

E3 - Framework for Telecenter Network Sustainability Development

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ABSTRACT

Although Telecenters are playing a major role in developing remote, rural communities; their sustainability has become a central issue, thus it requires to develop adoptable, scalable and replicable solutions to face emerging Telecenter challenges in the 21st century *Digital Knowledge Economy*.

E3 is a Framework researched in *Telecenter Network Sustainability Development*, used e learning, e business and e leadership as key strategies to provide answers to critical sustainability issues faced by Telecenters. This aim of this paper is to present E3 framework and It's implications in shaping future Telecenter networks.

The research is based on a one year M & E assignment carried out to improve sustainability of Nenasala Network in Uva Province, Sri Lanka. The 60 Nenasala used in research forms a physical network and most importantly forms social networks involved in Telecenter movement. E3 research focuses on technical, social and economical aspect of network development that impact sustainability of Telecenters and formed networks.

The E3 is a Framework is built on a cultural footing with local language to create an inter-actor communication platform to enable knowledge sharing and to encourage collaboration to formulate *Collaborative Network Strategies (CNS)* to develop a *Network Development Plan (NDP)* for building *Multi Stake Network Partnerships (MSNP)* in order to develop network wide e learning, e business services and e leadership, aimed to create a digital knowledge economy around the Telecenter Network.

This paper describes E3 methodology, its approach and how E3 was applied to improve sustainability of Uva Nenasala Network, discusses E3 findings with examples and faced challenges and finally analyzes effectiveness of E3 on improving Telecenter Network

performance. The paper also intends to initiate a discussion on E3 and Telecenter Network sustainability to create a base for future Telecenter Network development research. As a result of E3, The *Sustainability Index (SI)* of Uva Telecenter Network grew from 2.6 to 5.1 in the 12 months. *SI* is a 1 to 10 scale indicator that describes the Telecenter and Telecenter Network sustainability position.

Openness, inclusion, participation and collaboration are important strategies for Telecenter Network development.

Developing Telecenter Networks require development of Network leadership, collaborative partnerships, content and services to improve network economy.

The E3 research conclusions are that openness; inclusion, participation and collaboration are important strategies in Telecenter Network Development. The social sustainability of Telecenters has a key important in gaining long term financial profitability. E learning is a key strategy in Telecenter development and require wider spectrum of subjects and content to serve community needs. E3 is a viable framework for building Telecenter economic networks and require further studies enhance learning on, how e learning, e business and e leadership implications in Telecenter Network Sustainability.

1.0 INTRODUCTION

Although Telecenters are playing a major role in developing remote, rural communities; their sustainability has become a central issue. Recently, researchers have shown an increased interest in addressing Telecenter sustainability issues. The research to date has tended to focus on Telecenters rather than Telecenter networks; therefore lack emergence of adoptable, scalable and replicable solutions to face emerging Telecenter challenges in the 21st century *Digital Knowledge Economy*.

This aim of this paper is to present E3 framework and It's implications in shaping future

Telecenter networks and based on one year preliminary research carried out to improve sustainability of 60 Telecenter Network in Sri Lanka; and intends to initiate a discussion on E3 approach for Telecenter Network Sustainability for future Telecenter research.

Keywords: Nenasala, Telecenter/Telecentre, Sustainability, E3, e-Learning, e-business, e-leadership, Sri Lanka, Rural Community, ICT4D, Research

1.1 Uva Province

Uva province, situated south east of Sri Lanka. Uva is traditionally challenged with transportation, communications and high poverty and records lowest education results due to lack of educational resources and the community suffer from poor economic conditions, health and environmental issues. Yet there are vast untapped natural resources in uva and present lot of opportunities for development. (See figure 1.0)

1.2 Uva Nenasala Network

The 60 Nenasala used in research are distributed across the Uva Province forming a physical network of Telecenters and most importantly forms a social network involved ICT4D in different scale. This research focuses on technical, social and economical aspect of network development that impact sustainability of Telecenters and formed networks, or Telecenter Networks.

1.2 Previous Studies

A considerable amount of literature has been published on Telecenters; but lack network context as well as addressing of local sustainability issues. Telecentre.org has useful discussions in various aspect of Telecenter sustainability. Telecentre 2.0 (Roger Harris, 2007) provides an insight into modern Telecenters. Impact Monitoring & Evaluation for Developing of Sustainable Tele Center Networks (2009), RIT reports and ICTA RFP referenced in this research.

1.3 E3 Framework

E3 stands for e learning, e business and e leadership (see figure 2.0) and designed to serve emerging digital knowledge needs of rural societies, to develop micro economic networks and to address global development concerns through Telecenter leadership. The general meaning of 'e' in E3 is defined as "research and development process for integrating ICTs to serve social needs".

In a broader sense 'e' could be elaborated as a "way of thinking, an attitude and a commitment for networked development to improve society using ICTs". In ICT4D 'e' also gives combined meanings of efficiency, enhancement, empowerment, encouragement, extension, equity and enabling environments.

E3 recognized openness, inclusion, participation, collaboration as its key philosophies and admits that effective use of ICTs catalyze the development. The e learning and e business development are self explanatory keywords and e leadership aimed to address United Nations' Eight Millennium Development Goals (MDGs), in 6 key thematic areas (i.e. Education & technology, Economic and livelihood, Agriculture and environment, Women & youth and health, Networking & government services, Culture & integration). These themes influenced E3 in building zonal, district, regional and National *Telecenter Knowledge Networks (TKN)*. (Figure 3.0)

E3 framework (see figure 2.0) created on a cultural footing, made local language a key element; to create an open platform for inter-actor communications for enabling knowledge sharing and collaboration. The open communications helped revealing of network issues and needs to formulate Collaborative Network Strategies (CNS) and a Network Development Plan (NDP) to create an enabling flatworm for building Multi Stake Network Partnerships (MSNP) to develop network wide e learning, e business services and e leadership to create a digital knowledge based economy, around the Telecenter Network.

2.0 Material and Methods

E3 based on M & E assignment of ICTA, is a Public Private and Community (PPC)

partnership implemented by e fusion collaborating with Uva Telecenter community. The research used mixed methods, involving open as well as structured approaches. In depth interviews using questionnaires and observations of the activities and facilities and took part in focus group meetings. Telecenter performance data collected periodically through M & E process and produced a needs assessment, monthly, quarterly capacity building, and content deployment reports.

2.1 Needs Assessment

A Needs assessment study covered 80% of Nenasala and studied policy, infrastructure, management, operation, content and services, Nenasala operator, zonal and regional issues to identify Nenasala needs (List 1.0) which lead to creation of a *Nenasala Development Plan* to be implemented through the M & E process integrated with capacity building, deployment of content & services and technical assistance.

2.2 The M & E model

The goal for M & E was set by ICTA RFP as “Nenasala would be able to generate sufficient revenue to ensure its sustainability in the long term” To fulfill this requirement E3 developed a living model to evaluate each Nenasala and the Network to assess the impact of M & E activities done to improve Nenasala sustainability.

E3 evaluation model used a set of informative, quantitative and qualitative indicators that described each Telecenter and its performance. E3 designed *Sustainability Index (SI)*, a unified indicator to describe Telecenter sustainability position, derived from the monitored indicators. The performance data fed into the model and used statistical methods to track changes in performance of each Nenasala and zonal, district and provincial networks. (Figure 5.0)

2.3 Integration of Culture and local languages

Building E3 on ground, culture and local language served the footing for the development process. (Figure 2.0) Culture was the common thread for integration and helped creation of the social formation for the Network. The need also justified by 48%

Temple Nenasala presence in the network. The workshops done in local language encouraged more participation and interactivity. The content created in local language helped Nenasala to learn essential skills in Telecenter Management, Technology and Community development.

2.4 Communication and Networking flat form

Open Communications were used as a key strategy to engage Nenasala in the network development. (Figure 4.0). It required awareness, training in communication tools and multiple channels in communications. “The E3 communication platform enabled creating and delivering of messages among regional, national and global Telecenter actors to initiate network actions for managing Network M & E process for sustaining Uva Telecenter Network.” (CASE STUDY: E3 Network Communications Platform, 2009)

Communication skills training included Sinhala and Tamil Unicode local language standards, online communications, virus care, and hardware and network maintenance. Postal communications helped inclusion of Nenasala owners who were not connected. The communication was complemented by phones, email, Google group and a social network were used to publish e learning content, initiate discussions, organize events and advocacy. However meeting as physical groups helped establishing better communications.

2.5 Regional Nenasala Think Tank

RIT facilitated Nenasala to form a think tank and formulated set network strategies served as guidelines for development of the Network.

1. Networking of business and government.
2. Professionalizing Telecenter operators.
3. Implementing local language e learning.
4. Business tools and content for Telecenters.
5. ICT for youth, women, children and health

6. ICT for environment, agriculture, energy and culture.
7. Aligning Nenasala objectives with National objectives.
8. Initiating Network projects
9. Institutionalizing Telecenter network
10. Research and global collaboration

2.6 Building Multi stake partnerships for network leadership

E3 research found that earlier attempts to develop a community organization and leadership had not yielded expected results. “Earlier formed entities lacked structure, inclusion and openness” Nenasala operators said. E3 collaborated with Nenasala operators to design a new community organizational model and formed *Telecenter Community Association (TCA)* aimed at developing Telecenter Networks. The unique features of the TCA were inclusion of all actors, bottom up structure and grass root empowerment. TCA has become a strong enabler for collaborative network development.

2.7 Development of e-learning, e business and e leadership

The e learning, e business and e leadership are broad concepts in meaning and the implementation, needed appropriation to meet local needs with in available resources. Shilpa Sayura and ICT literacy in Local Language were network wide e learning examples which helped improving usability and economic improvement of Nenasala.

3.0 Results and Discussion

At the initiation of project E3, Nenasala in Uva had faced critical sustainability issues as they were challenged with isolation; limited knowledge in ICT4D; lack of locally relevant content. Technical support and training needed to improve their performance. E3 training improved Nenasala communications, reduced Nenasala technical issues, involved community, increased e learning and other services, developed network leadership and improved network economy.

3.1 Communication development

E3 found out in August 2008 that 75% of the Nenasala were facing risk of closing down. The establishment of zonal networks in Mahiyangana, Hali-Ela, Thanamalwila, Bibile and Monaragala increased communication, local collaboration, peer to peer technical support and knowledge sharing which transformed isolated Telecenters to a collaborative network with a common vision.

3.2 E – Learning development

Uva province poor education facilities resulted poor examination results and early school drop increasing unemployed youth. This was an opportunity for Nenasala. E3 developed advanced ICT courses like Web designing, Networking, Hardware and ICT Literacy and National Curriculum available in local language, which improved Nenasala position in education, increased usage and revenue. Siyambalanduwa, Haldumulla, Talakumbura, Nagala, Hingurukaduwa, Thanamalwila, Kandiyapitawewa, Mapakadawewa and Buttala Telecenters used e learning as a key strategy to sustain them self.

Siyambalanduwa Nenasala had been closed when we first visited in June 2008. The computers were missing parts, no internet access and the Nenasala had been abandoned and the worst was that the owner was not corporative, but E3 inclusive efforts made Nenasala operational again; trained a local community teacher; developed e learning services with Shilpa Sayura. After one year over 150 students creates revenue over Rs 35000 per month, which is significantly higher than network average. Siyambalanduwa has become one of the best examples of Telecenter sustainability. It was e learning and Nenasala operator leadership made the change.

3.3 e Business development

E3 found that there is a need for e business services to access to external markets to get better prices for their produce, but e business hasn't been explored by Telecenters. It's the presence of a network that can create such market, but still simple e business processes are tried by Nenasala.

Talakumbura Nenasala offered a successful service to pay community electricity bills using internet banking. They also initiated a low cost digital photography services for national ID cards. Both services saved 25km travel time and costs for the community. Punsisigama Nenasala intends to collect local commodities from women, store it and sell at better prices, but they don't have initial investment capital. Balagolla Nenasala has opened an agriculture store to provide supplies at a lower cost. The results are yet to come. Bandarawela, Koslanda, Haldemulla and Glenore are engaging in BPO opportunities and creating local jobs are replicable examples of e business.

3.4 e Leadership developments

Nenasala are generally engaged in culture and youth development activities. Badalkumbura, Madagama, Balagolla Nenasala are Non Profit Organizations (NPO) involved in Organic Agriculture and Environment development. Balagolla Nenasala teaches adults how to write and conduct art training for carpenters and do women micro economic development. Surprisingly, It was found that, among 48 Nenasala operators none were aware of MDGs, is a clear evidence that information on major global development initiatives are not reaching rural communities. The reasons could be availability of such information in local language and accessible media.

Research found that Nenasala needed new knowledge to improve their communities in maternity Health, environment sustainability, sustainable agriculture, Youth and women empowerment; Content can help them create social actions to bring these issues into community agenda.

Thalakumbura Nenasala contributing to peace and community harmony started teaching Tamil language to young Buddhist priests with the help of a Muslim priest, is a global example of cultural harmony by Telecenters. Nagala Nenasala involved in indigenous agriculture development, Hingurukaduwa, Kandiyapitwewa, Haldummulla leading rural youth education development are examples of Telecenter leadership which helped their social sustainability.

4.0 Analysis

When E3 started 75% of the Nenasala was isolated and facing a risk of closing down. The *Sustainability Index (SI)* was 2.6 in June 2008. E3 set a goal to achieve *SI* of 6.0 by November 2009. In May 2009, The Network *SI* grew from 2.6 to 5.1. It's a 96% increase of network performance with in a year. (Figure 5.0) . Project E3 made poor Nenasala to reduce from 38% to 18.33% (Figure 6.0). In 36 of the Nenasala (60%) studied; average number of users and income had grown from 28 to 101 and Rs. 7650.00 to Rs. 17597.00 respectively with in a year. This is viewed as significant increase of performance in the network. (List 2.0).

4.1 Impact of Shilpa Sayura e Learning

43 Nenasala (72%) who provided Shilpa Sayura E learning recorded an average *SI* of 5.0. In this group 93% Nenasala had an average *SI* of 6.5 with standard deviation of 1.28. Among 28% Nenasala who did not provide Shilpa Sayura e learning, recorded an average *SI* of 3.9 with standard deviation of 1.70. In terms of income Shilpa Sayura Nenasala recorded an income of Rs 19995.00 and 118 users in average. Although high number of users recorded at some Nenasala, the income stayed low as Nenasala charged subsidized fees. Currently Shilpa Sayura e Learning implemented in 151 Nenasala, serves over 10,000 students and earns around Rs 800,000 per month for the network.

4.2 Effectiveness of E3

E3 helped M & E process and evaluation of effectiveness activities to asses impact and performance change in the Network. The feedback from community increased Nenasala and Network activities, increased usage and revenue, local, regional, national and international advancements made by Nenasala were further evidences of effectiveness of E3 approach for developing Telecenter Network sustainability. The research finding and resulted learning also has improved E3 to research further finding replicable solutions.

5.0 Social and Financial Sustainability

An important finding was that it was the younger generation who were using Telecenters for e learning and Shilpa Sayura had become one of their main resources. The older community who lacked interest in using Nenasala for education became comfortable with multimedia projectors based learning. Unavailability of multimedia projectors had made Nenasala to focus on rural youth for e-learning and ICT literacy services.

This finding raises a question, weather Nenasala should focus on youth to develop a future market or invest in services for adults to make more revenue? Finding an answer to this question require considering of Nenasala sustainability in a context of short term and long term goals of the network.

Telecenters greatest impacts were in education, creating jobs, incomes and skills in their communities. Nenasala is a micro-social-enterprise now challenged to achieve financial sustainability within their social purpose. Monaragala, Bibile and Sevanagala Nenasala took the advantage of their city location to offer value added services to sustain them selves. Balagolla, Nagala, Talakumbura like Nenasala located in rural poverty pockets used volunteering, extended opening hours and lower fees in there operational philosophies to sustain them selves. The sustainability strategies varied in both cases.

Balagolla, Wekumbura and Kandewinna Nenasala challenges the context sustainability based on financial profitability by surviving with low income far below the network average? "Its our duty to maintain Nenasala, unless it will close down" they said. It's the commitment of three female operators Dilhani, Nisansala and Nirosha made their Telecenters sustain.

It's a broad question how these findings translate to Telecenter Network sustainability? And how will they influence the definition of Telecenter sustainability biased for financial survival. Most of the well performing Nenasala showed that they have become socially

sustainable before becoming financially sustainable which suggests that sustainability of Telecenters is a more of a social arrangement.

Thanamalwila Nenasala had been closed and abandoned; Sampath and Wasana a newly married couple took over the Telecenter and started operating it. They both lived by the side of the Telecenter. They collaborated with local government office and community leaders to develop a scholarship program for ICT literacy for poor children. A local NGO interested in proposal partly funded them. It's hard to believe that 60 students joined the program, completed the course. There were no drop offs. After an year Thanamalwila planning to open a branch in the town. This case of sustainability again based on social work they did, which finally translated to financial profitability.

6.0 Challenges of E3

Among key challenges of Telecenter sustainability development were getting the support of diverse Telecenters to establish a trusted network to bridge knowledge gaps and finding of resources to build capacity of Telecenters.

7.0 Conclusions

Openness, inclusion, participation and collaboration are important strategies for Telecenter Network development.

The social sustainability of Telecenters has a key important in gaining long term financial profitability.

Developing Telecenter Networks require development of Network leadership, collaborative partnerships, content and services to improve network economy.

E3 could be used as an adoptable, scalable and replicable solution for Telecenter Network development, in which e learning is a key strategy, and wider spectrum of subjects and content in local language required to serve community education needs.

8.0 Future Research

The first phase of E3 research focused on developing capacity of Nenasala and implementing e learning services. A way of elaborating the conclusions above is to continue research and development in Uva province to enhance the learning on “How e learning, e business and e leadership can develop Telecenter Network sustainability?”

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About Author

Niranjan Meegammana is an ICT4D activist, involved in grass root Telecenter development; has strong experience in e learning, e business and local language technologies, online community building and local content. Niranjan is a Member of ICTA E-Society focus group, Member of Sri Lanka Evaluation Association and Computer Society of Sri Lanka, Managing Director of E fusion, and the designer of Shilpa Sayura Project which won several Global ICT4D awards.

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<http://www.Shilpasayura.org> (retrieved may 2009)

Figure 1.0

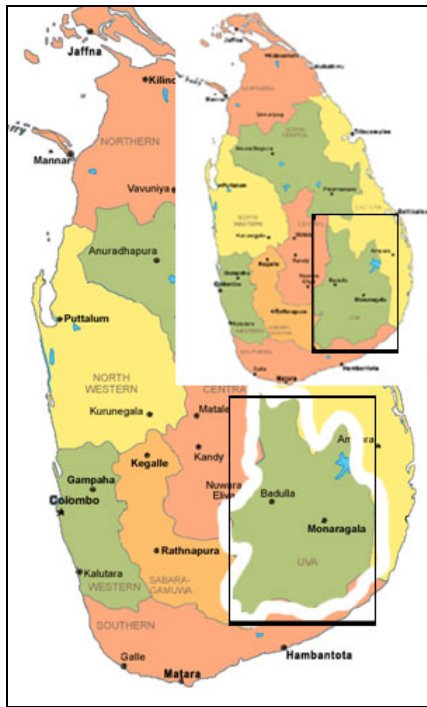


Figure 2.0

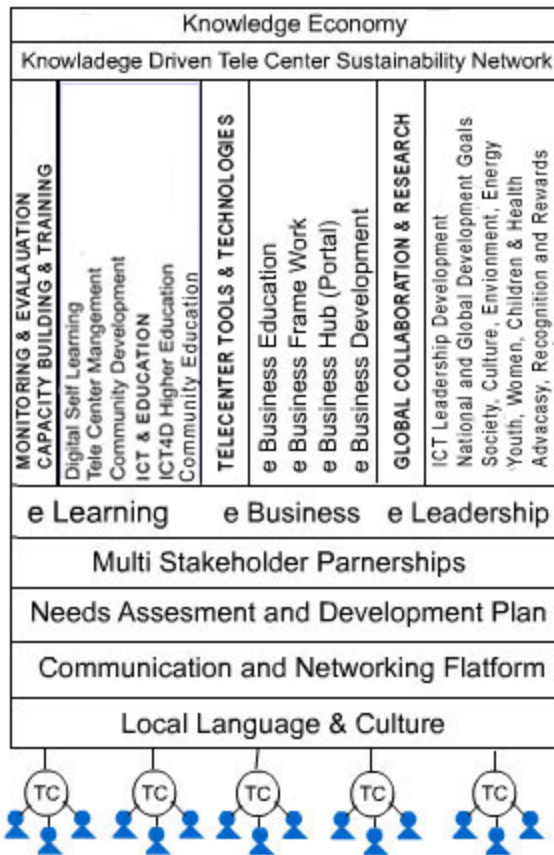


Figure 3.0

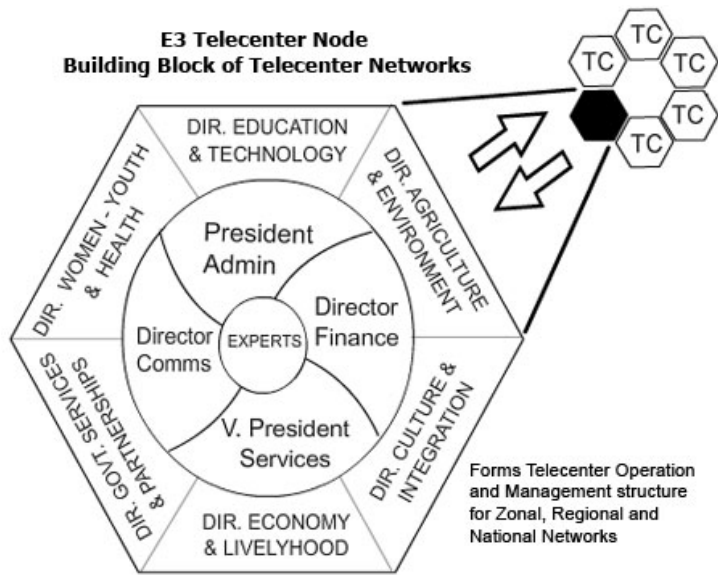


Figure 4.0

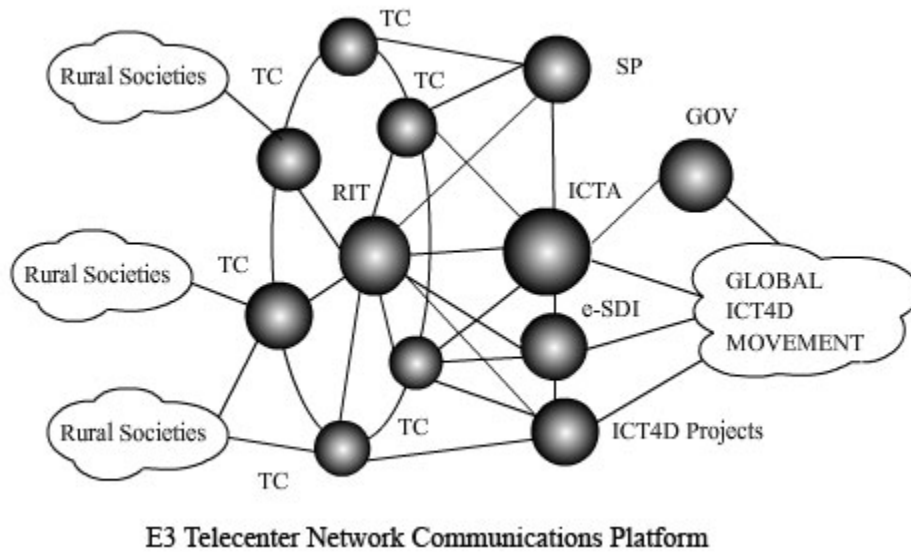


Figure 5.0

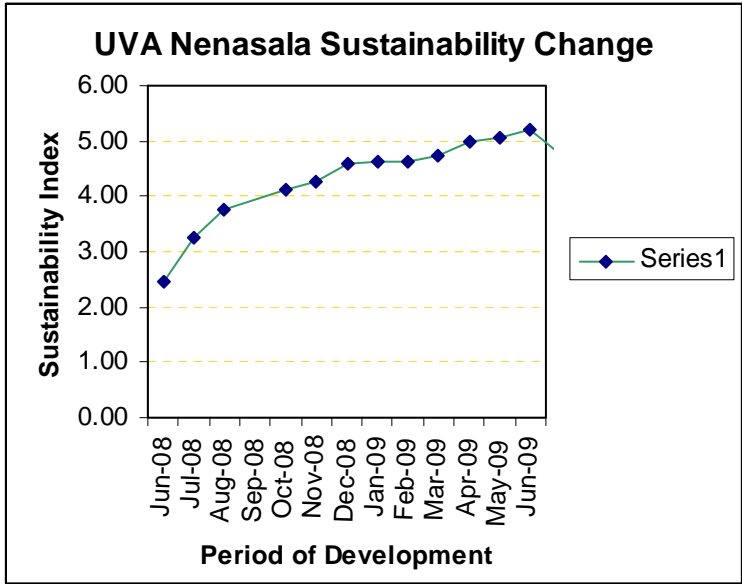
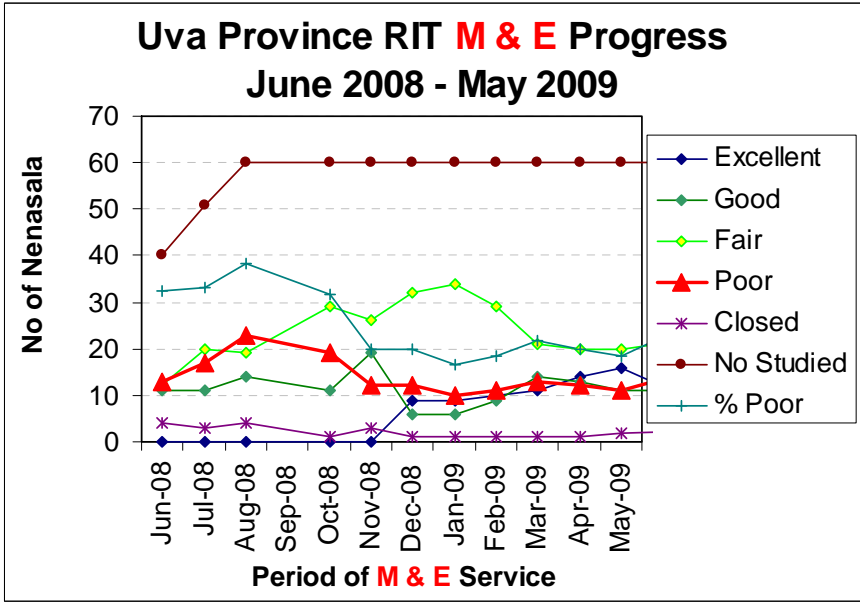


Figure 6.0



List 1.0

1	Infrastructure
1.1	Improving of internet access
1.2	Improving regular hardware maintenance
1.3	Improving of technical support, Frequent electrical breakdowns

1.4	Assistance to upscale
2	Policy
2.1	Local government need to make use of Nenasala to improve their presence in community.
2.2	Local and National governments need to create an enabling environment for Nenasala
3	Management
3.1	Nenasala need a clear mission and objectives
3.2	Nenasala need governance structure needed to manage operations effectively
3.3	Nenasala Leadership needed to identify local opportunities and needs to be served
3.4	Nenasala activities need community participation in
3.5	Nenasala need collaboration in the network
4	Operation
4.1	Need improving record keeping
4.2	Need service innovation
4.3	Need to make better pay for staff
4.4	Need marketing to improve visibility in the community
4.5	Need professional advice for Nenasala innovation
4.6	Need to create partnerships for services
4.7	Need investments in areas that can bring revenue
4.8	Need to improve operational strategies
5	Content and services
5.1	Need to improve content and services awareness
5.2	Need locally relevant content and services and new services
5.3	Need content for youth and women
5.4	Need government services
6	Nenasala Operators

6.1	Need essential Technical, Management and community skills
6.2	Need communication skills
6.3	Need for Networking among operators
7	Zonal and Regional
7.1	Need inter Nenasala corporation
7.2	Need Networking among Nenasala
7.3	Need Zonal and regional training facilities
7.4	Need knowledge and resources sharing
7.5	Need government and business relationships
7.6	Need to engage in regional business activities

List 2.0

Telecenter	Monthly Sustainability Index											
	1	2	3	4	5	6	7	8	9	10	11	12
Badulla Town	6	6	6	6	6	6	7	7	7	7	7	7
Bhuddhappriya	1	1	1	1	3	2	2	2	2	3	2	3
Bandrawela	5	6	6	6	6	6	7	7	7	7	7	7
Thalakumbura	0	4	3	3	4	4	5	5	6	6	6	7
Warakanda	0	0	1	1	2	1	2	2	4	2	3	3
Heeloya	5	6	6	6	6	6	6	6	7	6	7	7
Giradurukotte	1	1	0	1	3	4	4	4	4	5	5	6
Koslanda	5	6	6	5	5	6	5	5	6	6	6	6
Haldummulla	5	5	5	5	5	5	7	7	7	7	8	9
Etampitiya	3	4	5	5	6	6	7	7	7	7	6	5
Perahettiya	0	0	0	0	3	0	4	4	3	3	2	0
Hali-Ela	2	3	3	3	3	4	4	4	4	4	4	4
Oodoowara	5	5	6	5	5	6	5	5	5	5	6	6
Glenanore	2	4	4	5	5	4	5	5	5	5	6	6
Andawulpotha	2	2	2	2	4	4	4	4	4	4	5	5
Lunugala	3	3	4	4	4	5	4	4	4	4	4	5
Mahiyanganaya	3	3	3	3	3	4	5	5	6	6	6	6
Keselpotha	4	6	5	5	5	6	5	5	5	6	6	6
Meegahakiula	4	4	3	4	4	4	4	4	4	4	4	4
Narangala	3	3	3	3	3	4	5	5	4	5	5	5
Mapakadawewa	3	4	5	5	5	5	6	6	6	7	7	7
Olangangala	1	2	1	2	2	1	2	2	1	1	2	2

Saraniya	1	2	3	3	3	3	3	3	4	4	4	5
Abagahawatte	3	3	4	4	4	5	4	4	5	5	4	5
Maspana	2	3	3	3	4	3	4	4	4	4	4	4
Bogahakumbura	2	4	4	5	5	6	5	5	5	6	6	6
Gavarammana	3	5	6	4	5	6	6	5	5	6	6	6
Kebellegrama	0	2	3	3	3	3	4	4	1	3	3	3
Kandedgedara	1	2	3	3	3	4	4	4	4	5	5	5
Welimada Town	2	4	5	5	4	5	3	3	3	4	3	3
Nugathalawa	1	3	4	3	3	2	3	3	2	2	3	3
Badalkumbura	1	3	2	2	3	3	3	3	3	3	3	3
Wekumbura	1	2	3	3	4	4	4	4	4	4	5	5
Higurukaduwa	5	6	6	6	6	6	7	7	7	7	7	7
Bibile	5	6	6	6	6	6	7	7	7	7	7	7
Nagala	2	3	4	5	5	5	5	5	6	6	7	7
Diyakobala	4	4	5	6	6	6	5	6	5	5	5	5
Unavatuna	4	4	4	4	4	4	5	5	5	6	7	7
Pelwatte	3	4	4	5	5	6	5	5	5	6	6	6
Kataragama Dv	2	3	3	4	4	4	3	4	4	3	4	4
Kataragama Dt	3	4	5	6	6	6	6	6	6	7	4	4
Kariwila	4	5	5	6	6	6	6	6	6	6	6	6
Katharagama Kv	1	3	3	4	5	4	4	4	4	4	6	6
Kandawinna	1	3	3	3	3	4	4	4	4	4	4	4
Therulla	0	0	0	0	2	0	3	3	2	2	3	3
Medagama	0	0	0	0	0	0	3	2	2	2	2	2
Monaragala	5	5	5	6	6	6	7	7	7	7	7	7
Maduruketiya	2	4	4	4	4	3	4	4	4	3	4	4
Yalkubura	1	3	3	4	3	3	3	3	2	2	3	3
Sevanagala	5	6	6	6	6	6	7	7	7	7	7	7
Mahagama	4	5	6	5	5	6	6	6	6	6	6	7
Siyabalanduwa	0	2	2	3	4	4	4	4	5	6	7	7
Ethimale	2	3	3	3	3	4	3	4	3	2	3	3
Kandiyapitawewa	5	5	5	5	5	5	7	7	7	7	7	7
Balaharuwa	4	4	4	5	4	5	5	5	5	4	5	5
Punsisigama	3	4	4	5	4	5	5	5	5	5	5	5
Wedihiti Kanda	1	1	1	1	1	1	0	0	0	0	0	0
Wellawaya	4	5	5	5	5	5	5	5	5	5	5	5
Sooriya Ara	2	2	2	3	3	3	4	4	4	4	5	5
Thanamalvila	3	4	4	4	4	4	5	5	6	6	7	7
Province Average	2.6	3.5	3.7	3.9	4.1	4.2	4.6	4.6	4.6	4.8	5	5.1