Information and Communication Technologies for Enhancing Socio-economic Development at the Local Level in Sri Lanka: Issues, Challenges and Strategies[1]

Dr. R.S. Gunatunge
Department of IT and Decision Science
University of Sri Jayawardenapura
Sri Lanka
sgunatunge@sjp.ac.lk
Prof. M.M. Karunanayake
Department of Geography
University of Sri Jayawardenapura
Sri Lanka
mkaru@sltnet.lk

Abstract

Information and communication technologies (ICT) have been growing rapidly in developed countries over the last five decades. ICT has been revolutionising the way in which people in these countries live and conduct their work. ICT has changed the administration, governance, education, business competitiveness and global operations in them. The developed countries consider ICT as much vaunted technology for increased socio-economic development and depend on the "knowledge economy" for wealth creation. In contrast to the developed countries that have been steadily capitalising on the rapid pace of ICT, a large number of developing countries, particularly low-income countries have failed in the adaptation of these technologies thus contributing to the "digital-divide" between the developed and developing countries. This is predominantly so in the rural villages in that modern technology has not reached to the institutions in rural villages. In other words, the majority of people living in rural areas has neither access nor the means to obtain modern ICT because of their low economic position. ICT can be implemented within the institutions in rural villages to improve administrative processes, increase transparency of activities making them accountable to the public, connect villagers to the administration and socio-economic development, increase their knowledge base through greater participation and deliver better services to improve their socio-economic conditions. However, this can be achieved only through the development of social and physical infrastructure within the government institutes and villages. This paper presents the issues, challenges and strategies in this regard with reference to the Kotmale Divisional Secretariat Division in hill country Sri Lanka.

Introduction

Information and communication technologies (ICT) have been growing rapidly in developed countries over the last five decades. ICT has been revolutionising the way in which people in these countries live and conduct their work. ICT has changed the administration, governance, education, business competitiveness and global operations in them. The developed countries consider ICT as much vaunted technology for increased socio-economic development and depend on the "knowledge economy" for wealth creation. However, many developing countries have not taken up ICT to the fullest possible extent as a means of reaching increased socio-economic development by entering the knowledge economy (Sofield, 2000). In contrast to the developed countries that have been steadily capitalising on the rapid pace of ICT, a large number of developing countries, particularly low-income countries have failed in the adaptation of these technologies thus contributing to the "digital-divide"

between the developed and developing countries (Human Development Report, 2001).

A significant progress was made by Sri Lanka in the ICT sector during the 1990s. However, these technologies are limited to the Greater Colombo Region (Gunatunge, 2002). Nearly, 80% of the population living in rural areas has neither access nor means to obtain modern ICT because of their low-income. Although, Sri Lanka has aimed at distributive justice in terms of national development, the majority, that comprise rural communities stand to be left aside in the nation's path to progress widening the "digital-gap" between the haves and the have-nots.

Therefore, as part of an on-going research activity, the Department of Geography of the University of Sri Jayawardenapura under the assistance of the Sida-SAREC Research Cooperation Project has initiated research to identify critical issues and challenges in the development of ICT for communities in the local level[2]. The objective of this paper is to identify critical issues and challenges that are shaping ICT development, implementation and use in rural community development in the Kotmale Divisional Secretariat Division (KDSD) in the Nuwara Eliya District of Sri Lanka.

This paper is structured as follows. First, it briefly looks at the place of ICT in developing countries. Secondly, ICT in Sri Lanka is discussed. Thirdly, the research methodology used in the study is explained. Fourthly, a case consisting of issues and problems of developing, implementing and using ICT for rural community development in the KDSD is presented. Fifthly, the ways which ICT could be used to overcome these issues and problems are discussed. Finally, challenges of ICT development in KDSD are brought into focus.

ICT in Developing Countries
A prevalent belief that policy makers and managers in developing countries should focus on achieving pervasive ICT so that societal benefits will permeate to equivalent degrees of saturation as in developed countries (see Talero and Gaudette, 1995), has led many developing countries to increasingly adopt ICT for achieving enhanced socio-economic development (Waemer, 1996). It is believed that there is a direct social and economic value of ICT (Kling, 1996). For example, the US Labour Department announced in early December 1999, that productivity has risen by 4.9% in the third quarter of 1999, its biggest gain in almost seven years (cited in Splettstoesser and Kimaro, 2000).

Most developing countries have used ICT to improve results in productivity, increase efficiency of operations and effectiveness, strengthen management and administrative functions, improve market performance and increase business competitiveness (Avgerou, 1996). Therefore, ICT is recognised as a means to achieve more efficient socio-economic development in the developing countries (Meso and Duncan, 2000). Moreover, ICT is often identified as the key to the re-invention of the governments in developing countries in a liberalised market, following failures in the state

---

[2] In this paper, the terms 'local level' refers to communities living in rural villages such as Palamgammana village in the Kotmale Divisional Secretariat Division. We interchangeably use other terms such as 'local communities' and 'rural villagers' with the same meaning.

bureaucratic models of socio-economic development (Samaranayaka, 1999). For example, ICT can facilitate economic development by availing of information to make choice of development priorities easier and to plan and manage development activities better (Waema, 1996).

Many developing countries such as India have made economic management their prime agenda and use opportunities provided by the ICT to overcome the problems of rural poverty, inequality, and environmental degradation (Bhatnagar, 2000). In these countries, it is believed that development of information systems such as Document Management, Electronic Data Interchange, Group Ware for computer supported group work, and Internet and intranets can lead to innovative administrative information systems, improved service quality, more effective planning and thereby becoming a means of empowering citizens (Bhatnagar, 2000; Kiangi, 1996; Traunmuller and Lenk, 1996).

ICT in Sri Lanka
The use of computers in Sri Lanka began in the late 1960s and the early 1970s when certain state corporations and departments introduced computers at work for processing financial activities such as payroll, inventory, financial, and cost accounts on batch processing basis. The rationale for introducing computers to the state enterprises was the efficiency principle applied to the monitoring and controlling of government funds. Generally, during this period, information systems development (ISD) and practice was largely ad-hoc, with software vendors providing systems for state corporations and departments. These systems developed and produced in developed countries mainly the USA were promoted, sold, and served by agents in Sri Lanka.

The state organisations were mainly concerned with the reliability and accuracy of data maintained on their systems. Many of the state sector organisations, began their computerisation projects with little in-house capabilities (Samaranayaka, 1989), and focused on hardware acquisition rather than on developing necessary information systems infrastructure in-house. A number of projects introduced in this way did not have a significant impact on the improvement of performance of government corporations and departments in Sri Lanka (Gunatunge, 2002).

However, the expansion of computer applications for commercial and administrative purposes in Sri Lanka began with the liberalisation of the economy in 1977, resulting in more computers being used for financial and business applications. For example, in the 1980s, service oriented organisations such as Banks and most of the private sector institutions introduced IT for commercial activities (Samaranayaka, 1999).

IT Policy
In the mid 1980s, the need for a national computer policy for Sri Lanka was recognised. As a result the government established the Computer and Information Technology Council of Sri Lanka (CINTEC) by an Act of Parliament in 1984. The national IT policy objectives as stipulated by the CINTEC, involve the following:

(a) To harness computer technology in all its aspects, for the benefit of the people of Sri Lanka, and to further the socio-economic development of the nation;
(b) To promote and guide the development of computer-related resources and their application, to anticipate and meet the future needs of the national economy;

(c) To enhance and supplement manpower resources and increase the efficiency and productivity of management and employees at all possible levels;

(d) To improve the quality of life of the people of Sri Lanka, including the job satisfaction and working conditions of employees;

(e) To increase the flexibility and dynamism of Sri Lanka society to enable it to successfully meet the challenges of the future, arising from the ever-increasing pace of world wide scientific and technology.

These policies gave wide scope for ICT being used within both state and private sector organisations in the country. The apparent motivation was, and still is, the rationalisation of work practice by the use of ICT, rather than cost displacement (cost displacement is realised by substituting technology for people (Davis, 1992, p. 384). For example, in 1986, the Administrative Reform Committee of Sri Lanka recommended the extensive use of Management Information Systems (MIS) and ICT to ensure efficiency in the government sector organisations for rapid socio-economic development (Samaranayaka, 1999). Recently, these policies have been further widened to include community development, e-business, e-learning, and e-governance and more openly trumpeted under the banner of e-srilanka. This program can be considered as the first ever attempt in Sri Lanka introduced at the national level (Ministry of Economic Reforms, Science and Technology, 2003).

ICT and Socio-economic Development

In Sri Lanka ICT was, and still is, deployed in the context of enterprises striving for efficiency, productivity, and competitiveness in a liberalised market economy. It is conceived as one of the most significant forces of modernisation that provides a "technology push" for socio-economic development in the country (Samaranayaka, 1988).

The development of the ICT sector occupies a very important element in the annual budget (Budget Speech, 2001, 2002). The implicit assumption is that ICT will promote socio-economic development. For example, the Minister of Economic Reforms, Science and Technology recently stated that

> ICT has been revolutionising the … way in which we live and conduct our work. ICT is quickly changing the rules of the game globally dictating who will win and who will lose in commerce, administration, governance and education. The future of our country is at stake. The Government cannot afford to continue to operate without incorporating ICT into the fabric of life of the nation. Otherwise, Sri Lanka will be left far behind, while other countries which have adopted ICT progress" (Parliament Handsard, 2003).

In Sri Lanka, a significant progress was made in the application of digital technologies during the 1990s. Telecommunication infrastructure development through liberalisation has included an increase in land phone users (36 people per telephone), cellular telephone services organisations (currently 4 companies offering a combination of analogue and digital networks), paging services (5 operator companies), Internet service providers (28 companies), and implementation of modern communication technologies such as integrated services digital network (ISDN), Frame Relay, and very small aperture terminal (VSAT). There are five web site providers, who operate as resellers of licensed operators (Kularatna, 1999).

Presently, there are about 17214 e-mail and Internet subscribers (Central Bank, 1999). The development of telecommunication infrastructure signifies an indication of the

"emerging digital economy" in Sri Lanka (Ranasinghe, 1999). However, these developments are limited to the Greater Colombo Region. Nearly 80% of the population living in rural areas have no access to modern ICT. They are neither aware of the benefits of ICT nor are able to obtain them because of their low-income.

Methodology
The methodology used in this study was a qualitative one with the techniques of case study methods. As such, a study was undertaken in the KDSD to reveal empirical and interpretive understanding of ICT development, implementation and use practices. Ontologically, research lies within the subjective reality of the social world. Epistemologically, it is based on the replication of theory as against the generalization of the positivist perspective. Methodologically, it adopts a (de) constructionist position as against hypotheses testing in the positivist perspective to study social phenomena.

Research Method
The researchers used the case study method for the study (Myers, 1997). Case studies contribute in important ways to our knowledge about ICT development and practices (Yin, 1994). Case studies arise out of a need to understand and explain complex phenomena (Remeneyi et al., 1998). The case study method is increasingly being used as a qualitative research method in information research to explain the contexts within which systems are being developed, implemented and used (Darke, Shanks and Broadbent, 1998). Yin (1994, p. 13) defines the scope of a case study thus

> a case study is an empirical inquiry that investigate a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used.

Research Site
The research site selected for this study was the Divisional Secretariat (DS) and Palamgammana Village in the KDSD of Nuwara Eliya District (NED) in Sri Lanka. DS is the main government organisation which implements and coordinates government socio-economic and administrative programs in the KDSD. It is located in the new town centre called 'Kotmale Nawa Nagaraya' (KNN). Palamgammana Village (PV) is situated in proximity to both DS and KNN and it is one of the oldest villages in the KDSD. Both the DS and PV to who easily accessible carry out the study.

Research Respondents
Several respondents were interviewed both at institutional and village levels to understand and obtain a balanced view about ICT development and implementation for rural community development within KDSD. At the institutional level, 12 respondents (employees) of the DS were interviewed to understand: (i) various services that the DS offers to rural communities, (ii) ways in which the present services are being provided to rural communities, (iii) manner in which the DS has developed, implemented and used ICT for rural community development, (iv) nature of employee perception of ICT development and implementation within the DS for rural community development, (v) critical issues that shape ICT development, implementation and use for rural community development, and (vi) challenges faced by the DS to develop and implement ICT for rural community development. The

respondents included: Divisional Secretary, Administrative Officer, Accountant and three Clerks (responsible for preparing accounting reports using computers), Assistant Director in the planning division, two clerks in other divisions, two Grama Niladaries (GNs), and the Samurdhi Manager (SM).

Additionally, the former Dvisional Secretary of Kotmale DS, Additional Secretary and Chief Accountant in the Nuwara Eliya District Secretariat (NEDS), Senior Assistant Secretary (SAS) of IT division in the Ministry of Public Administration, and Director of Training at the Institute of Public Treasury were also interviewed. In order to understand ICT education within KDSD, SAS of IT division in the Ministry of Tertiary Education, two teachers of two government schools (only two government schools in the KDSD have introduced computing for students) and four IT trainers in private IT training institutes and the Chairman of the "Harangama Pradesiya Sabhawa (HPS)" (divisional council) were also interviewed.

At the village level, twenty respondents (villagers) including school children, school leavers, government officers, and few adults in the PV were interviewed to understand: (i) socio-economic and political context of the village, (ii) villagers' interaction with DS for their day-to-day service needs, (iii) the nature of the services being provided by the DS to the villagers, (iv) villagers' perception of the value of ICT for overcoming the socio-economic problems that confront them, and (iv) the critical issues and major challenges of ICT development, implementation and use within the village.

Data Collection, Documentation, and Validation
The principle data collection technique used in this study was the interview method. As such, interviews were conducted using a non-directive technique that allows respondents to focus on specific issues but permits them the freedom to expand on areas of personal interest and issues.

Interviews were documented. Each interview lasted one and half-hours to two hours. Interviews were mainly conducted using Sinhala language and these were paraphrased in English. Crosschecking was achieved by interviewing different respondents about the same issues, policy reports, circulars, observations, searching Internet webs, and attending a monthly progress review meeting at NEDS. In this way, the triangulation of data was obtained. Finally, a case description consisting of major issues, problems and challenges of developing, implementing and using ICT in the KDSD was prepared.

The KDSD -Case
Introduction
KDSD is one of the four Divisional Secretariats (DSs) in the Nuwara Eliya District (NED). The four DSs are administered and controlled by the NEDS. KDSD has a plural, multi-cultural, and agricultural society. The population is about 96,280. There are three major ethnic groups (Sinhalese 51%, Sri Lankan and Indian Tamils 42%, Moors 6.4%). (Assistant Director's Report, 2003). Employees in the Divisional Secretariat (DS) and villages in the KDSD use Sinhala and Tamil languages for every day communication.

The majority of Sinhalese are Buddhists. Farmers in the KDSD cultivate paddy, tea, coffee, etc in their own and the lands provided by the government. Few people (3.4%) are employed as teachers, drivers, security personnel and clerks in government sector organizations. These villages received a fixed income. Generally, the unemployment rate among the youth and adults is very high. About 11392 (12%) people receive subsidiary benefits from the major welfare program *Samurdhi* launched by the government.

There are 25,642 families, 96 Grama Niladari Divisions (GNDs) and 117 Samurdhi Niladari Divisions (SNDs) in KDSD. Of the 25642 families, 79% live in their own houses, 5.8% live in rented houses and 15.2% families have no houses at all. About 26.8% families have electricity. Only 577 land telephones lines (0.6%) and 52 mobile phones are available for public and private sector institutions such as DS, schools, hospital, banks, rest house, *Pradesiyasabhawa* etc. The procession of mobile phones by individuals is extremely rare.

The Divisional Secretariat in KDSD
NEDS oversees the Divisional Secretariat (DS) in the KDSD. The formal authority of the DS flows from the NEDS. The head of NEDS is the District Secretary who is appointed by the President on the recommendation of the Minister of Home Affairs. The present District and Local level administration emanates from the Colebrook reforms introduced in 1833 (Wijeweera, 1998). It has undergone considerable change in the context of devolution of power to the provinces. At present the administrative structure is highly bureaucratised and politised.

The head of the Divisional Secretariat (DS) is the Divisional Secretary. Within the Kothmale DS, there are 58 employees employed in several capacities to perform various activities of both the central government (25) and the provincial council (33). Some of these employees are employed as field officers such as the village development officer, social service officer, community development officer, sport officer, cultural officer, development coordinator, professional counsellor, peace advisor, environment development officer, youth services officer, science and technical officer. Additionally, there are 96 Grama Niladariess and 117 Samurdhi Niladaries. The DS is responsible to the central government and provincial councils for all the government activities executed within the KDSD via the DS of NEDS.

Functions and Activities of DS
DS is the only government organisation in the KDSD engaged in implementing and coordinating social and development programs of the various line ministries of the central government and the provincial council ministries. Its major role is to implement social, economic and administrative programs initiated by political leaders, cental government, line ministries, provincial councils and divisional council (*Pradesiyasabhawa)*.

These social and economic programs are implemented and coordinated through seven main sections established within DS. These sections are: administration and establishment, finance, planning, land, permit, *Samurdhi,* and registration.

The administrative officer coordinates general administrative work of internal staff, field officers and GNs. An accountant heads the finance section and coordinates all

the accounting activities. These include: preparation of monthly and annual accounting reports, payment of salaries and pensions, issuing of vehicle licences, *Samurdhi* payments, payments of poor reliefs, land compensation payments, and all the other payments done by the DS. An assistant director coordinates planning activities of the KDSD. These activities include: collection and maintenance of socio-economic data pertaining to the KDSD, preparation of monthly reports of all the social and economic projects which have been implemented within KDSD and sending of monthly progress reports to NEDS and providing socio-economic data to government institutions such as the department of census and statistics.

Land section performs land distribution, acquisition of land, preparation of deeds, settlement of land disputes, and monitoring of the progress of land development under the direction of the Assistant Divisional Secretary (ADS). The permit section issues timber permits, timber transport permits, sand mining permits, liquor permits, and business registration permits under the supervision of ADS. Samurdhi section is organised under the supervision of DS. The planning section coordinates the activities. Additionally, a manager appointed by the Samurdhi Authority looks after daily activities of the Samurdhi section. 117 field officers are employed to assist the implementation of Samurdhi activities. Registration section is responsible for the registration of births, deaths and marriages and the issue of birth, death and marriage certificates to the residents in the KDSD. Among these activities only the preparation of monthly and annual accounting reports, payroll, and pension in the finance section is handled using computers. All other activities are performed manually (Interview with the Divisional Secretary and employees, 2002).

Sources of Funds
The DS receives funds from several sources to coordinate and implement social and development programs within the KDSD. These sources include allocations from: (i) the decentralised budget given by the central government to the DS via the NEDS, (ii) provincial councils, (iii) the *Samurdhi* authority to implement *Samurdhi* program, (iv) allocations from line ministries, and (v) divisional secretary's vote via district secretary for office administration such as payment of employees' salaries, wages, travelling, poor relief and pensions etc. (Interview with former DS, 2003).

Funds received under the decentralised budget, i.e. Rs. 3.5million for each Member of Parliament within the district is allocated among DSs at District Development Committees (DDC). A Member of Parliament representing the existing government usually heads these committees. The District Secretary functions as the Secretary of the committees. At these meetings, each Member of Parliament provides a proposal containing social and development programs to be implemented within the district. Some members provide proposals containing social and development programs to be implemented only within their chosen electorates. In both cases, each member informs the way that his or her money should be spent by the DDC. In this way, District Secretary allocates money from the decentralised budget among the respective DSs in the district. DS implements and coordinates these social and development projects. Accordingly, monthly and annual reports are submitted to the treasury via the NEDS (Interview with Divisional Secretary, 2003).

The Members of Parliament decide the social and development programs that should be implemented by a particular DS. Sometimes the political supporters of the villages

present these needs to the politicians for their own benefit rather than of the villagers (Group interviews with villagers, 2003). However, there are no genuine efforts to identify the needs of villagers and incorporate such felt needs in the development programs. The villagers do not actually participate in deciding on social and economic development programs that concern them (Group interviews with villagers, 2003). In point of fact, money allocated in this way benefits only the politicians and their supporters but not the poor villagers (Group interviews with villagers, 2003).

Similarly, Provincial Council Members decide on the social and development projects to be carried out within each DSs without identifying the real socio-economic needs of the villagers. The Provincial Council funds these programs and the DS implements and coordinates them. Most of these projects are geared towards gaining economic and political advantages (e.g. collecting votes) in the interest of politicians rather than in the interest of villages (Group interview with villagers, 2003). These projects are, therefore, largely top-down than bottom-up. Because of the disparate manner in which projects are selected, there is no proper coordination between the projects initiated by the members of the central government and the members of the provincial councils. This lack of coordination leads to waste and misuse of funds resulting also in the lack of transparency (Interview with former Divisional Secretary, 2003).

The GNs and field officers, collect socio-economic data for the planning division. These data are routine and structured. Data are collected annually and processed manually. This process has become a routine requirement rather than the one that is required for the planning of socio-economic development within the KDSD. More importantly, data collected by the planning division are not related to the real social and economic needs of villagers in KDSD. Consequently, some politicians do not use the information collected by the planning division and implement their own agendas in the villages (Interview with the Assistant Planning Director, 2002).

Additionally, there exist data duplication and redundancy leading to inefficiency and poor transparency. For example, different field officers such as *Samurdhi* Niladaries (SNs) and GNs collect similar information but they do not tally with one another. GNs and other field officers manipulate these data for their advantages (Interview with Assistant Planning Director, 2002). Similarly, information provided by some field officers is distorted and there is no feedback mechanism from the DS to the villagers and vice versa (Interview with Office Administrator, 2002). There is no proper system to correctly understand the socio-economic needs of villagers. But it is imperative that the socio-economic needs of villagers be properly taken into account in the implementation of socio-economic development projects for the welfare of rural people.

ICT use in the Divisional Secretariat
In 1986, the Administrative Reform Committee of Sri Lanka recommended the use of MIS and IT to ensure efficiency in the government sector organisations for rapid socio-economic development. As a result, in 1993, Sri Lanka Institute of Development Administration (SLIDA) had developed software compatible with disk operating system version (DOS) called "SIGAS" aimed at processing accounting information within government departments. Consequently, this information system was introduced in 1995 within the DS in the KDSD to process monthly and annual accounting data and to submit reports to the treasury through the NEDS.

In 1999, the National Institute of Business Management (NIBM) developed an information system, namely Government Payroll System (GPS) for processing the pay roll. Subsequently, this GPS was introduced within the government sector organisations including the DS in the KDSD. Moreover, in 2000, the Pension Department also introduced another information system to prepare pension payment slips. These three types of information systems are installed in two computers located at the accountant's office of the DS and three different clerks working in the accounting section perform the computing activities. Other employees are not allowed to use these computers because of the fear of damaging the computers and therefore perform their routine work manually (Interview with employees, 2002).

One of the objectives of introducing computerised accounting information systems (CAIS) into the DS was to transform it into an efficient and an effective organisation. However, information systems have not made much impact on changing the working practices and the culture of the organisation. To date both manual and computerised accounting information systems co-exist. As explained by the three clerks working in the accounting division, no one has yet asked them to stop manual processing and focus only on computer processing (Interview with computer operating clerks, 2002). Apart from this lack of policy, auditors ask for the manually prepared reports rather than the computer-generated reports (Interview with accountant, 2002). More importantly, employees prefer to work with manual systems. A one clerk put it,

> "it is very easy to work with and understand manual systems than computerised systems because we can see how transactions are related and how they function, but with computers we don't know what is happening inside. Therefore, we check all the computer-generated reports manually too. This process is cumbersome because we have too much of work to do with both manual and computerised systems. Apart from all these we use computers because we were asked to do so. Otherwise we wouldn't".

Except for these barely trained clerks in the accounting section, all other employees are illiterate in IT. This is very common not only within the DS in the KDSD but also within the NEDS (Interview with the accountant in the NEDS, 2002). This illiteracy exists not only among middle and lower level employees but also among the senior officers (Interviews with District Secretaries, 2002). Therefore, the senior executives do not provide proper leadership to introduce IT related systems to improve administrative systems within departments (Interview with the Senior Assistant Secretary, 2003). Even though, the government has recognised the importance of introducing IT within government sector organizations for achieving socio-economic development (http//www.esrilanka), so far there are no such initiatives at the village level institutions. Administrators and other employees are incapable of developing computerised information systems to assist in village level socio-economic development.

More importantly computers have not been provided adequately to perform other activities. Apart from the lack of computers, there are problems of maintenance of existing computers. If a computer breaks down, there is no internally trained person to repair it. The procedure for repairing a computer is long and it should be undertaken by an approved organization. This process takes months and interrupts the internal data processing activities. The cost of repairing a computer is also very high. At some

times a new computer may be bought for the price paid for repairing a computer (Interview with computer operating clerks, 2002).

Because of the incompatibility of the different software, the three information systems are not integrated and operate independently. The clerks working with these systems too have not acquired the relevant skills to develop such an integrated system combining the three systems (Interview with computer operating clerks, 2002). They have been given training on an ad-hoc basis. However the knowledge gained from the training was barely sufficient to manage the day-to-day processing activities (Interview with computer operating clerks, 2002).

The need to implement accounting information systems emerged from the efficiency criteria and the accountability paradigm. In mid 1995, a tight financial controlling system was introduced within the government sector organisations (Interview with former Divisional Secretary, 2003). As a result, every DS should submit monthly accounting reports by the 5th of each month to the Treasury through the District Secretary. Accordingly, before the 5th of each month, a hard copy of the computer print outs of accounting reports with the signature of the relevant authorities is sent to the District Secretary. In addition, a soft copy, i.e. a floppy diskette is handed over to the District Secretary in person. Sometimes, email is used to send an electronic copy, but the District Secretary does not   respond to information submitted until it receives the hard copy in keeping with government policy that requires authorised signature to authenticate documents (Interview with the Accountant, 2002). Therefore, email facilities are hardly used for improving administrative activities.

Generally, many employees in the DS do not like to change their existing working habits and culture. Most of the employees perform their duties according to the traditionally established manual systems. They adhere to government rules and procedures and perform routine work. Some employees perform the same work rather mechanically for nearly ten to twelve years. When new tasks are assigned to these employees, they are reluctant to do so because they do not like to take up new challenges and risks (Interview with Administrative Officer, 2002).

Motivation is lacking to use ICT at work in the senior positions of the government sector organisations. Therefore, they do not provide active leadership to implement new changes via ICT. Nearly, 90% of the senior officers are illiterate in ICT. For example, the majority of officers of various departments who attended a monthly progress review meeting at NEDS were ICT illiterate and had a negative impression about the use of ICT in their work (Observation at the monthly progress meeting at NEDS, 2002). Therefore, they are unable to give proper directions and leadership to change the government sector organizations through the adoption of ICT to improve the social and economic programs (Interview with SAS, 2003).

Furthermore, they do not like to change mainly because of the fear of loosing their existing power relationship with the rest of the employees. The existing bureaucratic culture protects their political hegemony within as well as outside the organisations. For example, if on-line information sharing systems are introduced, the senior officers will lose their commanding position because they are not literate in ICT and have to depend on other employees for information from computerised information systems (Interview with SAS, 2003).

Some politicians do not have a positive attitude towards the introduction of ICT within the administration. They do not rely on the information produced by computerised systems. According to the accountant at the NEDS, he had prepared a database using MS spread sheet to allocate election officers within the district at the last general election which was not wide received by the politicians. They did not trust this system and wanted him to revert to the manual system (Interview with accountant in the NEDS, 2003).

Palamgammana Village in the KDSD
The population of Palamgammna Village (PV) is 927 comprising 294 families. They belong to 288 households. The population is mainly Sinhalese (98%)and Buddhist (99%). Most villagers fall into the category of either farmers or labourers. The farmers cultivate paddy, tea, coffee, etc in their own land or government owned land. Thirty-five villagers are in permanent wage employment, 50 villagers are self-employed, 165 are engaged in temporary work and 68 villagers are unemployed. It is found that 190 families (65%) receive benefits from the Samurdhi program (Assistant Director's Report, 2003).

Communication within the village is largely informal. In everyday communication, word of mouth communication is predominant. Hundred and eighty-four families (62%) do not have electricity. The modern day technology such as ICT is yet to reach the village. However, 150 householders have own TVs and 275 householders have Radios (Assistant Director's Report, 2003). In the evening, villagers without radios or TVs gather in places where they are available to follow various programs such as musical shows, news etc. This may generate exchange of information by the villagers. In this way, social interaction has become increasingly mediatised. Generally, villagers have a fair understanding of the social, economic and political context of the country. However, the media constantly threaten the traditionally held values systems of the village (Interviews with youths in the PV, 2003).

Villagers in the PV are divided on the basis of party politics. Political power within KDSD shifts between the two major political parties namely, the United National Party (UNP) and the Sri Lanka Freedom Party (SLFP). Inter group rivalry resulting in damage to property belonging to the opposing party members are common when one or the other of the two fractions form a new government. For example, some villagers in the PV stated that the division of villagers according to party politics has constrained socio-economic development of the village over the last five decades (Group interviews with villagers, 2003). As pointed out by many villagers, during the election period politicians visit the village and make promises but they do not come bade the village once the election is over (Group interview with villagers, 2003).

People in the PV often visit the DS seeking various services. However, according to some villagers the services they receive are not satisfactory due to delays in decision-making on the part of some of the DS employees. For example, some villagers stated that they have to visit the DS several times to get something done (a land deed or a birth certificate). If a villager happens to know an employee working in the DS, his or her request will be processed quickly while others have to queue up (Group interview with villagers, 2003).

Generally, there exists a high level of motivation among youths, particularly school children and school leavers, to learn IT to secure a job to overcome their economic hardships. For example, some villagers stated that they send their children to private training institutes for training in IT mainly for the purpose of securing jobs. However, facilities at such as training institutes are not sufficient; e.g. qualified teachers to impart IT related skills. Hence training provided at these institutions is not sufficient to develop IT related skills. Presently, a few youths who can afford the cost of training go for IT related education to few private institutes in major cities such as Kandy and Nuwara Eliya. Few schools also offer computer training. The training provided by both government schools and private institutes is largely technical. It is also inadequate and largely ad-hoc and does not provide the technological know-how to educate students in IT.

The teachers in schools and instructors in private institutes understood only MS word, Excel and Power Point as IT tools. These teachers and instructors have not acquired proper training in IT to teach students. Their training is inadequate to cultivate technological innovations in the minds of youths. For example, one woman stated that, she had sent her daughter to a private IT training institutes after paying Rs 3000 as the tuition fees for the course, but her daughter is still at home because she could not find a job due to lack of knowledge gained from the training course (Interview with a woman in PV, 2003).

Apart from the lack of facilities to learn computing, there is also the belief among village students that IT learning is an elite activity for the rich and those who could afford it (Interview with youths, 2003). For example, a youth who had made several visits to rich houses in Colombo to sell his *Kitul jaggery* (a sweet made out of the soup of the *kitul* palm) stated that he saw how computer learning has become part of the everyday life of children in cities. He pointed out, that the youths and children in villages are left out of knowing and learning ICT. Majority of youths in this village have passed G.C.E (O/L) and/or (A/L) examinations. They are eager to learn English and ICT to find suitable jobs and contribute to the socio-economic development of this country, but they are prevented from the process of knowing and learning ICT.

Youths in this village have no opportunities to learn ICT and English and to make use of them as part of their everyday life. Therefore, many youths in this village are frustrated (Group interview with youths in the village, 2003). Generally, villagers wanted politicians and administrators to listen to their everyday social and economic problems and address them within their social and economic programs. However, they are largely ignored as not of primary importance. Both the bureaucracy and the politicisation prevented any meaningful participation of villagers in social and economic decision making at the local level.

Emerging Issues
In the KDSD the DS under the direct supervision of District Secretary of the NEDS implements and coordinates all the social and development programs initiated by both the central government and the provincial councils. For this purpose, DS receives money from various sources. Except for the preparation of monthly and annual accounting reports, payroll and pensions, all the other activities are performed manually at the DS. The DS administration is seen from the interviews with officers assumed that ICT would improve the efficiency of social and economic development

programs being implemented within KDSD. However, the ways of handling administrative, social and economic activities at present have raised several issues leading to inefficiency, lack of transparency and thus accountability to the public.

The DS formally followed the bureaucratic and rational legal procedures and the government in the administration of social and economic affairs within its realm of jurisdiction. Decision-making at the DS was guided by bureaucratic ideals that have been institutionalised as norms and normative structures within it. The senior administrative officers, being bureaucrats, did not want to see their power diminishing exercise vis-à-vis the employees and villagers. This rigid bureaucracy severely restricted the socio-economic development at the village level.

Generally, the inability to develop ICT based information systems (CIS) within the DS to help the villagers was due to the existence of bureaucratic rationality. This bureaucratic rationality was rooted in the historical context of administration of government organisations in Sri Lanka (Wijeweera, 1998). As many other government sector organisations in Sri Lanka, the DS followed the ideal model of formal bureaucratic rationality to implement and coordinate social and economic affairs (Weber, 1947). While the state was acting as a provider of guidance and services to helping villagers, the covert but highly institutionalised and politically manipulated apparatus hampered the village level development. The politicians were effective in the manipulation of the declared objectives of government's socio-economic development for their benefit and of their supporters.

The rigid bureaucracy, impractical top-down approaches in decision-making and communication, use of overly authoritarian power structures, and unrealistic intervention by politicians in the DS affairs constrained employees to engage in critical examination and self-reflection of their work. As a whole, many DS employees are not aware of the use of ICT in discharging their responsibilities. They have no capacity to develop information systems to improve their service delivery and thereby help villagers. Apart from the lack of awareness, the DS was not provided the required infrastructure facilities to develop and implement information systems to improve the service being provided to the villagers. Instead, the DS officials have become myopic masters of the use of bureaucracy leading to a self-imposed ideology that bureaucracy is the ideal form of administration and control of organisations.

Another problem that contributed to the inefficiency of the DS was that the politicians are the exclusive preserve power for the control and access to resources. The politicians often arbitrarily influenced and changed the direction of DS activities, particularly that of social and development programs in their interest rather than that of the villagers. The senior administrators have minimal power or their power is weak as compared to the political power exercised by the politicians of the ruling government. They are unable to provide proper advice and guidance the politicians. Hence the reverse is often true.

Co-existing bureaucracy and political domination has prevented the DS from becoming an efficient organisation. Consequently, villagers have become instruments of bureaucrats and politicians and their social and economic life mediated by them. Thus social and economic programs are not based on clear objectives agreed upon by the villagers. Many of the projects introduced in this way have served the partial interest of the politicians in power rather than serving the wider interests of local

communities. Generally, the officials have minimal power to change the decisions of politicians and they are unable to make the DS an effective organisation in the implementation and coordination of social and economic programs for local communities.

The above analysis and discussion raise several issues in relation to ICT development and implementation for community development at the DS in the KDSD.

First, how to overcome all pervasive bureaucracy, corruption and politicisation of various activities making the administrative process more transparent and accountable to the public through the development and implementation of ICT to benefit the local communities? Secondly, within a range of relationships, how could the officials become effective in helping villages through ICT development and implementation? Thirdly, how to change the attitudes of employees including that of the senior officials to embrace ICT in their everyday activities to improve the services being provided to the villagers? Fourthly, how to improve the level of ICT use among youths in villages to make them innovative? Finally, how to make use of the knowledge of local communities for the socio-economic development of the country by combining experiential knowledge with ICT?

ICT led Socio-economic Development at Village Level
Sri Lanka aims to achieve its economic development through the wide application of ICT in business, administration, health, education and other sectors. This is evidenced in the recent Information Act presented to the Parliament. Even though the new focus of attention is economic activity, improving government services, building of social infrastructure and human development will continue to be important areas of concern particularly in the rural sector to address the aforementioned issues. It is believed that the application of IT would lead to innovative administrative systems which can enhance policy formulation, promote participation, improve service quality, make planning more effective, empower citizens, and improve transparency and accountability of government affairs (Traunmuller and Lenk, 1996).

Improving DS Services through the Application of ICT: Challenges and Strategies
The DS performs different but highly integrated activities such as general administrative work, accounting, planning and monitoring, land allocation and registration, issue of permits, *Samurdhi*, receipts of funds, registration of births, deaths and marriages. The basic objective of building and implementing information systems is to expand the various services being carried out while improving their efficiency. Computerization of these activities would lead to improved service quality. Using the network and Internet facilities DS can integrate various activities enabling DS employees to share information with various line and provincial council ministries operating at the District level. And NEDS enables the DS to quickly share information and respond to the needs of villagers.

Information systems such as Decision Support Systems (DSS) would help the DS to plan and monitor various social and economic programs implemented within the KDSD. The use of Geographic Information Systems (GIS) can assist to identify location of development programs and disaster prone area. Introduction of electronic document management (EDM) for land allocation and registration of land recipients, issue of permits, registration of births, deaths and marriages would improve the

efficiency and quality of services being provided enabling the DS's employees to overcome unnecessary delays in the processing of activities. Provision for PCs for accounting and management of funds received from various sources would lead to improve the transparency and accountability to the public because information becomes recorded and online. Similarly, providing PCs to field officers would lead to accurate information. And to improve, coordinate and monitor socio-economic projects and consequently transmit information on line to the DS planning.

However, building such applications within and outside the DS is a highly challenging task because of the long established socio-cultural and negative attitudes of employees towards using ICT at work. This is mainly due to the lack of awareness of ICT applications, lack of commitment to work, poor knowledge in English, illiteracy in ICT, and long established bureaucratic culture. Additionally, a misfit of socio-cultural values of employees and the values of ICT has resulted a poor motivation to systems being developed, implemented and used. Moreover, successful application of ICT within DS is constrained by the unavailability of physical infrastructure facilities such as computers, telephones, Internet facilities, maintenance facilities, and unrealistic rules, procedures and at times by outdated administrative and financial regulations that best suit a 'closed' but not an 'open economy'.

Successful application of ICT within the DS requires building consensus among the administrators and employees, building the required social and physical infrastructures.

At present, some external experts dominate the ICT development and implementation activities in the organization where the actual users and affected parties are ignored. ICT should be developed taking into consideration the socio-cultural values and the needs of the users and affected parties. Systems should be culturally and socially amenable because ICT is developed, implemented and used within a wider socio-cultural context. It should be fit to socio-cultural values operating within the DS. Any forced attempt to introduce ICT within the DS will be defeated by the existing socio-culture. Hence, an open, participatory approach would enable the DS to develop and implement necessary ICT within it.

Development of social infrastructure includes organizing awareness programmes of ICT and training programs in ICT, changing law, and English. Building physical infrastructure involves provision of adequate physical resources such as PCs, telephones, maintenance and Internet facilities, and changing existing law and procedures of administration. A recent change of law in relation to electronic transmission of information is indeed commendable. A circular issued by the Secretary to the Prime Minister and Chairman/Administrative Reforms Committee (Administrative Reform Circular no.1/03, 2003) states,

> It is necessary to introduce the electronic culture within government organizations to expedite government processes.

It encourages the use of electronic communication for sharing of information However, parallel to the change of law, other aspects in the social and physical infrastructure too should be developed to create an ICT culture within government organizations including those at the local level.

Human Development through the Application of ICT: Challenges and Strategies

The basic objective of human development is to enlarge the range of people's choices and make development more participatory and democratic (Human Development Report, 1991). It allows sharing of knowledge. It is only by allowing people to participate in the development process that development in its different manifestations can be achieved. This means that sharing of knowledge is an interactive process of making the right information available to people at the right time in a comprehensible manner to enable them to act judiciously- enriching the knowledge base in its entire mechanism (Nath and Scholar, 2000).

ICT can improve the knowledge and awareness of villagers by providing information about social and economic programs, markets, employment opportunities, medical, agricultural, educational and training, weather and disaster warning. This can be achieved by establishing a "networked integrated centre" (NIC) within the village and integrating it to the DS. By integrating the villagers' with the social and economic programs through the NIC, decision makers and policy planners would be able to include a range of needs as voiced by the villagers and make development a more participatory and democratic process.

Similarly, the DS can make use of NIC to share information with line and provincial council ministries. And disseminate information on receipts of funds, use of funds for various social and economic projects, distribution of state lands, and disbursement of *Samurdhi* and other social benefits. The NIC can be used to provide information on health practices, new methods and techniques of farming etc. Furthermore, NIC can also be used to raise awareness among youths, school children, women and other marginalized groups in the village. In this way, the knowledge base of the villagers can be improved.

However, the major challenge is how to build the NIC to benefit the villagers. Prior to introducing the ICT to the village, it is essential to develop the environment in which such technologies can be implemented. As stated earlier, the villagers cannot afford ICT because of their generally low economic situation. Hence, the intervention of the government or some collaboration with the private sector is essential to build the NIC within the village.

The development of social infrastructure involves creating awareness of ICT, developing competence in accessing computers and networks, developing the level of literacy in ICT, developing ICT systems compatible with Sinhala language, providing training in English and generally educating the villagers on benefits of ICT use. The development of the physical infrastructure involves the development of NIC, telephone, electricity, and houses. It is only through such an endeavour that the "digital-gap" between the haves and the have-nots could be bridged to benefit local and village level socio-economic development.

Conclusion
As a developing country, Sri Lanka is far behind in the application of ICT in government sector institutions. To date the development of ICT applications at village level include few mechanisms to ensure its remote rural communities able to receive the ensuing benefits. ICT can be developed and implemented within the state

institutions in rural areas to improve administrative processes, increase transparency of activities to make such activities accountable to the public and deliver better service to improve the socio-economic conditions of villagers. And ICT can also be developed and implemented within the rural villages to connect villagers with the socio-economic development activities of the central and provincial governments, improve their participation, increase their knowledge base and empower them. However, this can be achieved only through the building of consensus among the administrators, employees, and villagers and the development of the social and physical infrastructures within the government institutions such as the DS in the KDSD and in the villages such as Palamgammana.

References

Avgerou, C. (1996). Transferability of information technology and organisational practice. In M. Odedra-Straub (Eds.), *Global IT and Socio-Economic Development*. Nashua, New Hampshire: Ivy League Publishing, 106-115.

Bhatnagar, S. (2000). Social implications of information and communication technology in developing countries: lessons from Asian success stories. *The Electronic Journal on Information Systems in Developing Countries* [On-line]. Available WWW: http://www.unimas.my/fit/roger/EJISDC/ EJISDC.htm, 1, 1-9.

Budget Speech (2001). Ministry of Finance and Planning. Sri Lanka: Colombo.

Central Bank of Sri Lanka. (2001). *Annual Report*. Sri Lanka: Colombo.

Computer and Information Technology Council (CINTEC). (1984). *Act No. 10*.

Darke, P., Shanks, G., and Broadbent, M. (1998). Successfully completing case study research: combining rigour, relevance and pragmatism, *Information Systems Journal*, 8, 273-289.

Davis, G. B. (1992). A model for adoption and diffusion of information systems in less developed countries. In S. Palvia, P. Palvia & R. Zigli (Eds.), *Global Issues of Information Technology Management*. Harrisburg, PA: Idea Group Publishing.

e-Sri Lanka. (2003) Ministry for Economic Reform, Science and Technology [On-line] Available WWW: http://www.esrilanka.lk/staff.htm

Gunatunge, R.S. (2002). Information Systems Development and Practices in Organizations in Sri Lanka: An In-depth Case Study, Unpublished PhD thesis submitted to the Edith Cowan University, Western Australia, Perth, Australia.

Human Development Report (1991). United Nations Development Programme (UNDP). Oxford University Press.

Human Development Report (2001). Technology's role in reducing poverty in developing countries [On-line]. Available WWW: http://www.colombopage.com.

Kiangi, G. E., and Tjipangandjara (1996). Opportunities for information technology in enhancing socio-economic development of a developing country. In M. Odedra-Straub (Eds.), *Global Information Technology and Socio-Economic Development*. Nashua: Ivy League Publishing, 73-81.

Kling, R. (1996). The centrality of organisations in the computerisation of society. In R. Kling (Eds.), *Computerisation and Controversy: Value Conflicts and Social Choices*. (2nd ed.). San Diego, C.A: Academic Press, 109-132.

Kularatna, A.D.V.N. (1999). Telecommunications development in Sri Lanka: an independent assessment. In A.D.V. de. S. Indraratna (Eds.), *Fifty Years of Sri Lanka's Independence*. Colombo: SLISES, 432-458.

Ministry of Economic Reforms, Science and Technology, 2002. E-Sri Lanka: An ICT Development Roadmap, Colombo

Myers, M. D. (1997). Qualitative Research in Information Systems. *MIS Quarterly*,

21(2), June, 241-242. MISQ Discovery, archival version [On-line]. Available WWW: http://www.misq.org/misqd961/isworld/. MISQ Discovery, updated version, April 28, 1999, http://www.auckland.ac.nz/msis/isworld/.

Nath. V., and Scholar, I. (2000). Heralding ICT enabled Knowledge Socities: way forward for the developing countries [On-line]. Available WWW: http://www. members.tripod.com/knownetwork/articles/heralding.htm.

Odedra-Straub, M. (Eds.) (1996). *Global Information Technology and socio-economic development*. Nashua, N. H: Ivy League Publishing.

Ranasinghe, B. (1999). Editor's comments. *IT Exchange, 7*(2).

Ratnayaka, R. M. K. (1999). Poverty in Sri Lanka: independence and poverty reduction strategies. In A. D. V. de. S. Indraratna (eds.), *Fifty Years of Sri Lanka's Independence*. Colombo: SLISES, 577-591.

Remeneyi, D., Williams, B., Money, A., and Swartz, E. (1998). *Doing Research in Business and Management*: *An Introduction to Process and Method*. London: Sage Publications.

Ryker, R, and Nath, R. (1995). An empirical examination of the impact of computer information systems on users. *Information Management*, 29(4), 207-214.

Sachs, W. (Eds.). (1992). *The development dictionary*: *A guide to knowledge as power*. London: Zed Books.

Samaranayaka, V.K. (1988). *Implementing new technologies: issues and strategies*. Paper presented at the Castme Pacific Regional Workshop, 1-15.

Samaranayaka, V. K. (1989). *Key Not Address*: Ninth national computer conference organised by the computer society of Sri Lanka.

Samaranayaka, V. K. (1999). Fifty years of information technology. In A. D. V. de. S. Indraratna (Eds.), *Fifty Years of Sri Lanka's Independence*. Colombo: SLISES, 417-429.

Sofield, T. H. B. (2000). Outside the net: Kiribati and knowledge economy. In F. Sudweeks and C. Ess (Eds.) (2000), *Proceeding of the Second International Conference on Cultural Attitudes Towards Technology and Communication* (pp. 3-26), Perth, Australia.

Splettstoesser, Do, and Kimaro, F. (2000). Benefits of IT-based decision making in developing countries. *The Electronic Journal on Information Systems in Developing Countries* [On-line]. *Available WWW*: http://www.unimas.my/ fit/roger/EJISDC/ EJISDC.htm, 3, 1-13.

Talero, E, and Gaudette, P. (1995). Harnessing information for development: a proposal for a World Bank group vision and strategy. *Information Technology for Development*, 6, 145-188.

Traunmuller, R., and Lenk, K. (1996). *New public management and enabling technologies, advanced IT tools*. Edward, London: Chapman and Hall, 11-18.

Waema, T. M. (1996). Implementation of IT projects and economic development: Issues, problems and strategies. In M. Odedra-Straub (Eds.), *Global Information Technology and Socio-Economic Development*. Nashua: Ivy League, 8-18.

Weber, M. (1947). Sociological categories of economic action. *Max Weber*: *The theory of Social and Economic Organisation*. New York: The Free Press.

Yin, R. K. (1994). *Case study research*: *Design and methods*. London: Saga Publications.