

Role of ICT for Sustainable Development

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Abstract:

Knowledge is a primary resource which more important than capital for improving the lives of people. In the recent years, one of the best tools for delivering information in India is Information and Communication Technology (ICT). We face many environmental challenges, including climate change, improving energy efficiency and waste management, water quality and scarcity, and loss of natural habitats and biodiversity. In this paper defines sustainable development and ICT have a potential to offer new opportunities for a creation of innovative solutions to move towards the sustainable development and explores the role ICTs play in climate change. However, ICT can accelerate development by facilitating access to information and can have effective role to promote sustainable development in India by raising awareness, sharing knowledge and environmental monitoring.

Keywords - ICT, Environment, Sustainable development.

1. INTRODUCTION

Modern technologies, such as information technology, biotechnology, new materials and aerospace technologies, have dramatically changed the way of life. Such technologies were developed in the past centuries and all the policies were recognized for enchasing human development. Information and Communication Technologies (ICTs) are often seen as the way to limit environmental problems and improve the aspects of our life under this context. At the same time, the production and use of ICT equipment has its own harmful impact on the environment.

The role of ICT based on two broad categories. The first are those largely dependent on traditional telecommunication networks that enable on-demand communications to provide information to the user's convenience and needs. The second those where information is processed, whether it is used at all, whether it is transformed into knowledge. For development to be sustained, it must integrate environmental, economic development and the well-being of all people, not just for today, but also for countless generations to come. This is the challenge for facing governments, non-governmental organizations, private enterprises, communities and individuals. There are so many researches and initiatives on utilizing ICT for sustainable development on national level, yet it was almost focused in already developed countries. On the other hand, there are some pilot ICT projects and researches for development in developing countries. It is also accepted that ICTs can promote sustainable development (Hilty et al., 2008). ICT sustainability refers to an approach of efficient and effective design, manufacturing, use, and disposal of computers, servers. It promotes economic viability and cost-effective management, including cost of disposal and recycling, while complying with social and ethical constraints. The recent World Summit on the Information Society focused extensively on Capacity building, Communications. ICTs play an important role in the economy transformation process and in addition they are a vital source of competitiveness for enterprises.

The definition of sustainable development pronounced by the World Commission on Environment and Development (1987). Hughes and Johnston (2005) address sustainability through three major components: continued economic growth and human development, protection and extension of social capital with a special emphasis on social equity, and protection of the natural environment [3]. Through the field survey the

following factors include financial factor, technical factor, human resources factor, logistical factor, motivation factor and political factor. They are equally important and often related with each other

The main motto of this paper is to understand ICT, its applications, innovations and strategies. It draws the attention of decision and policy makers in sustainable development of ICT. Furthermore, the benefits and the improvements in quality of life, economy, and environment through ICT are presented. Nowadays we face the challenges of sustainable development and economic recovery. Last few years, ICTs have been adopted in several areas of our lives and work, impacting upon our professional and private life, offering convenience, and improvements. Also, the benefits ICTs that contribute to environmental problems, consuming great amounts of electricity and generating carbon dioxide emissions.

1.1 Sustainable Development

Although there are many definitions of sustainable development, the most commonly quoted comes from the Brundtland Commission's 1987 report, "Our Common Future". Here, sustainable development is defined as "development which meets the need of the present without compromising the ability of future generations to meet their own needs". In this paper we define sustainable development as: A dynamic process which enables all people to realize their potential and improve their quality of life in ways that simultaneously protect and enhance the Earth's life-support systems. Sustainability Categories as economic sustainability, environmental sustainability and social sustainability. Hughes and Johnston (2005) have recognized that sustainable development is now as much about social equity for current generations as about efficient resource use and conservation of natural resources for future ones. Vallega (2001) explains that sustainability is intended as the result of the contextual pursuit of (i) the integrity of ecosystem, (ii) the efficiency of the economy, and (iii) social equity, including the rights of future generations. The following some factors are responsible for development,

- it is the key role to make the sustainable financial cycle by income generating activity.
- technical aspect is essential for sustainable development
- skilled human resources are required to develop and operate the system.
- Basic factors such as infrastructure, climate condition, roads and transportation, geographical element and communication in the sites should be considered for implementation of the development activities.
- motivation is a key to promote the community involvement. The community involvement is considered as an essential element for sustainable development.
- political factor is influential. Strong support of local government and central government is necessary to carry out the planned activities. Particularly in case of ICT project, the political factor would become important.

Many developing Countries have accepted ICT as a national mission. ICT has play important role even within manufacturing and industry. It also plays an increasingly important role, when Indian economy posted impressive overall growth, nearly one-third of the growth in productivity was attributable to ICT while growth rates of ICT even in developing countries are impressive.

1.2 ICT and the Environment

The relationship between ICTs and the environment is complicated, as ICTs can play both positive and negative roles. Positive impacts can come from dematerialization (J.W. Houghton, 238) and online delivery, transport and travel substitution, a host of monitoring and management applications, greater energy efficiency in production and use, and product stewardship and recycling. Negative impacts can come from energy consumption and the materials used in the production and energy consumption in use directly for

cooling. The direct impacts of ICTs on the environment are energy consumption and e-waste while indirect direct impact of ICT applications, such as intelligent transport systems, buildings and smart grids. The impacts enabled by the direct. Exactly what the impacts of ICT are, and to what extent there may be rebound effects, are widely discussed. However, it is clear that attempts to measure the impacts of ICT on the environment should take account of the potential rebound effects and the entire life cycle, rather than just the direct impacts of the product or application itself [9, 10]. In 2021, it was estimated that ICT equipment contributed around 4% to 7% of worldwide Greenhouse Gas emissions – 40% of this was reported to be due to the energy requirements of PCs and monitors, 23% to data centers, 24% to fixed and mobile telecommunications, and 6% to printers. For example, The Climate Group identified key areas of enabling impacts potentially leading to global emissions reductions by 2020 that were five times the ICT sector's direct footprint [1]. mitigation, mitigating other environmental pressures, and climate change adaptation.

1.3 The role of ICTs and Climate change adaptation

We have to adapt our lifestyles and our habits to reduce carbon in the planet's atmosphere and prevent runaway climate change that could threaten the ultimate existence of a habitable planet called Earth. The vital role of ICT is monitoring and providing early warning of climate change on the earth such as storm and tsunami, drought and flood, famine and disease. It has identified areas of vulnerability, ICTs allow a range of responses, with information networks playing a crucial role. Now a days technology is developing fast, and we are choosing to embrace it on the following factors.

- Renewable energy
- The digital revolution
- Environmental monitoring
- The sharing economy
- Smarter homes
- Electric cars

2. Discussion on ICT and Development Goal

The process of information technology exchange and reducing the transaction costs, this universal technology is instrumental in increasing productivity, efficiency, competitiveness and growth in all angles of human activity [8]. This technologies process to distribute and communicate the desired information to the specific audience and making the target audience more participative in nature. In spite of this great potential ICT can play in enhancing development. In recognition of this, the UN Millennium Declaration outlines a focus on partnerships with the private sector to "ensure that the benefits of new technologies, especially information and communication technologies are available to all. In its development strategy, it is a focus on mainstreaming ICT to contribute effectively to achievement of the development goals, particularly those related to income poverty reduction, education, health, environment.

Conclusion

The role of ICT will play crucial role when the economic problems pass from a certain power to change behavior and generates innovation towards dematerialization. It has effectively contributed to those related to income poverty reduction, education, health, environment and gender equity through contributing to poverty reduction, creating economic opportunities and providing basic services (e.g. healthcare, education) at lower cost.

The goals of sustainable development are to qualify all people to realize their potential and improve their quality of life. ICT itself is not in a force for sustainable development, but has both positive and negative

effects. In order to maximize the positive effects and minimize the negative effect for the sustainable development.

So, the technological revolution is of great significance for several reasons such as the ICT has an enormous range of applications and can be strongly empowering. Innovative ICT solutions can help organizations work out their priorities, informing decisions as to funding, staffing and resource allocation to improve sustainability and profitability.

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