives for political and cultural practices. Though it is new, the Internet builds on the achievements of women to break their

social isolation – framed within the private/public context of women’s lives – in order to work collectively towards social change, across cultural, national, and other boundaries. Away from wider social gazes that may constrain women from breaking boundaries and social norms, women’s communication on the Internet provides the opportunities for developing new agendas for priority areas as well as a means for implementing programmes. Various projects by women engaged in fostering women’s access to and use of the Internet also stress the importance of improving the circumstances in which women use the technology and extending the freedom to conceptualize the opportunities for empowerment it provides. Increasingly, “the challenge for women is not only, nor mainly the problem of access – though this is still the case for a large sector of women – but how to harness the technology for their own goals and how to stake out the spaces that will enable them to make an impact on this new medium.” One example where women’s Internet activism has made a significant impact is in assessing women’s roles (and presence) in national and international politics. It is a historical fact that women’s involvement has been limited, and that politics is an arena mainly defined by masculinist principles and dominated by the activities, ideas, and associations of men. The limited participation of women in national politics has had a knock-on effect on their presence in international politics, making women largely absent from this scene. Where women have entered national and international politics, they have been subsumed into masculinist practices, structures and cultures. Some argue that there is a reverse hierarchy between the virtual and concrete realms of politics at the international level, or equality in some respects. A reversal via the Internet has occurred in the respect that women have been able to communicate across many boundaries and form new political associations, exchanges, and organizations.

Chapter - III

GENDER INEQUITIES IN THE INFORMATION SOCIETY: INDIAN PERSPECTIVE

India is one of the world's fastest growing economies, which have seen enormous growth in recent years. The trade press enrich with stories about India's booming IT industry then has resulted in burgeoning middle class mostly in urban India. Urban centers have seen an influx of young women from semi-urban and rural parts of the country, living alone and redefining them. However the story of empowerment for women is not a singular narrative, rather it is located in a complex set of caste, class, religious, ethnic identities and rural and urban. Indian rural women's economic opportunities remain restricted by social, cultural, and religious barriers. Any assessment of the status of women has to start from the social framework, social structures, cultural norms and value system that influence social expectations regarding the behavior of both men and women and determine women's role and their position in society. A society is composed of many institutions and most important of them are the system of decent, family and kinship, marriage and religious traditions. They provide the ideology and moral basis form men and women about their rights and duties and their status and role. Among rural women status is worse condition, the rural women face the denial of freedom even in their homes, repression and unnatural indoctrination, unequal and inferior status, rigid cast hierarchy and untouchability. Consequently most women were reduced to dumb cattle and had led to inhuman beastly life. Woman in rural India have been victim of humiliation, torture and exploitation. There are many episodes like rape, murder, dowry, burning, wife beating and discrimination in the socio-economic and educational fields. Indian society itself is pre-dominated by men; hence women are a victim of male domination in the respective sphere of life.

It has become widely understood that promoting gender equality is an essential component of an effective economic and human development strategy. "There is now a shared understanding within the development community that development policies and actions that fail to take gender inequality into account and fail to address disparities between males and females will have limited effectiveness and serious cost implications (World Bank 2003). Gender equality refers to the view that men and women should receive equal treatment and should not be discriminated against the basis of their gender unless there is a sound biological reason for different treatment (Universal Declaration of Human Rights). Gender

equality is, first and foremost, a human right. Women are entitled to live in dignity and in freedom from want and from fear. Empowering women is also an indispensable tool for advancing development and reducing poverty. Empowered women contribute to the health and productivity of whole families and communities and to improved prospects for the next generation. The importance of gender equality is underscored by its inclusion as one of the eight Millennium Development Goals. Gender equality is acknowledged as being a key to achieving the other seven goals. Information and communication technologies in recent years have been recognized as an effective tool for promoting economic growth and sustainable development (UNPF, 2015). Women need encouragement and support from the family members, government, society, male counterparts etc., with the right assistance from varied groups; they can be mainstreamed at the national economy and thereby contribute to the economic development (Mishra et al., 2014).

The important characteristics of ICTs that have enabled it to be an effective tool for economic development also make them an effective mean through which gender equality can be improved and promoted. There are several ways in which an established ICT infrastructure or access to ICTs can make people aware about gender equality. The concept of e-commerce emerged as trading in products or services using computer networks, such as the Internet. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle, although it may also use other technologies such as e-mail. Thus, ICT and e-commerce offer substantial possibilities to improve the lives of women and their families in developing countries. Gender equality aims to enhance women's participation in the digital economy and can increase national capacity and achieve greater economic independence and development.

3.1 GENDER INEQUALITIES

Gender inequality refers to health, education, economic and political inequalities between men and women in India. Gender inequalities, and its social causes, impact India's sex ratio, women's health over their lifetime, their educational attainment, and economic conditions. Gender inequality in India is a multifaceted issue that concerns men and women alike. Some argue that some gender equality measures, place men at a disadvantage. However, when India's population is examined as a whole, women are at a disadvantage in several important ways.

A. Economic Inequalities

Labor participation and wages: Over 50% of Indian labor is employed in agriculture and wage inequality is prevalent between men and women in our country, which is also referred to as “gender gap in earnings. The largest wage gap was in manual ploughing operations in 2009, where men were paid 103 per day, while women were paid Rs. 55, a wage gap ratio of 1.87. For sowing, the wage gap ratio reduced to 1.38 and for weeding 1.18. For other agriculture operations such as winnowing, threshing and transplanting, the male to female wage ratio varied from 1.16 to 1.28. For sweeping, the 2009 wages were statistically same for men and women in all states of India

Access to credit: Government has made many laws that are supportive of lending to women and microcredit programs targeted to women are prolific, women often get difficulty in getting loan due to low level of property ownership.

B. Education inequalities

Schooling: In the present scenario, there are very few places where women are denied a formal right to education. However, as is already established, formal equality is inadequate to ensure and guarantee equality of rights between men and women. Even when the state provides girls with access to education, gender discrimination can be reinforced by practices such as a curriculum which is inconsistent with the principles of gender equality, by arrangements which limit the benefits girls can obtain from the educational opportunities offered, and by unsafe or unfriendly environment which discourage girls' participation. True equality in education requires the development of specific and effective guarantee to ensure that female students are provided with access to the same curricula and other educational and scholarship opportunities as male students (**Ranganath et al. 2011**).

Literacy: In India, literacy rate of female has always been lower than male literacy rate. If we look at the census 2011, we find the literacy rate of females is 65.46% as compared to males (82.14%). Compared to boys, far fewer girls are enrolled in the schools, and many of them drop out. Although this gap has been reduced significantly, problems still remain in the quality of education for girls where boys in the same family will be sent to higher quality private schools and girls sent to the government schools in the village.

C. Occupational inequalities:

There are few sectors where women are being denied of getting equal opportunity. In the military services, women are being neglected in some aspects. In the armed forces permanent commission could not be granted

to female officers since they have neither been trained for command nor have they been given the responsibility so far. As far as property rights of women are concerned, women have equal rights under the law to own property and receive equal inheritance rights, but in practice, women are at a disadvantage.

D. Health and survival inequalities:

On health and survival measures, International standards consider the birth sex ratio implied sex-selective abortion, and gender inequality between life expectancy of women and relative number of years that women live compared to men in good health by taking into account the years lost to violence, disease, malnutrition or other relevant factors. On the other hand, mental health has been reported as an important factor influencing an individual behavior. Women who work outside the home are required to make many socio-familial adjustments that may contribute more stress and anxiety. The problem of stress in women, particularly working women, is an important aspect due to the social and emotional changes (Mishra et al., 2014).

E. Political inequalities:

This measure of gender inequality considers the gap between men and women in political decision making at the highest levels. India passed 73rd and 74th Constitutional Amendments in 1993, which provides for 33 per cent quota for women's representation in the local self-government institutions, but practically the percentage of women encouraged to occupy prominent places is very meager and very often women in political positions are over-ruled by men (husband or father) in decision making.

Table 3.1: India's Global Ranking on Various Gender Inequality Indices

Indicator	India Ranking (Year)	Source
ICT Development Index	138/175 (2016)	ITU
Gender Inequality Index	130/155 (2015)	UNDP
Global gender Gap index	87/144 (2016)	WEF
Gender Development Index	130/188 (2014)	UNDP

3.2 Concept of the Digital Divide

In the last few years, the concept of digital divide has received a lot of attention because of the need to balance technological development across the world and study its societal repercussions. So intense is the need to control technological development that politicians too have attempted to reduce the digital gap within their constituencies by applying the most effective tools (Hermana & Silfianti, 2011).

The digital divide refers to the unequal access of citizens to ICT, and uneven possession of skills and experience required for using it. The digital divide can take many forms, and can be described variously in terms of gender, location, skills, and income. It is also related to the social and economic differences between the developed and developing countries, access to computers and the Internet, and also to the quality of access and use (AL-Rababah & Abu-Shanab, 2010; Orbicom, 2005). Social reforms put the spotlight on both e-government and the digital divide, placing on the government the onus of bridging the divide (Lepadatu, 2013).

The digital divide also refers to the gap between people who have access to ICT tools and those who do not; it entails access to both hardware and software. It implies adequate access to or possession of ICT such as computers and mobiles (hardware), convenient and easy-to-use applications and websites (software), and the skills required to use ICT tools (Bansode & Patil, 2011; Helbig, Gil-García & Ferro, 2009). The digital divide, as many studies concur, has two different aspects: access and use (Ono & Zavodny, 2007). Equal access may not lead to equal use. Access relates to hardware such as access to computers and phones, while use relates to having the required skills to use ICT tools efficiently and effectively. The digital divide is the outcome of many factors; one of the most important being insufficient bandwidth and high cost of purchasing or renting hardware and software (Bansode & Patil, 2011). Another factor is physical disability and lack of ICT skills and support. Much research has focused on the categories of the digital divide such as the GDD (AL-Rababah & Abu-Shanab, 2010; Minguez, 2005; Subramanian, 2007; Tobola, 2010; Yao & Okoli, 2007), race digital divide (Enoch & Soker, 2006); digital divide due to disabilities (Seckin, 2010), education (Eynon, 2009), age (Enoch & Soker, 2006; Geana & Greiner, 2011; Redsell & Nycyk, 2010), and income (Abu-Shanab, 2013b; Seckin, 2010). Some researchers use the e-readiness index for measuring digital divide (UNDESA, 2012). This measure includes a broad range of components such as telecommunication infrastructure, skills, the service interface, and legal framework.

The notion of a digital divide gained attention in the 1990s with recognition that some people and institutions were not going online or were not onto broadband. The concept of a digital divide between technological „haves and have not’s has been a useful tool in efforts to bring greater, more equal access to powerful new information and communication technologies like the Internet. The term digital divide is used to describe situations in which there is a market gap in access to the use of new information communication devices. In general the term digital divide refers to „the gap between individuals, households, business and geographic areas at the different socio-economic levels with regard to their opportunities to access and use of new information communication technologies and Internet. It reflects difference

among and within the countries. Digital divide exists in variety of other levels; sector, community, and individual level with regard to use access of new information communication technologies. Further digital divide is also referred to as „the spiral of uneven access and usage of new information communication technologies and the socio-economic rebound causes that have caused the emergence of information inequality throughout the globe, both in and between the countries and also locally in communities. The term digital divide was introduced by Larry Irving, Jr., former Assistant Secretary of Commerce for Telecommunication and Communication in the mid-1990s in order to focus public attention on the existing gap in access to information services between those who can afford to purchase the computer hardware and software necessary to participate in the global information network, and low income families and communities who cannot. Some other scholars have defined digital divide as an inequality in access, distribution, and use of new information communication technologies between two or more population. Digital divide can have eight aspects: physical, financial access, cognitive access, design access, content access production access, institutional access and political access. In the field of new information communication technologies the scholars have refers the digital divide to unequal patterns of material access to usage capabilities of, and benefits from computer-based information and communication technologies that are caused by certain stratification processes that produce classes of winners and losers of the information society, and participation in institutions governing new information communication technology and society.

Thus digital divide can be defined as economic, social or cultural deprivation generated by missing new information communication technologies access and skills. This definition goes beyond conventional definitions and it has number of practically important characteristics. First, it explicitly spells out the three different dimensions where digital divides are important and where new information communication technologies make a difference. In the modern knowledge and information based world, economic opportunities, such as employability, depend on information communication technologies access and skills. Information communication technologies, however, also play an increasingly important role in all social relationships, ranging from political participation to connecting local communities, friends and the family. Second, in the global and culturally diversified world, new information and communication technologies are also increasingly important for access to cultural resources and expression. Third, the definition also replaces traditional technology focused characterizations of digital divide, noting that lack of technology; per-se is not always a problem. It is clear that technology remains inert and useless with knowledge and capabilities to use them, and when they are embedded in social without necessary human skills and competences. The digital divide is not a problem for developing countries, but also for developed countries. As in the developing countries of today,

developed countries also have some inequalities between new information communication technologies 'have' and 'have-nots'. This statement is accepted by United States one of the leading knowledge economies and network societies, it faces the digital divide: income-related distributional inequalities regarding home personal computer ownership across the nation. Geographic inequality in access to information and communication services exists in Japan also. There are many types of the digital divide at local, national, regional or world levels, such as the gender divide, the age divide, the income divide, each such divide having its specific background phenomena, evolution trends, perspectives as well as its specific bridging solutions and initiatives. Because of the continuous development of information technologies and the emergence of new technologies, the digital divide is a dynamic problem in the world and even in India.

3.3 Digital divide in India

India has achieved to a great extent of new information communication technologies growth but lagging behind in diffusion of information technologies. There are some initiatives taking place for diffusion of information technologies from different stakeholders but comparing the vastness of the economy; these are isolated cases and mostly concentrated in urban areas and organized sectors only. India is a snake with its head in the 21st century and its tail in the 17th century. Loaded with 16% of the world's population, more or less 30% of its population are in the below poverty line. This means that these people have no proper basic infrastructure like drinking water, electricity, sanitary facilities and well over 35% of population is illiterates. More than 65% population is live in the alienated rural area and 60% earn their livelihood from agriculture. India's efforts to capitalize on the new information communication technology revolution are far from spectacular when it comes to numbers, going by the latest country rankings and associated data released by the International Telecommunication Union.

New information communication technologies have emerging at a rapid pace and it's already been a part in the field of business, economy, entertainment, social groups all over the globe and India too. The rise of new information communication usage across the country unlocked various new businesses, products, services. These technologies have constantly changing the way consumers shop and businesses sell their products. A country of a more than a 1.21 billion population has to do lot in the area of new information communication usage to catch up with globe pace. Several studies have indicating that only a few million people have broadband connection in India. The reach of these new information communication technologies is limited to certain class and section of the society. All modern facilities are concentrating in urban areas and these facilities will be enjoying by the urban class compare to poor rural class. The new information communication technologies also mostly located in urban centers.

National Institute of Electronics & Information Technology (NIELIT), a flagship organisation under Ministry of Electronics & Information Technology is a Govt. of India initiative towards bridging the digital divide and is taking forward skill development and capacity building initiatives in the area of IT. This organisation has also launched a unique program ‘Saksham – Power of She’ aimed at encouraging Entrepreneurship among women under ‘Digital India’. Along with this, in order to fulfil the primary objectives of empowering the rural youth and enhancing their livelihood in line with ‘Digital India’, ‘Make in India’ and ‘Skill India’ mission of GOI, NIELIT is making continuous efforts.

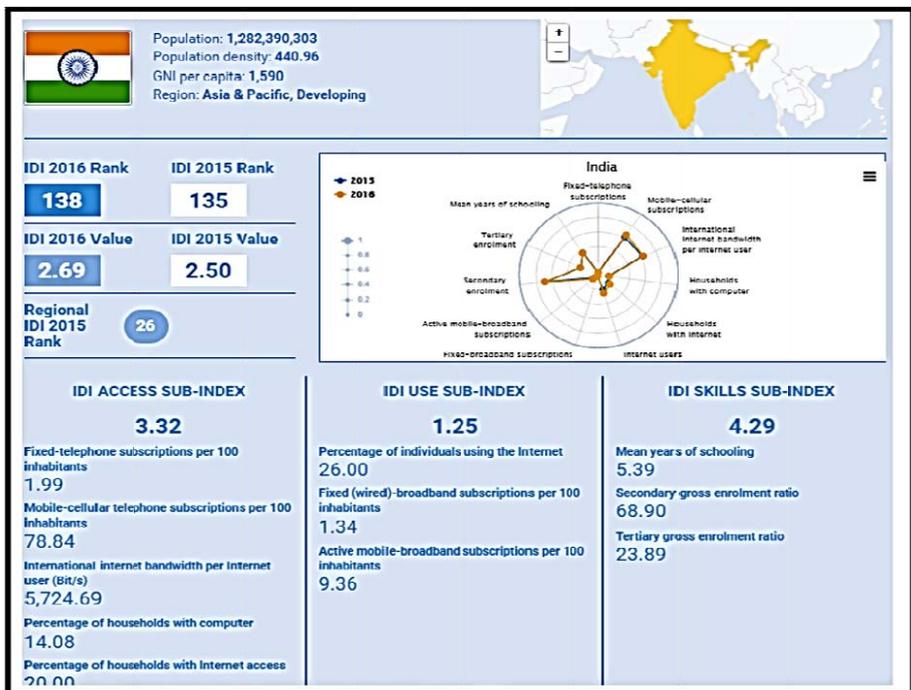
(Sunday Times of India, 23rd July 2017)

Table 3.2: ICT Development Index (IDI) of India (2016)

Indicator	Ranking	Value
ICT Development Index	138	2.69
IDI Access sub-index 2016	139	3.32
IDI Use sub-index ranking	142	1.25
Skills sub-index ranking	122	4.29

Source: Measuring the Information Society 2016, ITU

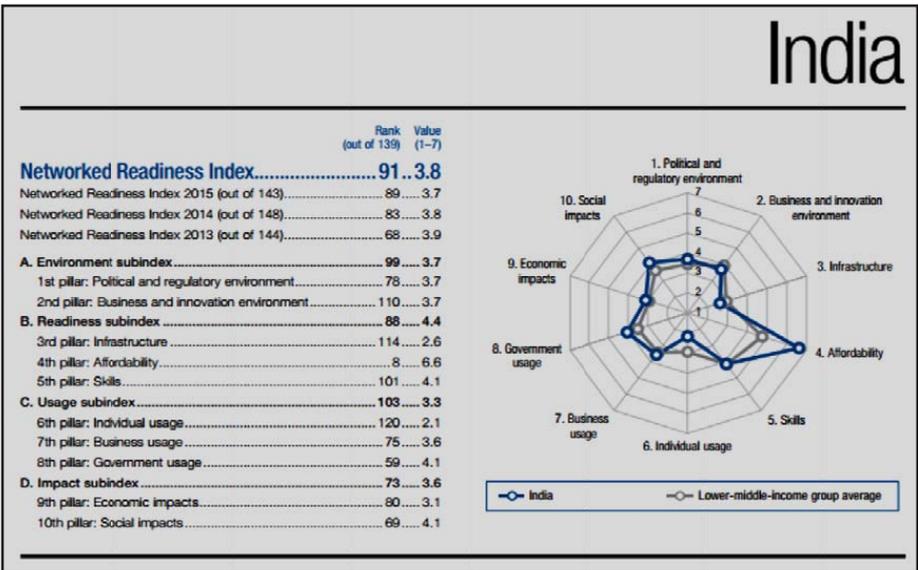
Figure 3.1: ICT Development Index (IDI) of India (2016)



Source: Measuring the Information Society 2016, ITU

According to “The Global Information Technology Report (2016)”, despite of improvements in its political and regulatory environment (78th, up four) and in its business and innovation environment (110th, up five), India slips down two positions to an overall rank of 91. Although India’s absolute score has changed only marginally in recent years, the drop can be attributed in part to the fact that other countries are moving ahead at higher speeds. In addition, lack of infrastructure (114th) and low levels of skills among the population (101st) remain the key bottlenecks to widespread ICT adoption, especially in terms of individual usage (120th). A third of the Indian population is still illiterate (95th) and a similar share of youth is not enrolled in secondary education (103rd). Only 15 out of 100 households have access to the Internet and mobile broadband remains a privilege of the few, with only 5.5 subscriptions for every 100 people. This is in spite of the fact that affordability has long been one of the strengths of the Indian ICT ecosystem, with the country ranking 8th this year in this area. A deep divide persists between well-connected metropolitan hubs and remote rural areas, where even the most basic infrastructure is insufficient. In 2015 the government launched the Digital India program, which aims to close this gap by fostering investment in digital infrastructure, improving digital literacy, and increasingly providing online services to citizens. India’s performance in terms of providing online services and allowing e-participation has so far been in line with that of peer countries, but far from the global best (57th and 40th, respectively).

Figure 3.2: Networked Readiness Index 2016 (NRI) of India



Source: The Global Information Technology Report (2016)

The Gender Digital Divide

In traditional societies, the role of women was limited to the house and hearth, but industrialization changed all this and in advanced societies recent technological advances have enabled women to compete with men on a more equal footing. However, even now gender biases continue to influence the access to and use of ICT by women even in developed countries such as Japan and Sweden (AL-Rababah & Abu-Shanab, 2010, 2011). The operation of traditional gender biases in this technological era translates into GDD (Lamani & Honakeri, 2012).

GDD can be defined as the unequal opportunity for ICT use between men and women in social, political, economic, and cultural domains. Some researchers use gender divide and gender inequality interchangeably (Rababah & Abu-Shanab, 2011; Younghoon, Mehri, Hyerin, & Myeong-Cheol, 2012). GDD is also defined as under-representation of women in the ICT sector (Gargallo-Castel, Esteban-Salvador, & Pérez-Sanz, 2010).

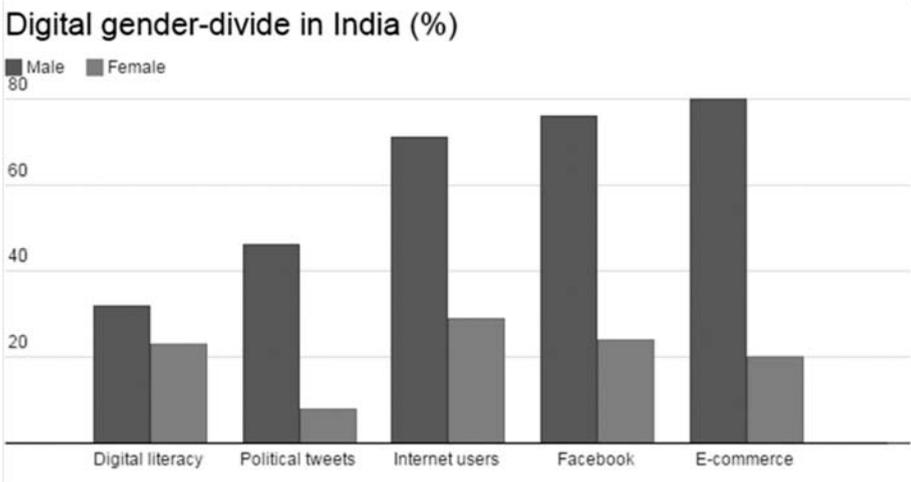
According to Cooper (2006) the roots of GDD exist in our social environment, which stereotypes men and women, and links technology to men. According to research in Spain, there are a higher percentage of ICT users among men as compared to women; men tend to be the first-movers to use new ICT, and they also use it more than women (Gargallo-Castel, Esteban-Salvador, & Pérez-Sanz, 2010). The authors arrived at this conclusion after utilizing data from international websites (OECD), and from the Aragonese Observatory of the Society of Information (AOSI) for the year 2008.

Although governments are increasingly using ICT to promote programs for women in rural areas, the GDD is being overlooked (Harb & Abu-Shanab, 2009). Even though scholars have proved that ICT can be a tool to empower women and provide them with health, food, and education (Yildiz, 2007), women are increasingly being marginalized in e-government initiatives (World Bank, 2004). Research indicates that most e-government applications have neither addressed the issues faced by women nor their needs (Bhatnagar, 2004; Rababah & Abu-Shanab, 2011).

India's skewed gender ratio finds reflection in its internet usage as well. Even as an increasing number of people are going online in the country, and the government is aiming to provide internet access to all 1.25 billion citizens, several studies have shown that far more men in India are logged on to the internet than women. For instance, while globally, women tend to dominate usage on major social networking websites, the trend is reversed in India. On Facebook, the world's largest social networking site that sees

India as one of its major markets, there are three men for every woman, according to a recent report by We Are Social, a consultancy firm in the United Kingdom. India’s Facebook population, comprising 76% men and just 24% women, is more gender-skewed than that of neighbouring Nepal and Bhutan. This disproportionate access to men and women permeates across digital services. In India, men are 62% more likely than women to be internet users, according to a recent report by GSMA, a global mobile association. Additionally, men are 25% more likely to own a SIM card than women. This makes India’s digital divide more skewed in terms of gender than any other country surveyed by the GSMA.

Figure 3.3. Digital Gender divide in India



Internet users	Internet users	Facebook	E-commerce	Digital literacy	Political tweets
Male	71	76	80	32	46.15
Female	29	24	20	23	8

Source <https://scroll.in/article/816892/indias-internet-population-is-exploding-but-women-are-not-w-inia>

Statistics of Indian Internet users show a skewed graph when it comes to gender. About 68 percent of all urban Internet users are male, whereas 88 percent of rural internet users are male. Male domination in the rural sector can say a lot about the accessibility and availability of Internet access and smartphones to rural women. We may also say that rural women are less aware of this technology as well as its possibilities. But digital marketers can leverage this difference and create an audience out of the lesser privileged or at least reach out to them.

Figure 3.4: Distribution of internet users in India as of October 2015, by gender and urbanity

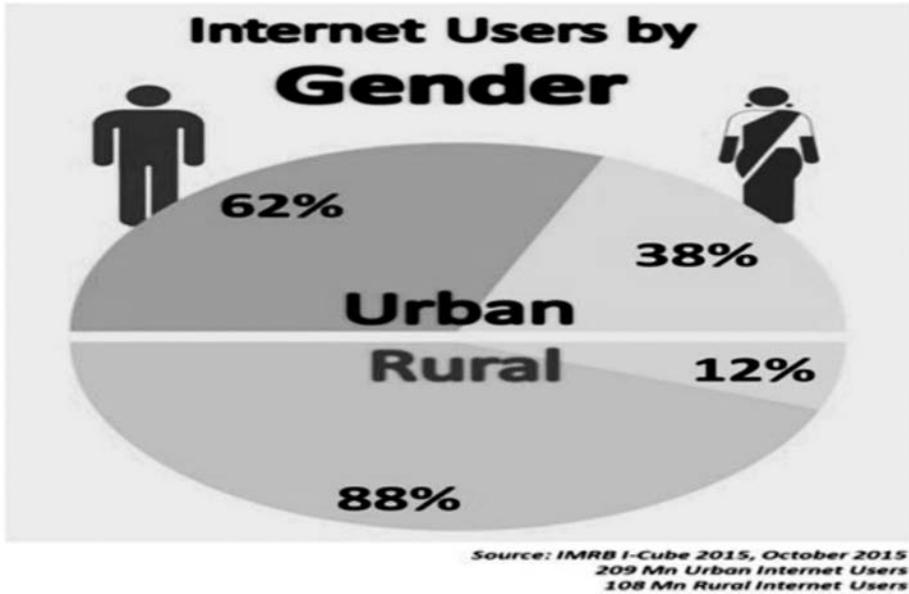
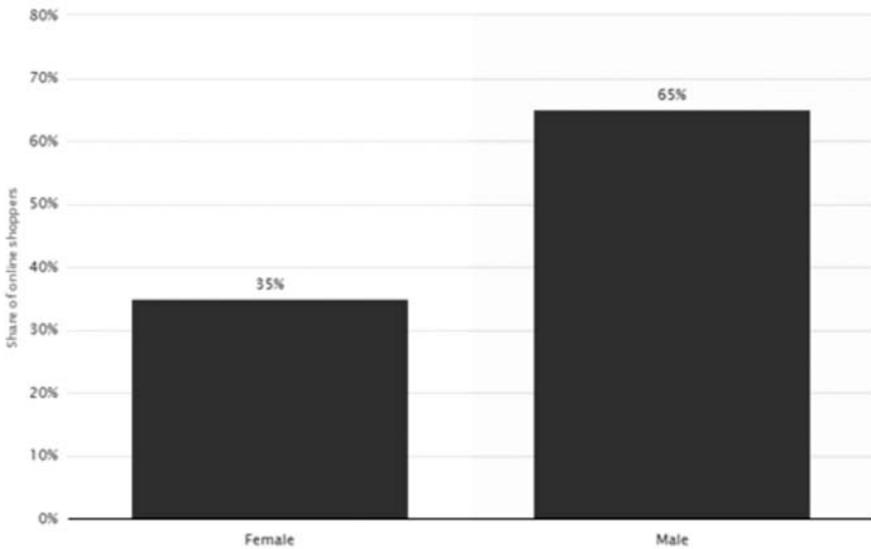


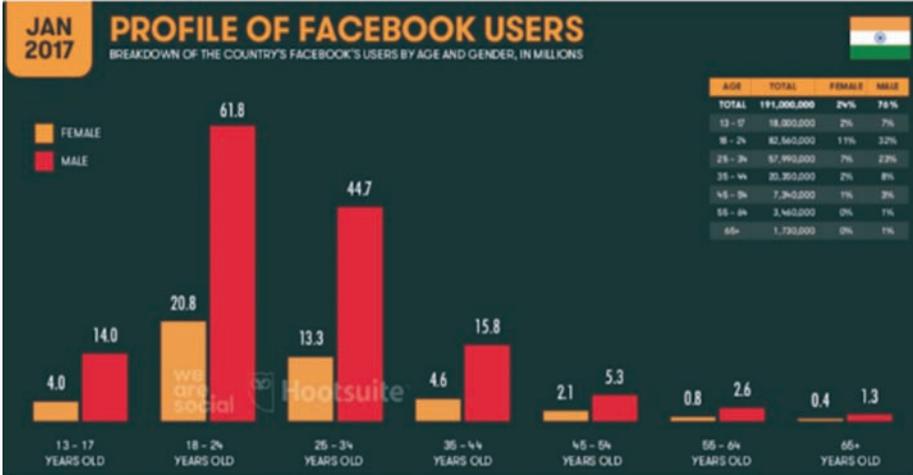
Figure 3.5: Distribution of online shoppers in India as of 2015, by gender



Source: <https://www.statista.com/statistics/499191/gender-distribution-of-online-shoppers-in-india/>

India prides on being a modern, liberal democracy. But the truth is that gender inequality in India is as bad as in some of the most repressive regions of the world. More than three-quarters of Facebook users in India are male. If the internet and social media are liberators of the new age, clearly that’s yet to happen in India for women.

Figure 3.6: Genderwise distribution of Facebook users in India (Jan 2017)



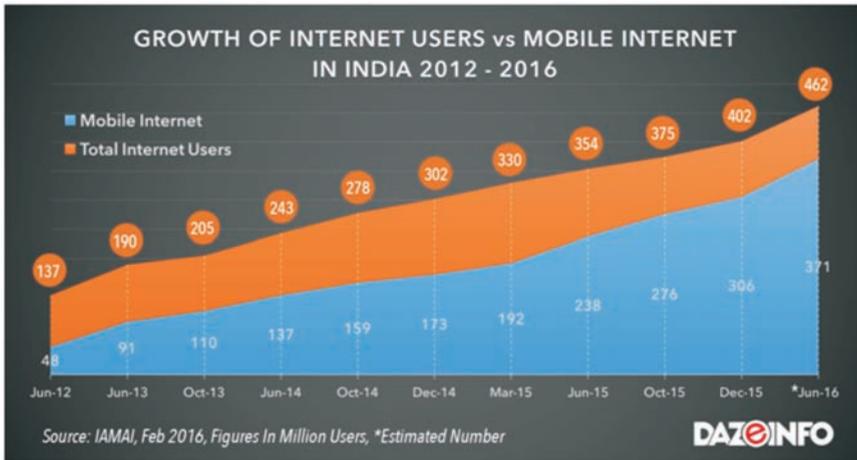
Most Facebook users in India are in the 18-24 age group, and boys outnumber girls three to one. Source: We Are Social and Hootsuite.

3.4 Mobile Internet

The exploded adoption of smartphones due to declining ASP (Average Selling Price) is resulting in an enormous surge in the **number of mobile internet users in India**. According to the latest report from IAMAI, titled **Mobile Internet in India 2016**, the country was estimated to have 371 million mobile internet users by June 2016. India attracted 65 million new mobile internet users coming onboard during the period of six months, ending June 2016.

When we put these growth figures of mobile internet users in India along-side the total number of internet users in India, mobile emerges as the clear winner. According to the another the previous report from IAMAI, the number of total internet users in India reached 462 million mark by June 2016, a 31% YoY growth during the first half of 2016. The percentage, however, is way below than the estimated 56% YoY growth in the number of mobile internet users in India during the same period.

Figure 3.7: Growth of Internet users Vs Mobile Internet in India 2012-2016

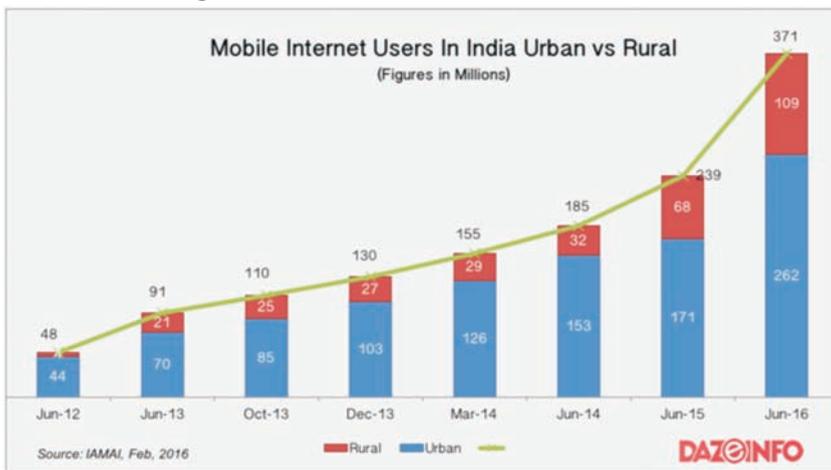


3.4.1 Mobile Internet Users In India: Urban vs Rural

The latest IAMA report highlights that **71% of the estimated 371 million mobile internet users in India will belong to urban area**. However, the rural area still holds an enormous potential to drive the future growth of mobile internet in India. In 2015, the number of mobile internet users from rural area doubled from 2014 and in 2016 the growth percentage was estimated to outclass all the previous figures.

As the number of mobile internet users is increasing with each passing year, mobile users in India are becoming more data hungry. In 2015, the share of mobile internet spend in the average monthly bill rose to 64% from 54% in the previous year. However, this has a clear impact on the cost

Figure 3.8: Mobile Internet users in India



of accessing mobile data that fell about 18% in 2015. These changes can be attributed to the fact that with the improving mobile infrastructure and the availability of improved high-speed 3G and 4G connectivity, people are shifting to apps and internet for most of their activities. The dependency on Voice call has been reduced and people are rather preferring the internet on their mobile phone to make more informed decisions.

3.4.2 Barriers to Internet Access for Women in Developing Countries

In the developing world, it appears that the majority of women are not accessing the Internet to the same degree as men and, even when access to a computer and the Internet is available, women are not necessarily using it. We will now consider some of the barriers that have been implicated in the reduced access and use that women in developing countries have experienced. Gil *et al.* identify four barriers that hinder women's access to and use of ICTs: Exclusion from technology education and design; limited free time; social norms favouring men; and financial and/or institutional constraints. Existing research on the gender digital divide invariably fits within these categories, which are thus used as the basis for analysis in this review.

Exclusion from Technology Education and Design

Melhem, Morrell and Tandon claim that "women and girls are poorly placed to benefit from the knowledge society because they have less access to scientific and technical education specifically and to education in general". Access to education continues to be a greater barrier for women than men and it is estimated that two-thirds of the world's illiterate population are women. In contrast, across all developing countries, 75% of women are literate compared to 86% of men. In some countries, India for example, 51% of women can read and write compared to 75% of men and without this fundamental skill, the Internet and the benefits of the online world will remain out of reach. Overcoming Internet access barriers requires action on a number of fronts. In order to reduce inequality in Internet access, we need to educate and train people to facilitate access and modify attitudes that may serve to impede access. The Women and the Web report revealed that one in five women in India and Egypt believe that the Internet is not appropriate for them, or that their families would disapprove, and that engaging online would not be beneficial regardless. These attitudes are presumably derived from their socio-cultural conditioning. 40% of women in this study, moreover, cited a lack of familiarity or comfort with technology as a reason for not pursuing Internet use and, typically, women who were uncomfortable with technology lacked the exposure to Internet technologies that would allow them to develop their computer and digital literacy skills.

In addition, it has been reported that one of the consequences of having relatively few women web developers and programmers is a lack of content relevant to women's needs and interests. Moreover, 90% of online content is in English, yet only one-third of users worldwide speak it, which may create barriers to access for non-English speakers, many of whom are women living in rural and remote areas. Furthermore, the content associated with new technologies, and terrestrial media generally, is largely male-centric. In 2010, the Global Media Monitoring Project (GMMP) reported that only 12% of all news stories across the world's media focus specifically on women. The GMMP further noted that 46% of news stories reinforce gender stereotypes while just 6% challenge them. It is therefore unlikely that women in developing countries will be motivated to seek information online if the content is inaccessible (not available in their native languages) and irrelevant for their needs.

Limited Free Time

Women invariably bear a disproportionately heavy burden of household and family responsibilities. Due to the combination of domestic chores and their role as primary caretakers, women have very little free time to experiment with new technologies. They are further constrained by social norms that confer control of technology to men. A major digital divide based on gender is emerging in India, which is partly attributed to the constraints that women face in accessing education due to a lack of time to attend school, families and household duties and social-cultural norms that give a low priority to education. Moreover, the extent to which women exercise autonomy in using the web significantly influences the extent to which they can access it. There are several factors that contribute to a woman's autonomy. Location of access, for example, is important. If Internet access is only available outside the home, and the user has to travel long distances to an Internet-enabled facility, this is likely to reduce one's likelihood of pursuing the online environment. If access is available within the home, to what extent is women's autonomy limited by the actions of other family members? The greater the autonomy of use, the greater the benefits the user is likely to derive.

Social Norms Favours Men

Technologies are often considered to be within the purview of men and gender norms about men's control of technology, information and knowledge limit women's opportunity to learn, use and benefit from technology. More than two-thirds of the world's population still lack access to the Internet. Given that women enjoy fewer educational and career opportunities globally and, in some places, they face having to endure

restrictive gender norms, it is not surprising that most of them are women. As a result, conservative gender roles become even more entrenched due to a lack of exposure to alternative perspectives and women become increasingly marginalised as social connections are increasingly fostered and maintained online. Even in countries where access is no longer an issue, “inequalities in actual use can hamper women’s opportunities on both economic and social fronts. Access is necessary, but not sufficient, to close the gender digital divide”. Given the rapid proliferation of ICTs, most individuals are likely to have access; however, high rates of access do not imply high rates of usage and, as such, “the discourse on the digital divide has expanded to include a consideration of other factors that generate digital inequality”.

Ono and Zavodny found that differences in IT usage, along demographic and socioeconomic dimensions reflect the extent of differences in other areas of the economy and society. At the individual level “differentiated spread of the Internet (may) lead to increasing inequalities, befitting those who are already in advantageous positions and denying access to better resources for the underprivileged”. That is, having Internet access does not necessarily imply use and DiMaggio *et al.*, among others, advocate the need to examine access and use separately so as to distinguish between opportunity and choice. “Use presumes access, but not vice versa” . Even in the developed nations that are the subject of this study, non-users are disproportionately female, older, less educated and poor, and similar patterns have been observed in developing nations. In terms of women non-users, we need to ask whether this is a choice that is freely made without constraints or whether this choice is influenced by larger social factors. Someone who has not completed high school, for example, may not be aware of what information is available online or how to navigate it. Simply giving such a person a computer and/or Internet access would not guarantee use and the results of this study certainly bear out this contention: computer ownership and use was positively associated with education in all five countries. Moreover, women are significantly less likely to use a computer at home, given ownership, which suggests that living in a household where a computer is available does not necessarily mean that women will use it; access does not translate to use in many cases.

There is further evidence that perceived benefit is another factor that influences women’s use of ICTs in developing countries. Regardless of whether or not Internet access is available, women are less likely to use ICTs if they perceive the benefits of doing so to be low. However, Ono and Zavodny note that “both actual and perceived benefits of IT use

may be related to larger social forces that are tied in with inequality at the macroeconomic and societal level". Melhem *et al.* similarly assert that "social and cultural factors limit women's access to shared ICT facilities, such as tele-centres, which tend to become meeting places for young men, and hence deter women's absorption and adoption of ICTs to access information and knowledge". Furthermore, common access points such as tele-centres are often not open for women and, in several cultures, women's use of such facilities and their interaction with men in public locations is frowned upon. Moreover, research indicates that tele-centres in Sri Lanka have been less than successful due to a combination of factors, including cost, logistics, scarcity of resources, connectivity speeds and lack of support.

Financial or Institutional Constraints

Chadwick *et al.* note that, "due to its role as a means of information gathering and sharing, use of ICT corresponds to having increased power and control within society. The digital divide draws attention to how disempowered groups with limited economic resources have reduced access to ICTs". There are still 1.4 billion people living on less than US\$1.25 a day, and at least 70% of them are in rural areas. Moreover, women often do not control finances or have sufficient personal income to purchase products or pay Internet service providers for monthly access. As such, due to financial and institutional barriers, women lack the means to use, rent or purchase established and new technologies that could help them advance economically. The combination of laws, policies and social customs in many developing countries prohibit women from owning property and obtaining loans for technology purchases. A vicious cycle is thus perpetuated in which "women cannot develop their skills, which prevents them from earning higher incomes, so they cannot afford the technologies that might boost them to the next rung on the economic ladder" .

To summarise, there appear to be a number of barriers that prevent women in developing countries from accessing and using the Internet: "For many women, ICTs remain inaccessible due to affordability issues associated with poverty, lack of basic technological skills, low levels of literacy and numeracy, geographic isolation, and poor technology infrastructure as well as the cultural expectations, norms and mores that influence the ability of women to own and/or access ICTs in public places". The reason why fewer women access and use ICTs is a direct result of their unfavourable conditions with respect to education, employment and income. When these variables are controlled, women are generally more active users of digital technologies than men.

Chapter - IV

SOCIO-ECONOMIC AND EDUCATIONAL FACTORS INFLUENCING GENDER DIGITAL DIVIDE

The present chapter is based on field survey conducted in six districts of Uttar Pradesh (UP). ie. Gautam Buddh Nagar, Ghaziabad, Sitapur, Gorakhpur, Rae Bareli and Sultanpur and out of each district one rural and one urban region has been selected for the study. The state of Uttar Pradesh was chosen for field survey as it is considered as the 'IT- Hub' of North India contributing about 38% of the region's export of software and services, second in terms of number of ITIs/ITCs in India (UP IT Policy vision, 2012) but still TRAI (2014) data reveal that internet penetration in UP is only 11.9 % (as on 31/6/14). The districts have been selected on the basis of percentage of households having computer/laptop with and without internet along with mobile telephone (Census 2011). Three of the selected Districts have households with computer and internet penetration more than 2% while the remaining three have less than 2%. Another decisive factor kept in mind while selecting the Districts is that the selected Districts should have female literacy more than 50% and should not be too rural. Further, to tap regional variations across households, the Districts are preferred from different geographical regions. These districts are also selected as E-Districts in online project under the e-governance by UP State Govt. The sample size for survey is 50 respondents per region including 25 males and 25 females which sum to around 600 respondents. (For details refer to Methodology from Chapter-1).

4.1 Outcomes of the Field Survey

4.1.1 Social Factors

Table 4.1: Religion and Caste Wise Distribution of Respondents in percentage (%)

UP Districts	Sub-District/ tehsils	Sex	Religion				Caste			
			Hindu	Muslim	Sikh	Christian	SC	ST	OBC	General
Gautam Buddh Nagar	Dadri	M	100	0	0	0	24	4	32	40
		F	96	4			16		40	44
	Jewar	M	100				20		20	60
		F	100				44		12	44
Ghaziabad	Ghaziabad	M	100	0	0	0		8	8	84
		F	96	4			20	12	20	48
	Garhmukteshwar	M	88	12	0	0	36		8	56
		F	84	8	8		20		20	60

Gorakhpur	Gorakhpur	M	91.3	4.3	4.3	0		26.1	52.2	21.7
		F	82.6	17.4					95.7	4.3
	Campierganj	M	92.0	8.0	0	0	24.0		68.0	8.0
		F	95.7	4.3			21.7		69.6	8.7
Sultanpur	Sultanpur	M	100	0	0	0	12	0	28	60
		F	95.8	4.2	0	0	4.2		37.5	58.3
	Jaisinghpur	M	92.0	8.0	0	0	24	24	20	32
		F	100	0			20	36	12	32
Rae Bareli	Rae Bareli	M	80	12	4	4	28		28	44
		F	80	16	4		40	8	32	20
	Maharajganj	M	66.7	20.8	4.2	8.3	20.8	8.3	45.8	25
		F	79.2	20.8			45.8		37.5	16.7
Sitapur	Sitapur	M	84	16			24	4	36	36
		F	96	4			28		52	20
	Laharpur	M	72.0	28.0	0	0	8		44	48
		F	84	16			4		60	36
Total		M	88.88	9.09	1.01	1.01	18.51	6.06	32.32	42.76
		F	90.81	8.1	1.02	0	22.10	4.7	40.13	32.99
Grand Total		M+F	89.8	8.6	1.01	0.50	20.3	5.41	36.20	37.90

Source: Field Survey

Table-4.1 shows Religion and caste wise distribution of respondents in the areas of study. In all the districts most of the respondents are Hindu followed by Muslim and Sikh .In the same way large number of respondents belongs to General caste followed by Other Backward Caste, Schedule caste, Schedule tribe and others.

Table 4.2: Family Responsibility of working People in percentage(%)

UP Dis- tricts	Sub- District/ tehsils	Sex	Nature of Family		Dependent Children		Children Care taken while on job				Depen- dents				
			Joint	Nuclear	Yes	No	Family	Neighbour	Crèche	Others	Parents	Children	Siblings	Husband	Others
Gautam Buddh Nagar	Dadri	M	72	28	72	28	68.00	4.00	0.00	0.00	72.00	24.00			4.00
		F	76	24	72	28	72.00				52.00	48.00			
	Jewar	M	48	52	80	20	68.00	8.00	0.00	4.00	32.00	68.00			
		F	80	20	80	20	44.00	36.00			60.00	36.00			4.00
Ghaziabad	Ghaziabad	M	20	80	64	36	64.00	0.00	0.00	0.00	48.00	40.00	8.00	0.00	4.00
		F	24	76	48	52	28.00	20.00			8.00	28.00	32.00	4.00	8.00
	Garhmuk- teshwar	M	80	20	68	32	32.00	12.00		24.00	24.00	48.00	4.00		24.00
		F	100	0	64	36	28.00	8.00	12.00	4.00	24.00	64.00			3.00
Gorakhpur	Gorakhpur	M	60.86	39.13	52.17	43.47	39.13	4.35	8.70	0.00	47.83	34.78	17.39	0.00	0.00
		F	60.86	39.130	13.04	86.95	8.70	4.35			65.22	13.04	8.70	8.70	4.35
	Campier- ganj	M	64	36	36	64	36.00	0.00	0.00	0.00	80.00	20.00	0.00	0.00	0.00
		F	65.21	34.78	26.08	73.91	26.09				4.35	47.83			

Sultanpur	Sultanpur	M	84	16	68	32	64.00	4.35	0.00	0.00	32.00	32.00	36.00	0.00	0.00
		F	87.5	12.5	79.166	20.83	79.17				25.00	54.17	4.17	4.17	8.33
Sultanpur	Jaisinghpur	M	52	48	100	0	100.00	0.00	0.00	0.00	72.00	8.00	20.00	0.00	0.00
		F	80	20	96	4	96.00				60.00	20.00	20.00		
Rae Bareli	Rae Bareli	M	44	56	80	20	88.00	4.00		8.00	52.00	24.00			16.00
		F	28	72	64	36		60.00	4.00		44.00	44.00		12.00	
	Maharaj-ganj	M	41.66	58.33	54.16	45.83	50.00	4.17	0.00	0.00	41.67	54.17	8.33	0.00	0.00
		F	37.5	62.5	66.66	33.33	58.33	4.17	4.17		66.67	37.50			
Sitapur	Sitapur	M	80	20	80	20	76.00	4.00	0.00	0.00	72.00	24.00	4.00	0.00	0.00
		F	80	20	76	24	52.00				8.00	56.00			
	Laharpur	M	92	8	64	36	60.00	4.00	0.00	0.00	56.00	16.00	28.00	0.00	0.00
		F	92	8	72	28	72.00				4.00	16.00		8.00	
Total		M	61.61	38.38	68.35	31.31	62.29	4.04	0.67	3.03	52.53	32.99	31.00	3.03	12.00
		F	67.68	32.31	63.60	36.39	47.28	11.22	1.70	1.36	35.03	38.78	16.00	9.18	9.00
Grand Total		M+F	64.63	35.36	65.98	33.84	54.82	7.61	1.18	2.20	43.82	35.70	47.00	6.09	21.00

Source: Field Survey

Above table 4.2 clearly indicates that urban as well as in rural area most of the people live in joint families and responsibility of kids are mostly taken by their families. Although different kind of options are available in front of working couples like crèche, neighbour, but still data reflects that families are the most trustworthy options for care of kids.

Table 4.3: Access to Resources in percentage(%)

UP Districts	Sub-District/ tehsils	Sex	Freedom to participate in social events		Decision making in purchasing major household items		Availability of basic resources (water, electricity, etc.) are available at your home		Mode of transport for commuting to workplace	
			Yes	No	Yes	No	Yes	No	Public	Private
Gautam Buddh Nagar	Dadri	M	100.00		100.00		100.00		68.00	32.00
		F	92.00	8.00	92.00	8.00	88.00	12.00	56.00	44.00
	Jewar	M	76.00	24.00	80.00	20.00	100.00	0.00	72.00	28.00
		F	44.00	56.00	100.00		100.00		68.00	32.00
Ghaziabad	Ghaziabad	M	100.00	0.00	96.00	4.00	100.00	0.00	20.00	80.00
		F	100.00	0.00	92.00	8.00	100.00	0.00	24.00	76.00
	Garhmukteshwar	M	68.00	32.00	88.00	12.00	100.00	0.00	60.00	36.00
		F	64.00	36.00	80.00	20.00	100.00	0.00	80.00	20.00
Gorakhpur	Gorakhpur	M	73.91	26.09	56.52	43.48	56.52	43.48	30.43	69.57
		F	60.87	39.13	65.22	34.78	56.52	43.48	17.39	82.61
	Campierganj	M	92.00	8.00	72.00	28.00	72.00	28.00	40.00	60.00
		F	86.96	13.04	82.61	17.39	65.22	34.78	13.04	86.96
Sultanpur	Sultanpur	M	96.00	4.00	96.00	4.00	100.00	0.00	48.00	52.00
		F	75.00	25.00	95.83	4.17	95.83	4.17	83.33	16.67
	Jaisinghpur	M	100.00	0.00	92.00	8.00	84.00	16.00	0.00	100.00
		F	100.00		100.00		96.00	4.00		100.00

Rae Bareli	Rae Bareli	M	84.00	16.00	60.00	40.00	96.00	4.00	88.00	12.00
		F	72.00	28.00	56.00	44.00	72.00	28.00	80.00	20.00
	Maharajganj	M	54.17	45.83	58.33	41.67	62.50	37.50	33.33	66.67
		F	75.00	25.00	50.00	50.00	79.17	20.83	62.50	37.50
Sitapur	Sitapur	M	96.00	4.00	96.00	4.00	96.00	4.00	28.00	72.00
		F	64.00	36.00	60.00	40.00	96.00	4.00	40.00	60.00
	Laharpur	M	84.00	16.00	84.00	16.00	24.00	76.00	92.00	8.00
		F	60.00	40.00	56.00	44.00	16.00	84.00	96.00	4.00
Total		M	85.52	14.48	81.82	18.18	82.83	17.17	48.48	51.18
		F	74.49	25.51	77.55	22.45	80.61	19.39	18.03	47.96
Grand Total		M+F	80.03	19.97	79.70	20.30	81.73	18.27	33.33	49.58

Source: Field Survey

Table 4.3 reveal the inequality in access to resources between male and female of selected UP region .Data clearly shows that there is variation between male and female in Freedom to participate in social events, perceptions and mobility .Females have less Decision making power in purchasing major household items.

4.1.2 Economic Factors

Table 4.4: Barriers in the employment in percentage (%)

UP Districts	Sub-District/tehsils	Sex	Employed	Nature of Employment				Not Employed	Reasons for unemployment				
				Govt.	Private	Entrepreneur	Part time		Marriage	Mobility	Health	Unable to find employment	Others
Gautam Budhdh Nagar	Dadri	M	80.00	28.00	52.00			20.00		8.00	4.00	8.00	
		F	72.00	28.00	36.00	8.00		28.00	24.00	4.00			
	Jewar	M	52.00	12.00	36.00		4.00	48.00	4.00	16.00	4.00	20.00	4.00
		F	48.00	20.00	24.00	4.00		52.00	16.00	20.00		16.00	
Ghaziabad	Ghaziabad	M	80.00	20.00	56.00		4.00	20.00		8.00			12.00
		F	48.00	4.00	24.00	12.00	8.00	52.00	20.00	8.00		12.00	4.00
	Garhmukteshwar	M	64.00	16.00	32.00	8.00	8.00	36.00		12.00		16.00	8.00
		F	36.00		28.00	8.00		64.00	32.00	8.00	8.00	16.00	
Gorakhpur	Gorakhpur	M	26.09	13.04	8.70		4.35	73.91	8.70	0.00	21.74	8.70	4.35
		F	0.00					100.00	26.09	4.35	26.09	43.48	
	Campierganj	M	64.00		48.00	8.00	8.00	36.00					36.00
		F	13.04			4.35	8.70	86.96	52.17	8.70			26.09
Sultanpur	Sultanpur	M	56.00	12.00	40.00		4.00	44.00				20.00	24.00
		F	29.17	4.17	25.00			70.83	20.83	4.17		12.50	33.33
	Jaisinghpur	M	48.00		44.00		1.00	52.00				20.00	32.00
		F	12.00		12.00			88.00	32.00	4.00	32.00	4.00	16.00

Rae Bareli	Rae Bareli	M	64.00	16.00	48.00			36.00				4.00	32.00
		F	64.00	12.00	44.00		8.00	36.00	24.00			12.00	
	Maharajganj	M	54.17	12.50	29.17	12.50		45.83		12.50	12.50	20.83	
		F	33.33	16.67	12.50	4.17		66.67	29.17	4.17	4.17	29.17	
Sitapur	Sitapur	M	72	20.00	28.00	12.00	12.00	28.00	14.00				14.0
		F	24	4.00	12.00	4.00	4.00	76.00	56.00	4.00		8.00	8.00
	Laharpur	M	80		80.00			20.00				11.00	9.00
		F	8			8.00		92.00	32.00	28.00			32.00
Total		M	61.95	12.46	42.08	3.37	4.04	38.04	1.35	7.07	3.37	12.11	14.14
		F	32.65	7.48	18.37	4.42	2.38	67.35	30.28	8.84	5.78	12.59	9.86
Grand Total		M+F	47.37	9.98	31.47	3.89	3.21	52.62	15.73	7.95	4.57	12.35	12.01

Source: Field Survey

Table 4.4 highlights the fact that females are less employed than men in all the selected six regions of UP but they are more employed in Dadri district in comparison to other ones. Females are more engaged in private jobs followed by Govt. job, own business. In order to be self-dependent females are also opting for part time jobs. Marriage is the important factor that creates hindrance in female labour workforce. Due to the family responsibility, they prefer jobs of flexible times but it is very difficult to find that type of job in India. Mobility is another factor which stops females moving from one place to another for a job.

Table 4.5: Gender wise Account Penetration (in percentage)

UP Districts	Sub-District/tehsils	Sex	Account at a formal financial institution?	
			Yes	No
Gautam Buddha Nagar	Dadri	M	100.00	0.00
		F	92.00	8.00
	Jewar	M	96.00	4.00
		F	100.00	0.00
Ghaziabad	Ghaziabad	M	100.00	0.00
		F	100.00	0.00
	Garhmukteshwar	M	100.00	0.00
		F	100.00	0.00
Gorakhpur	Gorakhpur	M	91.30	8.70
		F	73.91	26.09
	Campierganj	M	80.00	20.00
		F	91.30	8.70
Sultanpur	Sultanpur	M	192.00	4.00
		F	75.00	25.00
	Jaisinghpur	M	192.00	4.00
		F	88.00	13.00

Sultanpur	Sultanpur	M	4	21	2	0	1	1	14	9	18	25	11	3	2
		F	3	21	1	2	0	0	11	5	15	22	11	1	0
	Jaisinghpur	M	6	19	6	0	0	0	6			6			
		F	8	17	8	0	0	0	8	0	0	8	0	0	0
Rae Bareli	Rae Bareli	M	7	18	7	6	1	1	5	3	2	0	1	3	1
		F	6	20	6	1	2	1	7	4	1	1	6	0	0
	Maharajganj	M	12	12	4	7	5	1	9	2	2	3	3	1	3
		F	8	16	2	1	5	0	9	1	0	0	1	1	2
Sitapur	Sitapur	M	16	9	14	4	1	0	3	13	0	0	1	13	1
		F	11	14	10	2	0	0	0	2	0	0	1	12	1
	Laharpur	M	0	25	0	0	0	0	0	0	0	0	0	0	0
		F	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		M	126	172	86	85	42	22	89	98	68	85	76	57	32
		F	109	138	80	58	44	18	84	80	61	82	66	52	19
Grand Total		M+F	235	310	166	143	86	40	173	178	129	167	142	109	51

Source: Field Survey

Table 4.6 shows that in case of internet usage for bill payment only 37% of females are using this facility and around 42% of males are using the same. Internet banking is getting more popular for online bill payments as it is the easiest way to pay the bills. Another mode which is getting popular is mobile banking followed by PayTm. Mostly males are using internet for the payment of telephone and females are using it for electricity. So slowly and slowly India is heading towards digitization, but there is a need to fill the gender divide

4.1.3 Educational Factors

Table 4.7: Gender wise Educational distribution

UP Districts	Sub-District/ tehsils	Sex	High school or less	Graduation	PG	Ph.D.
Gautam Buddh Nagar	Dadri	M	16.00	56.00	24.00	4.00
		F	16.00	72.00	8.00	4.00
	Jewar	M	20.00	40.00	-	-
		F	36.00	48.00	12.00	4.00
Ghaziabad	Ghaziabad	M	4.00	76.00	16.00	4.00
		F	4.00	76.00	16.00	4.00
	Garhmukteshwa	M	28.00	60.00	12.00	
		F	16.00	60.00	20.00	4.00
Gorakhpur	Gorakhpur	M	17.39	60.87	21.74	
		F	34.78	60.87	-	4.00
	Campierganj	M	96.00	4.00	-	-
		F	82.61	17.39	-	-

Sultanpur	Sultanpur	M	36.00	40.00	24.00	-
		F	45.83	33.33	20.83	-
	Jaisinghpur	M	80.00	20.00	-	-
		F	80.00	20.00	-	-
Rae Bareli	Rae Bareli	M	56.00	44.00	-	-
		F	76.00	24.00	-	-
	Maharajganj	M	58.33	33.33	8.33	-
		F	56.52	20.83	25.00	-
Sitapur	Sitapur	M	12.00	40.00	48.00	-
		F	20.00	32.00	40.00	8.00
	Laharpur	M	76.00	24.00	-	-
		F	64.00	36.00	-	-
Total		M	41.75	44.78	12.79	0.67
		F	43.88	41.84	11.90	2.38
Grand Total		M+F	42.81	43.32	12.35	1.52

Source: Field Survey

Table 4.7 indicates that in selected six districts of UP, most of males are graduate while most of the females are educated upto high school. Due to educational facilities and awareness, females in urban areas are more educated compared to rural areas. So there is a need to sensitize people about female education.

Table 4.8: Gender wise Barriers in IT Stream (in percentage)

UP Districts	Sub-District/tehsils	Sex	Any Barrier in IT Stream		If Yes, Nature of Barriers				
			NO	Yes	Lack of Opportunity	Family Pressure	Parents Pressure	Friends Influence	Others
Gautam Buddh Nagar	Dadri	M	68	32	4	16	4	4	4
		F	60	40	16	24	0	0	0
	Jewar	M	48	52	28	8	0	4	12
		F	0	100	36	16	20	4	24
Ghaziabad	Ghaziabad	M	84	16	0	16	0	0	0
		F	28	72	8	28	32	4	0
	Garhmukteshwar	M	44	56	8	12	4	8	24
		F	40	60	12	24	0	0	24
Gorakhpur	Gorakhpur	M	57	43	9	17	9	9	0
		F	57	43	0	22	13	0	9
	Campierganj	M	24	76	44	16	8	0	8
		F	22	78	9	39	17	0	13

Sultanpur	Sultanpur	M	56	44	4	4	8	8	20
		F	67	33	13	4	4	0	13
	Jaisinghpur	M	52	48	20	16	8	4	0
		F	84	16	0	8	0	0	8
Rae Bareli	Rae Bareli	M	28	72	20	16	4	4	28
		F	12	88	40	44	0	4	0
	Maharajganj	M	17	83	33	29	0	8	13
		F	29	71	29	21	17	0	4
Sitapur	Sitapur	M	12	88	32	28	4	12	12
		F	8	92	4	12	36	36	4
	Laharpur	M	4	96	40	36	20	0	0
		F	4	96	28	48	20	0	0
Total		M	41	59	20	18	6	5	10
		F	34	66	16	24	13	4	8
Grand Total		M+F	38	62	18	21	9	5	9

Source: Field Survey

Table 4.8 reflect that females have to face lots of barriers of entry into the IT stream and family pressure is the main factor which prevent female's entry into IT stream. Other important factors were lack of opportunity parents and friends influence. For females mobility (access to IT infrastructure) and house hold responsibilities was the main constraint in entry to IT stream.

4.2 Contingency tables for analysis of hypothesis

Contingency tables (also called cross tabs or two-way tables) are used in statistics to summarize the relationship between several categorical variables. A contingency table is a special type of frequency distribution table, where two variables are shown simultaneously. They are heavily used in survey research, business intelligence, engineering and scientific research. They provide a basic picture of the interrelation between two variables and can help find interactions between them. Hence contingency tables are used in the study for analysis of hypothesis.

1. Contingency table for first hypothesis

Age * Internet banking Usage Crosstabulation				
Count				
		Internet banking Usage		Total
		Yes	No	
Age	Less than 23	29	68	97
	23-35	99	183	282
	36-50	36	139	175
	Greater than 50	2	35	37
Total		166	425	591

Above cross tabulation result depicts the relationship between two variables i.e. age and Usage of Internet banking. Data shows that with the increase in age, internet banking usage is reducing. It illustrates that elderly people still believe in manual process of banking and they hardly use internet banking for banking purposes. Hence hypothesis 1 is true which states that age is inversely related to ICT usage.

2. Contingency table for Second hypothesis

Gender * Place of Residence (Rural/Urban) and Withdrawal				
Cross tabulation				
		Count		
		Place of Residence (Rural/Urban)		Total
		Yes	No	
Gender	Male	226	71	297
	Female	208	86	294
Total		434	157	591

Given contingency table revealed that both males and females agree that there is a significant impact of Place of residence on ICT usage. Hence it supports second hypothesis.

3. Contingency table for third hypothesis

Gender * Approximate Internet access time per day Cross tabulation						
Count		Approximate_ Internet access time per day				Total
		<2 Hrs	2-4 Hrs	4-6Hrs	>6Hrs	
Gender	Male	89	41	21	9	160
	Female	54	37	12	0	103
Total		143	78	33	9	263

Given contingency table revealed that although more males and females are spending < 2 hrs on internet per day and few males are able to manage >6 hrs to internet usage. Because of household hold responsibilities, overall females are spending less time on internet then males. Hence third hypothesis is true which states that males are spending more time on internet in comparison to that of females.

This chapter analysed the Socio-economic and educational factors which can create lasting impact on Gender Digital divide.

Chapter - V

WOMEN EMPOWERMENT THROUGH ICT: A CASE OF ENTREPRENEURSHIP

“Technology is a means by which women can create new worlds and realities...”
-Hawthorne & Klein, 1999, p. 4

Entrepreneurship took a more prominent role in fostering economic development and social inclusion, creating jobs, and allowing wealth accumulation. Sustainable development requires economic participation of both men and women. In developing countries women’s entrepreneurial potential remains underutilized. Women are less likely to become entrepreneurs and their businesses are more likely to be informal, stay small, generate less revenue, and employ fewer staff. Their participation is well below their presence in the labor market or their educational qualifications. ICT is viewed as one of the most promising developments in recent times as it has the potential to bridge many gaps in human socio-economic development. There is ample evidence about the potential of information and communication technologies (ICTs) such as mobile phones, computers, and the internet to support empowerment of women. ICT use by women has led to improvements not only in business performance but also in living conditions. With this background, this chapter focus on the potential of ICT to catalyze women’s entrepreneurship in selected six regions of UP. The sample size for survey is 8 respondents per region including 4 males and 4 females which sum to around 96 respondents. (For details refer to Methodology from Chapter-1).

5.1 Outcomes of the Field Survey

Table 5.1: Demographic details of the Respondents

UP Districts	Sub-District/ tehsils	Sex	Age				Marital Status			Education			
			<23	23-35	36-50	>50	Single	Married	Others	High School or Less	Graduation	PG	Other
Gautam Buddh Nagar	Dadri	M	25	75			50	50			50	25	25
		F	100				75	25		75	25		
	Jewar	M		75	25		50	50			75	25	
		F		75	25		50	50		25	50	25	

Ghaziabad	Ghaziabad	M	25	2	25		50	50	25	50		25	
		F		25	75		100		75	25			
Ghaziabad	Garhmukteshwar	M	25	25	50		50	50	50	25	25		
		F		2	50		50	50	25	50	25		
Gorakhpur	Gorakhpur	M		100			100		66.6	33.3			
		F		50	50		100		75	25			
	Campierganj	M		50	25	25		100		25	75		
		F	25	50	25		25	75		25	25		50
Sultanpur	Sultanpur	M		75	25		25	75		100			
		F		25	50	25	100		50	50			
	Jaisinghpur	M	50	50			50	50		25	75		
		F	25	75			100	0		50	50		
Rae Bareli	Rae Bareli	M		25	50	25		100		50	25	25	
		F		50	50		25	75		50	50		
	Maharajganj	M	25	50	25		50	50		50	25	25	
		F		75	25		25	75	25	50			25
Sitapur	Sitapur	M	50	25	25		25	75		75	25		
		F		50	50					25	75		
	Laharpur	M	25	75			75	25		50	50		
		F	50	25	25					50	25		
Total		M	19.14	55.13	21.27	4.25	36.17	63.82		23.40	57.44	14.89	4.255
		F	16.66	45.83	35.41	2.08	50	50		41.66	39.58	12.5	6.25
Grand Total		M+F	17.89	50.52	28.42	3.15	43.15	56.84	1.05	32.63	48.42	13.68	5.26

Source: Field Survey

Table 5.1 Clearly shows that most of the entrepreneurs are married and belongs to age group 25-35 and 35-50. In case of education large variation has been noticed between male and female. Data reveal that most of the males are graduate while mostly females are educated upto high school and PG females are less in percentage in comparison to that of males. This clearly indicates that more education should be provided to females not for their performances in business and carriers but for the economic growth of the nation also it is imperative.

Table 5.2: Family Characteristics of Respondents

UP Districts	Sub-District/tehsils	Sex	Type of your family		Working spouse		Nature of spouse employment	
			Joint	Nuclear	Yes	No	Part Time	Full time
Gautam Buddh Nagar	Dadri	M	75	25	50	50		50
		F	100		25	75	0	25
	Jewar	M	100		25	75		25
		F	100		25	75	25	75
Ghaziabad	Ghaziabad	M	75	25		100	0	0
		F	100		100			100
	Garhmukteshwar	M	75	25	25	75		25
		F	75	25		100	0	0

Gorakhpur	Gorakhpur	M	66.6	33.3	66.6	33.3	66.6	33.3
		F	50	50	100		50	50
	Campierganj	M	100	0	50	50	25	25
		F	100		75	25		75
Sultanpur	Sultanpur	M	100		50	50	50	50
		F	100		50	50	25	25
	Jaisinghpur	M	75	25	50	50	50	
		F	100		50	50	75	25
Rae Bareli	Rae Bareli	M	50	50	75	25	25	75
		F	25	75	75	25	25	50
	Maharajganj	M	50	50	50	50	75	25
		F	50	25	100	0	75	25
Sitapur	Sitapur	M	100	0	75	25	75	
		F	100		100			100
	Laharpur	M	100	0	50	50	25	25
		F	100		100		25	75
Total		M	80.85	19.1	46.8	53.19	31.9	27.6
		F	83.3	16.6	66.6	25	25	52.0
Grand Total		M+F	82.1	17.8	56.8	38.9	28.4	40

Source: Field Survey

Table 5.2 indicate that in this modern time where culture of nuclear families is increasing day by day, in U.P. most of the people live in joint family. Data shows that in most of the families both husband and wife are working for their economic efficiency, and the percentage of full time working parents are more. In this situation, joint families are taking the responsibilities of kids growth and development.

Table 5.3: Family Responsibility of Respondents

UP Districts	Sub-District/ tehsils	Sex	Number of Persons dependent				No. of Kids				Support from family	
			0	1	2	more than 2	0	1	2	>2	Yes	No
Gautam Buddh Nagar	Dadri	M			50				50		75	25
		F				100	100				100	
	Jewar	M	25	0	50	25	50	25	25		100	
		F		25	50	25	25	25			50	50
Ghaziabad	Ghaziabad	M	50	0	25	25	50	50			100	
		F			50	50			50	50	100	
	Garhmuk- teshwar	M	25	50		25	25	25	25		100	
		F	25	50		25	50				75	25

Gorakhpur	Gorakhpur	M			33.3	66.6			66.6	33.3	66.6	33.3
		F	25				75		100		25	75
	Campierganj	M				100			25	75	100	
		F	25		25	50	25		25	50	75	25
Sultanpur	Sultanpur	M		25	25	50		25	50	25	100	
		F		25		75		25	50	50	75	25
	Jaisinghpur	M	25			50	50	25		25	100	0
		F	25	25	25	25	25	50	25		100	
Rae Bareli	Rae Bareli	M			50	50		25	50	25	50	50
		F	25		50	25	25		25	50	75	25
	Maharajganj	M			25	75	50			50	100	
		F			75	25	25		25	50	100	
Sitapur	Sitapur	M				100	25	25	0	50	25	75
		F				100			75	25	50	50
	Laharpur	M	0	0	50	50			50		75	25
		F	25		25	50	50	25		25	75	25
Total	M	12.76	6.38	25.5	51.06	21.2	17.02	27.65	23.4	82.97	17.02	
	F	12.5	10.4	25	52	27.08	10.41	31.25	25	75	25	
Grand Total	M+F	12.63	8.42	24.26	51.57	24.21	13.68	29.47	24.2	78.94	21.05	

Source: Field Survey

Data of selected six districts of UP shown in table 5.3 indicates that in joint families since number of dependent members are more there is need both male and female to working. Since data reveals that most of families are having minimum two kids, so to tackle the growth of kids it is required that work of female should be such that they can balance their work as well as their life. Entrepreneurship is the best solution to balance the responsibilities of females. Among females having support of their parents it was they were able to work without any time constraint compare to support of in laws as with in laws one has more social expectations to perform the role of dutiful daughter in laws.

Table 5.4: Gender wise Business details of respondents

UP Districts	Sub-District/tehsils	Sex	Type of business		Type of firm			Role in your firm			
			ICT	Non ICT	Small Firm (1-9 workers)	Medium Firm (10-99 workers)	Large Firm (100 or more workers)	Managers and Professionals	Technicians and Assoc. Professionals	Services and Sales	Others
Gautam Buddh Nagar	Dadri	M	50	50	100			75		25	
		F		100	100			25	75		
	Jewar	M	75	25	25	75			25	25	50
		F	25	75	100			50			50

Ghaziabad	Ghaziabad	M	25	75	75	25		50	0	25	25
		F		100	75	25		50		25	25
	Garhmukteshwar	M	100		75	25		25		50	25
		F	100		75	25		25		50	25
Gorakhpur	Gorakhpur	M	66.6	33.3	100				66.6	33.3	
		F	50	50	100				75	25	
	Campierganj	M	50	50	100			100		50	
		F	50	50	100			50		75	
Sultanpur	Sultanpur	M	50	50	100			75		25	
		F	25	75	100			75		25	
	Jaisinghpur	M	100		100			25		75	
		F	50	50	100			50		25	25
Rae Bareli	Rae Bareli	M	50	50	100			25	25	50	
		F	50	25	75	25		100			
	Maharajganj	M	50	50	100			75		25	
		F	50	50	75	25		100			
Sitapur	Sitapur	M	50	50	100			75	25	0	0
		F	75	25	75	25		100			
	Laharpur	M	75	25	100			75		25	
		F	25	75	75	25		75			25
Total		M	61.7	38.29	89.36	10.6		51.06	10.6	34.04	8.5
		F	41.6	56.25	87.5	12.5		58.33	12.5	20.83	12.5
Grand Total		M+F	51.57	47.3	88.42	11.57		54.73	11.57	27.36	10.52

Source: Field Survey

Table 5.4 analyses the situation of entrepreneurship gender wise, which clearly shows that most of the entrepreneur of these districts are having small firms (1-9 workers) but they are adopting ITC to enhance the performances of their business. But females still lag behind in adopting ITC for their businesses and are engaged in their traditional methods of businesses. So, there is need to spread the information about advantages of ITC in businesses to females. Data clearly reveals that both males and females are having managerial position in their businesses. In sales, more males were found as this is time consuming job.

Table 5.5: Change in Life style of people after adopting entrepreneurship (in percentage)

UP Districts	Sub-District/ tehsils	Sex	Level of Stress				Time for exercise/ meditation		Time for hobbies		Vacation with your family in a year			
			High	Mod-erate	Slight	No Stress	Yes	No	Yes	No	Once	twice	thrice	More
Gautam Buddh Nagar	Dadri	M	25	50	25		75	25	50	50	75	25		
		F		50	50		100		75	25	25			75
	Jewar	M		50	25	25	50	50	100	0	75			25
		F		50	50		100		50	50	50			50

Ghaziabad	Ghaziabad	M		25	50	25	50	50	100	0	25	50	25	
		F		50	25	25	50	50	50	50	25	25		50
	Garhmukteshwar	M			75	25	50	50	100	0	50	50		
		F			75	25	50	50	100		50	50		
Gorakhpur	Gorakhpur	M	33.3	66.6			33.3	66.6	66.6	33.3	100			
		F	25	75			50	50	50	50	75	25		
	Campierganj	M				75	75		50	25	50	25		
		F				100	25	75	75	25	100			
Sultanpur	Sultanpur	M			100		100		100		25	25	50	
		F		100			100		100		50	50		
	Jaisinghpur	M	25	25	25	25	25	75	25	75	100			
		F	75			25	75	25	100		100			
Rae Bareli	Rae Bareli	M		100			25	75	50	50	75	25		
		F	75	25			75	25	100			25	25	50
	Maharajganj	M	50	50			75	25	75	25	50	50		
		F	75	25			100		100		75			25
Sitapur	Sitapur	M		25	75		50	50	25	75	100			
		F		75	25		100		0	100	100			
	Laharpur	M	25	50	25		100	0	75	25	75	25		
		F	25	50	25		75	25	50	50	50	50		
Total	M	12.76	36.17	34.04	14.89	59.57	38.29	68.0	29.7	65.9	23.04	6.3	2.1	
	F	22.9	41.6	20.83	14.58	75	25	70.83	29.1	58.3	18.75	2.08	20.83	
Grand total	M+F	17.8	38.9	27.3	14.7	67.3	31.5	69.4	29.4	62.1	21.0	4.2	11.57	

Source: Field Survey

Table 5.5 depicts the change in life style of people of selected six districts of UP after adopting entrepreneurship. Data reveal that IT entrepreneurship has moderate the level of stress and provide more time of exercise, meditation, yoga, hobbies to entrepreneur. Even they are able to manage outside trips with their families not once in a year but more than one. So, we can say that IT is changing traditions and transforming the business processes.

5.2 Contingency tables for analysis of hypothesis

1. Contingency Table for Fourth Hypothesis

Gender * Level of stress at workplace Crosstabulation						
Count						
		Level of stress at workplace				Total
		high	moderate	slight	no stress	
Gender	female	11	18	12	7	48
	male	6	18	14	10	48
Total		17	36	26	17	96

Above cross tabulation output reveals the fact that ICT not only eases the life of males but it also creates a positive impact on the life of females and reduces the complexity of workplace. Therefore, fourth hypothesis holds true.

2. Contingency Table for Fifth Hypothesis

Gender * Time for Exercise and mediation Crosstabulation				
Count				
		Time for Exercise and mediation		Total
		yes	no	
Gender	female	37	11	48
	male	27	21	48
Total		64	32	96

Gender * Hobbies Crosstabulation				
Count				
		Time for Hobbies		Total
		yes	no	
Gender	female	28	20	48
	male	28	20	48
Total		56	40	96

Given frequency distribution reveal that in case of time for hobbies the responses of males and females are almost same, but in case of time of exercise and meditation females are much more relaxed with the use of ITC then males. Hence hypothesis fifth is true which states that ICT simplify the life of entrepreneur and able to provide more time for exercise, meditation, hobbies to entrepreneur.

5.3 CASE STUDY

X husband retired from defense services during 2000. Post retirement he opened printing press in Ghaziabad and they were able to raise their two kids under constant financial constraint. In between they also got help from their parents to continue school education of their children in reputed private school. But they could not afford higher education in private university. So, during 2012-13 rented an apartment near her house to start property business of buying and selling. Her children who were computer literate helped her in polishing computer skills. They sold their vehicles to cut the expenditure. They also closed their printing press. Presently, their children are doing vocational courses in photography and cloud technology. When I meet this lady in 2017, she was satisfied on her timely decision to start business near her home. She learned internet and website monitoring skill from her children. Initially, she felt very uncomfortable to enter the male dominated area as there were many restrictions posed by fellow businessmen in property business. But ICT helped her to open

her own website and gave her space to communicate with her customer through internet.

Now her husband also supports her in her business that has expanded over year. They have developed a chain of soft relations with their customer. This has an added advantage of monthly rental commission from their customer as they rent a house for 11 months. In this way, at least one month rent from one or another customer has become their monthly income. With passing of government regulation of property bill.

They look forward to buy a shop in nearby market for smooth run of their business and also contribute to their children plan to startup their own business once they complete their vocational course.

Chapter - VI

GENDER DIGITAL DIVIDE: COMPARISON OF ICT AND NON-ICT COMPANIES

The present chapter is based on field survey conducted in Noida and other selected district of the U.P state. To analyse the problems of working women in ICT industry, IT companies which are registered with NASSCOM are selected for the study. By checking the website of NASSCOM (http://memberdirectory.nasscom.in/mms_company_free_search/city/Noida) it has been noticed that out of all selected sub-districts only Noida region has registered IT companies with NASSCOM. For the purpose of this study approximately 60% of registered companies are surveyed i.e. 80 companies. To compare the working condition of ICT and Non-ICT companies, from other regions those non-ICT companies are selected where percentage of women are higher. Considering the importance to skill development and start-up policy of Government, this study has selected manufacturing and construction companies as Non-ICT companies from remaining 11 sub-districts of UP. For the purpose of comparison of ICT and Non-ICT companies similar number of registered manufacturing and construction companies from 11 sub districts are considered for survey i.e. 80 Non ICT companies. So purposive random sampling method has been followed in the study. (For details refer to Methodology from Chapter-1).

6.1 Outcomes of the Field Survey

Table 6.1: Employees and Employers Perspective Regarding Affirmative policies: Comparison of ICT and Non-ICT Companies (in percentage)

ICT Company		Nature of affirmative policies				
		Maternity/ paternity leave	Sexual Harassment Committee	Transport facility	Rest room	others
Employees	M	93.75	100	21.5	28.5	10.25
	F	99.75	100	21.25	33.75	11.75
Employers	M+F	93.75	66.25	22.5	27.5	18.75
NON ICT Company						
Employees	M	55.5	19.75	21.5	33.75	12.75
	F	57	23.25	13.75	23	5.75
Employers	M+F	53.75	20	31.25	17.5	13.75

Source: Field Survey

From table 6.1, it can be analysed that ICT companies are more alert towards their affirmative policies like Maternity/ paternity leave, Sexual Harassment Committee, Transport facility, rest rooms etc. Out of all the policies they are more particular about first two. But Non-ICT companies are still lagging behind in providing such facilities to their employees. Hence hypothesis sixth holds true which states that there is large variation in affirmative policies provided by ICT and Non-ICT companies. (Statistical testing of this hypothesis is given at the end of this chapter)

Table 6.2: Employees and Employers Perspective Regarding Work life Balance policies: Comparison of ICT and Non ICT Companies (in percentage)

ICT Company		Separate policy for work life balance	
		Y	N
Employees	M	53.75	46.25
	F	54.5	45.5
Employers	M+F	67.5	32.5
NON-ICT Company			
Employees	M	45.25	55.25
	F	20.25	79.75
Employers	M+F	50	50

Source: Field Survey

Table 6.2 illustrates that now a days companies are giving more attention to work life balance concept. Data shows that ICT companies are giving more importance towards these policies in comparison to Non-ICT companies.

Table 6.3: Employees Perspective Regarding Child care programs: Comparison of ICT and Non-ICT Companies (in percentage)

ICT Company		On site child caring programs provided by the organization	
		Y	N
Employees	M	16.75	83.25
	F	18.75	81.25
NON ICT Company			
Employees	M	8.25	91.75
	F	7.50	92.5

Source: Field Survey

For working parent child care is a significant issue, if companies are providing child care help to the employees then it becomes convenient for employees to work. Above table data clearly shows that all the companies are not providing this kind of assistance and still in India employees have

to face or struggle with child care issue and this is main reason why married females have to leave their vital position from world of work.

Table 6.4: Gender wise employee's perspective about Night Shift Working (in percentage)

	Sex	Working in night shift		Provision of the cab facility to pick and drop from home	Satisfaction with the facility	Health issue due to night shift	Night shift compulsory
		Y	N				
ICT Company Noida		Y	N	Y	Y	Y	Y
EMPLOYEES	M	23.5	76.5	9.75	14	11.75	6.75
	F	10.25	89.75	10.25	9.25	9.5	4
NON ICT Company							
EMPLOYEES	M	14.5	85.5	5.25	10.75	8.5	5
	F	7.75	92.25	6.5	6.5	7	8.25

Source: Field Survey

From the above table, it can be understood that more females are doing night shift in Non-ICT Companies while more males are doing night shift in ICT companies but from satisfaction point of view in ICT companies more females are satisfied with facilities they are getting from the company like getting cab facility to pick and drop while in Non-ICT Companies females are getting less facilities in comparison to that of ICT companies. Regarding health issues in both type of companies, females are suffering from various kind of problems like back pain, neck pain, disturbed biological cycle etc. Hence hypothesis seventh holds true which states that regarding night shift working females are more satisfied in ICT companies than in Non-ICT companies.

Table 6.5: Employers perspective about Female position in ICT and Non-ICT Companies (in percentage)

	ICT background		Percentage of women representation				Most common level of studies for women who apply to ICT positions					From total applicants hired in ICT positions, percentage of women representation			
	Y	N	0-25	24-50	50-75	75-100	10th	12th	Graduation	PG	Ph.D.	0-25	24-50	50-75	75-100
ICT Company Noida															
EMPLOYERS	96	4	9	26	35	30	9	5	64	23	0	10	24	41	25
NON-ICT Company															
EMPLOYERS	69	31	41	51	8	0	23	36	33	8	1	33	63	5	

Source: Field Survey

Table 6.5 gives an overview about females position in ICT and Non-ICT companies. Data of ICT companies shows that ICT education is must for their entry and approximately 50-70% applicants were females. Mostly graduate females apply for jobs in ICT companies and their representation in companies are about 50-70%. While in non ICT companies this scenario is quite different. In Non-ICT companies also ICT education helps females to enter for jobs and from total applicants approximately 24-50% were females. Generally, 12th pass females are applying in Non-ICT companies and about female’s representation was around 25-50%.

Table 6.6: Factors influencing Females entry in ICT Jobs (in percentage)

	Sex	Hindrances for women to enter ICT Jobs			
ICT Company Noida		Family Pressure	Society Pressure	Lack of Skills	Others
EMPLOYERS	M+F	32.5	31.25	70	22.5
NON ICT Company					
EMPLOYERS	M+F	77.5	13.75	20	15

Source: Field Survey

Table 6.6 explains the reasons which keep women out of ICT jobs. According to ICT employers due to lack of suitable skills female are unable to enter into ICT jobs, so according to them proper digital literacy should be provided to females either through online education or MOOC (Massive online open courses) which are the easiest way through which knowledge can be earned in this digital era or through appropriate Govt. institutes. According to Non ICT employer’s family pressure is the main reason which restricts female to enter on ICT jobs and they suggest that there is dire need to change the mindset of societal thinking.

Table 6.7: Steps for increasing Women participation in ICT Sector (in percentage)

	Sex	Steps to increase women participation in ICT Sector			
ICT Company Noida		Increasing IT knowledge	Increasing awareness among society	Conducting training campaigns	Others
EMPLOYERS	M+F	17.5	38.75	25	18.75
NON ICT Company					
EMPLOYERS	M+F	27.5	41.25	23.75	7.5

Source: Field Survey

Above table illustrates various ways through which participation of females in ICT sector can be increased but the data revealed that employers of both ICT and Non ICT companies are in favour of second option i.e. increasing awareness among society. Spreading awareness in the society can cause radical change in family thinking and could lead to increased female participation. Hence hypothesis eighth holds true which states that Increasing awareness among society is the main factor to increase female participation in the ICT sector

6.2 TESTING THE SIXTH HYPOTHESIS USING T-TEST:

T-test was used to compare the means of the two groups of Companies that is ICT and Non ICT companies to know if there was any significance difference in affirmative policies provided by them.

1. Nature of the Company
2. Affirmative policies

SETTING THE HYPOTHESIS

H0=(NULL HYPOTHESIS) There is no significance difference between the ICT and Non ICT company in providing affirmative policies to their employees.

H1=(ALTERNATIVE HYPOTHESIS) There is a significance difference between the ICT and Non ICT company in providing affirmative policies to their employees.

Group Statistics					
	Type of Organisation	N	Mean	Std. Deviation	Std. Error Mean
Transport Facility	ICT	800	1.75	.435	.015
	Non ICT	800	1.79	.410	.015
Maternity paternity leave	ICT	800	1.03	.177	.006
	Non ICT	800	1.44	.496	.018
SHCommittee	ICT	800	1.00	.000	.000
	Non ICT	800	1.79	.411	.015
RestRoom	ICT	800	1.63	.484	.017
	Non ICT	800	1.66	.473	.017

The above table shows that there are total 800 employees were surveyed from ICT as well as Non ICT company.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Transport Facility	Equal variances assumed	14.354	.000	-1.891	1598	.059	-.040	.021	-.081	.001
	Equal variances not assumed			-1.891	1592.345	.059	-.040	.021	-.081	.001
Maternity paternity leave	Equal variances assumed	4699.492	.000	-21.730	1598	.000	-.405	.019	-.442	-.368
	Equal variances not assumed			-21.730	999.899	.000	-.405	.019	-.442	-.368
SH Committee	Equal variances assumed	1660.218	.000	-54.012	1598	.000	-.785	.015	-.814	-.756
	Equal variances not assumed			-54.012	799.000	.000	-.785	.015	-.814	-.756
Rest Room	Equal variances assumed	8.483	.004	-1.463	1598	.144	-.035	.024	-.082	.012
	Equal variances not assumed			-1.463	1597.213	.144	-.035	.024	-.082	.012

In above table the Levene's test for equality of variance shows that the significance value for all the affirmative policies comes out to be $< .05$. Further on checking the significance value under 2-tailed test again the obtained value is less than the value of $\alpha=0.05$ except for rest room its $\alpha =.144$ which states that we reject the null hypothesis stating and concluding that there is a significance difference between the affirmative policies provided by ICT and Non ICT companies except the rest room facility.

Chapter - VII

CONCLUSION

In India, the ICT sector has come to occupy a prominent position. The contribution of ICT is significant in terms of income and earnings. Although women are expected to contribute around one third of the labour force, they represent only one section of the Indian society. The new knowledge based ICT are considered to be non-discriminating. However, access to ICT is not even and there persists a divide in society. It is seen that the IT workforce is largely urban and middle and high class and hail from educated families (Upadhyay, 2006; Agarwal, 2000; Krishna and Brihamdeshan, 2006; Fuller and Narasimhan, 2006) various factors affect women's participation in IT. The work participation rate in any country also affects their employment patterns in IT industry. Other factors are access to IT education, employment opportunities, location of employment, work structure of IT and skill up gradation. Women have double responsibility of market based work as well as home responsibilities.

7.1 SUMMARY ON THE BASIS OF PRIMARY SURVEY

On the basis of primary survey the study found that

In all the districts most of the respondents are Hindu followed by Muslim and Sikh and in terms of caste largely respondents belongs to General caste followed by Other Backward Caste, Schedule caste, Schedule tribe and others. Regarding type of the families, study identifies that urban as well as in rural area most of the people live in joint families and where parents are working responsibility of kids are mostly taken by their respective families.

Study revealed that there is large variation in social independency of male and female of selected UP region .Females have less decision making power in purchasing major household items ,along with this female account penetration is less in comparison of males and in case of ATM usage there is large variation . Around 71% of males are using ATM as a main mode of deposit or withdrawal while only 60% of females are using the same.

Females are less employed then man in all the selected six regions of UP but they are more employed in Dadri district in comparison to other ones. Females are more engaged in private jobs followed by Govt. job, own business. In order to be self dependent, females are also opting for part time jobs.

Marriage is the main cause that creates hindrance in female labour force participation. Due to the family responsibility females prefer job of flexible times but it very difficult to find that type of job in India. Mobility is another factor which stops females to get job of their own choice.

Females have to face lots of barriers of entry into the IT stream and family pressure is the main factor which prevent females entry into IT stream. Other important factors are lack of opportunity, parents and friends influence.

In case of internet usage for bill payment only 37% of females are using this facility and around 42% of males are using the same. Internet banking is getting more popular for online bill payments as it is the easiest way to pay the bills.

7.1.1 Entrepreneurs

Study revealed that, in case of education large variation has been noticed between male and female entrepreneurs of six selected districts of UP. Most of the males are graduate while females are educated upto high school. This clearly indicates that more education should be provided to females not for their performances in business and carriers but for the economic growth of the nation also it is imperative.

Data shows that in order to mainstream female entrepreneurship IT access is the best solution .

Study analyses that most of the entrepreneur of these districts are having small firms (1-9 workers) but they are adopting ITC to enhance the performances of their business .But females still lag behind in adopting ITC for their businesses and are engaged in their traditional methods of businesses.

IT entrepreneurship has moderate the level of stress and provide more time of exercise, meditation, yoga, hobbies to entrepreneur. So we can say that IT is changing traditions and transforming the business processes as well.

7.1.2 ICT and NON ICT Companies

From the study it can be analysed that ICT companies are following affirmative policies more attentively like Maternity/paternity leave, Sexual Harassment Committee, Transport facility ,rest rooms etc. But Non ICT companies are still lagging behind in providing such facilities to their employees. ICT companies are also paying more attention towards work life balance concept.

For working parents child care is a significant issue, if companies are providing child care help to the employees then it becomes convenient for employees to work. All the companies are not providing this kind of assistance and still in India employees have to face or struggle with child care issue and this is main reason why married females have to leave their vital position from the world of work.

Regarding night shift working study identified that employees are more satisfied in ICT companies as they are getting safe pick and drop facilities while in Non ICT Companies females are getting less facilities in comparison to that of ICT companies. Regarding health issues in both type of companies females are suffering from various kind of problems like back pain, neck pain, disturbed biological cycle etc.

Data of ICT companies shows that ICT education is must for women entry and approximately 50-70% applicants are females .Mostly graduate females apply for jobs in ICT companies and their representation in companies are about 50-70%. While in non ICT companies this scenario is quite different. In non ICT companies also ICT education helps females to enter for jobs and from total applicants approximately 24-50% are females. Generally 12th pass females are applying in Non ICT companies and about 25-50% females representation is there.

According to ICT employers due to lack of suitable skills female are unable to enter into ICT jobs , so according to them proper digital literacy should be provided to females either through online education or MOOC (Massive online open courses) which are the easiest way through which knowledge can be earned in this digital era or through appropriate Govt. institutes. According to Non ICT employers, family pressure is the main reason which restricts female to enter on ICT jobs and they suggest that there is a dire need to change the mindset of societal thinking.

Participation of females in ICT sector can be increased but the data revealed that employers of both ICT and Non ICT companies are in favour of increasing awareness among society .Spread of Society awareness can cause radical change in family thinking and could lead to increased female participation.

Recommendations

In an effort to create an enabling environment and to support women's social and economic empowerment through ICTs, action needs to be taken by different actors - at local, regional, national and international levels. The recommended action steps are:

- Adopt legislative, regulatory and administrative measures and approaches to encourage the participation of women in the ICT arena, and in particular, adopt legislation in ICT-specific sectorial areas to address gender equality and create monitoring frameworks and capacity to ensure implementation of these frameworks. Develop gender-sensitive technical and regulatory instruments when addressing ICT policy issues such as universal access, regulatory frameworks, licensing, tariff plans, spectrum allocation, infrastructure, and labour policies. Attention is required in drawing up a list of ICT policy issues and integrating gender issues in this.
- Encourage and facilitate collaborative action for gender equality among government bodies responsible for ICTs.
- NGOs and the government should come together to develop poverty alleviation programmes

through women-centric initiatives, in particular circumventing the problems of liberal development. Self-help groups are formed by government agencies or NGOs to benefit women members economically and socially by helping them engage in micro-entrepreneurship activities and share generated income between themselves. Women in India derive access to low-cost financial services and learn a process of self-management and development. These self-help groups can help women take social action, accumulate social capital, practice better economic viability and demonstrate a greater sustainability than individual based models for women's empowerment.

- There is a need to push basic communications services (and by extension, markets) into the rural regions of the country.
- Women-centric organisations need to be engaged in decision making concerning the development of new technologies in order to participate in their growth and impact.
- In the absence of any specific ICT agenda for women, gender digital gap cannot be bridged. So there is a need of "Gender Centric ICT Policy" for the country. This policy will certainly go a long way to increase ICT access by women, especially in rural and remote locations, and for those who are marginalised among tribal peoples and minorities. This policy framework can take up specific interventions such as an ICT fellowship programme for women, digital literacy for women, and access and connectivity cafés for women only. The critical ministries

in this endeavour could be the Ministry of Women and Child Development in alignment with the Ministry of Communications and IT, with collaborative support from bilateral agencies such as UNDP or UN Women.

- A gender gap in internet policy and gender focused research in India does not expressly prevent women's internet access, but it does restrict its ability to grow. On the policy front, government policies already aim at increasing internet access for the general population, specifically with the rapid take-up of broadband. For example, India has adopted national plans to expand broadband access. Such ICT policy plans are created without reference to genderspecific barriers that women and girls often face, such as safe access to public internet sites. However, a root challenge remains the lack of experts at the intersection of technology and gender, and this needs to be addressed at the appropriate level in order to have trickledown effect

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