KENET

THE KENYA EDUCATION NETWORK TRUST (KENET)

STRATEGIC PLAN 2007 - 2010

Establishing Sustainable Networking and Communication among Kenyan Educational and Research Institutions

JANUARY 2007

ACRONYMS AND ABBREVIATIONS

CCK   Communications Commission of Kenya
ICIPE   International Centre of Insect Physiology and Ecology
ICT   Information Communication Technology
ISP   Internet Service Provider
IT   Information Technology
KENET   Kenya Education Network
NREN   National Research and Education Network
USAID   United States Agency for International Development

PREFACE

The Kenya Education Network (KENET) is a membership (not-for-profit) organization that currently provides Internet services to 42 higher education institutions. Another five higher education institutions have already lodged applications to become members. The institutions include all the 13 private and 6 public universities in Kenya as well as national and international research bodies. In total, the institutions have a student population of about 100,000 and over 5,000 faculty members and researchers. KENET is constituted as a Trust with a small secretariat of four highly qualified Information Technology (IT) professionals and one Administrative Assistant.

Apart from providing Internet services, KENET also aims to transform and strengthen the capacity of the leadership and the faculty members of the member institutions so that they can make more effective use of information and communication technologies (ICT) in teaching, learning, research, and management. This will be achieved by organizing workshops for heads of the member institutions and facilitating training of ICT support staff in the management and expansion of institutional IT infrastructures. KENET is also evolving into a national education and research network that supports faculty members and researchers in Kenya.

This Strategic Plan is an Interpretation of the KENET leadership's vision for the next four years. We aim to become a truly National Research and Education Network by providing efficient, affordable and reliable connectivity services to our member institutions. We all have a role to play for the betterment of our education through leveraging on ICTs. Let us pull together.

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1. BACKGROUND AND CONTEXT

Between 1995 and 1999, all universities in Kenya had recognized the need to provide institutional Internet access to their students and faculty members. A few of the universities had signed up with local Internet service providers (ISPs) to provide institutional Internet access at very high costs of about US$ 4,000 per 64 kilobytes/second. The academic research community had also started publishing papers on radio-based national academic network, similar to the Joint Academic Network in the UK. In 1999, the Kenya government received an initial grant of US$ 300,000 from the US government through the Leland Initiative. The Kenya government decided that the grant would be used to provide Internet access to educational institutions. A multi-stakeholder forum, dominated by higher education institutions, started meeting to discuss how the grant would be utilized for the benefit of educational institutions. The main expectation was that each institution would have access to affordable Internet access at reasonable speed.

It is against this background that the Kenya Education Network (KENET) (http://www.kenet.or.ke) was created in 1999 as a membership institution for educational and research institutions. It was constituted as a trust whose beneficiaries included students, faculty members, and staff in the member institutions. Currently, it has eight trustees: three vice chancellors of public universities, two vice chancellors of private universities, the Permanent Secretary Ministry of Education and the chief executive officers of Telkom Kenya Limited—the national fixed telecommunications incumbent operator—and the Communications Commission of Kenya (CCK)—the Kenya government regulator of all information and communication services (see http://www.kenet.or.ke/about/index.php? yah=structure). The trustees are assisted by a management board representing universities and research institutions in Kenya. As expected, one key objective of the trust is to provide cost-effective Internet access that would support teaching, learning, research, and management.

KENET provides Internet services to 42 member institutions in Kenya representing a student population of about 100,000 and over 5,000 faculty members and staff members. Five other institutions have lodged applications to join the network. KENET has continued to provide cost-effective Internet connectivity to its member institutions. This connectivity is achieved because KENET is a not-for-profit institution and gets international bandwidth from Jambonet at 50% of the commercial rate available to Kenyan ISPs. It has also joined the Africa Institutions of Higher Learning Internet Bandwidth initiative supported by the Partnership for Higher Education in Africa (see http://www.foundation-partnership.org). The satellite Internet bandwidth under the partnership is available at a monthly cost of US$ 2330 per Megabit/Second compared to the commercial price of US$ 3000 per Megabits/Second. These savings are all passed on to the member institutions. KENET is a founding member of the UbuntuNet Alliance that is negotiating direct access to the East African submarine undersea optical fibre cable system (http://www.eassy.org, http://www.unbuntunet.net) to further reduce the cost of international Internet bandwidth to its member institutions.

Apart from the basic service of providing Internet services to the member institutions, KENET aims to transform and strengthen its member institutions by actively promoting the use of ICT in teaching, learning, research, and management. This aim is being pursued through training faculty members and ICT professional staff as well as organizing stakeholder meetings with the leadership of the member institutions; for example, in March 2004, KENET with the support of the United States Agency for International Development (USAID) organized a stakeholder meeting of vice chancellors and heads of higher education institutions in Mombasa to discuss strategies that the institutions could adopt to increase the use ICT by students, faculty

members and management staff in member institutions and to demonstrate how KENET could be a partner in that process (see presentations at http://www.kenet.or.ke/2004VCworkshop). The papers on strategic directions of KENET and ICT opportunities in higher education institutions in Kenya presented during the workshop demonstrated how the heads of member institutions could increase IT diffusion in their respective institutions by careful re-allocations of their budgets. Anecdotal data suggests that KENET has had a significant influence on IT usage, diffusion, and financing in member institutions. KENET has since June 2006 conducted a comprehensive and diagnostic e-readiness assessment of the member institutions to establish the actual degree of readiness in each institution.

In 2004, a UNESCO African ICT Experts Group meeting identified KENET as a possible e-campus model for Africa because of its multi-organizational structure. Using ICT, the e-campus model aims to achieve Education for All objectives of UNESCO; it for example could support open educational content development using ICT champions in the member institutions and provide a platform for open and distance learning to all higher education institutions in a country or region.

One of the other objectives of the KENET Trust is to provide a research network for faculty members and researchers in education and research institutions in Kenya. Leading research institutions such as the International Centre of Insect Physiology and Ecology (ICIPE), Kenya Medical Research Institute (KEMRI), and International Livestock Research Institute (ILRI) are members of KENET. Thus KENET is evolving into a National Research and Education Network (NREN). In November 2005, KENET was invited to make a presentation at the World Summit on the Information Society (WSIS) conference in Tunis (http://www.kenet.or.ke/presentations). KENET therefore will support collaboration among the researchers in the member institutions as well as researchers in other parts of the world.

KENET has recognized an even greater challenge of ICT adoption in higher education institutions—although the cost of international Internet bandwidth is still very high. This is because of the large ICT infrastructure investment required in each institution and the associated cost of operating and maintaining the infrastructure. This is an internal institutional leadership challenge, but KENET will continue to provide advisory and training support for faculty members and IT professionals responsible for operating the institutional networks.

In future, ICT will have an even greater and more significant role in educational institutions, particularly HE institutions, because of the emerging global knowledge economy. In a knowledge economy, the development and competitiveness of countries will depend on their ability to leverage local and global knowledge. The knowledge economy rests on four main pillars, namely (see http://www.worldbank.org):

1. **Economic and institutional** pillar that provides incentives for the efficient creation and dissemination and use of existing knowledge.
2. **Education pillar** that develops an educated workforce that can use knowledge effectively.
3. **Innovation pillar** that ensures that global knowledge diffuses into the nations adapts it for local use and creates new local knowledge.
4. **ICT infrastructure** pillar that facilitates effective communication, dissemination and processing of information.

It therefore is clear that investment in ICT infrastructure in higher education institutions is essential for national development and wealth creation in Kenya. Increased use of ICT in higher education institutions will translate into greater adoption of ICT in primary and secondary schools because of IT literate teachers and administrators. In future, each higher education institution could also become a hub for providing Internet access to the neighbouring secondary and primary schools.

KENET remains the only institution in Kenya that understands the challenges and opportunities of using ICT in the higher education sector. For example, in the past 5 years, there has not been a significant reduction in the cost of bandwidth or the leased lines in Kenya. The penetration of Internet infrastructure into rural areas has only happened in areas where KENET needed Internet nodes such as in Meru and in Baraton. It is also not clear if the 50% Internet bandwidth discount originally extended to KENET by Telkom Kenya will be sustained after the latter is privatised. This strategic plan for 2006-2010 addresses these challenges and opportunities.

2. STRATEGIC FOUNDATION

Strategic foundation is the root of the strategic plan. Its elements are the vision, mission, and guiding values.

2.1. VISION

To be a national world-class research and education network in Africa by 2010.

2.2. MISSION

To drive the integration of ICT in research and learning through quality, cost effective and efficient provision of ICT services and to be a key partner in the development of the ICT society.

2.3. CORE VALUES

1. **Collaboration and engagement.** KENET shall nurture collaboration and sharing of resources among members.
2. **Sustainability.** KENET shall endeavour to be self-sustaining in all its operations.
3. **Integrity and fairness.** At all times KENET shall operate in an atmosphere that ensures impartiality, transparency, and accountability in its operations.
4. **Innovation and creativity.** KENET shall actively seek appropriate solutions for continuous improvement.
5. **Excellence.** KENET shall be guided by the need to maintain the highest standards in all its operations.

3. ENVIRONMENTAL ANALYSIS

As a tool to appraise the status of internal and external environments, strengths, weaknesses, opportunities, and threats (SWOT) will be used. The internal appraisal (strengths and weaknesses) focus on human resources, ICT, structure, culture or traditions, processes, physical facilities, policies and other internal conditions that directly affect KENET. The external appraisal (opportunities and threats) are external conditions that have a broad rather than a direct impact on KENET.

3.1. STRENGTHS

All higher education institutions in Kenya have recognized the important role of ICT in teaching, learning, research, and management. The five vice-chancellors, who serve as trustees, have experienced the benefits of an educational network, especially in regard to the reduction in the cost of Internet bandwidth; in Kenya, vice chancellors are very high-profile individuals seen to represent an important higher education sector. The other two trustees who represent the ICT sector are the Managing Director of Telkom Kenya—for a long time the only provider of international Internet bandwidth and a key partner of KENET—and the Director General of CCK—the ICT sector regulator. CCK oversees the large mobile communications sector of over 5 million subscribers and is committed to promoting the use of Internet. It therefore sees KENET as a vehicle for achieving greater Internet penetration as well as universal access to ICT in the rural areas and has contributed KSHS 3 million per year for operating the KENET secretariat since its inception in 2000. On the whole, the trustees have supported KENET by contributing to the salaries of key technical and administrative staff in the secretariat.

The management board, which assists the trustees on daily operations is still made up of the original volunteer group of faculty members and staff who were already ICT champions of their respective member institutions. It also includes a representative from ICIPE, a leading international research institution based in Kenya. The group works with the Executive Director on all strategic and operational issues. The current Executive Director—a lecturer in the Department of Electrical Engineering at the University of Nairobi—not only is a very competent ICT professional and engineer but also is passionate about educational networks. Consequently, KENET has identified the following as its strengths:
1. High profile and committed trustees
2. A competent and committed management board to assist the busy trustees
3. An established institutional framework consisting of a trust and associated secretariat
4. Technical and managerial capacity to offer ICT services
5. Cooperation, unity, and goodwill of KENET member institutions
6. A pool of well trained human resources within member institutions willing to support KENET
7. A Private Network Operator license from CCK
8. An established cost-effective and innovative national educational and research network
9. Recognition by UNESCO and Association of African Universities as a viable NREN model

3.2. WEAKNESSES

Member institutions that joined KENET had very high expectations in terms of a reduction of the cost of Internet bandwidth. They however did not realize that effective utilization of the Internet bandwidth by students and faculty members required massive investment in the campus

ICT infrastructure and personnel costs; educating the leaders of the member institutions on the long-term benefits of KENET has been a slow process. Further, most institutions did not understand the financial model of KENET which assumes a large number of users in the institutions and an increase in locally relevant content. As a result, KENET has identified the following as its weaknesses:

1. Low investment in the ICT infrastructure in most of the member institutions, most of which still do not have integrated campus network infrastructure
2. Lack of institutional ICT policy and framework—most institutions lack a formal policy and organizational structure for ICT
3. Limited human capacity
   a. Most senior managers are not aware of the strategic impact of ICT
   b. Technical capacity in member institutions is limited or non-existent
   c. Turnover of technical ICT staff is high
   d. Managerial, technical and administrative capacity in KENET is limited
4. Limited ICT funding
   a. Most institutions have small ICT budgets
   b. There is limited funding for KENET investments and operations
5. Lack of a sustainable business model; KENET depends on donations from CCK, member institutions, and development partners rather than services
6. Weak and inadequate linkages with strategic industry partners
7. A very small secretariat without an appropriate succession plan

3.3. OPPORTUNITIES

A number of partners such as USAID, the Rockefeller Foundation, the Ford Foundation, Telkom Kenya, CCK, the Ministry of Education, and the Ministry of Information and Communication have supported KENET. There is need to further leverage on the goodwill created with these valued as well as with future partners. What is more, KENET worked with a number of telecommunications operators in rolling out the network. KENET values these partners and is committed to continue working with them and with other players that emerge as the ICT industry becomes more liberalized. Such partners provide KENET with an opportunity to roll out and manage a rapidly expanding network.

At the same time, the demand for ICT resources and services, including Internet services and e-learning resources, by students and staff in the Kenyan higher education sub-sector, is very high as it has been growing rapidly. The demand presents an opportunity to provide products and services as its mandate requires KENET to do.

Further, KENET has been actively involved in the development of the current national ICT policy. It has an opportunity to influence the implementation of the current policy, especially in the education sector—in addition to continue to participate actively in national ICT policy processes.

Finally, in its secretariat and the academic and professional staff in member institutions, KENET has a rich mix of human resources in its areas of primary responsibility. It can exploit the access to these resources to provide consultancy and outsourced services to the stakeholders.

3.4. THREATS

The cost of bandwidth in Kenya, as in other African nations, is very high. The limited or non-existent budgets for ICT in member institutions worsen this situation. Besides, some member institutions cannot connect to the Internet because of lack of Internet points of presence near them resulting from the limited penetration of the telecommunications infrastructure, especially in the rural areas.

Further, some ISPs consider KENET a competitor—although KENET is not in commercial business. This perception however makes it difficult these ISPs to collaborate with KENET. Furthermore, special arrangements with some ISP operators, which contribute to making KENET connectivity cheaper, are not based on sound business agreements.

On the whole, however, a common threat to ICT systems in Kenya is the unavailability or poor reliability of commercial power. KENET will need to address this issue in all its network operation centres.

In the end, KENET is heavily reliant on a volunteer management board to support operations and management. This may not be sustainable in the long term, especially when that support is not available. At the same time, KENET may be in competition with some of the member institutions in the provision of certain services, especially consultancy and research. This competition may pose a danger in that KENET may not get the necessary cooperation from member institutions or access certain human resources in carrying out these activities for which there is potential competition.

4. STRATEGIC FOCUS

The analysis of the strengths, weaknesses, opportunities and threats—which has enabled KENET identify areas that need focus while planning—is the basis of the strategic objectives, the expected outcomes and the strategies presented in this section. The strategic objectives, the expected outcomes and the strategies are presented according to the strategic issues that are the key challenges that KENET has to address to achieve its vision and mission. The following 10 strategic issues arise from the environmental analysis given in section 3:
1. Human capacity
2. Governance
3. Interconnection infrastructure
4. International bandwidth
5. Content development
6. Funding
7. Image and leverage
8. Partnerships and collaboration
9. Institutional policy framework
10. Sustainable business model

This section presents strategic objectives, the expected outcomes to be realized, and the strategies necessary to realize those outcomes, for each strategic issue.

4.1. HUMAN CAPACITY

The technical and managerial human capacity situation in the KENET secretariat has been inadequate. At the same time, the ICT managerial and technical capacities in the member institutions are developing slowly but are far from adequate. Further, both KENET and its member institutions do not have mechanisms to attract and retain quality professional staff. In this plan period, KENET intends to address these issues in the secretariat and advocate the addressing of the issues in member institutions. The following strategic objective, expected outcomes and strategies will help address the issues.

Strategic Objective 1
To recruit, develop and retain adequate and quality management and technical personnel in KENET and member institutions

Expected outcomes
- Highly skilled, motivated and productive ICT personnel in KENET and member institutions
- Increased retention of staff in KENET
- Adequate staff complement in KENET

Strategies
- Establish a competitive reward structure for KENET staff
- Recruit adequate number of staff for KENET
- Establish a staff development programme
- Establish a strong and structured internship programme
- Develop best practice/ guidelines for ICT management and operations

4.2. GOVERNANCE

KENET's governance and management structures need to be improved to enhance its credibility and image. Finalising official incorporation and operating in an appropriate legal framework and management structure are key concerns. The following strategic objective, expected outcomes and strategies will help address these concerns.

Strategic Objective 2
To establish rationalized and sustainable governance and management structures

Expected outcomes
- Enhanced credibility of KENET
- A model NREN

Strategies
- Incorporate KENET Trust and review its legal framework
- Obtain the certificate of incorporation
- Review all KENET legal instruments
- Reform KENET's governance structure to accommodate evolving education needs
- Develop a comprehensive KENET management structure with its appropriate functions
- Develop appropriate job descriptions

4.3. INTERCONNECTION INFRASTRUCTURE

One objective of KENET was to interconnect member institutions using relatively high-speed links. The objective is based on the assumption that students and faculty members desire to communicate among themselves for purposes of learning and research such that a professor in one university in Kenya could give a lecture that could be attended on-line by students at other universities.

At present, member institutions are clustered and connected to each other via KENET traffic aggregation nodes in Nairobi, Nakuru, Eldoret, and Kisumu. In future, an aggregation node will be established in Mombasa and other regional traffic areas. The connection from the member institutions to an aggregation is normally over a leased line. At this time, the capacity of the leased in kb/s is the same as the Internet bandwidth capacity. This is partly due to the lack of locally relevant content in Kenyan universities, which makes most of the inbound traffic to be from outside the country—US or Europe. This will change in the near future as universities increase the amount of locally relevant content.

Leased lines in Kenya are still very expensive, priced as they are on the basis of capacity and distance. A 2 Megabits/Second Kenstream leased line costs KSHS   81,457 per month within a radius of 50 km. A similar leased line from Mombasa to Nairobi, covering about 500 km., would cost KSHS   686, 033 per month. This cost has not been decreasing even with increasing competition from leased line providers. Further, some member institutions in rural areas still cannot be reached because of the low penetration of the Internet infrastructure in Kenya. Apart from interconnecting the member institutions, KENET aggregation nodes need to be connected to the Kenya Internet Exchange Point using high-speed leased lines to ensure that local traffic remains local.

KENET therefore needs to establish a cost-effective and much cheaper high-speed private network that would reach all the KENET member institutions using a combination of

communications technologies and partnerships with licensed operators. The following strategic objective, expected outcomes and strategies have been identified.

Strategic Objective 3
To extend the reach and enhance the capacity and quality of the national interconnection infrastructure
Expected outcomes
- Quality and affordable infrastructure to enable research, teaching and learning, collaboration, and communication among KENET members
- Managed network infrastructure

Strategies
- Partner with a technology company to roll out own national infrastructure
- Lease infrastructure capacity from licensed operators
- Obtain government support for building infrastructure

4.4. INTERNATIONAL BANDWIDTH

KENET and the member institutions have realized that the lack of locally relevant local content means that the demand for international Internet bandwidth is very high. Some member institutions have had to install satellite download dishes to improve the browsing experience of students and faculty members. KENET has observed that many students have Yahoo or Gmail Web-based e-mail accounts, partly due to the poor ICT infrastructure in member institutions. This situation further increases the need for International bandwidth.

Since Kenya is not connected to any international optical fibre networks, all international bandwidth is satellite-based. This connectivity is very expensive—the best price being US$ 2,350 per Megabits/Second per month. Consequently, Internet speeds are poor and best for e-mail communications only. Increasing the international bandwidth per institution could mean an increase in Internet bandwidth budget per institution. The use of available bandwidth might also improve the satisfaction level of the users. Strategic objective 4 below will address this strategic issue; expected outcomes and possible strategies that will be used are listed.

Strategic Objective 4
To increase the Internet bandwidth per institution to levels equivalent to the best in the developing world

Expected outcomes
- Affordable institutional Internet access at acceptable quality of service levels
- Increased level of satisfaction of users

Strategies
- Reduce the cost per Megabits per Second to the cost in the benchmarked countries
- Increase the bandwidth per terminal to the cost in the benchmarked countries
- Increase the quality of service to levels comparable to benchmarked countries

4.5. CONTENT DEVELOPMENT

KENET has identified content development—in particular, locally relevant content—as a key strategic issue that needs to be addressed in this strategic plan; such content includes:
1. Research databases for different subject areas such as local databases created by organisations such as ICIPE, International centre for Research in Agro-forestry (ICRAF), and Kenya Agricultural Research Institute (KARI)
2. E-learning and open and distance learning course materials
3. Interactive institutional websites containing news support for student groups, course registration, web-based e-mail, detailed information on programme offerings, academic calendars, and tuition fees information, and on-line applications for admission and grants.
4. Access to on-line catalogues

KENET has identified its role as a facilitator and promoter of the content development process, since most content must be created at the member institutions. Local content will reduce the demand for international bandwidth and eventually reduce the cost of operating the KENET private network (see the discussion on the international bandwidth section). Strategic objective 5 below will address that content; associated outcomes and strategies are listed.

Strategic Objective 5
To promote and facilitate open educational content development by member institutions

Expected outcomes
- Dramatically increase relevant local content in member institutions
- Increased quality of local content
- Increased use of local content

Strategies
- Influence policy and strategy on content development in member institutions
- Train KENET members on content development and delivery
- Create partnerships for content development
- Host local content and aggregate content from member institutions
- Create communities of practice for students and staff in related disciplines
- Support a common e-learning platform
- Advocate for local content

4.6. FUNDING

Funding has a major issue since the formation of KENET, but KENET has been fortunate to have valuable partners who have made a tremendous input into its funding. As this source of funding might not always prevail, KENET needs to plan for funding that ensures that it meets its objectives in a sustainable manner. The following strategic objective, expected outcomes and strategies will help address the funding issue.

Strategic Objective 6
To achieve sustainable level of funding for growth

Expected outcomes
- KENET has sufficient resources to meet its objectives
- KENET is able to meet its operational costs without dependence on outside resources
- Member institutions can develop and maintain their campus networks

Strategies
- Fundraising
- Establish and implement viable business plans
- Review levies to member institutions
- Increase the number of KENET members
- Establish an endowment fund
- Encourage government support
- Advise member institutions on adequate levels of spending on ICT

4.7. IMAGE AND LEVERAGE

One of the strengths of KENET is its good image as perceived by stakeholders inside and outside the country. In particular, KENET has been very active in influencing national ICT policy as well as ICT policies of its member institutions. During this plan period, KENET intends to strengthen its ICT policy advocacy role and improve its image as it strives to achieve its objectives. The strategic objective, expected outcomes and strategies below will be instrumental in this regard.

Strategic Objective 7
To influence ICT in educational policy at institutional and national levels and brand KENET

Expected outcomes
- Better integration of ICT in learning processes
- Improved policies for ICT in education
- Better equipped workforce for a knowledge economy
- Increased access to education
- Improved learning outcomes
- Member institutions are aware of the benefits provided by KENET
- Wide recognition of KENET as an NREN model

Strategies
- Be proactive in ICT in education forums
- Create pilot and demonstration programmes and projects
- Provide position papers on topical ICT issues
- Publicize KENET in electronic and print media

4.8. PARTNERSHIPS AND COLLABORATION

KENET could facilitate the collaboration of researchers and faculty members from different member institutions to create large projects. Such projects could involve course development and offerings or multi-disciplinary research projects. This is especially critical in areas where expertise has been spread thinly among different universities and research centres. For example, in the area of ICT, there are only a very limited number of doctoral faculty members and researchers spread in different universities; each of the universities therefore does

not have a critical mass of senior faculty members and researchers. Collaborative projects could ensure that faculty members are not isolated and could start joint doctoral or master's programmes for capacity development.

Partnerships often involve external institutions such as universities or foundations outside Kenya or local industry and government departments. In most cases, external partners desire to have a single institution that can engage internal stakeholders. For example, the partnership for higher education prefers to deal with KENET rather than with individual institutions; similarly, the Massachusetts Institute of Technology (MIT) open-course projects or Internet Labs projects would rather partner with KENET. Strategic objective 8 below addresses this important strategic issue of collaboration and partnerships; expected outcomes and strategies identified are listed.

Strategic Objective 8
To enhance partnerships and collaboration with strategic institutions

Expected outcomes
- Expanded intellectual contribution
- Reduced cost of ICT equipment and services
- Improved standards in education and research

Strategies
- Coordinate joint programmes and projects
- Establish collaboration with institutions with common goals
- Joint pricing negotiations

4.9. INSTITUTIONAL POLICY FRAMEWORK

KENET recognizes that without viable campus networks in member institutions, its interconnection and Internet infrastructure would not be very useful. KENET has attempted to influence ICT policy on and implementation of integrated campus networks in member institutions with some degree of success. During the plan period, KENET will continue to influence not only ICT policy development but also its implementation in member institutions. The strategic objective, expected outcomes and strategies below will be instrumental in this regard.

Strategic Objective 9
To influence ICT policy formulation and implementation in member institutions

Expected outcomes
- Enhanced role of ICT in teaching and learning in member institutions
- Each institution has a viable ICT policy that supports institutional educational objectives
- Sustainable business model

Strategies
- Develop templates for institutional ICT policies
- Hold workshops for senior managers
- Hold workshops for ICT managers
- Create and publish an e-readiness index for each institution

KENET needs to be financially sustainable to achieve the desired outcomes of the other nine strategic objectives. So far, KENET has been sustained through the following income streams:

1. CCK's grant of KSHS 3 million per year since its inception which is used to pay the salaries of the five full-time members of the secretariat as well as sustain the secretariat operations.
2. Contributions of member institutions such as the University of Nairobi that has given KENET free office space (the executive director is an employee of that university), the United States International University that offers free payroll processing services, and the Jomo Kenyatta University of Agriculture and Technology that offers part-time administrator and accountant.
3. Volunteer contribution of the management board.
4. KENET offers a limited number of training workshops at a fee
5. A US government grant of up to US$ 1.2 million, initially through the Education Democracy and Development Initiative. A recovery arrangement has meant KENET does not have to pay all the monthly bandwidth costs—although this was used to purchase equipment that was used to extend the Telkom's Jambonet Internet backbone at no cost.
6. Limited savings of about KSHS 1 million per month on Internet bandwidth due to traffic aggregation—a benefit passed directly back to subsidize bandwidth for member institutions.
7. Miscellaneous travel, training, and workshop grants given by USAID, the Ford Foundation, International Network for the Availability of Scientific Publications (INASP), and other partners.

This means that KENET has not been financially sustainable in terms of the commercial services it provides to member institutions. This is not acceptable. Strategic objective 10 therefore aims to move KENET from an unsustainable operation to one that can meet its operational financial obligations. Among other things, this will mean generating new income streams by developing and selling new innovative knowledge services to member institutions and looking for capacity and research grants from development partners such as the Partnership for Higher Education in Africa, USAID, and the European Union. The strategic objective, as well the expected outcome and strategies that will be used to close the income gaps for KENET, is listed below.

Strategic Objective 10
To establish a sustainable business model

Expected outcome
Increased growth and meeting of major objectives in terms of mission and vision

Strategies
- Review the existing business models and adopt the most appropriate business model
- Update and implement the new model

5. IMPLEMENTATION PLAN

The main elements of our implementation plan are outlined below:

1. **Expected outcomes**: These refer to end-of-plan results that are effects or consequences of achievement of a set of planned outputs.

2. **Outputs or deliverables**: Outputs are describable or measurable changes are produced by activities (sometimes referred to as "deliverables"). They are the consequences of activities and are immediate, visible, concrete, and tangible.

3. **Activities or projects**: These are the tasks performed or projects carried out to transform inputs into outputs.

4. **Performance indicators**: These measure the direct and short-to-medium-term effects of the plan outputs. They generally answer the question "How will we know success when we see it?"

5. **Targets**: These are the numbers or percentage the plan commits itself to against an outcome or indicator based on a baseline.

6. **Time Frame**: This indicates the time domain within which performance targets are to be achieved.

7. **Responsibility**: Here the specific officer(s) to be responsible for the specific performance is specified.

8. **Assumptions**: The success of the implementation of the strategic plan shall depend on certain assumptions, which represent the conditions that are necessary to ensure that results will occur as expected. These conditions are in the external environment and KENET has no or very little control or both over them. We can deal with those in the internal environment through strategies and these therefore do not feature in the matrix.

The implementation plan that shall guide KENET's operations in the next five years is shown in the following tables.

Strategic Objective 1: To recruit, develop and retain adequate and quality management and technical personnel of KENET and its member institutions								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
Highly skilled, motivated and productive ICT personnel in KENET and member institutions	Terms of service manual	Develop terms of service manual, including staff development plan	Extent of completion of the terms of service manual	0%	100%	Management Board (Outsource)	December-06	
Increased retention of staff in KENET		Recruit skilled technical and administrative staff	Extent to which in-post technical and administrative staff is in line with the manual	40%	100%	Executive Director	Continuous	Terms of service can attract skilled personnel
		Train technical and administrative staff	Number of technical staff trained	All	3 more	Executive Director	June-06 and continuous	
			Number of administrative staff trained	0	1	Executive Director	July-06	
			Staff members developed according to their job requirements	40%	100%	Executive Director	Continuous	
			Number of key staff retained for at least 4 years	50%	80%	Management Board	Continuous	
	Internship guidelines	Develop and implement Internship guidelines	Extent of completion of Internship guidelines	50%	100%	Executive Director	July-06	
			Extent of use of internship guidelines	50%	100%	Executive Director	Continuous	

	Best practices in ICT management guidelines	Develop ICT management best practices	Extent of completion of ICT management best practices	0%	100%	Management Board (Outsource)	December-06	
		Disseminate ICT management best practices to member institutions	Number of member institutions adopting the ICT management best practices	30%	100%	Management Board	June-07	
	ICT capacity development programmes for member institutions	Develop the training programme in network management and content development	Extent of completion of the training programme	20%	100%	Executive Director	July-06	
		Train member institution staff in network management	Number of member institutions staff trained on network management	20	1 per institution	Executive Director	June-07 and continuous	Member institutions will readily meet the costs of training
		Train member institution staff in content development	Number of member institutions with staff trained on content development	0%	75% Training of Trainers (TOTs)	Executive Director	June-07 and continuous	Member institutions will readily meet the costs of training
	Conducive working environment	Create and maintain a conducive working environment in KENET (office and equipment)	Extent to which working environment in KENET is conducive	60%	100%	Executive Director	Continuous	
Adequate staff complement in KENET	Level of in-post staff	Maintain an adequate complement of staff	Number of in-post staff to total establishment	50%	80%	Executive Director	Continuous	

Strategic Objective 2: To establish rationalized and sustainable governance and management structures								
Outcome	**Outputs (or Deliverables)**	**Projects/ Activities**	**Performance Indicators**	**Baseline**	**Targets**	**Responsibility**	**Timing**	**Assumptions**
Enhanced credibility of KENET	Incorporated KENET Trust	Incorporate KENET Trust	Progress to complete incorporation	80%	100%	Executive Director, Outsourced Lawyer	December-06	Minimal delays in the AG's Office
	Revised KENET Trust	Revise KENET Trust	Progress to revising the KENET Trust	0%	100%	Management Board	December-07 and annually thereafter	
A model NREN	Efficient governance and management structures	Review and implement efficient governance and management structures	Turnaround time for key policy decisions	Months	1 month	Board of Trustees	December-06	
		Review and implement efficient governance and management structures	Turnaround time for key operational decisions	Weeks	1 week	Management Board	December-06	
	Operations manuals	Benchmarking	Benchmarks	None	With South Korea, Egypt and China NRENs	Management Board, Executive Director	June-07	
		Develop manuals for all operations	Quality of service delivery	Average	Excellent	Executive Director	June-07	

Strategic Objective 3: To extend the reach and enhance the capacity and quality of the national interconnection infrastructure								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
Quality and affordable infrastructure to enable research, teaching and learning, collaboration and communication among KENET members	Grants to purchase equipment	Develop and "sell" grant proposals	Amount of infrastructure grants available for terminal equipment and owned local loop links	US$ 1.5 million (used up)	US$ 3 million	Board of Trustees, Management Board, Executive Director	December-07	Commitment of the Government of Kenya
	Rural network design	Design rural networks for unreached member institutions	Completeness of the rural networks for extended reach	20%	100%	Executive Director (Outsource)	June-07	
		Bid for UA/ US funds to extend reach	Amount of UA/ US funds allocated	0	US$ 100,000	Executive Director	December-07	UA/ US fund is established
	National broadband network design and business plan	Design a national broadband network	Completeness of the national network design	30%	100%	Executive Director (Outsource)	December-06	
		Update the business plan for the national infrastructure	Completeness of the business plan	40%	100%	Executive Director (Outsource)	March-07	
		Negotiate and implement partnership agreements with licensed operators	Number of active partnership agreements	1	3	Management Board, Executive Director	July-07	
		Negotiate and implement partnership agreements with equipment suppliers	Number of active partnership agreements	0	2	Management Board, Executive Director	July-07	
Managed network infrastructure	Network management system	Implement a network management system	Level of operational use of network management system	10%	100%	Executive Director	December-07 and continuous thereafter	
	Data centre	Implement a data centre	Degree of operation of data centre	0%	100%	Executive Director	December-07 and continuous thereafter	

Strategic Objective 4: To increase the Internet bandwidth per institution to levels equivalent to the best in the developing world								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
Affordable institutional Internet access at acceptable quality of service levels	International satellite Internet bandwidth agreements with operators	Develop Internet bandwidth agreements and negotiate cost reductions	Percentage reduction in cost of Internet bandwidth	50%	60%	Executive Director, Management Board, Trustees	December-06	Privatization of Telkom
	Internet bandwidth grants from development partners (e.g., Partnership)	Develop Internet bandwidth grant proposals	Percentage of satellite Internet bandwidth cost paid by development partners	30%	60%	Executive Director, Management Board, Board of Trustees	June-07	
	Direct access to undersea optical fibre (e.g., EASSy optical fibre)	UbuntuNet Alliance project	Level of optical fibre Internet bandwidth	0%	90%	Executive Director, Management Board Trustees	December-08	Completion of EASSy or other undersea optical fibre project
Increased level of satisfaction of users	Service level agreements between KENET and bandwidth providers (operators)	Develop service level agreements with operators	Degree of compliance with service level agreements	40%	100%	Executive Director	June-07	
	Service level agreements between KENET and Member Institutions	Develop service level agreements with KENET	Degree of compliance with service level agreements	40%	100%	Executive Director	June-07	Upgrade of national network

Strategic Objective 5: To facilitate educational content creation, sharing and delivery								
Outcome	**Outputs (or Deliverables)**	**Projects/ Activities**	**Performance Indicators**	**Baseli ne**	**Targets**	**Responsibility**	**Timing**	**Assumptions**
Dramatically increase relevant local content in member institutions	Open content development policy	Develop and promote open content development policies in member institutions	Number of member institutions adopting open content development policies	0%	60%	Executive Director, Management Board, Board of Trustees (Outsource)	June-08	
Increased use of local content	Searchable databases of theses, researchers, facilities etc. in Member Institutions	Write grant proposals to create databases	Amounts in US Dollars awarded	0	US$ 100,000	Executive Director, Management Board, Trustees	June-07	
		Develop thesis/ journal database	Number of thesis/ journals by year in database/ Number of searches of the database	0	10,000	Executive Director (Outsource to Researcher)	June 08	
		Develop national faculty and research database	Percentage of faculty members and researchers in the database	0%	60%	Executive Director (Outsource to Researcher)	June-08	
		Develop research projects and facilities database	Number of research projects captured	0%	80%	Executive Director (Outsource to Researcher)	June-08	
	E-learning and distance education courses developed by Member Institutions	Develop and update Institutional e-learning courses	Number of courses per member institution posted on e-learning platform	5%	50%	Executive Director, Content Coordinators	June-08	

		Content development training for faculty members and instructional designers	Number of faculty members and instructional designers who have completed e-learning training programmes	5%	50%	Executive Director (Outsource)	June-08	
		Write grant proposals for open content development for life-long learning and faculty development courses	Amounts in US Dollars awarded	0	500,000	Executive Director, Management Board, Board of Trustees	June-08	
	Post solicitations for funded research projects, requests for proposals (RFP) so that interested parties can bid on them	Upgrade the KENET to a full educational and research portal for member institutions	Number of hits from member institutions to the research and projects network sites	0	20,000 per month	Executive Director	December-06	
	Each institution to appoint a content coordinator	Appoint institutional content coordinator	Number of member institutions that have a content coordinator	0%	50%	Executive Director	June-07	
	Mirror site for institutional content	Mirror member static parts of member institution Websites	Number of member institutions website mirrored by KENET	0%	100%	Executive Director	June-08	Data centre set-up
	Web-based free e-mail for students, faculty members, and alumni	Set up an web-based e-mail server and discussion groups, chat rooms etc.	Number of free e-mail addresses	0	100,000	Executive Director	June-07	Data centre set-up
	Local visitors to the KENET Website and databases	Maintain a count of the number of local and international visitors to KENET Website	Number of local visitors per month/ Number of international visitors per month	Unknown	1 million per month	Executive Director	June-07	

Strategic Objective 6: To achieve sustainable level of funding for growth								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
KENET has sufficient resources to meet its objectives	Funds	Fundraise	Amount of funds raised from fundraising	> US$ 1.5m in last 4 yrs	US$ 1m p.a.	Board of Trustees, Executive Director, Management Board	Every year	
		Encourage government support	Equivalent fund amounts for Government of Kenya support	0	Kshs 500,000 p.a.	Board of Trustees, Management Board	Every year	Government of Kenya partnership is maintained
KENET is able to meet its operational costs without dependency on outside resources	Funds	Review levies to member institutions	Amount of annual subscription	Kshs 20,000	Kshs 50,000	Board of Trustees, Management Board	July-07	Institutions pay their subscriptions on time
		Increase the number of KENET members	Number of members	42	60 members	Executive Director	June 2010	12 new institutions per year; expanded secretariat and bandwidth
		Establish an endowment fund	Amount of endowment fund	0	US$ 2m	Board of Trustees	2010	
		Establish and implement viable business plans	Amount of surplus from business ventures	0	Kshs 500,000 p.a.	Executive Director	2008	
Member institutions develop and maintain their campus networks	Guideline on ICT funding	Advise member institutions on adequate levels of funding for ICT	ICT budget as a percentage of total institutional budget	< 1% on average	> 3%	Management Board	July-07	Member institutions have the other requirements to develop and maintain their campus networks

Strategic Objective 7: To influence ICT in education policy at the institutional and national levels and brand KENET								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
Improved policies for ICT in education	Policies for ICT in education	Presentations in ICT in education forums	Relevance of ICT in education policy	Medium	High	Management Board	Continuous	
Better equipped work force for a knowledge economy	Graduates	Implement integration of ICT in academic programmes	Number of graduates that used ICT for at least 20% of their learning	1%	5% Increase per year	Content Manager, Executive Director, Member Institutions	Continuous	
Increased access to education using ICT	Students	Roll-out ICT-enabled distance education programmes	Enrolment in ICT-enabled programmes as a % of total university enrolment	1%	2% in first year and 10% increase every year	Content Manager, Executive Director, Member Institutions	Continuous	Member institutions embrace ICT-enabled distance education; Government of Kenya supports open and distance learning
Improved learning outcomes	Academic programmes	Implement integration of ICT in academic programmes	Number of academic programmes with ICT integrated in most of the courses	1%	5% of Courses every year	Content Manager, Executive Director, Member Institutions	Continuous	Member institutions embrace integration of ICT in academic programmes
Member institutions are aware of the benefits provided by KENET	Newsletters	Develop and distribute informative newsletters regularly	Number of newsletters per year	0	4 p.a.	Executive Director	Every quarter	
	Stakeholder forums	Organize stakeholder forums	Number of forums per year	0	1	Executive Director	Yearly	
Wide recognition of KENET as a national research and education network model	Journal papers and conference presentations on KENET and topical ICT issues	Write papers on KENET and topical ICT issues	Number of papers per year	0	2	Executive Director, Management Board	Yearly	

			Number of sabbaticals in plan period	0	3	Executive Director	Start in 2007	
	Website	Maintain an informative and dynamic website	Number of hits on KENET website per month	?	50,000	Content Manager	Monthly	
	Articles on KENET in print and electronic media	Maintain an active presence in both electronic and print media	Number of times in a month KENET positively appears in electronic and print media	?	1	Executive Director, Management Board, Administrator	Monthly	

Strategic Objective 8: To enhance partnerships and collaboration with strategic institutions								
Outcome	**Outputs (or Deliverables)**	**Projects/ Activities**	**Performance Indicators**	**Baseline**	**Targets**	**Responsibility**	**Timing**	**Assumptions**
Expanded intellectual contribution	Joint Publications and reports	Develop joint research and consultancy policy guidelines	Completion of the policy guidelines	0	100%	Executive Director (Outsource)	June-07	
		Joint research projects	Number of publications in refereed journals and conferences	0	8 p.a.	Management Board, Executive Director	From July 2007	
		Joint consultancy projects	Contract amounts	0	KSHS 5 Million	Executive Director	From July 2007	KENET does not compete with individuals or member institutions for small consultancy assignments
Reduced cost of ICT equipment and services	Joint agreements	Negotiate competitive pricing of equipment and services based on bulk purchase	Percentage reduction in cost of ICT equipment and services	10%	30%	Executive Director	Continuous	

Improved standards in education and research	Memorandum of Understanding MoU/ Memorandum of Agreement MoA	Develop partnerships and collaborations with national research and education networks and universities	Number of MoUs/ MoAs with established national research and education networks	0	1 in first year and maintain 2 all years	Executive Director	June-07 for first MoU/ MoA	
			Number of MoUs/ MoAs with top external universities	0	1 in first year and maintain 2 all years	Executive Director, Management Board	June-07 for first MoU/ MoA	

Strategic Objective 9: To influence ICT policy formulation and implementation in member institutions								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
Enhanced role of ICT in teaching and learning in member institutions	E-readiness ranking for institutions	Carry out e-readiness study for all member institutions	Number of e-readiness studies carried out per year	0	1	Executive Director (Outsource)	Annually, starting 2007	
		Publicize the e-readiness ranking	Number of member institutions aware of their ranking	0	All	Executive Director	Annually	
		Implement the recommendations of the e-readiness report	Proportion of institutions implementing the e-readiness recommendations	0	50%	Board of Trustees, Member Institutions	Continuous	Member institutions will have the willingness and capacity to implement the recommendations
Each institution has a viable ICT policy that supports institutional education objectives	ICT policy template	Develop an ICT policy template	Level of completion of the ICT policy template	0	100%	Executive Director (Outsource)	December-06	
		Communicate an ICT policy template to all member institutions	Number of member institutions aware of the ICT policy template	0	All	Executive Director	March-07	
	ICT policy	Develop and implement ICT policy	Number of member institutions with ICT policy	10%	100%	Board of Trustees, Member Institutions	June-07 and continuous thereafter	

Strategic Objective 10: To establish a sustainable business model								
Outcome	Outputs (or Deliverables)	Projects/ Activities	Performance Indicators	Baseline	Targets	Responsibility	Timing	Assumptions
Increased growth and meeting of major objectives in terms of mission and vision	Business plan that includes the entrepreneurial aspects of KENET	Develop a business plan that leverages the innovations of KENET member institutions	Completeness of the business plan	0	100%	Executive Director (Outsource)	June-07	
			Amount from additional income streams	0	KSHS 3m Per Annum.	Executive Director, Partners	July-08	
	Internet Protocol policy	Develop and implement an Internet Protocol policy	Completeness of the Internet Protocol policy	0%	100%	Executive Director (Outsource)	June-07	
	New organizational structure	Develop the new organizational structure	Level of operation of the new organizational structure	0%	100%	Executive Director, Management Board	December-06	
		Implement the new organizational structure	Level of completion of the structure	0%	60%	Executive Director	June-07	