THE COMMONWEALTH OF LEARNING

School Networking in the Pacific Island States

An Environmental Scan and Plan for the Establishment of Schoolnets for the Pacific Island States

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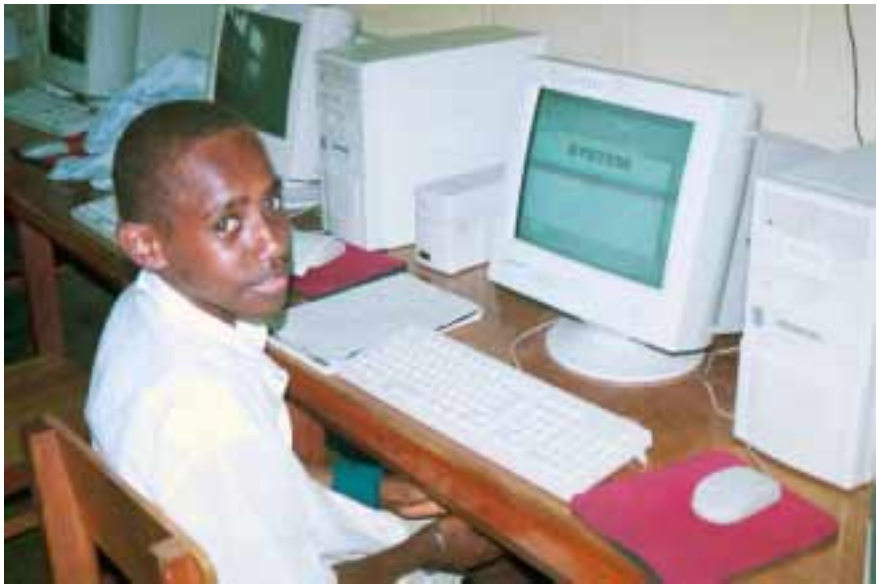

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Image 1: Nauru College

ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
ASP	Associated Schools Project (of UNESCO)
COL	The Commonwealth of Learning
DFID	Department for International Development (of the United Kingdom)
EU	European Union
GDP	Gross domestic product
ICT	Information and Communication Technology
iEARN	International Education and Resource Network
ISP	Internet service provider
KTC	Kiribati Teachers College
LDC	Least Developed Countries
NUS	National University of Samoa
ODL	Open and distance learning
PICT	Pacific Island Countries and Territories
PIFS	Pacific Islands Forum Secretariat
PIN	Pacific Islands Network
PITA	Pacific Island Telecommunications Association
PNG	Papua New Guinea
PTC	Pacific Telecommunications Council
SOPAC	South Pacific Applied Geoscience Commission
SPC	Secretariat of the Pacific Community
TCC	Tonga Communications Corporation
TVL	Telecom Vanuatu Limited
TTI	The Technical Institute (Kiribati)
UNA-USA	United Nations Association of the United States of America
UNESCO	United Nations Educational Scientific and Cultural Organization
USP	University of the South Pacific

Image 2: Tarawa Atoll, Kiribati, from the air

EXECUTIVE SUMMARY

This report is the result of a study focused on the establishment and promotion of school networking agencies (schoolnets) in the Pacific island states. The Commonwealth of Learning, based in Vancouver, Canada, commissioned the study. The task comprises an environmental scan and feasibility study leading to a proposal for the development of school networking in the region. The complete Terms of Reference for this study are attached as Annexure A.

The methodology includes visits to six Pacific island states, namely Kiribati, Nauru, Samoa, Tonga, Vanuatu and Fiji, in August 2001. The participating countries exclude Fiji, although it was visited due to the location there of the University of the South Pacific (USP), which is an important regional entity. The individual state visits were each completed in several days, and entailed meetings and discussions with education ministry officials and representatives, corporations involved in information and communication technology (ICT), such as Internet service providers (ISPs), telecommunications providers and power utilities, organisations such as UNESCO, educational institutions such as USP and the National University of Samoa, and schools.

The findings from the state visits are presented in conjunction with wider research and discussions with relevant stakeholders. The report includes a proposed way forward for the development of school networking in the region, including the establishment of a regional working group for school networking, leading to a stakeholder workshop. This workshop will have an informative function, demonstrating the roles of ICTs in teaching and learning and the importance that a schoolnet could have in the implementation of ICT–in-education strategies. In addition, it will lead to the development of a Pacific schoolnet secretariat which will determine objectives and decide on a range of programmes on which to focus and projects to implement. Due to the relatively small sizes of the countries under review, a regional approach is proposed, including a close working relationship with Ministries of Education in the individual countries. A range of policy issues to be addressed to further ICT in education integration are suggested, and a budget is proposed as a point of departure.

Image 3: Children at play in lagoon, Tarawa, Kiribati

The involvement of the stakeholders would add value to this initiative and is a critical factor for success. Many of the stakeholders have been listed and described, although there will be other organisations and individuals that can add significant value to the development of a Pacific schoolnet. It is hoped that this report, and the commitment of The Commonwealth of Learning (COL), will prove to be an important step in encouraging the effective use of ICTs in the education sector and enriching the lives of the peoples of the Pacific region.

INTRODUCTION

In recent years there has been an increased emphasis on the use of technology to address developmental concerns throughout the world. The education sector has attracted a large part of this attention, which is centred on the use of information and communication technologies (ICTs) to address teaching, learning and administrative needs. For the purposes of this report, information and communication techologies refer to computers, networks, the Internet, and broadcast and related technologies that enable information and communication flow and processing.

The use of ICTs beyond technical and vocational development was initially promoted in the educational sector as a tool to support tertiary education. It was applied particularly in revising distance education methodologies in order to ensure larger and more varied access to education. The result has been a proliferation of courses and qualifications on offer by an increasing number of institutions in a variety of formats supported by technology, many through the Internet. This has increased accessibility to education in communities that were previously excluded. However, the "digital divide," the gap that exists between those who have access to ICTs and those who do not, continues to limit the advantages of these technologies to those who have the finances, infrastructure and expertise to support them.

The extension of the use of ICTs into the primary and secondary education system followed, as practitioners saw the benefits of the various technologies. The use of computer hardware and software in the school environment can be traced to the late seventies and early eighties, where the use of basic software and games on equipment such as the BBC Micro, Apple, Acorn and Atari was encouraged in a few schools, particularly in Europe and North America. Another large initial driver was the introduction of Computer Studies as part of the curriculum in numerous countries, promoting the development of computer specialists. With the development of the IBM-compatible personal computer and the Apple Macintosh, the use of the technology to support teaching, learning and administration became more apparent, and in the nineties more classrooms throughout the world started to utilise the technology to enhance and support the education process, within and beyond the classroom. A significant development has been the understanding within the schools community of the use of ICTs beyond Computer Studies or computer literacy. These uses include research and information retrieval, collaboration and group work and concept instruction and reinforcement through specialised Web sites or software. The impact that ICTs have on teaching and learning has driven the development of school networking and schoolnets throughout the world.

Schoolnets can be defined as groupings of schools that use ICTs to support the education process, or agencies that facilitate and develop the use of ICTs in the education context. The word "school" refers to the participants, namely the schools in the primary and secondary education space. Schools generally consist of the teachers, students, families and the broader community, all of whom can benefit from the introduction of schoolnets. The word "net," a shortened form of "network," refers to the purpose of the initiatives. Most importantly, it is the network of people within the community of practitioners that collaborate for the purpose of enhancing teaching and learning. Secondly, it is the network or platform of ICT infrastructure that allows people to communicate, collaborate and share within restricted or larger groupings. Thirdly, it refers to the emphasis on the Internet and related technologies that enable the world at large to be accessible to the individual, no matter where in the world he or she may be. By definition, schoolnets encourage teaching and learning through a collaborative approach to the education process. Complementing this is the belief that the use of ICTs promotes a more individualised learning experience, with a broad range of educational resources and experiences available to both the teacher and learner, and that the use of ICTs throughout the world supports the trend towards outcomes-based and learner-focused education.

These movements have typically been organised within school districts, or within geographic or socio-economic boundaries and include the establishment of national and regional Schoolnets to promote and facilitate the use of ICTs in the education sector, in both the developed and developing world. Although the overarching theme among Schoolnets is similar, they range in their focus from policy formulation and advocacy, information dissemination, deployment and installation of technology, teacher training and facilitation of collaborative student projects. Examples of schoolnets include the following:

1. SchoolNet Canada (www.schoolnet.ca) is an initiative led by Industry Canada (government ministry) in partnership with provincial and territorial governments, the education community and private sector. SchoolNet carries out many initiatives to encourage the use of ICT in the classroom, including SchoolNet GrassRoots, SchoolNet's Network of Innovative Schools, First Nation's SchoolNet, LibraryNet and SchoolNets Youth Employment Initiative. SchoolNet's services allow students, teachers and parents to learn about the world of ICTs and how they can be used to enhance education.

2. European SchoolNet (www.eun.org or www.eschoolnet.org) is an international partnership of more than 20 European Ministries of Education developing learning for schools, teachers and pupils across Europe, and supporting school networks in individual European Union (EU) countries. It is primarily driven by individual governments and the EU, and is focused on the teaching and learning experience, using ICTs.

3. SchoolNet South Africa (www.school.za) is a non-profit, independent organisation with an emphasis on promoting the use of ICT for teaching and learning in South Africa, particularly in historically disadvantaged schools. The organisation initially worked in many aspects of school networking including policy and advocacy, infrastructure provision, teacher development and content provision. As the use of ICTs in South Africa schools has proliferated, the organisation has refocused to ensure that the educational value of ICTs is realised, largely through teacher development, conferencing and workshops.

4. Western Cape Schools Network (www.wcape.school.za) was established in 1994 and, together with other provincially based school networks in South Africa, assisted in the development of SchoolNet SA. It is largely a volunteer-based organisation with a small staff that originated as an educational ISP and extended its functions over time. It is soon to be merged into SchoolNet SA. The Western Cape office of SchoolNet SA will continue to manage help desk and educational ISP services on behalf of SchoolNet SA for the entire country, in addition to providing other services.

5. SchoolNet Africa (www.schoolnetafrica.org) emerged out of the need to promote and support the development of schoolnets throughout the African continent. The organisation has been created as a support mechanism for national schoolnets, and thus works primarily in the areas of policy direction, information dissemination and support, and resource mobilisation, participating in various continent-wide initiatives.

6. World Links for Development (www.worldlinks.org) started as an initiative of the World Bank Institute and has grown to encompass a separate non-profit entity. World Links is focused on the promotion of ICTs in the developing world, and as of October 2001, it is active in 15 countries, reaching approximately 650 schools. It works in collaboration with Ministries of Education and supports the development of national schoolnets in the countries in which it works. Although involved in various aspects of ICT in education, it has had a particular focus on teacher development. The organisation is currently developing a fee-for-service contracting component that will enable it to share its knowledge and expertise more broadly and will also assist in sustaining the organisation.

7. SchoolNet India (www.schoolnetindia.com) was incorporated by Infrastructure Leasing & Financial Services Limited (of India) as part of a broader initiative to address the requirements of the social infrastructure sector, in specific, the learning training segments. Schoolnet is committed to enhancing the quality and delivery of education across the learner spectrum and learning segments. The focus is not so much on the teaching of technology alone as on the use of technology in the teaching and learning process. The organisation focuses on the areas of technology, content, training and services and is operational in over 18 locations across India. In order to facilitate support for their programmes in less advantaged schools (over 750,000 schools), it has established the SchoolNet Foundation, which attracts financial and in-kind support from individuals, corporations and donor agencies. The SchoolNet India model is a standard corporation that performs the operations with the assistance of a special purpose charitable vehicle.

Image 4: Moroni High School, Tarawa, Kiribati

OBSERVATIONS

OVERALL OBSERVATIONS AND RESEARCH

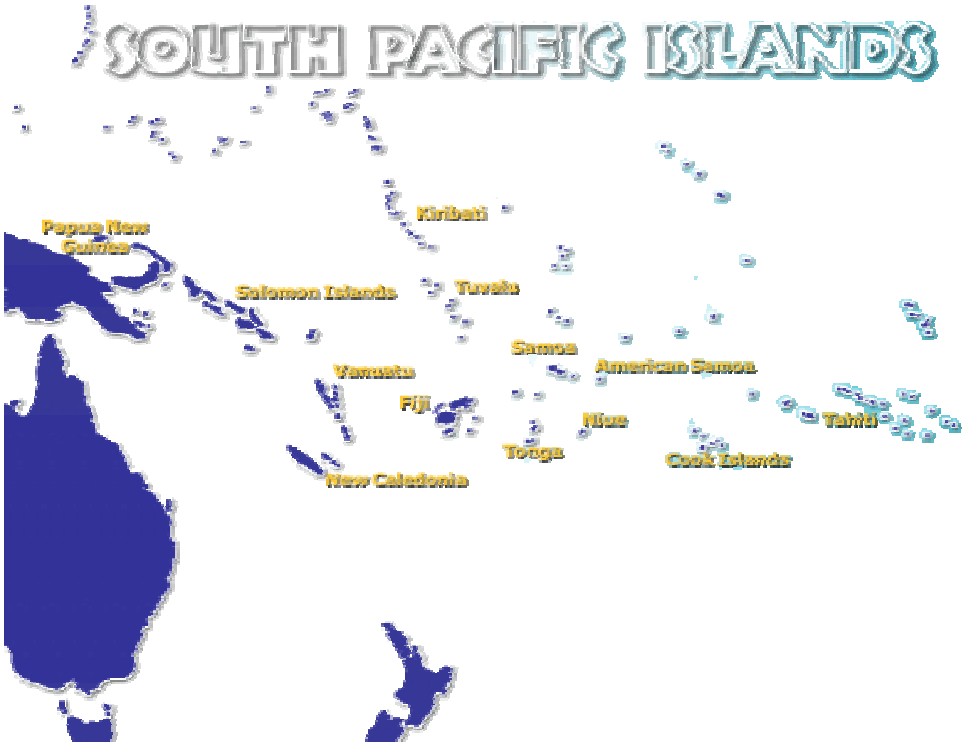

Image 5: South Pacific Regional Map

GENERAL

The Pacific Ocean covers an area of 165,250,000 km^2, which is a third of the earth's surface and more than all the earth's land combined. However, the thousands of islands of the Pacific have a total land area of less than 1,300,000 km^2, the bulk of which is in the islands of Papua New Guinea (PNG), New Zealand and Hawaii. According to Errol Hunt (2000), it was the French Explorer Dumont d'Urville who divided up the Pacific islands along racial and cultural grounds into three main subdivisions: Melanesia (Greek for "black islands"), Micronesia ("small islands") and Polynesia ("many islands"). Melanesia includes PNG, the Solomons, Vanuatu, New Caledonia and Fiji; Micronesia is composed of the atolls and small islands north of and north-east of PNG and the Solomons (such as Kiribati, Nauru and Guam); Polynesia is roughly the huge triangle of islands bounded by Hawaii, Easter Island and New Zealand (including Cook Islands, French Polynesia, Samoa and Tonga). Due to the remoteness, size and height above sea level, many of the islands, particularly in Micronesia, are under constant threat from the elements.

The population of the Pacific islands (excluding PNG, Hawaii and New Zealand) is 2.3 million, with country populations ranging from 50 people in Pitcairn to 775,000 in Fiji. Most populations are coastal and concentrated on one island or in one town of the state. The population densities range from as low as 8 people/km^2 in Vanuatu to 430 people/km^2 in Nauru.

The gross domestic product (GDP) per capita in Pacific countries varies widely, from as high as U.S.$14,670 in New Caledonia to U.S.$590 in Kiribati. Comparing countries in the region, the larger

Melanesian countries are relatively stronger economically, although most Pacific states have weaker economies that are subject to many external influences, such as donor support and climate. According to the International Telecommunications Union (ITU) basic indicators (ITU, 2001) the countries included in this research have the following GDP per capita as at 1999:

- Kiribati: U.S.$590
- Nauru: U.S.$2,805
- Samoa: U.S.$1,159
- Tonga: U.S.$1,589
- Vanuatu: U.S.$1,273

These figures can be compared to the world average of U.S.$5,205. Despite these low GDP figures, people live fairly simple lives and are able to satisfy their basic needs.

A good statistical and informational overview of the region can be found on the University of the South Pacific (USP) Web site at www.usp.ac.fj/~gisunit/pacatlas/Frame2/Atlas2.htm and at the Web site of the Secretariat of the Pacific Commmunity (SPC) at <www.spc.org.nc/region.htm>.

Through the World Educational Forum and UNESCO in particular, there has been a concerted effort to achieve Education for All <www.unesco.org/education/efa/db/index.shtml>, a programme to ensure basic levels of education, particularly in completing primary schooling throughout the world. Countries in the Pacific region, despite having small Education Ministries, participated in an assessment of the status of Education for All in individual countries, which were then presented in the World Education Forum meeting held in Dakar in 2000. The individual country reports, as well as the regional report for the Asia-Pacific region (UNESCO, 2000), indicate that there has been substantial improvement in the quality and impact of education in the five reviewed countries. These reports were most useful in compiling the Country Reports, which are attached as Annexures to this document.

Generally, countries have paid attention to getting the basic tenets of education correct and ensuring that all children have access to free and compulsory primary schooling as a minimum. This has resulted in the improved rates of literacy over the last 10 years in all of the countries. Literacy rates in the Pacific are generally high, excluding the Solomon Islands (at 23%) and Vanuatu (64%). However, only a small percentage of the state populations complete secondary school education. In some of the countries, secondary school education is largely in the hands of private and church schools. At this level, the majority of Pacific island nations participate in the Pacific Senior Secondary Certificate to ensure compliance to an acceptable regional standard of education. In addition, many of the schools participate in the New Zealand Bursary Examinations.

The education systems in all the reviewed countries are based on a similar traditional teacher-centred model, with similar subjects being offered to those in many other countries around the world. The average class size in all the countries is less than 32 students per teacher, which is a good ratio in comparison to other developing nations. The school infrastructure for primary schools is basic, although adequate. Secondary schools generally have better-equipped school structures.

Each of the reviewed countries, apart from Nauru, has a teacher training college, which trains the majority of teachers in the individual countries. In addition, some of the teachers are trained through the University of the South Pacific (USP), or other regional universities, particularly in Australia or New Zealand. The standard entrance requirements for teachers to enter the profession have generally improved throughout the region, although physical facilities and resources at teacher training institutions have not improved significantly in the last decade.

Tertiary or higher learning institutions are represented in each country by a few government vocational training institutions. There are several private institutions also evident. The only universities currently serving the region directly are USP and the National University of Samoa (NUS). Evidence points to the increased awareness of these institutions to the use of ICTs, both in the delivery of teaching and learning and as part of the curriculum.

Image 6: Namamanuca Primary School, Fiji Islands

TELECOMMUNICATIONS AND GENERAL INFRASTRUCTURE

The table below shows the various rates of connectivity according to the ITU basic indicators (ITU, 2001a) and Internet indicators (ITU, 2001b).

Communications infrastructure 2000

	Telephone lines per 100 inhabitants	Internet users per 100 inhabitants	Estimated PCs per 100 inhabitants
Kiribati	4.03	1.2165	1.22
Nauru	Not listed	Not listed	Not listed
Samoa	4.73	0.2822	0.56
Tonga	9.86	1.0176	Not listed
Vanuatu	3.37	1.6136	Not listed
World average	16.17	5.9941	7.73

These statistics emphasise the lack of basic telecommunications infrastructure throughout the region. The problem is exacerbated by the distances between different islands in the same country and the remoteness of the islands relative to the rest of the world. In response to these problems, concerted efforts were in evidence in some of the countries assisted through foreign aid, to develop the infrastructure, particularly in the telecommunications environment.

The telecommunications and power provision sectors are still regulated and controlled by government, despite limited foreign ownership in Vanuatu. Telecommunications and power provision are generally limited to urban areas in most countries and concentrated on few of the islands in countries consisting of many islands. The small size of the populations on some of the islands makes it not viable financially to develop the

infrastructure. International telecommunications access (including voice and data) is provided by satellite in all of the reviewed countries. Diesel generators generate most electricity, although there is some use of alternatives such as hydroelectric power, particularly in Samoa. The individual country profiles presented later in this Annexures of this report provide details.

The enabling elements that would stimulate the proliferation of ICTs is lacking throughout the region, with few visible efforts by individual governments to move countries into the information economy. There are few incentives to encourage the use of ICTs or to build businesses focused or dependant on ICTs, and this is despite the need to establish new income streams, such as the tax-free havens provided by some of the countries. In addition to the low levels of ownership of PCs and use of the Internet in the home and work environments, there are few community-access Internet cafés, and the costs of use are very high. The Internet cafés that do exist tend to be dominated by visiting foreigners. In addition, there are few advanced training opportunities in most of the countries, restricting the skilled ICT professional base to a very small pool.

Mansell (1998) notes that "it has been recognised that LDCs (least developed countries), including the Pacific island countries and the central Asian republics, will have problems in building up the absorptive capacity for ICTs because of pricing, restrictive terms and conditions on technology transfer, low technical capabilities of users, and continuing dependence on a narrow set of suppliers." She adds that as a result, initiatives in the ICT field are leading to the development of regional and sub-regional initiatives, such as those discussed later in this report, which do offer hope for increased activity in the sector. In addition, Samoa is focusing increased attention on the role of the National University of Samoa in increasing ICT skills, with world-class facilities being available to students. Tonga has a plan for creating a higher education institution with a strong focus on technology and the plan enjoys a high level of political support.

Image 7: Onesua Presbyterian College, Efate, Vanuatu

USE OF ICTS IN EDUCATION

The figures presented above and visits to the respective countries both show that there is only limited use of ICTs within the education sector, particularly in the schooling systems.

In each of the countries under review, the following points were clearly evident:

1. ICTs in the education sector are not a priority. Despite this, there was increased awareness of the need to introduce ICTs at all levels of the education system, and a willingness to participate in programmes to encourage their use.

2. There is no formal Ministry/Department of Education policy for the use of ICTs at the administrative, teacher training or school level. Tonga appears closest to making this change.

3. There is no formal Ministry/Department of Education personnel and resource allocations at any levels to implement ICTs, apart from some efforts in radio and television broadcast of educational material. In some cases, Education Ministries have acted as a channel in order for schools to receive donations of equipment from foreign donor and aid organisations.

4. A small number of government, mission and private schools in each country, mostly at the secondary school level, have introduced ICTs at their own initiative. These schools are generally regarded as the best achieving and resourced schools in the individual countries.

5. Schools that have implemented ICTs have done so in the form a computer lab, and not through computers in classrooms. There is normally a maximum of two labs, or 50 computers, in a school.

6. Computers are used mostly to support the Pacific Senior Secondary Certificate subject of Computer Studies, with the additional lab capacity used for basic computer literacy. There is little evidence of the use ICTs to support teaching and learning across the broader curriculum.

7. Only a very small percentage of schools with computers have access to the Internet, due to a lack of telephone lines or prohibitive costs.

According to Heimuli (2001), reporting on The Commonwealth of Learning Symposium Pacific Region, the barriers to ICTs encountered by women (and more broadly in the region) for the purposes of open and distance learning (ODL) include the following:

1. Policy/Planning/Politics: lack of understanding of ICT role in ODL, and thus lack of policy and planning at government level.

2. Education/Training: lack of training of teachers and technicians to support use of ICTs.

3. Infrastructure: lack of basic telecommunications, equipment and electrical infrastructure, which is acquired at high cost for lower resource allocation, particularly in rural areas.

4. Resources (human, capital and materials): lack of ICT-skilled persons and financial and materials resources in relatively poor countries.

5. Brain Drain: movement of few skilled persons from rural to urban areas, and then from Pacific nations to overseas nations.

Many of the strategies adopted at the Symposium are in accordance with the Final Draft Pacific Islands Regional Information and communication techologies Strategic Plan (SPC, 2001) adopted at a recent South Pacific Applied Geoscience Commission (SOPAC) and Secretariat of the Pacific Community (SPC) Workshop held in New Caledonia (see Annexure J).

An encouraging element is that there are signs of development and support for the use of ICTs in schools in each of the countries and throughout the region as a whole. There are champions for the development of Schoolnets in individual schools, in some education ministries and in some organisations and corporations. On interviewing a broad range of players in each of the countries, a wide range of people and organisations expressed an interest in assisting with the development of schoolnets, with some initiatives already being undertaken. In Vanuatu, for example, the Telecom Vanuatu Limited company has made free Internet access, including the telephone costs, available to all schools during certain hours. They are also prepared to donate some computers to schools to ensure that schools get onto the Internet. In Samoa, there is a plan underway to give low-cost or free Internet access (excluding telephone costs) to schools through the National University of Samoa (NUS). In Nauru, there are very few schools in total, a number of them having some computers. Due to the size of the country, limited number of schools with small distances inbetween and the positive attitude of the Department of Education, it would be relatively easy to ensure that all schools in the country were equipped with ICTs.

Image 8: National University of Samoa, Apia, Samoa

INITIATIVES

There are numerous initiatives that involve the education and ICT sectors in the Pacific islands; some have a particular focus on the use of ICTs in the education sector. Dr. James McDivitt of the United Nations Association of the USA (UNA-USA) Hawaii Division recently constructed a listing of organisations with an active interest and participation in ICTs in education sector. This listing, attached as Annexure I, creates the sense that there is an active interest in the development of schoolnet-type activities in the region, and supports the decision of COL to further investigate the establishment of schoolnets in the Pacific islands. There are numerous agencies with which COL can partner to further support ICTs in education in the region.

The following organisations were found to be active. Annexure I complements this list:

1. United Nations Educational, Scientific and Cultural Organization (UNESCO): a regional office in established in Apia, Samoa, with very active programmes throughout the Pacific region. Many of these programmes have an education improvement focus, often tied into the Education For All (EFA) movement. In addition, UNESCO administers their Associated Schools Project (ASP), which promotes collaboration between schools throughout the world. Many of the schools involved in the programme use ICTs, which in turn has encouraged the use of ICTs throughout the programme. The regional UNESCO office in Apia has indicated its willingness to participate in encouraging the deployment and use of ICTs in schools in the region A detailed interview with the Regional Director, Edna Tait, is included as part of the Samoa Country Report in Annexure D.

2. University of the South Pacific (USP): this regional university has a central campus in Fiji, with extension centres in numerous South Pacific countries. Due to the distance education methodology employed by the university, it has set up USPNet, a telecommunications infrastructure between the central campus and the extension centres. The USP is keen to assist in the development of the use of ICTs in primary and secondary education, where they can be of use. An interview held with Prof. Chandra, Deputy Vice-Chancellor, USP, is attached as Annexure G. It gives insight into specific areas of collaboration. A graphical representation of USPNet is shown in Image 10.

3. South Pacific Applied Geoscience Commission (SOPAC) and Secretariat of the Pacific Community (SPC): these regional bodies are involved in broader regional development. In late August 2001, they held a joint workshop entitled Pacific Information and Communication Techologies Needs Assessment and Strategy Planning Workshop in Noumeá, New Caledonia. The Final Draft Strategy (SPC, 2001) indicates the importance of ICTs in education as part of the whole strategy for the Pacific region. The overall vision is “Information and communication technologies for every Pacific Islander.” The Guiding Principle 1 is “ICT will be used to inform and connect Pacific island populations and ensure that they benefit from flexible and appropriate education and training,” with high priority given to connectivity, teacher training and curriculum in schools from the year 2003.

4. Pacific Island Network (PIN) is an initiative of the UNA-USA Hawaii Division and is currently the leading initiative to promote school networking in the region. A project overview is attached as Annexure H. Although a small initiative, this is currently the most active project to develop Schoolnets in the region. Together with Schools Online (www.schoolsonline.org), a Californian-based non-profit organisation, they have equipped Samoa College with computers, and more importantly, have started to encourage the use of ICTs across the curriculum through collaborative online projects.

5. COL International (specifically Patrick Y. Julien) has been commissioned by the Asian Development Bank (ADB) to investigate the use of ICTs in the Pacific region. Their findings could complement the research in determining the way forward.

In addition, there are a number of donors, aid organisations and non-profits working in the area of ICTs in education, in other parts of the world, that have shown an interest in this research being done on behalf of COL. These organisations, which include World Links Organisation and the British Department for International Development (DFID) Imfundo project could be asked to participate in any intervention in this region.

Lastly, it must be mentioned that there has been a large-scale implementation and acceptance of ICTs across the curriculum in many schools in countries bordering the Pacific region, notably in Australia, New Zealand and the United States. The interaction of schools in these areas with schools in the Pacific region would be invaluable in the promotion of school networking. In addition, there are numerous agencies and experts located in these bordering countries that would be willing to provide assistance. It must be ensured that this intervention includes the involvement of other education practitioners.

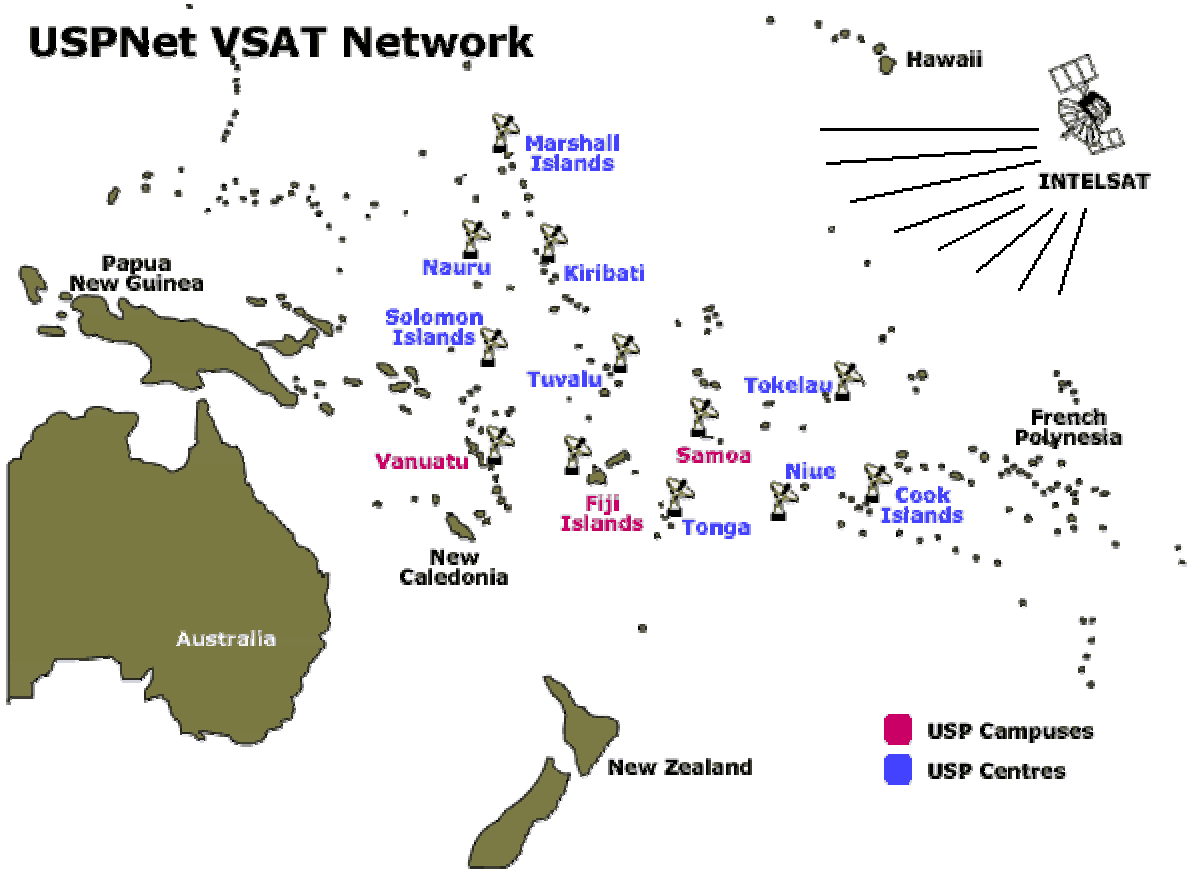

Image 9: USP VSAT Network Map

KIRIBATI

OVERVIEW

The detailed Kiribati Country Profile including observations and interviews is attached as Annexure B. The following selected observations are noteworthy highlights.

The level of development throughout the country is remarkably low, even in the more-developed urban areas. There is a lack of basic infrastructure such as power and telephony, which implies increased requirements to implement alternative connectivity and power solutions.

ENCOURAGING FACTORS

Despite the overall level of development, there are some positive factors to encourage the development of ICTs in the education sector, particularly in the urban areas.

Three functional computer facilities were viewed in the country, at KGV EBS Secondary School, Moroni High School and The Technical Institute (TTI). These facilities appear to be used effectively for computer literacy and Computer Science/Studies purposes, and have enthusiastic and knowledgeable personnel in attendance. Personnel at each of the three facilities indicated a willingness to participate in a Schoolnet programme, with TTI offering technical support. Although there was little evidence of the use of ICTs across the curriculum, assisting the schools with computer facilities with teacher training could see model examples of ICT integration for the country.

The Kiribati Teachers College (KTC) does not presently have ICTs facilities or any integration programmes, but has plans for the establishment of a facility. Involvement of teacher trainers in Schoolnet workshops would be vital to ensuring the introduction of ICTs across the curriculum. TSKL, the national telecommunications provider, indicated a willingness to consider programmes to increase schools access to the Internet. They indicated that they currently offered discounted rates to schools in their own Internet café facility.

TTI indicated that there were no import duties levied on educational institutions, and this together with a developed shipping industry could encourage lower-cost access to computers and related equipment for schools.

Image 10: KGV EBS Secondary School, South Tarawa, Kiribati

NAURU

OVERVIEW

The detailed Nauru Country Profile including Observations and Interviews is attached as Annexure C. The following observations are highlights worth noting.

Nauru is a small island state, supporting a very small population. Due to the reliance of the state on the phosphate industry, which is in decline with reserves almost depleted, there is a sense of despondency with few alternative opportunities and industries established. The current economic climate has caused an overall decline in service provision for basic infrastructure including telecommunications and power generation.

ENCOURAGING FACTORS

Due to its size, the challenges facing the country as a whole and the education sector in particular are limited. The six schools in the country, servicing almost 3000 students, provide an adequate level of education. All have some computers, although only one school has an Internet connection. Most teachers have been trained in other countries or through distance education, and therefore many have had experience with ICTs. Thus, despite the lack of telephony, the high cost of Internet access, and other infrastructural challenges, Nauru is ready for ICT in education intervention provided by schoolnets.

The installation of a wireless network covering the island by the government could easily be extended to include the six schools on the island. While Internet connectivity options are being explored, the schools could develop a schools Intranet and database of information, cached Web sites and software. From a technology perspective, this is easily achievable at relatively low cost. As there are already a large number of computers in the schools, little money would need to be spent in order to ensure all schools have a minimum ICT infrastructure.

These factors, together with the immense support and interest of the education department leadership to initiative.

Image 11: Richard Lewis, Principal and Mr. Venos Agege, Teacher, Nauru College, Nauru

SAMOA

OVERVIEW

The detailed Samoa Country Profile including observations and interviews is attached as Annexure D. The following observations are highlights worth noting.

An overall impression of the country is one of positive developments, from the economic, infrastructural and educational perspectives. Despite many existing challenges, there appears to be a willingness to develop the country and enhance the lives of its citizens. There are many signs that reflect the problems and challenges that the country has faced and continues to address. The telecommunications infrastructure is old and problematic, however it is being addressed positively by Samoa Communications, with new projects being carried out. This includes a new backbone from Apia all the way to the airport. Few schools have access to telephones, but this is being addressed through The Institutional Strengthening Project of the Department. Samoa Communications has indicated its willingness to support school connectivity programmes, in support of the National University of Samoa (NUS), in similar fashion to Telecom Vanuatu Limited (TVL) of Vanuatu. The Electric Power Corporation indicates wide, although not universal, access to electricity.

ENCOURAGING FACTORS

NUS has state-of-the-art ICT facilities, used for its own programmes, and also accessible by agencies for training. The Teachers College was recently integrated into the Faculty of Education of NUS, and there are encouraging signs of improvements in teacher education. With to the ICT facilities at NUS, including video-conferencing and high bandwidth Internet access, teachers trained at this institution could have positive impact in the nations' schools. In addition, the government has mandated that all schools can have access to the Internet through the link NUS enjoys with American Samoa. At the time of visit, the logistics, including the dial-up lines, had not been finalised, so no schools were taking advantage of this. However, if the telephone infrastructure proves a problem, a wireless solution could be implemented.

A large number of schools have at least one computer, with a few having computer labs. Samoa College that has benefited from a PIN/SchoolsOnline initiative and has participated in some collaborative projects. This school could lead developments to integrate ICTs across the curriculum. A strategy to target government colleges, followed by the secondary schools, could ensure that ICTs begin to infiltrate the teaching and learning process. UNESCO and its Associated Schools Project could have a positive role in the implementation of ICTs in Samoa and throughout the region.

Image 12: Mr. Reupena Rimoni, Headmaster, Samoa College, Apia, Samoa

TONGA

OVERVIEW

The detailed Tonga Country Profile including observations and interviews is attached as Annexure E. The following observations are highlights worth noting.

The country, with a population of about 100 000 people occupying 45 islands, shows positive signs of development within a fairly stable political and economic climate. Like all the countries reviewed, there are numerous challenges, including the lack of basic infrastructure, but most encouraging are the developments within the education sector, including its programmes and the leadership in place. The Minister of Education is extremely supportive of ICT in education and distance education programmes and would like to see all schools gaining access to computers and the Internet. The country also currently has plans for the development of a Technology University to service its own needs and those of the region. This environment is most conducive to the implementation of a successful schoolnet initiative.

ENCOURAGING FACTORS

The Tonga Communications Corporation (TCC), the country's sole telecommunications and Internet service provider, is undergoing renewed development and has offered special rates to schools, although these still prove to be prohibitive. Most schools, particularly those in the most populous island of Tongatapu, have access to electricity and telephones (these may be for the wider community use).

There are a number of post-secondary vocational entities, mostly falling under the umbrella of the Community Development and Training Centre (CDTC). These include the Tonga Institute of Education, the teacher training college, and the Distance Education and Communication Centre. These facilities could certainly be utilised in teacher development programmes for ICT in education integration. In addition, the equipping of the teacher resource centres would give teachers in the country access to ICTs. Students could then also use these facilities, during and after school hours.

A number of schools have computer centres, with encouraging use of the facilities shown at Tonga College and Tonga High School. The schools appear willing to use the facilities for activities beyond computer literacy and Computer Studies, although they claim that they would need more facilities. Focusing schoolnet activities at these schools and at the above-listed facilities would be a positive initial strategy.

Image 13: Library, Tonga Institute of Education, Tongatapu, Tonga

VANUATU

OVERVIEW

The detailed Vanuatu Country Profile including observations and interviews is attached as Annexure F. The following observations are highlights worth noting.

The country appears to be experiencing positive developments, despite the obvious lack of infrastructure, particularly outside of the urban areas of Port Vila and Luganville, where the majority of the population live in sparsely populated areas. There are indications of infrastructural development, particularly in the telecommunications sector, although there are complaints that initiatives do not seem to be integrated.

ENCOURAGING FACTORS

Telecom Vanuatu Linited (TVL), the sole telecommunications and Internet service provider, is having a positive impact in making free Internet access, including free Internet calls, available to all schools in the country that can access their grid between certain hours of the day. Only a few schools have taken the company up on its offer and have started to experience the benefit of ICT in teaching and learning. TVL has realised the value that the Internet can play in education and in developing the overall telecommunications sector as future customers. It has also been involved in the provision of computers to some schools and is committed to assisting in the development of schoolnet initiatives in the country. TVL has indicated that there are a large number of donors that would be interested in developing a programme of action for Vanuatu.

Most teachers are trained at Vanuatu Teachers College, which does not currently have reasonable ICT facilities. An important strategy would be to equip this facility and ensure the introduction of integration programmes. The National Institute of Technology, a vocational centre, has computer facilities that could be useful in teacher development programmes and in providing community access to ICTs in Vila.

Some of the schools, particularly secondary schools, have computer centres, which are mostly used for Computer Studies. Onesua said that it had used the facilities for broader educational use, as had Central Primary. As with the other countries under review, a programme to further enhance the use of the facilities at these schools would promote school networking, and may enhance the levels of education.

Image 14: Mr. John Niroa, Principal, Malapoa College, Port Vila

RECOMMENDATIONS

Based on my visit to the Pacific islands, specifically Kiribati, Nauru, Samoa, Tonga, Vanuatu and Fiji, site visits, interviews and additional research, the following recommendations concerning schoolnets in the Pacific islands are offered. These recommendations should be for action within the entire Pacific region, although COL's support could focus on Commonwealth member nations. This section begins with certain assumptions that will ensure the success of school networking in the region. It then outlines a process of establishing a working group that could plan and execute a stakeholder workshop. A Pacific schoolnet secretariat could be appointed as a result of the consultation of the stakeholder workshop that could carry out specific functions in developing school networking throughout the region. A draft budget for these activities is included. In addition, this section outlines key policy issues that need to be addressed in the region by government in order for the use of ICTs in the primary and secondary education sector to proliferate.

ASSUMPTIONS

The recommendations in this report are based on a set of assumptions that aim to ensure the effective and meaningful implementation of school networking in the region. These assumptions are:

1. Political and organisational support: the support for this study from the Ministries of Education in the selected countries is an indicator of a level of systemic backing for the development of school networking in the region. The interactions I experienced with a wide cross-section of stakeholders validate this assumption. The importance of this support cannot be underestimated. However, moral support will need to be reinforced through policy and budgetary processes, as emphasised throughout this report. Various policy issues are highlighted later in this section for serious consideration.

2. The value of ICTs in enhancing teaching and learning: the core assumption for introducing ICTs within the education system is that it adds value to the teaching and learning process. It assumes that the educational system is deficient in some way, and that ICTs can benefit and positively influence the educational processes. In order to successfully implement ICTs to derive the benefits, the education system will need to adapt, and ICTs will need to be prioritised. If this initiative is viewed as a minor project, it will not have the desired benefits.

3. Willingness of island states to collaborate to benefit the region: as a regional approach is being proposed, it is necessary for regional collaboration to be highly regarded and supported. Despite the uniqueness of each country and its people, all indications are that the region does collaborate in order to ensure its advancement within a global context.

These assumptions were developed and continuously tested throughout the research process. However, as is the case with most assumptions, they represent a potential risk factor and must be regarded in this light in the implementation of the recommendations.

PROCESS

PHASE 1 – PACIFIC SCHOOLNET WORKING GROUP AND POINT OF CONTACT

In order for the Pacific schoolnet initiative to be successful, it must ensure the identification and involvement of all relevant stakeholders in the process. From this identification process, a Pacific schoolnet working group should be established by the end of the first quarter of 2002. The key role to be played by the working group would be the identification and participation of the relevant leaders in the field, leading to a stakeholder workshop. The working group members should be formed with these points in mind:

1. The most important stakeholders are the individual country governments (specifically the Education Ministries), and it is understood that this report and its recommendations will be presented to them as the first priority. Without the support and involvement of the individual countries, this exercise will be futile. Each of the individual countries should be invited to nominate a participant on the working group, or at least appoint a country contact person with whom the working group can communicate.

2. As COL and PIN appear to have been most active in the investigation and promotion of school networking in the region, both agencies will need to play a key role in the operation of the working group. One of these agencies should take the lead, and make resources (primarily human) available to drive the process forward. In addition, a part-time co-ordinator could be appointed to take responsibility for the working group and manage preparations for the workshop. Additional administrative support would also be necessary in the planning of the workshop.

The identification of the most appropriate agencies and individuals operational in the Pacific region is vital. The Observations section of this report and Annexure I lists a range of initiatives and organisations that need to be consulted and involved in the process. As a minimum, the working group should include representation from USP, SPC, SOPAC and UNESCO, in addition to COL and PIN. Participants must have an understanding of school networking and be willing to contribute in time and effort.

An important task of the working group will be the assessment of this report as a basis for further development of the school networking initiative in the region. An integral part of that assessment will relate to the budgetary recommendations and assumptions and starting the process to raise the necessary financial support. This report, together with additional findings and recommendations, will form the basis of discussions and deliberations at the workshop.

PHASE 2 – STAKEHOLDER WORKSHOP

The working group's key objective would be to organise and manage a Pacific schoolnet stakeholder workshop. The workshop's key outcome would be to establish a school networking venture in the region. This four- to five-day workshop could be scheduled for mid-2002, and include representation from individual countries, interested local, regional and international agencies, and teachers and heads at leading schools. In addition, it would be useful to ensure the participation of several successful school networkers from throughout the world. It is recommended that this take place in Fiji or Samoa, due to travel and venue considerations. The venue will need to have the minimum of a plenary room, breakaway rooms and, more importantly, computer facilities with stable Internet connectivity. Such venues exist at USP (Fiji) and NUS (Samoa). The working group would need to ensure financial support for the workshop and the participation of individual country members. This stakeholder workshop should have the following primary functions:

1. To detail the concept of school networking and the varied roles of ICTs and its use in education. This can be achieved through presentations by international specialists, videos from successful schoolnets throughout the world and the creation and viewing of an explanatory video.

2. To hold practical workshops, orientating participants on the methodologies used to integrate ICTs in the classroom, the associated learning paradigms and the numerous technical solutions and alternatives.

3. To develop an action plan for the establishment of the Pacific schoolnet secretariat and identify priority areas for its action over a two-year period.

In addition to the leading role that COL could play in steering the working group, it could perhaps support the participation of delegates to the workshop from the five nations investigated as part of this report. COL could also manage the task of compiling a video detailing school networking concepts that could be highlighted during the workshop and be available to the countries after the workshop.

PHASE 3 – ESTABLISHMENT OF PACIFIC SCHOOLNET SECRETARIAT

As the islands are all small in population, and school networking is a new concept in the region, one regional body should initially be established to promote school networking. This may evolve into separate country initiatives over time, although that would largely depend on the roles the individual governments play in the development and promotion of the concept. The role of a Pacific schoolnet could be one of support of individual states and their initiatives. Out of the workshop, agreement should be reached on the establishment of a full-time Pacific schoolnet secretariat at regional level to act on behalf of all islands in developing school networking. This secretariat should be based with another key agency with similar interests in the region initially, in order to ensure costs are minimised and to capitalise on the strengths and support base enjoyed by this agency. Some critical success factors to be considered include:

1. The identification of a host agency that would support and not hinder the development of the schoolnet concept and may lead to an independent organisation. The agency should have good reach throughout the Pacific region and be operationally orientated. Although the organisation will probably become independent in time, it is important that it has the support and positioning offered by a host agency in its start-up phase. My specific recommendation is that this agency be USP. Through USPNet, the Pacific schoolnet could have inroads into a large number of countries already members of the network. This idea is further enhanced through the appointment of the Ministers of Education of numerous countries on the governing body of USP. Although USP specifically targets the tertiary education sector, its support of the schoolnet initiative would surely benefit its positioning in the region. A reading of Annexure G will support this recommendation.

2. The identification of an individual as the champion of the initiative is critical. This person should have an ICT education and background, as well as good management and leadership skills.

3. The recruitment of more personnel should take place based on financial support and should include both ICT and education specialists, ensuring the best technical solutions are implemented in support of educational outcomes. In the initial phase of development, additional personnel may be considered an unnecessary luxury, but as the initiative gains ground, these appointments will be vital. The suggested budget below makes provision for these appointments within six months of operation.

4. The sustainability and financial model for the development of the organisation should be agreed to from the onset. This will determine the functions of the organisation and its staff, and the overall role

it will play. Examples of other schoolnets and their financial models are listed in the Introduction to this report. It is vital that a solid financial base be sourced initially to ensure that the organisation can begin operations as soon as possible after launch.

5. It should also be clear how the organisation would interact with the individual countries, their governments, agencies and schools. This may be recorded in the form of a memorandum of understanding (MOU).

6. A number of larger countries bordering the region, including Australia, New Zealand and the United States, have experience in the integration of ICTs in the school system. Learning from such experiences and consulting with theorists and practitioners in these countries would add tremendous value to the development of the Pacific schoolnet.

Image 15: Primary School, Apia, Samoa

KEY FUNCTIONS OF PACIFIC SCHOOLNET SECRETARIAT

In line with other schoolnets throughout the world, the Pacific schoolnet secretariat could focus on the following broad areas:

1. Connectivity and technology: as the infrastructure is vital to the schoolnet concept, the organisation would need to have an understanding of appropriate and workable solutions, and may well be involved in the implementation of the infrastructure, including the computers, networking, connectivity, and even off-the-grid power alternatives. As there is a lack of infrastructure in the region as a whole, and few schools currently have ICTs, this would be a focus for the organisation in its initial stages. Schoolnets in more developed countries could place less emphasis on this area.

2. Content and curriculum: the use of the technology to enhance teaching and learning and the education process is pivotal to the schoolnet concept. The focus of the Pacific schoolnet in this area may initially be the promotion of interactive communication and learning projects (such as those offered by iEARN and ThinkQuest), but may lead to the development of an indigenous portal with localised content and projects, or even an online school.

3. Teacher development: the schoolnet concept as a whole has a concentration on a learner-focused approach to education, in which the teacher is the key to the effective use of ICTs in the classroom. Thus an emphasis on teacher development is characteristic of most organised Schoolnets, from computer and information literacy, to advanced integration skilling, using a combination of face-to-face and mentor-supported distance education methodologies. As the education systems in each of the reviewed countries is largely teacher-centred, and lack of resources and finances has limited the use of audiovisual aids in the teaching and learning process, a concentration of effort on teacher development will be needed.

4. Policy and advocacy: an important role of a Schoolnet is the promotion of the concept throughout the region, particularly within the governments, in order for ICTs to be integrated within the education systems of the countries. Below, specific policy issues that need to be addressed and advocated within the countries are identified. These are further outlined in the sub-section *Key Policy Issues Be Addressed* later in this section of the report. Some schoolnets have engaged successfully with policy-makers and Education Ministry Officials through workshops, such as that available from World Links.

As the organisation determines its broad focus areas, it can then outline its specific activities and projects. An important consideration will be whether the organisation acts as a research and development entity, or as an operational entity that is involved in activities such as sourcing funding, commissioning technology in schools and/or community centres and developing a portal. Most schoolnets have taken an operational approach and have thus engaged in various activities that have a visible impact in the schools. As a starting point, I recommend drawing out areas of strength in different countries to accentuate and develop in particular countries and throughout the region. Some of these opportunities have been raised in the individual country profiles presented in the Observations section of the report. These may include the introduction of ICTs in more ASP schools supported by UNESCO, support of TVL in Vanuatu with its current initiative, the promotion of the TVL free-Internet model in other countries, and the development of wireless connectivity infrastructure in contained areas such as Nauru.

Overall, the organisation would probably be involved in fundraising and partnership activities, due to the limited resources in the Pacific region, developing projects in support of the focus areas, and working with the countries in developing a policy environment that is conducive to school networking.

Specific support from COL for a Pacific schoolnet could include:

1. A teacher development programme of workshops within each of the five countries could be undertaken, perhaps in collaboration with other agencies such as World Links.

2. Participation in the development of an online portal of resources and content for the region.

3. Support of Education Ministry authorities in prioritising use of ICTs through policy development and/or training, through the current work that COL does throughout the region.

4. Supporting the participation of a few key players in a study visit to a successful Schoolnet in another country.

Image 16: Children at Central Primary School, Port Vila, Vanuatu

DRAFT BUDGET

The following budget is based on the implementation of the recommended three phases for the development of a Pacific schoolnet, as outlined in this report. As there are numerous variables, including in-kind support that could be provided by various organisations, it is more important to consider the specific items listed than the figures.

PROPOSED DRAFT BUDGET FOR IMPLEMENTATION OF PACIFIC SCHOOLNET (in U.S. Dollars)					
Item #	**Description**	**Qty.**	**Item Cost**	**Cost**	**Phase Subtotal**
	PHASE 1 - WORKING GROUP				**21,000**
1	Part-time co-ordinator to develop the venture and oversee the workshop, until appointment of (months)	8	2,000	16,000	
2	Travel and subsistence of co-ordinator through the island states to facilitate preparations for workshop	1	5,000	5,000	
	PHASE 2 – WORKSHOP				**92,000**
3	Documentation for workshop and communications	1	5,000	5,000	
4	Production of school networking video	1	5,000	5,000	
5	Workshop venue (largely sponsored)	1	2,000	2,000	
6	Regional delegates travel and subsistence (based on 2 or 3 persons per country, over 5 days)	30	2,000	60,000	
7	International delegates travel and subsistence	5	3,000	15,000	
8	Contingencies	1	5,000	5,000	
	PHASE 3 - SECRETARIAT OVER 2 YEARS				**421,000**
9	Pacific schoolnet director (annual package)	2	60,000	120,000	
10	ICT specialist (annual package)	1.5	45,000	67,500	
11	Education specialist (annual package)	1.5	45,000	67,500	
12	Administration (annual package)	2	20,000	40000	
13	Furniture and equipment (per person)	4	4,000	16,000	
14	Rent, utilities and communications – largely sponsored (per annum)	2	10,000	20,000	
15	Programme management and development (dependant on programmes – see notes below)	2	15,000	30,000	
16	Regional travel (6 trips per professional per annum)	2	30,000	60,000	
	TOTAL BUDGET (IN US$)			***534,000***	

Budget Notes

The budget above does not give guidelines for implementation of ICTs in each of the countries or throughout the region, but focuses on the organisational development of a Pacific schoolnet. From experiences in other countries, implementing a 30-PC basic computer lab, with dial-up connectivity, provision

of software, ongoing teacher development, additional staff resources and overall management could be implemented at a cost of U.S.$50,000 per school over five years. In the five island states reviewed in this report, there are approximately a total of 750 government schools, and thus roughly speaking, the overall cost of implementing an ICT programme in all government schools could be less than U.S.$40 million over five years.

However, due to the lack of basic infrastructure, particularly in the rural areas and in primary schools, a first level intervention could include equipping secondary schools throughout the region, using alternative connectivity and electricity sources in schools that do not have access to basic infrastructure. There are numerous mechanisms to obtaining equipment at lower costs, thus the implementation costs could be very much lower than indicated above. The Technical Institute in Kiribati sourced its "as-new" computers at a greatly reduced rate, and more can readily be sourced. An objective of interventions in a quarter of all government schools in the next five years could be easily attainable.

As there are numerous factors and issues to be considered, a detailed budget has not been prepared to accompany these indications. Overarching the budget is the knowledge that teacher development and training are a significant and costly component and vitally important if an ICT in education intervention programme is to be effectively implemented. With some schools already having the ICT facilities throughout the states, an effective teacher development programme targeted at these schools could ensure model schools that could illustrate and promote the Schoolnet concept throughout the region.

KEY POLICY ISSUES TO BE ADDRESSED

The concept of schoolnets has thrived throughout the world, although it has been greatly advanced through the establishment of a policy environment conducive to the use of ICTs in the education sector. School networking is often seen as a vital component to advance a country in the global environment. Thus, the impact of the policy changes is felt beyond the education environment. The following policy issues have been taken up in different countries throughout the world and are by no means considered complete or definitive. They should be seriously considered as policy opportunities in the Pacific island states.

EDUCATION POLICY

1. Computerisation of administration systems: this initial policy introduces computers into the school environment and assists in establishing a uniform database of necessary information across the country. This requires only one computer per school and the necessary software packages. Most importantly, training and support of the administrators in each school will ensure the benefits of the policy are experienced within the education system. Although this policy does not address issues around school networking, it does assist schools in the computer literacy process and in gaining an understanding of the value of ICTs.

2. Computer literacy for all: as this becomes a stated policy objective, activities and budgets develop to ensure it is met over time. This policy generally translates into a large budget, as equipment will need to be provided to each school, concurrently with teacher development. This policy could be implemented by targeting specific levels of the school system, or through specific types of schools, for example the government colleges in Samoa. Although school networking seeks to use ICTs beyond computer literacy, this policy would indeed further the cause, provided an ICT across the curriculum policy is planned. This policy must not be confused with the introduction of the

subject discipline of Computer Studies or Computer Science, which is targeted at a smaller group of students with a specialist interest in computers, and which is often more vocationally orientated.

3. Use of ICTs across the curriculum: in order for ICTs to be effectively used for educational value, policies need to be implemented that will ensure that the technologies are used in all learning areas of the curriculum. In many parts of the world, this has been allied to changes in the fundamental education systems of those countries, towards a learner-focused system. This policy can only be effectively implemented with a comprehensive teacher development programme.

4. Focus on technical vocation: in order to further a country's stated objective to enter the new economy, there must be an increase in the skills base to meet that objective. This will ensure that the introduction and use of ICTs in any sector, including education, is supported and further enhanced. This policy may translate into various activities, including the following:

    a. Establishing technical vocation institutions, with the focus on ICTs, similar to the concept of a Technology University being considered by Tonga.

    b. Community service obligations for state-aided students during or on completion of studies in the education sector. Thus, a Java programmer whose studies have been funded by the state has to work *x* time during holidays or after completion of studies on a portal development or mathematics application.

    c. A skills development levy or skills development obligation imposed on all businesses, to ensure that the overall development of skills of the nation, particularly in the ICT environment, is increased.

TELECOMMUNICATIONS POLICY

5. E-rates on telecommunications and Internet access: many countries have encouraged the use of ICTs in the education sector through policy enforcing advantageous rates for telecommunications and Internet access. Countries that have implemented some form of an education rate (e-rate) include the United States, Egypt, Senegal and South Africa. According to an article in the *New York Times* by Susan Stellin, "97 percent of public schools in the United States are now connected to the Internet, while 84 percent of public school classrooms are online. Jeanne Hayes, president of the research company, attributed the high connection rates to the federal rate programme, which provides money to wire schools in part through fees assessed on consumers' phone bills" (Stellin, 2001). TVL in Vanuatu has implemented free Internet access for schools in that country, and this could certainly be used as the example to be followed in other island states.

6. Universal service obligations for telecommunications operators: some countries have set up or at least legislated a universal service fund through contributions by telecommunications operators as a means to increase universal access to telecommunications services. As education institutions are commonly regarded as community facilities, the education sector could greatly benefit from this strategy.

TRADE AND PRIVATISATION POLICY

7. Tariffs on ICT equipment: computers and ICT-related equipment represent the highest visible costs relating to the use of ICT in education. As this equipment is mostly imported into developing countries, the costs are more than in developed countries. A relaxation or reduction of import tariffs

on education-bound ICT equipment could promote the entrenchment of ICTs in education. Various strategies exist to implement the policy, both pre-acquisition and post-acquisition of the equipment. There are also various mechanisms that can be used to prevent abuse of the policy. Apparently Kiribati and Tonga do not charge import duties to educational institutions.

8. Privatisation and liberalisation used to benefit education sector: the sale of state assets, particularly in the telecommunications sector, could be attached to additional financial or service support directed at the educational community, specifically for the use of ICTs. This strategy was successfully applied to the sale of the share of Telkom South Africa to the Thintana Communications consortium comprising Telekom Malaysia and SBC. This could be a once-off or ongoing commitment.

9. Education tax fund: this is an additional taxation on corporate entities within a country in order to improve the overall education sector. This policy has been implemented in Nigeria.

Image 17: Nauru Shoreline

CONCLUSION

The Pacific island states present an environment that is ripe for a major technology intervention. Developments at grassroots level suggest a common theme of desire to breach the digital divide across these communities. No time should be lost in the implementation of a programme that will take advantage of the existence of this groundswell movement. Structures should be designed and developed with a sense of urgency. Governments must be marshalled and communities of learners and educators must rally with partners in the private sector.

Global technological developments continue unabated and at high speed. Paradoxically, it is through the rapidly advancing nature of contemporary technology that the developing world has the opportunity for the first time in the history of mankind to compete with developed nations on an equal footing. Indeed, given the rapidity of developments in technology, it has become possible to surpass the status of developed nations. One has only to look to the achievements of countries such as India (software development), the Philippines (semiconductor production) and Taiwan (production and assembly) for examples of how this has already taken place.

The logical point of intervention is with the youth, and the schoolnet model with its focus on schools has displayed its merit in contributing to the creation of an enabling environment for socio-economic

development through ICTs in education. A Pacific schoolnet has an inestimable role to play in fast tracking the Pacific island states into the new economy.

Image 18: Satellite Dish at Tonga Communications Corporation

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THE AUTHOR

Denis Brandjes is currently an independent consultant specialising in the field of information and communication technologies in education and development. He has consulted widely in this field, from the management, technical and educational perspectives.

He is currently assisting in the development of NetDay Association, a non-profit entity providing technical infrastructure to schools in South Africa, and a continent-wide business, DireqLearn. He is on the board of directors of NetDay Namibia and the Washington, D.C.-based World Links organisation, as well as two private companies.

Until July 2001, Denis was the Executive Director of Schoolnet SA, and has he been involved in schools networking in a volunteer and full-time capacity since 1995. He played a pivotal role in the conceptualisation and formation of SchoolNet SA in 1997. SchoolNet SA is today the leading school networking initiative in Africa.

His initial work experience was as a high school teacher in Johannesburg between 1991 and 1997, focusing specifically on the introduction and use of information technology. He was also involved in managing two small information technology companies over a period of four years.

He is married, with two sons, and resides in Johannesburg, South Africa.

THE COMMONWEALTH OF LEARNING

Vancouver, Canada

Environmental Scan and Plan for the Establishment of Schoolnets for the Pacific island states

BACKGROUND

Education systems in all countries are undergoing change and transformation designed to make the system more efficient, effective and inclusive. Many of these changes are being driven by the socio-economic and educational needs within the country, by the international Education For All campaign and the need to bridge the digital and knowledge divide. Another key driver for such change is the use of information and communication techologies (ICT) to support all sectors of the education and training system. There is increasing evidence that using ICT in the education and training system has had a positive impact on the efficiency of the system and performance of the learners.

During informal discussions with Education Ministers and formal discussions with officials from the different Pacific island nations, it became evident that using technology to support the schooling sector is vital to enable access to a better quality and efficient education and training system. Ministers also noted that introducing technology into the education system is a vital mechanism to close the digital divide and ensure that learners, especially young students, are familiar with the technology and its application. Many countries have begun to establish schoolnet structures to support the use of technologies. Ministers in this region have indicated their interest in pursuing this option.

COL has agreed to undertake a study that will consist of an environmental scan of ICT and its use in the education system and develop a plan for the establishment of an schoolnet structure.

OBJECTIVE OF THE STUDY

To undertake an environmental scan of ICT infrastructure and its current and potential application to the education and training system in the specific Pacific island country, and based on this scan, to outline a plan for the establishment of an schoolnet structure.

CLIENTS

The main clients for the study are The Commonwealth of Learning and the Education Ministry of the participating Pacific island nation. Other secondary clients could include donor and development agencies and technology and educational institutions within the country.

SCOPE

The study will review current ICT infrastructure and future plans in this area. This will include developments in the telecommunications and education infrastructure (school buildings, electricity, etc.). It will also focus on current use of ICT in the different sectors of the education and training system. Based on this analysis, the study will offer options for the organisational form and function of an schoolnet structure and include the cost implications for such options. The study will further offer a broad plan with cost implications on the implementation process to establish such an Schoolnet structure. All of the above will be delivered in a report,

which will include an executive summary, a list of the documents consulted, people interviewed and sites/institutions visited.

Specifically the study will:

- Review current ICT infrastructure for the country
- Note the state of school infrastructure in terms of buildings, electricity, telecommunications, and equipment.
- Identify education and technology institutions/organisations that would support the school system using ICT
- Analyse how ICT is currently being used within the education and training system.
- Identify educational and technological policy issues that need to be addressed.
- Based on the above, make recommendations on the most appropriate organisational form and function for a schoolnet structure.
- Determine the financial implications of the recommendations.
- Provide a draft plan for the establishment of such a structure.

APPROACH AND ACTIVITIES

This study will be undertaken by a consultant contracted by COL and will visit the participating Commonwealth Pacific island countries. S/he will be working with officials and/or committee from the Ministry of Education to carry out the review and analysis of the country. The consultant will review documents, interview officials and visit institutions to gain greater insights into developments.

Based on this, the consultant will prepare a draft report to ensure that the areas covered in the scope of work are addressed. The report will then be shared with COL and officials and/or committees for comments before preparing the final report.

The report will then form the basis for discussion between the Pacific island countries, COL and other parties.

TIMEFRAME AND COSTS

The consultant is expected to spend 45 days completing the visits and report. All costs associated with the consultant's time and expenses while in the participating country and in preparing the report will be met by COL.

MARCH 2001

ANNEXURE B – KIRIBATI COUNTRY PROFILE

GENERAL DEFINITIONS

Information and communication techologies (ICTs): Various technologies, with key focus on computers (hardware and software), Internet and multimedia
Schoolnets: Collaboration of schools using ICTs for educational outcomes
Students: Participants in learning component of education process, at any level of education. Also known as learners.
Teachers: Participants in delivery or teaching component of education process. Also known as educators.
Graduates: Learners that have completed formal tertiary education

INTERVIEWEE/S AND SOURCES

1. **Mr. Temaia Ereata,** Senior Education Officer**,** Ministry of Education, Training and Technology, Republic of Kiribati
2. **Mr. Kinta Eram,** Head of Mathematics and Computer Studies, KGV EBS Secondary School, South Tarawa, Republic of Kiribati
3. **Mr. Kamatoa Babo,** Accountant, Moroni High School, South Tarawa, Republic of Kiribati
4. **Mr. Tiribo Tabanga,** Principal, Kiribati Teachers College, South Tarawa, Republic of Kiribati
5. **Mr. Phillip Gottschalk,** Technical Advisor and Lecturer, TTI, South Tarawa, Republic of Kiribati
6. **Mr. Teata Taratiera,** Manager Sales and Marketing, TSKL, South Tarawa, Republic of Kiribati
7. **Mr. Karotu Tannang**, LAN and Computer Systems Engineer, TSKL, South Tarawa, Republic of Kiribati
8. **UNESCO Education for All 2000 Country Report (Kiribati),** Mr. Timau Tira
9. **Kiribati Travel Fact File 2000-2001,** Ministry of Commerce, Industry and Tourism
10. **Dorling Kindersley Atlas of the World**, 1998

GENERAL COUNTRY FACTFILE

1. Official country name	Republic of Kiribati
2. Date of formation	1979
3. Capital	Bairiki
4. Population	82,558 (1998), 40% under age of 14years
5. Total area	710 km^2
6. Number of islands	33
7. Geography	Three groups of tiny, very low-lying coral atolls scattered across 5 million km^2 of ocean. Most have central lagoons. South Tarawa and Kiritimati (or Christmas Island, in the Northern Line Islands) are considered as urban and the other outer islands as rural.
8. Density	108 people km^2
9. Languages	English, Kiribati
10. Government	Multiparty Republic
11. Economy	Until 1980, when deposits ran out, phosphate from Banaba provided 80% of exports. Since then, coconuts, copra, seaweed and fish have become main exports. The islands are heavily dependent on aid.

MINISTRY OF EDUCATION

12. Minister	The Honourable Teambo Keariki, Minister of Education, Training and Technology, Kiribati
13. Head of Department/Director-General	Mr. Tukabu Teroroko, Permanent Secretary
14. Structure	Chief Education Officer reports to Permanent Secretary, with four Senior Education Officers accountable for primary education, secondary education, tertiary education and curriculum.
15. Other	Of the country's population, 38% is urban (South Tarawa and Kiritimati) and 62% rural (the outer islands). The distribution of schools in the urban-rural category is 14%-86%.

PRIMARY EDUCATION SYSTEM INFORMATION

16. Primary education definition/scope	Class 1 to Class 6, from 6 years of age to 12 years of age.
17. Typical school description	Simple-type structures, with wire-mesh windows. Use community-meeting halls (maneaba) for large gatherings. Little additional infrastructure at primary schools. Some schools, particularly in South Tarawa have two school sittings per day.
18. Funding	Compulsory universal primary education (UPE) is free. Historically, the provision of education in the country has evolved through a partnership, sometimes uncomfortable, between the government and the church organisations. While the church organisations were key providers of primary education during the colonial period, the government gradually took the lead and eventual control of all primary schools by 1990. Today the church organisations are concentrating on preschool, secondary and the non-formal sub-sectors.
19. Number of primary schools	Progress in primary education over the last five years has been steady. Beginning in 1990, the government has followed a policy of primary school consolidation in rural areas in order to achieve economies of scale and reduce multi-class teaching. This has resulted in a reduction of the number of primary schools from 112 in 1989 to 92 in 1995 to 86 in 1999.
20. Number of children in system	Total primary population of 20,798, of which 17,557 students are enrolled.
21. % age-appropriate children in system	Available data that indicates a net enrolment ratio of approximately 82% in 1995. This is a slight improvement for this age group but it continues to show that some 3000 primary school children do not get to schools for reasons believed to be quite varied and hardly documented.

22. % population completing primary education	The survival rate for classes 1-6 has increased from 87% in 1990 to 91% in 1995. However, of those sitting for the common entrance examination (CEE), about 70% pass it successfully.
23. Average class size	The teacher-pupil ratio was in the range of 29.2 to 31.3 between the 1990 - 1998 period.
24. Key learning outcomes for primary education	An assessment of learning achievement in Kiribati therefore comes from its local examinations the CEE that marks the entry to the secondary school into Form 1.
25. Key education methodology for teaching and learning	Traditional teacher-student learning methodologies
26. Use of audiovisual aids in classroom	In South Tarawa, there is greater access to AV than in remainder of islands, although use is generally limited.
27. Promotion and involvement of learners in extracurricular activities	Students are encouraged to participate in sporting and cultural activities, however very little is competitive.

SECONDARY EDUCATION SYSTEM INFORMATION

28. Secondary education definition/scope	Form 1 through Form 7, ages 12-19
29. Typical school description	Secondary schools, mostly managed by churches, are generally more formal and structured, and most include boarding facilities.
30. Funding	Three government-run secondary schools are completely funded by the government. The remainder of the schools receive a government grant based on enrolment, with all these schools charging fees, which limits access to secondary education.
31. Number of secondary schools	There are thirteen secondary schools of which three are government run, the remainder being church-administered. Large proportion of these schools are in South Tarawa.
32. Number of children in system	Large proportions of CEE students follow through their education into junior secondary schools and sit the Kiribati junior certificate (KJC) at the end of Form 3. Fewer still will pass into senior secondary school phase. See below for fall-out rates.
33. % age-appropriate children in system	As above. No exact figures available.

34. % population completing secondary education	Although the pass rates in the three successive examinations, namely CEE, KJC and KSC, are fairly stable at around 71%, 74% and 49%, the total number of students who actually move up the ladder decrease by an average rate of 30%, 26% and 51% at each of the external examinations respectively. In other words, only about 25% of a given cohort of students would reach Form 6 and appear for the Pacific senior secondary certificate examination. Of these only about 8% finally reach the top of the secondary level, Form 7.
35. Average class size	Similar ratios to primary schools.
36. Key learning outcomes for secondary education	Kiribati shares with the other Pacific island countries a rather heavy reliance on norm-referenced classroom tests and external examinations in assessing learning achievements of its students. The examinations have to date served the necessary function of selection for the limited places at the secondary level and the tertiary institutions. The Kiribati junior certificate (KJC) is administered at the end of Form 3; the Kiribati school certificate (KSC) that comes at Form 5 and finally, the SPBEA administered PSSC at Form 6. The establishment of a regional institution, the South Pacific Board for Educational Assessment (SPBEA) in the eighties has boosted the efforts of Pacific island countries to run their own examinations at the secondary level and to join in the regional examination, the Pacific secondary senior certificate (PSSC), that is for Form 6 students.
37. Key education methodology for teaching and learning	Traditional, although experimentation with other methodologies is common.
38. Use of audiovisual aids in classroom	More commonly used than in primary school, particularly in urban areas.
39. Promotion and involvement of learners in extracurricular activities	Encouraged to take part in sporting and cultural activities, with more competitive interschool activities taking place.

TERTIARY EDUCATION SYSTEM INFORMATION

40. Tertiary education definition/scope	Post-secondary, vocational and academic.
41. Key mechanism for education delivery	See below.
42. Number and type of tertiary institutions (including University of South Pacific)	Various tertiary institutions: the Tarawa Teachers College (TTC), The Technical Institute (TTI) and the Marine Training Centre (MTC, operated by Ministry of Labour), as well as Nursing Training School and Vocational Training Centres (mostly operated by the churches). The main objective of the Marine Training Centre (MTC) and the Fisheries Training Centre is seen as providing effective and appropriate training

	for I-Kiribati men to acquire seamen skills and knowledge for overseas employment. In addition, the University of the South Pacific (USP) has an extension centre in Kiribati.
43. Funding	Government-managed institutions completely funded by government. USP studies are considered private, as well as a few small private institutions.
44. % population completing tertiary education	Fair proportion of urban population complete some form of tertiary education, esp. in urban areas. No exact figures.
45. % graduates completing education out of country	Approximately 100 students per annum study outside the country.
46. % graduates completing education through distance education	Small percentage. No exact figures.
47. % graduates completing education with access to ICTs	Small percentage of those studying on the island. Most of the students studying overseas would have had some form of access.

EDUCATOR TRAINING AND DEVELOPMENT SYSTEM INFORMATION

48. % graduates entering education profession	Approximately 60 new teachers graduate from KTC each year, with about 10 new teachers that have studied overseas.
49. Basic qualification for entrance into profession	For pre-primary, a one-year KTC certificate is required as a minimum. For primary school, a three-year KTC diploma is the minimum entrance requirement. For secondary school, an overseas diploma or degree is normally required. See site visit report below for more detail.
50. Further training and development requirements for teachers	Teachers are encouraged although not obligated to study further. Upgrade courses are held during school holidays. Some teachers receive scholarships to study overseas.
51. Exposure of teachers to distance education methodologies	Limited exposure, as teachers are generally trained at KTC or directly overseas.
52. % education graduates completing education with access to ICTs	Very few, only those that have studied elsewhere, or had access at school. KTC does not currently have computers.
53. % teachers with home access to ICTs	Very few. At two leading secondary schools visited in South Tarawa, only eight out of over 75 teachers had home computers.
54. Incentive mechanisms to encourage use/ownership of ICTs among teachers	None

SCHOOLS AND ICT INFRASTRUCTURE

55. Sufficient schools and classrooms	Yes
56. Sufficient learning materials and text books	Sufficient learning materials provided by government at primary level. At secondary level, students are responsible for the provision of their own materials.
57. % schools with access to electricity (grid or alternative)	All secondary schools have electricity via grid or generator. Not so with primary schools, except in Tarawa.
58. Education Ministry/government involvement in provision of electricity to schools	Have been involved in generator provision to junior secondary schools.
59. % schools with telephone access (fixed or mobile)	All schools in urban areas have access, but very limited access elsewhere. See below for specifics.
60. Education Ministry/government involvement in provision of telephony to schools	None
61. % schools with access to Internet	All secondary schools in South Tarawa have a connection in theory, but this could not be verified.
62. Education Ministry/government involvement in provision of Internet to schools	None
63. % schools with at least one computer	Majority of secondary schools in urban areas, few elsewhere.
64. % schools with access to classroom/lab of computers	At least two of the 13 secondary schools have centres, based on visits.
65. Education Ministry/government involvement in provision of computers to schools	None
66. % population with access to Internet	Very limited. Currently only 400 dial-up users and a few leased lines.
67. Cost and accessibility of Internet access	Expensive. Access only in urban areas. See below for specifics.
68. Telephony and international communications access provision	Telecommunications Service Kiribati Limited (TSKL) is the only telecommunications provider.
69. Internet service providers	TSKL only
70. Variety and costing of technologies available for Internet access	Dial-up access and leased line access only. No varied technologies. Internet access costs are very high. See below for specifics.

ICT IN EDUCATION AND DISTANCE EDUCATION ACCEPTANCE AND USE

71. Education Ministry policy regarding use of ICTs in education system	None
72. Education Ministry acceptance and willingness to introduce and use ICTs	Acceptance and willingness apparent, especially for use in secondary schools.

73. Perceived value of ICTs in education process	Necessary in order to cope with technological changes globally. Valuable for communications and information-gathering.
74. Current and/or planned use of ICTs in primary education	None
75. Current and/or planned use of ICTs in secondary education	Not directly through Ministry, but through individual schools.
76. Current and/or planned use of ICTs in tertiary education	Current use, specifically at TTI.
77. Current and/or planned use of ICTs for pre-service educator training	Planned use at KTC, although not yet implemented.
78. Current and/or planned use of ICTs for in-service educator training	None
79. Consideration of use of ICTs to supplement/complement/replace learning materials for curriculum delivery	Evident that use of ICTs will have effect on learning materials and curriculum delivery.
80. Consideration of use of ICTs to supplement/complement/replace learning methodologies	Consider ICTs to definitely have impact on learning methodologies.
81. Consideration of use of ICTs for communication between learners and others, within the school, country or internationally	Value is seen to assist students in becoming global citizens. Students at KGV Secondary have previously communicated with students in Netherlands.
82. Current school/national project interventions (e.g. school-to-school projects, schoolnet):	Some school-to-school interaction, although isolated. No national projects.
83. Current participation in international projects (e.g., ThinkQuest, iEARN)	No apparent participation in international projects
84. Identified sources of funding for ICT in education	Education budget for 1999 was AUD$11,608,003, or 8.21% of total government budget. Aid donors play an important role in education in Kiribati. According to the Sector Review (1992), estimated donor spending during 1993-1994 was in the vicinity of AUD$3.8 million of which 52.4% went for training, 15.9% for technical assistance, 8.5% for instructional materials and 23.2% for buildings and equipment. Aid funds per student were expended in the ratio of 1:26:994 for primary, secondary and tertiary levels respectively. Other major external investments include funding from World Health Organization's Health Promoting Schools, UNICEF Pre-school Project, UNFPA In-School Population Project, UNESCO Basic Education Life Skills Project, PEACE CORPS/Kiribati Education Project, AusAID In-Country Training Project, AusAID Education Sector Program, JAPAN Secondary School Classroom Project, NZODA Teacher Education Quality Improvement Project, UNITED

	STATES Humanitarian Primary School Classroom Project, UNESCO Regional Youth Project. School fees are seen as large factor in funding ICT development, although donors will probably be largest source.
85. Possible involvement of private sector	Limited private sector, although may be willing to contribute to ICT development in schools.
86. Expectations of COL and this feasibility study	Would like to see schoolnet-type movement developed in Kiribati and throughout Pacific region.

SITE VISITS AND SPECIAL INTERVIEWS

SITE VISIT – KGV EBS SECONDARY SCHOOL

Interview with Head of Mathematics and Computer Studies, Mr. Kinta Eram.

The school is government-run (one of only three secondary schools managed by the government). It has approximately 1000 students, from Form 1-7, with over 400 students as hostel boarders. All of the approximately 50 teachers, including part-time teachers, are locals. Subjects offered are similar to those found in other British-originated education systems, very much prevalent in South Pacific countries. These include Mathematics, English, iKiribati for all levels; General Science and Social Studies in junior secondary; Physical Science, Chemistry and Biology, Geography, History, Accounting, Economics, Fine Arts, Industrial Arts, Music and Computer Studies as elective subjects in senior secondary phase. junior secondary school is completely funded by the government, but senior secondary students pay fees.

The school has one large and modern air-conditioned computer laboratory with 35 computers. Their first computers were supplied four years ago. A large number of the computers were supplied via a Japanese grant. The parents bought the remainder. All the Dell machines are networked via UTP and are served by a Win2000 Advanced Server machine. The power is regulated via line regulators and UPS. Internet and e-mail access is currently available on one machine only. Staff have access to mail and browsing, while only Form 6 students have access to e-mail. The school has applied for the domain *kgvebs.net.ki* and wants to use that for publishing on the Web and for identity. Other computers in the school can be found with the headmaster and certain senior staff, as well as the administrative staff.

Computer Studies, following the Pacific exam, is offered to 42 Form 6 students. The course curriculum covers hardware, operating systems and applications software. Currently no formal lessons with junior secondary students take place. In Form 4, general computer literacy is offered, and in Forms 5 and 6, some integration across the curriculum is taking place, particularly in the sciences. This is starting to increase. Irregular workshops are held with teachers, although there is a slow acceptance of using the technology. The school has participated in only one collaborative e-mail project with a school from the Netherlands, but is willing to participate in others.

The motivation for starting with computers was from within the school. They regularly send teachers to conferences for upgrading and learning experiences, and receive very little additional support for these activities. There are two primary teachers involved in managing and teaching in the facility. They believe that ICTs are important for communication and resource tools, in addition to standard application value.

SITE VISIT – MORONI HIGH SCHOOL

Moroni High School is a Mormon (Church of Jesus Christ of Latter Day Saints) school, catering for 470 students from Forms 1 to 6, and serviced by 27 teachers. It receives a government grant through the students, and not directly. In addition, the government pays for some teachers to receive some professional development. Despite this low level of government support, school fees are set at only AUD$123 per annum, with the majority of the funding for the operation of the school provided by the Mormon Church.

The school has a new computer centre, first established in 1996. The over 30 new Dell computers are all networked and have power regulators in place. The server is located in adjacent office, which is also used by the network manager. Although the school administrative staff have access to the Internet through one account, teachers and students currently have no access.

Form 6 students can do Computer Studies as an elective, as at KGV EBS, and in addition some enrichment across the curriculum and computer literacy courses are undertaken. The two responsible teachers assist the other teachers in using the technology, although uptake has been slow. Four teachers currently have computers at home.

The school does not presently interact with others through ICTs, but would like to. It is the only Mormon school in Kiribati, with others in Fiji, Samoa and Tonga.

SITE VISIT – KIRIBATI TEACHERS COLLEGE

The College is housed in an old set of facilities, in need of repair. However, a new lecture theatre is currently being built, and the U.S. Army has pledged to build a new building to house four classrooms, including a computer centre (which they will also fund). The college has 250 local students, as well as about 15 students from nearby countries (e.g., Tuvalu). The government funds student fees, and thus students are bonded for the time of their studies. The government, with input from the various religious groups managing schools, decide on the postings of the teachers after graduation.

Currently, the college offers the following courses:

- Preschool teacher certificate – one year
- Primary school diploma – three-year course, for new entrants
- Primary school upgrade diploma – one-year course for current teachers meeting various criteria, such as five-year service and proof of self-upgrading
- Primary certificate – two-year course for various people that have assisted in the classroom as monitor or teaching assistant, but do not yet have formal training. These persons must also meet various criteria, such as five years' service, minimum of a KNC certificate (Form 5)
- Junior secondary certificate – two-year course for new entrants. Students are prepared for teaching in fixed combinations of subjects, such as Maths and Science, or Kiribati and Industrial Arts
- There are currently no upgrade courses from primary-level qualifications to secondary-level.

There are computers for administration and staff use only. These computers will be networked soon. Students do not currently have any access, and no courses are available. They are looking to a possible donation from the U.S. Army for computers. Once they receive the computers, they will then introduce a course for all teachers.

They currently have an Internet connection, but believe that this will be cut off as the Cabinet has recently determined that each Ministry can only have two connections available, so will need to take away their connection.

SITE VISIT – THE TECHNICAL INSTITUTE (TTI)

TTI caters to over 1000 students per annum, from two-week courses to three-year diplomas, offering both full-time and part-time courses. The courses are divided roughly into:

- Trade courses: Carpentry, Mechanical and Electrical
- Business courses: Management, Accounting, Office Skills, Computing
- Maths and English upgrade, servicing the public and private sectors primarily Daytime full-time courses are free to students, while night time courses are charged for (approximately $65 per module).

The computer section services most of the departments within the college and also offers short courses. They cater to about 280 day students and 60 evening class students per annum. A large percentage of the students are adult learners attending upgrade courses from the public service. Two lecturers, one of which is an Australian volunteer, lead this section. There are two computer rooms, one of which is used for typing skills.

The Institute generally offers end-user computer courses, focused on:

- Introduction to computing
- Microsoft Office, including Word, Excel and Access (at varying levels)
- Introduction to the Internet
- PowerPoint presentation skills
- Computer graphics and desktop publishing

Eleven modules are needed in order to receive equivalent of Certificated II Level. Certificates and diplomas are recognised by Government of Kiribati. They do not offer Computer Technician and Repair courses currently.

The Computer Centre facilities have similar set up to KG5, with 20 computers on a network. This was recently upgraded with assistance from government. They received 10 as-new computers from Australia, in a deal which could be replicated for schools. Total cost for 10 computers was AUD$8,600 for computers, import levy of $80, port charges of $80, and shipping costs of $300. Educational institutions pay no import duties. TTI has Internet access, and when presented as part of the course, students gain access for that time via a proxy server.

They complete all their own technical work, due to skills set, but use external electricians for power-related maintenance. There are currently few computer technicians on the island, and approximately four commercial computer companies, of which two offer retail and repair services. Phillip Gottschalk is willing to assist in supporting schools as part of a schoolnet project.

SITE VISIT – TSKL

TSKL has a monopoly on telecommunications services (including Internet) in Kiribati. The company is 100% government-owned. A 10-year shareholding arrangement with Telstra recently ended with Telstra withdrawing. The following services are offered:

- Local and international telephony (3500 installed lines on four analogue exchanges, mostly in South Tarawa and Christmas Island)
- AMPS Mobile (500 subscribers)
- Inmarsat ISP terminal services
- Internet dial-up services
- Leased line data services (one month for installation)
- Equipment rentals (fax, switchboard, etc.)
- Computer and LAN sales, set-up and maintenance, including provision of computers, cabling, server set-up

Standard services are offered in urban areas by Telecom. Access to the other islands is offered via VHF radio, and a satellite link is provided for Christmas Island services. TSKL's international bandwidth is provided via Intelsat satellite. Currently, there is 180 Kbps bandwidth for S Tarawa, and a 120 Kbps link for Christmas Island. They maintain that they have plenty of capacity for growth.

TSKL currently has approximately 400 dial-up users. The following charges are applied:

- $100 (once off) refundable installation and connection fee
- $32 per month service fee per month
- $8 per hour use
- $0.18 per call cost for telephony

This makes the service extremely expensive and unobtainable for most of the population. In addition, it takes about one week to get an account. The server will be upgraded soon in order to cope with demand, and bandwidth is limited. As with the telephony services, all users are currently on Tarawa, with only two clients on a nearby island, dialling Tarawa directly.

As far as education is concerned, they see the value of provision of services to schools, and this was one of the motivations to set up the Internet café. At their café, they are willing to offer a 50% discount to schools for use (currently charged at $16 per hour). There is only one other Internet café established in South Tarawa, at the public library. They are also open to considering discounted or free access to schools, although currently not planned. There is knowledge of three connected schools only, namely KG5, Moroni, and Morikao Secondary Schools.

ANNEXURE C – NAURU COUNTRY PROFILE

INTERVIEWEE/S AND SOURCES

1. **Mr. Baron Waqa**, Director of Education, Department of Education, Nauru
2. **Ms. Ruby Willis**, Acting Secretary of Education, Department of Education, Nauru
3. **Alfonso Pelizzo**, Technical Consultant, Austron Hall Computer Specialists (an Australian company consulting in Nauru)
4. **Richard Lewis**, Principal, Nauru College, Nauru
5. **Venos Agege,** Teacher, Nauru College, Nauru
6. **UNESCO Education For All Report**, Waqa, 1999
7. **Dorling Kindersley Atlas of the World**, 1998

GENERAL COUNTRY FACTFILE

1. Official country name	Republic of Nauru
2. Date of formation	31 January 1968
3. Capital	No official capital
4. Population	11,280 (1999)
5. Total Area	21.2 km^2
6. Number of islands	1
7. Geography	Low-lying coral atoll, with a fertile coastal belt. Coral cliffs encircle an elevated interior plateau
8. Density	535/km^2 (1999)
9. Languages	Nauruan, English
10. Government	Parliamentary democracy
11. Economy	Phosphate, the only on-land resource, is sold to Pacific Rim countries for use as fertilizer. Deposits are near exhaustion. Huge investments in Australian and Hawaiian property. Possible future as tax haven. Fisheries are also growing sector.

MINISTRY OF EDUCATION

12. Minister	The Honourable Remy Namaduk, M.P.
13. Head of Department/Director-General	Ms. Ruby Willis, Acting Secretary of Education
14. Structure	Mr. Baron Waqa, Director of Education heads the system with following divisions: Schools, Curriculum, Personnel and Administration, Vocational Training, Scholarships.
15. Other	Entire government and public service undergoing reform process which will impact on Department of Education.

PRIMARY EDUCATION SYSTEM INFORMATION

16. Primary education definition/scope	Years 1 through 6, age appropriate from approx 6.5 years old to 12.5 years old. Preceded by two years of compulsory preparatory schooling.
17. Typical school description	Official and traditional schools with set instruction, from 8:00 a.m. to 1:30 p.m. daily, Monday to Friday. School year from January to December over four terms.
18. Funding	Compulsory education through government system to Year 10. Free government school education to Year 12. One private school, Kayser, is funded 80% by Department.
19. Number of primary schools	The following primary and secondary schools are present on the island: 1. Nauru – Yaren – Y1 & Y2 2. Nauru – Aiwo – Y3 & Y4 3. Nauru College – Y5, 6, 7 4. Location Primary – Y1 to 8 5. Kayser – Y1 to 11 6. Nauru Secondary School – Y8 to 12
20. Number of children in system	2,957 (2001)
21. % age-appropriate children in system	Almost 100%
22. % population completing primary education	Majority
23. Average class size	23.6 (1998)
24. Key learning outcomes for primary education	Exam at Y6 level, i.e., Nauru primary certificate. Examinable subjects are English, Maths, Science, Health.
25. Key education methodology for teaching and learning	Traditional education system
26. Use of audiovisual aids in classroom	Television and video, computers being introduced.
27. Promotion and involvement of learners in extracurricular activities	Students take part in variety of sporting and cultural activities.

SECONDARY EDUCATION SYSTEM INFORMATION

28. Secondary education definition/scope	Y7 – Y12, ages 12.5 to 17.5 years.
29. Typical school description	As above
30. Funding	As above
31. Number of secondary schools	As above
32. Number of children in system	As above
33. % age-appropriate children in system	No percentage available, but a majority of children are in the system.

34. % population completing secondary education	Year 10 is end of compulsory secondary education, so majority of students will complete secondary education. Limited scholarships are available for students to study secondary education overseas, primarily in Australia.
35. Average Class size	As above
36. Key learning outcomes for secondary education	External examinations at Year 10 and Year 12. Students complete Nauru junior certificate at Y10. Four core subjects are English, Maths, Science and Social Science. Internally examined (school-based) include Nauruan Studies, Music, Textiles, Home Ec, Tech. Drawing, Phys Ed, Religious Education etc. At Y12, students complete Pacific senior school certificate (PSSC) examinations. Core subjects are English, Maths, Physics, Chemistry, Computer Studies, Accounting, et al.
37. Key education methodology for teaching and learning	As above
38. Use of audiovisual aids in classroom	As above
39. Promotion and involvement of learners in extracurricular activities	As above

TERTIARY EDUCATION SYSTEM INFORMATION

40. Tertiary education definition/scope	Post-secondary education, including vocational training.
41. Key mechanism for education delivery	Face-to-face and distance education.
42. Number and type of tertiary institutions (including University of South Pacific)	One vocational school (Nauru Vocational Training Centre). Courses offered including carpentry, mechanical, secretarial studies, hospitality computers, etc. However, the facility was burned down August 2001, and thus students are currently completing practical components elsewhere. There is a branch of USP (Extension Centre) on the island, so students can study certain courses at a distance. A large amount of study is completed in other countries, particularly Fiji and Australia.
43. Funding	Vocational training at NVTC all funded by Department. Studies at USP or other institutions privately funded. Scholarships for tertiary education awarded to limited number of students per year.
44. % population completing tertiary education	Small percentage
45. % graduates completing education out of country	The majority of non-vocational students complete tertiary education out of the country.
46. % graduates completing education through distance education	Most undergrad and pre-degree courses completed on Nauru via distance education at USP Extension Centre.

47. % graduates completing education with access to ICTs	Majority would have had access to ICTs.

EDUCATOR TRAINING AND DEVELOPMENT SYSTEM INFORMATION

48. % graduates entering education profession	Low uptake of students into teaching profession, particularly at secondary level. Need to make use of ex-pat teachers, particularly from Fiji and Australia.
49. Basic qualification for entrance into profession	No Teachers College in country. For Pre-school education, minimum qualification is preschool teacher's certificate (1.5 years of extension studies via USP, at least having completed Y10). Primary school is primary teacher's certificate (two-year primary teaching certificate, post Y12 or upgraded from preschool teacher's certificate). For secondary education, teachers must have completed secondary teacher's diploma or recognised degree (although primary school certificate is accepted for lower grades of secondary school).
50. Further training and development requirements for educators	Ongoing training and upgrading is expected and paid for by Department via Extension Studies primarily, and can also apply for AusAID scholarships for overseas studies.
51. Exposure of teachers to distance education methodologies	Majority
52. % education graduates completing education with access to ICTs	Newly qualified teachers would have had some exposure.
53. % teachers with home access to ICTs	Small percentage of teachers have home access.
54. Incentive mechanisms to encourage use/ownership of ICTs among teachers	No formal systems, although encouragement is given. Teachers will be trained as schools have recently received computers.

SCHOOLS AND ICT INFRASTRUCTURE

55. Sufficient schools and classrooms	Sufficient supply of schools and classrooms currently. Destruction of NVTC has caused problem at post-secondary level.
56. Sufficient learning materials and text books	Lack of resources is quoted, although education appears to be of reasonable standard.
57. % schools with access to electricity (grid or alternative)	All schools have electricity, although supply is not 100% reliable.
58. Education Ministry/government involvement in provision of electricity to schools	No need

59. % schools with telephone access (fixed or mobile)	Telephony monopoly via Nauru Telecom. Telecom lists 2000 lines, although many are not active and functional. Majority of homes do not have functional telephony. Telecom infrastructure is aged and inappropriate for modern telecommunications, mostly analogue. Currently only one school (Nauru Secondary School) has a telephone connection.
60. Education Ministry/government involvement in provision of telephony to schools	Plans are underway.
61. % schools with access to Internet	One school now has dial-up Internet access (Nauru Secondary School).
62. Education Ministry/government involvement in provision of Internet to schools	No plans currently, although access through new government network is an option. Currently only one 64 Kpbs access pipe for an entire island's access (via Intersat), besides satellite bandwidth, for the online gaming industry of over 2 Mb, via Panamsat. New Government Network is a wireless network via point to multipoint routing. It involves fisheries, airport and NPC (Nauru Phosphate Corporation). Government has choice to connect schools via one of the 11Mb channels, enabling access to Intranet, mail and Internet for schools. Antenna for wireless network is placed on Command Ridge, within view of large part of the island. Possibility for all schools to gain access to the Internet through the wireless network is great.
63. % schools with at least one computer	All primary and secondary schools now have computers through a recent donation from the Taiwanese Government.
64. % schools with access to classroom/lab of computers	As above
65. Education Ministry/government involvement in provision of computers to schools	In 1995 a computer network was provided for the University of the South Pacific and the Vocational Centre. Hoped for technology assistance for other schools was not possible owing to lack of finance in the intervening years, but a full information technology course is presented at secondary school for Year 12 PSSC.
66. % population with access to internet	Extremely low.
67. Cost and accessibility of Internet access	Dial-up access is available via Cenpac, the one ISP on the island. CenPac is owned by Nauru Phosphate Royalties Trust (NPRT). Costs are AUD$100 per month (including 50 hours access, thereafter AUD$5 per hour). There are about 70 subscribers. Dial-up access is unreliable.
68. Telephony and international communications access provision	Limited access via Telecom. Outdated network that desperately needs upgrading.
69. Internet service providers	Only one: Cenpac.
70. Variety and costing of technologies available for Internet access	Dial-up access only to limited amount of subscribers. No leased line or direct satellite type access.

71. Education Ministry policy regarding use of ICTs in education system	ICT use encouraged. New ICT in education policy in progress.
72. Education Ministry acceptance and willingness to introduce and use ICTs	Acceptance and willingness evident.
73. Perceived value of ICTs in education process	Remote communications, research and international information, global positioning.
74. Current and/or planned use of ICTs in primary education	Starting to consider use, but need further assistance.
75. Current and/or planned use of ICTs in secondary education	As above
76. Current and/or planned use of ICTs in tertiary education	None, as little tertiary education takes place on island. As NVTC burned down recently, computer training from NVTC will not be taking place in the short-term.
77. Current and/or planned use of ICTs for pre-service educator training	None, as no pre-service training on island.
78. Current and/or planned use of ICTs for in-service educator training	On a school-by-school basis as each school has now received computers.
79. Consideration of use of ICTs to supplement/complement/replace learning materials for curriculum delivery	Supplement and complement current material offerings.
80. Consideration of use of ICTs to supplement/complement/replace learning methodologies	Do see education methodologies being altered. Individualised learning starts to come to the fore and brings variety to the learning experience.
81. Consideration of use of ICTs for communication between learners and others, within the school, country or internationally	Major tool for communication purposes, to assist in understanding and growth of international issues and cultures.
82. Current school/national project interventions (e.g., school-to-school projects, schoolnet)	None
83. Current participation in international projects (e.g., ThinkQuest, iEARN)	Some interaction from secondary school
84. Identified sources of funding for ICT in education	Limited national funding, although contributions from international agencies and governments welcomed, such as the Taiwanese.
85. Possible involvement of private sector	Limited private sector, due to monopolies currently governed by government.
86. Expectations of COL and this feasibility study.	Can provide expertise and guidance to develop process further. Can provide network with other countries so that resources are shared and Nauru can learn from international experience. Teacher and student exchange programmes are also welcomed. Teacher development in use of ICTs across curriculum most welcome.

SITE VISIT – NAURU COLLEGE

The Headmaster of the Nauru College is Richard Lewis, of Australian origin. The recently built school is in really good overall condition. There are 16 classrooms catering for 480 students. Like all Nauru schools, there is an abnormal amount of truancy. There is a computer room, recently stocked with computers donated by Taiwanese Government, but the computers are not currently networked. The College participates in ARMS (American Radiation Measurement) for Geographic Measure project involvement. Through this project they will receive Internet assistance. As computers are new, the teacher is currently instructing students in basic computer use, and will then progress on to integration across the curriculum.

ANNEXURE D – SAMOA COUNTRY PROFILE

INTERVIEWEE/S AND SOURCES

1. **Mr. Levaopolo Tupae Esera**, Director of Education, Department of Education, Samoa
2. **Doreen Roebeck,** Deputy Director, Curriculum Development Unit, Department of Education, Samoa
3. **Lufi Taulealo**, Department of Education, Samoa
4. **Mrs. Marie To'alepaialii,** Department of Education, Samoa
5. **Mr. Philip Bell**, Chief Operating Officer, Samoa Communications Limited, Samoa
6. **Edna Tait,** Director and Education Advisor, UNESCO Apia, Samoa
7. **Mr. Toluono Feti Toluono,** General Manager, Electric Power Corporation (EPC), Samoa
8. **Mr. Reupena Rimoni,** Headmaster, Samoa College, Samoa
9. **Mr. Kapeni Matatia,** ICT Manager, National University of Samoa, Samoa
10. **Mr. Louie Chanco,** ICT Consultant (on contract to Samoa Department of Finance), Philippines
11. **School Status Report 2001,** Department of Education, Samoa
12. **NUS Information and Communication Services**, 2001 Brochure
13. **Education for All Report: Samoa, 2000**
14. **Dorling Kindersley Atlas of the World**, 1998

GENERAL COUNTRY FACTFILE

1. Official country name	Independent State of Samoa
2. Date of formation	1962
3. Capital	Apia
4. Population	Approximately 200,000 (1991 Census – 161,000). Affected by high fertility, counterbalanced by high level of emigration. Next census planned for late 2001.
5. Total area	2,840 km^2
6. Number of islands	Two large islands (Savaii and Upolu), seven smaller islands.
7. Geography	Largest islands have rain forested, mountainous interiors surrounded by coastal lowlands and coral reefs.
8. Density	70 per km^2
9. Languages	Samoan, English
10. Government	Parliamentary state
11. Economy	Agricultural products including taro, coconut cream, cocoa and copra. Growth of service sector since 1989 launch of offshore banking. Dependent on aid and expatriate remittances.

MINISTRY OF EDUCATION

12. Minister	The Honourable Fiame Naomi Mata'afa
13. Head of Department/Director-General	Mr. Levaopolo Tupae Esera, Director of Education

14. Structure	Four Assistant Directors reporting to Director of Education, responsible for policy and planning, corporate services, schools operations and Curriculum Development Unit (incorporating assessment). Approximately 70 staff in the department apart from school-based staff .
15. Other	

PRIMARY EDUCATION SYSTEM INFORMATION

16. Primary education definition/scope	Primary education covers an eight-year cycle divided into three-year sections – lower primary (Years 1-3), middle primary (Years 4-6) and upper primary (Years 7 & 8), corresponding to the 5-14 year-old age group.
17. Typical school description	Traditional schooling system, as per other countries in the region.
18. Funding	Partnership between government and communities. government pays salaries, stationery and curriculum. Local communities, that mostly own the land, carry costs of maintenance and facilities. Education is compulsory until Year 8 or age 14.
19. Number of primary schools	As of 2001, there were 131 preschools in the country in addition to the 208 primary and secondary schools. There are currently (2001) 143 government primary schools, 18 mission primary schools and two private primary schools. Mission schools are operated by a variety of church groups, including Roman Catholic, Baptist, Congregationalist, Methodist, Seventh Day Adventist, Mormon and Bahai churches.
20. Number of children in system	37,705 (2001)
21. % age-appropriate children in system	Majority of children enter the primary school system. As there is no accurate and recent population statistic, projections indicate that there is over 92% enrolment in primary school (1999).
22. % population completing primary education	According to 1999 figures, the survival rate to Year 5 is 84.4%. Perceptions of large drop-out rate exist.
23. Average class size	There are 1,222 primary school teachers (1999), with a ratio of 1:25, lower in private schools, higher in government schools, particularly urban compound schools. New staffing process in development will rectify imbalances.
24. Key learning outcomes for primary education	Methodology of automatic promotion. Literacy tests are held in Years 4 and 6. A Year 8 national rxam determines if students progress to secondary school, and if so, which college or secondary school they will attend.
25. Key education methodology for teaching and learning	Traditional learning methodologies are dominant, due to the hierarchical culture, although attempts are underway to change approaches.
26. Use of audiovisual aids in classroom	Educational radio (located in Curriculum Development Unit) is prevalent and operational between 8:00 a.m. to 10:00

	a.m. on school days. The use of television and video is encouraged, but mostly restricted to private schools. (A project is currently underway for Y1 to Y3 to use CD audio. Y4 to Y8 generally use cassettes.
27. Promotion and involvement of learners in extracurricular activities	Widely encouraged

SECONDARY EDUCATION SYSTEM INFORMATION

28. Secondary education definition/scope	Colleges operate from Years 9 to 13. Colleges are currently streamed, based on academic performance. Secondary schools, which currently follow a slightly different curriculum are generally community-focused and built and managed by the districts. Secondary schools operate from Y9-Y12, and generally have less prestige than colleges. This steaming system is currently under review.
29. Typical school description	As above
30. Funding	As above
31. Number of secondary schools	Five government colleges (Samoa College, Avele, Vaipouli, Leifiifi and new College, Vaimauga) exist. These form part of the 24 government secondary schools (plus one primary and secondary combined school). In addition, there are 17 mission secondary schools (plus two combined schools) and one private secondary school.
32. Number of children in system	13,683 (2001)
33. % age-appropriate children in system	This can be addressed through a study of the transition rates. These are 2000-2001 transitions for the following years: Y8-9: 86%, Y9-10: 90%, Y10-11: 86%, Y11-12: 86%, Y12-13: 52%. Thus, there is a apparently large drop-off rate.
34. % population completing secondary education	Percentages are not viewed as acceptable, although there has been marked improvement, particularly at the secondary level since 1996.
35. Average class size	Generally smaller average class sizes than primary schools, at approximately 1:20.
36. Key learning outcomes for secondary education	Samoa school certificate is taken at Year 12 level and the Pacific senior secondary certificate examinations at Y13 level.
37. Key education methodology for teaching and learning	Traditional
38. Use of audiovisual aids in classroom	Educational radio (located in Curriculum Development Unit) is prevalent. The use of television and video is becoming further encouraged.
39. Promotion and involvement of learners in extracurricular activities	Encouraged

TERTIARY EDUCATION SYSTEM INFORMATION

40. Tertiary education definition/scope	Post-secondary
41. Key mechanism for education delivery	Face-to-face traditional
42. Number and type of tertiary institutions (including University of South Pacific)	National University of Samoa (incorporating Education and Nursing Faculties), Samoa Polytechnic (incorporating Marine Training School), USP Extension Centre
43. Funding	Funding is via combination of government and private funding. It is the only one of the five countries in the survey that had its own university.
44. % population completing tertiary education	No exact statistics, but evidence apparent that percentage is low.
45. % graduates completing education out of country	Through a government scholarship scheme, 70 to 100 undergraduate and post-graduate scholarships are awarded each year.
46. % graduates completing education through distance education	Small percentage. The presence of the National University has lessened the reliance on USP and international study.
47. % graduates completing education with access to ICTs	Majority of students would complete tertiary education having had access to ICTs.

EDUCATOR TRAINING AND DEVELOPMENT SYSTEM INFORMATION

48. % graduates entering education profession	There are 100 new education graduates each year that can enter the profession.
49. Basic qualification for entrance into profession	In 1997 the Samoa Teachers College was incorporated into the University of Samoa as part of the Faculty of Education. As at 1999, 93.7% of 1222 primary school teachers had the appropriate educational qualification and were certified to teach. Funding of teacher training is provided by the government.
50. Further training and development requirements for educators	In-service training provided for general needs, on occasion. Scholarships are also available.
51. Exposure of educators to distance education methodologies	Limited
52. % education graduates completing education with access to ICTs	Majority completing education training at NUS have some limited access to ICTs.
53. % educators with home access to ICTs	Very limited
54. Incentive mechanisms to encourage use/ownership of ICTs among educators	None

SCHOOLS AND ICT INFRASTRUCTURE

55. Sufficient schools and classrooms	Yes
56. Sufficient learning materials and text books	Not sufficient, although workable solution being implemented. Large emphasis on quality of learning materials.
57. % schools with access to electricity (grid or alternative)	Majority of schools have access to electricity (see interview report below).
58. Education Ministry/government involvement in provision of electricity to schools	None
59. % schools with telephone access (fixed or mobile)	Very small
60. Education Ministry/government involvement in provision of telephony to schools	The Institutional Strengthening Project of the Department to look at telephonic contact support for all schools
61. % schools with access to Internet	Very small, mostly private schools. Phone line problems and restricted access have been highlighted.
62. Education Ministry/government involvement in provision of Internet to schools	No current involvement
63. % schools with at least one computer	At least 13 ADB (see below) schools, all colleges, a few primary and secondary schools, and most private schools.
64. % schools with access to classroom/lab of computers	Some private and mission schools. Only two government colleges have complete labs, namely Samoa and Avele.
65. Education Ministry/government involvement in provision of computers to schools	No direct government funding. However, they are working with the Asian Development Bank in an ADB-funded project to equip 13 schools (three secondary, 10 primary) with at least one computer each.
66. % population with access to Internet	Samoa Communications reports that several thousand citizens have access, seemingly rating Internet use in the country among the highest in region. Figures could not be verified.
67. Cost and accessibility of Internet access	Internet access is widely available in Apia, with restricted access in the rest of the country. Poor quality telephone lines have negative impact on quality and speed of the service. Costs are still far too high for developing country, but reasonable in comparison to other countries in the region.
68. Telephony and international communications access provision	Provided via Samoa Communications, the telecommunications monopoly. A more detailed comment follows in the Special Interview with Philip Bell, COO of Samoa Communications.
69. Internet service providers	Three ISPs, namely iPasifika, LeSamoa and CSL. All gain bandwidth and service from Samoa Communications.
70. Variety and costing of technologies available for Internet access	Limited alternative technologies. Dial-up access is the key access modality.

71. Education Ministry policy regarding use of ICTs in education system	No current policy, however there is interest in formulating and implementing a policy.
72. Education Ministry acceptance and willingness to introduce and use ICTs	Basic form of ICTs in form of broadcasting applied through Educational Broadcasting Unit.
73. Perceived value of ICTs in education process	Valued for research, communication and networking purposes.
74. Current and/or planned use of ICTs in primary education	Generally supportive of ICT interventions, although not directly involved. Assisted in facilitating partnership between Samoa College and Pacific Island Network (PIN) and Schools Online to receive computers and engage in online collaborative projects between it and other schools internationally.
75. Current and/or planned use of ICTs in secondary education	None at government intervention level, although individual schools implementing strategies.
76. Current and/or planned use of ICTs in tertiary education	Local tertiary institutions have independent plans for some use of ICT.
77. Current and/or planned use of ICTs for pre-service educator training	No current operational plans. However, through NUS, all pre-service education students should be able to gain access to ICTs.
78. Current and/or planned use of ICTs for in-service educator training	None
79. Consideration of use of ICTs to supplement/complement/replace learning materials for curriculum delivery	View ICTs as supplemental at this stage. Direct involvement through Y12 Computer Studies (as part of the Pacific exam) has ensured that ICTs are on the agenda, although not high priority due to other developmental imperatives.
80. Consideration of use of ICTs to supplement/complement/replace learning methodologies	Consider that the large-scale implementation would definitely have a positive effect on learning methodologies and techniques.
81. Consideration of use of ICTs for communication between learners and others, within the school, country or internationally	Viewed as desirable. ICTs in Samoan schools viewed as opportunity for remote schools in small island states to have world-class education. View the Internet as having a positive influence in the classroom.
82. Current school/national project interventions (e.g., school-to-school projects, schoolnet):	None currently, except from external interventions by ADB in 13 schools, and the PIN initiative related to Samoa College.
83. Current participation in international projects (e.g., ThinkQuest, iEARN)	Associated Schools Project is a UNESCO project, which is a network of schools throughout the world, committed to the ideals of the organisation. Its four main themes are: • World concerns and the United Nations system • Human rights and democracy • Intercultural learning • Environmental issues

	Although the international programme does have an Internet-enabled component, and may act as a catalyst for ICT development, few of the Samoa schools are internet-enabled. Thirty-four primary, 10 secondary, one preschool and one special ed. school in Samoa participates in ASP.
84. Identified sources of funding for ICT in education	The government's commitment to education as one of its two priority sectors is reflected in the increased level of input and external assistance being directed at improving all levels of education from 1996 and into the next decade. Examples: UNDP's AIGA project, AusAid's Primary Education Materials Production project, the regional multilaterally funded BELS programme, NZODA's Samoa Secondary Education Curriculum and Resource Development (SSECRP), the Associated Schools Project (ASP) funded by UNESCO Apia, Health Promoting Schools (HPS) project which is funded by NZODA and WHO, Early Primary Literacy Development Project funded by Canada and implemented by IOE/USP and the construction of a new primary school at Vaitele under China's assistance. Interest has been shown in ICT in education funding by ADB, PIN and UNESCO, although there are no large scale commitments to date.
85. Possible involvement of private sector	CSL, the largest ISP, assisted St Josephs in their connectivity. The Department of Education do not consider the private sector as a large contender for support.
86. Expectations of COL and this feasibility study	Would appreciate COL's assistance in policy formulation and implementation planning, as well as in implementing the solution.

SITE VISITS AND SPECIAL INTERVIEWS

SPECIAL INTERVIEW: MR. TOLUONO FETI TOLUONO, GENERAL MANAGER, ELECTRIC POWER CORPORATION (EPC), SAMOA

EPC is the electricity supply corporation, established in 1972. It is fully owned by government, although there is talk of privatisation. Power is generated in an equal split between diesel and hydroelectric power. They are planning on extending the current 4000 Kw generated, beyond the four current generators. They are presently commissioning a new engine, and new converters are being installed, so power in Apia at present is not 100% stable. This will be completed shortly.

There has been a recent push to encourage solar energy (from outside agencies), but this has not been extremely successful due mostly to capital outlay costs and maintenance. EPC has not considered this further from a commercial generation perspective due to need for large tracts of land and initial costs.

Over 90% of people can have access to electricity in the country if they choose (the remaining population would be in rural outlying islands). Currently, they have 24,000 customers. The biggest issue is recuperating costs, and thus they are piloting a pre-paid electricity model. The majority of schools are electrified throughout the country. The government and all its agencies support a Rural Education Project, so there is effort being made to ensure schools are regarded as priority customers.

SPECIAL INTERVIEW: MR. PHILIP BELL, CHIEF OPERATING OFFICER, SAMOA COMMUNICATIONS, SAMOA

Samoa Communications (SAMCOM) was established in 1999 and comprises both posts and telecommunications; it is 100% government owned. Despite only one company being operational, each entity operates as an independent division, with a separate business plan and no cross-subsidisation. A separate company, Samoa Cellular Limited, is a joint venture between Samoa Government and Telecom New Zealand. This separate company has its own licence to operate wireless solutions. SAMCOM has an exclusive licence to offer fixed line telephony services and some other telecommunications services for a 10-year period.

Currently SAMCOM offers local, national and international telephony, the Internet Gateway, point-to-point data and interconnect services. IntelSat provides international bandwidth. SAMCOM owns the link between American Samoa and NUS. Three ISPs are currently active in the market: iPasifika, LeSamoa and CSL (dominant). The environment is fairly competitive, and there may well be room for a fourth ISP at least. There are currently a few thousand Internet users in the country. The majority of Internet access is via dial-up, with few point-to-point leased line circuits in operation throughout the country. SAMCOM is now upgrading its infrastructure and revising its gateway strategy. They operate a 2 Mb pipe for Internet and data services, which is resold to the ISPs. Current usage information indicates that the access is not yet at capacity, and when necessary can purchase more capacity.

SAMCOM services are offered on all populated islands, although services are limited in rural areas. The main centre of Apia is well covered. After the cyclone of 1991, when much of the infrastructure was destroyed, SAMCOM did not make any significant investments in the telecom infrastructure, although that is now being rectified. There is no effective wide-area backbone in place throughout the islands, but planning for this is well advanced. As far as their social responsibility obligations, they plan to offer non-discriminating" quality of service" (QoS) solutions throughout the country, beyond viable commercial operations. They believe that most schools can have access to telephony (and data lines) if they chose, but costs have restricted access of most of the schools. SAMCOM is supportive of efforts to introduce ICTs in the school environment. Interestingly, Telecom Samoa Cellular were advertising a competition to have schools assist in designing phone cards, with five computers for schools as prizes.

SITE VISIT AND INTERVIEW: MR. REUPENA RIMONI, HEADMASTER, SAMOA COLLEGE, SAMOA

Samoa College has 720 students (2001), in 22 classes from Y9 to Y13. Class sizes range from 30 to 35 students. A wide range of subjects is offered at the school, including Computer Studies at the senior secondary level. The school traditionally achieves between 60% and 70% success in the Pacific examinations, rating it as one of the best performing secondary schools in the country. The school has embarked on a programme to use alternate teaching and learning methodologies.

As far as computers, the school introduced a computer lab in 1994. They currently have 16 older computers, donated by Canadians and Samoans residing in Australia, all networked, and they are expecting a shipment of eight new computers from Schools Online, a California-based non-profit organisation. The prime objective of the donation is to involve the school in the Pacific Island Network (PIN) collaborative educational projects

between schools internationally. They do not currently have an Internet connection, although a connection is planned through the PIN project.

The majority of students use the computers, although primary use is reserved for the Computer Studies classes. Y9 students complete a computer literacy course, and thereafter classes can book to use the facility. The school wants to ensure that all students are prepared for use of ICTs at the tertiary level. There is dedicated Peace Corps volunteer staffing the lab, working with two local teachers. A number of teachers are computer literate, although it is not known by the headmaster whether any have home computers.

The school has not been involved in online collaborative projects up till then, however will be on receipt of the new computers. In order for the PIN project to proceed, the school had to obtain permission from the Department of Education. They attach great value to the use and proliferation of ICTs, especially through collaborative projects, to keep up with the pace of change in society. However, they plan strict control of the Internet, and have requested CSL, a local ISP, to integrate a security and control solution.

The headmaster would certainly like to see the idea of school networking proliferate, and has noted that only a few schools in Samoa have computers, to his knowledge. Currently the schools involved in offering Y12 Computer Studies are collaborating in drawing up a new curriculum.

SITE VISIT AND INTERVIEW: KAPENI MATATIA, ICT MANAGER, NATIONAL UNIVERSITY OF SAMOA

The National University of Samoa is the only national university within any of the five nations included in the study. Of particular importance to this study were their international connectivity and ICT applications, and their interest in assisting schools in gaining access to the Internet. Of interest is that ICT is not merely considered a technology issue, but has an impact on many disciplines and its applications are vital. The University has certainly started to encourage the use of ICTs more broadly; for example, there was an advertisement present on the campus for a lecture by Iona Chan Mow on Collaborative Learning vs. Individualised Learning in a Computer Environment.

The Samoan Government, as well as foreign donors, have funded the development at ICT facilities at the NUS. Key to their international connectivity is an agreement to collaborate between American Samoa and Samoa on a range of issues such as health, education and weather. American Samoa already has e-rate implementation from the U.S., and this was extended in the partnership to provide free bandwidth to NUS, via satellite. They currently have 960 Kbps bandwidth, comprising 15 x 64 Kbps channels, owned by Samoa Communications. Video applications use six channels, and the weather applications use a further four channels. They plan distance education and tele-health applications for the video-conferencing, and have already collaborated with American Samoa on a variety of projects using this technology. They have set up detailed proxies and filtering systems for their content and Internet access. NUS currently has two computer labs, with two new additional facilities planned.

As an extension of the Internet facilities at NUS, they have been mandated to offer free Internet access to schools through this service. Although this has been mandated through a government sub-committee, they have not been allocated any additional resources in order to implement it. In order for schools to gain benefit of this service, they have to have a telephone line, a modem and computer, and must have a technical resource to make the set-up. The University does not currently have the resources to do the installations at the school or to manage their technical needs. NUS has 10 modems available for dial-up, and although they currently do not have lines for dial-in, SAMCOM is ready to deploy a 4 x 2 Mbps radio link to NUS that will provide up to an additional 60 lines. Thus, technically, with the collaboration of NUS and SAMCOM, the solution can be implemented. In addition, NUS would then ensure that content is filtered to restrict access to undesirable

content. Thus, there are only a few hindrances stopping schools in Samoa that have telephone lines from gaining free access to the Internet through NUS.

SPECIAL INTERVIEW: EDNA TAIT, DIRECTOR AND EDUCATION ADVISOR, UNESCO APIA, SAMOA

This UNESCO office takes responsibility for the entire South Pacific Region. UNESCO has been fairly involved in the promotion of ICTs in education, and as such was involved in the Pacific Online Project. This project is an Internet training course made widely available, particularly for educational institutions. The course was designed on their behalf by RMIT University, Creative Media Department (www.unesco.org/webworld and www.tcm.rmit.edu.au). Additional sites and organisations recommended include SIDSNet (www.sidsnet.org). Edna Tait views the Internet as being important in addressing key developmental focus areas, and training being the starting point. Within the education sector, they have implemented their Associated Schools Project to highlight social issues and the role of the U.N. throughout the world. This network of schools could be used for ICT development within the education environment. They have continue to facilitate the Media Education in Schooling Project, which could be used to further evolve media teachers in the cross-curricular use of ICTs in the education environment. Edna Tait has been in contact with Jim McDivott of Pacific Island Network (PIN), and she believes that PIN can play an important role in developing the ICT infrastructure and use, particularly in Samoa.

UNESCO works in six-year phases, setting priorities for each two-year period. They have emphasised LINKS (as a traditional knowledge programme) and ICTs as the two key crosscutting areas throughout the focus sectors of Education, Science, Culture, Communication and Social Science. UNESCO clarified perceptions of lack of infrastructure throughout all the countries involved in this study, as well as lack of technical ability, but noted there are some exciting initiatives and proposals underway. Edna Tait highlighted the Tonga ICT University proposals.

As far as deployment of school networking in the region, she emphasised the following:

- Education Ministers appear supportive of ICT interventions, although they have many other priority areas to focus on. The support of the senior Ministry officials must be ensured.
- Principals' associations throughout the countries are good vehicles to convey the importance of school networking.
- Work with teachers can create a groundswell demand for the introduction of the technologies in the system.

SPECIAL INTERVIEW: MR. LOUIE CHANCO, ICT CONSULTANT TO DEPARTMENT OF FINANCE

Louie Chanco has been contracted to help the Treasury implement an AusAID-funded financial management information system (FMIS). As such, he has undertaken a study of the ICT infrastructure within the country. As part of the FMIS, they are to initiate a wide area network (WAN) between the relevant government departments. This includes dial-up access to Departments. They have extended the network access to the Department of Education, but they have not taken advantage of it as of yet. His opinion is that the Department of Education is presently concerned with internal matters.

As far as connectivity in the country, his impression is that certain ISPs are at capacity, although this contrasts with the views expressed by Samoa Communications. He reckons that the ISP speeds are slow due to bad copper (disputed by SAMCOM), although aerial connections, which form a large part of the network, are perhaps a larger factor as they are affected by weather conditions. He adds that costs of connectivity are reasonable though. They are currently investigating alternative technologies to standard copper. However, the tree canopy precludes CDMA and wireless local loop solutions. Samoa Communications is starting to focus on redesigning the entire communications infrastructure, with a key development being the proposed

installation of a fibre connection all the way to the airport, which traverses a large part of Upolo. He confirmed that AMPS wireless telephony was available on the island, not GSM, and that international agencies had advised there was place for a further 40,000 subscribers.

ANNEXURE E – TONGA COUNTRY PROFILE

INTERVIEWEE/S AND SOURCES

1. **Hon. Dr. K. Tutoatasi Fakafanua**, Minister of Education, Kingdom of Tonga
2. **Mr. Viliami Takau**, Acting Director of Education, Tonga
3. **Mrs. Peaua Tu'ipulotu Heimuli**, Deputy Director of Education, Tonga
4. **Mr. Timote Katoanga**, Manager Engineering, Tonga Communications Corporation, Tonga
5. **Ms. 'Alisi Katoanga,** Principal, Tonga Institute of Education (TIOE), Tonga
6. **Ms. Lata Langi,** Principal, and **David Whyte**, Computer Teacher, Tonga High School, Tonga
7. **Dr. Tu'ipulotu Katoanga,** Principal, Tonga College 'Atele, Tonga
8. **Mr. Brian Langi,** Officer-in-charge, Tonga Community Development and Training Centre (CDTC), Tonga
9. **Hon. Si'atukimoana Vaea,** Planning Officer, Tonga Distance Education and Communications Centre, Tonga
10. **UNESCO Education for All**, Tonga Report, 2000, 'Aneti Fonua
11. **Kingdom of Tonga Ministry of Education Annual Report 2000**
12. **Update Report on Tonga Technical and Vocational Education and Training 2000,** presented to COL Meeting, Brisbane, August 2000, Mrs. Peaua Tu'ipulotu Heimuli
13. **Dorling Kindersley Atlas of the World**, 1998

GENERAL COUNTRY FACTFILE

1. Official country name	Kingdom of Tonga
2. Date of formation	1970
3. Capital	Nuku'alofa
4. Population	98,000
5. Total area	750 km^2
6. Number of islands	Archipelago of 170 islands, 45 of which are inhabited. The most populous island is Tongatapu.
7. Geography	Easterly islands are generally low and fertile. Those in the west are higher and volcanic in origin.
8. Density	131 people per km^2
9. Languages	Tongan, English
10. Government	Constitutional monarchy
11. Economy	Most people are subsistence farmers. Commercial production of coconuts, cassava and passion fruit. Tourism is increasing slowly.

MINISTRY OF EDUCATION

12. Minister	Hon. Dr. K. Tutoatasi Fakafanua
13. Head of Department/Director-	Acting Director of Education: Mr. Viliami Takau

General	
14. Structure	Deputy Directors of Education reporting to Director. These include the following divisions: Secondary Schools and Professional Services; Administration and Finances; Primary Education and Post-secondary Education. Professional services include Curriculum Development Unit (CDU) and Examinations Unit.
15. Other	Strong reliance on non-governmental support in the education system. In particular, the secondary school system educates the majority of students. The key churches operating schools are Free Wesleyan, Latter Day Saints (Mormon), Roman Catholic, Free Church of Tonga, Tokaikolo Church, Seventh Day Adventist, Catholic, Anglican, and ‘Atenisi Institute.

PRIMARY EDUCATION SYSTEM INFORMATION

16. Primary education definition/scope	Class 1–6, from age of five to six years. Education is free and compulsory for all children between the ages of six and 14, or unless a child has completed six years of primary education. The Tongan Preschool Association, a non-government organisation established in 1986, administers early childhood education. There is no government policy for this level of education.
17. Typical school description	Traditional
18. Funding	Currently, Government schools receive free education, with government subsidies to non-government schools. However, additional fundraising by parent-teacher associations is necessary in order to pay for utilities.
19. Number of primary schools	105 government schools and 11 non-government (mainly religious) schools.
20. Number children in system	16,697 (2000)
21. % age-appropriate children in system	Access is 100% and participation rate is estimated at 99.9%.
22. % population completing primary education	Majority of the population complete primary education.
23. Average class size	1:22 (754 teachers in 2000).
24. Key learning outcomes for primary education	Class 6 students write the secondary schools entrance Examination .
25. Key education methodology for teaching and learning	Traditional
26. Use of audiovisual aids in classroom	Radio highly used. Little use of other technologies.
27. Promotion and involvement of learners in extracurricular activities	Highly encouraged.

SECONDARY EDUCATION SYSTEM INFORMATION

28. Secondary education definition/scope	Forms 1 to 7 (Form 7 is relatively recent introduction to the system). Schools are streamed by academic abilities
29. Typical school description	Traditional
30. Funding	Government funds government schools. However, students are still liable to pay some school fees directly to the government. The non-government schools, with the exception of one, receive a government subsidy of T$100 per student per year. They also have the privilege to apply for importation of educational materials and equipment free of duty. Participation rate is approximately 100% up to the age of 16 years or Form 5.
31. Number of secondary schools	Eight government and 31 non-government schools (2000)
32. Number children in system	14,955 (2000)
33. % age-appropriate children in system	Large percentage of children in the system and complete secondary school.
34. % population completing secondary education	Students are encouraged to achieve up to Form 7 level.
35. Average class size	The 993 teachers establish a rate of 1:15, one of the best ratios encountered throughout the islands.
36. Key learning outcomes for secondary education	Form 2 common examination; Tonga school certificate at Form 5; Pacific senior secondary certificate at Form 6; and Form 7 New Zealand Bursary exam.
37. Key education methodology for teaching and learning	Traditional
38. Use of audiovisual aids in classroom	Their use is being encouraged. The government is currently involved in equipping secondary schools with additional AV tools, however it is dependent on location of schools and funding available.
39. Promotion and involvement of learners in extracurricular activities	Highly encouraged.

TERTIARY EDUCATION SYSTEM INFORMATION

40. Tertiary education definition/scope	Post-secondary education, from three months' training.
41. Key mechanism for education delivery	Traditional, both theoretical and practical. Government wants to further develop technical vocations
42. Number and type of tertiary institutions (including University of South Pacific)	Eight government institutions and six non-government Institutions. Excludes institutions based elsewhere, such as USP. The Community Development and Training Centre (CDTC) was established by government to co-ordinate and expand post-secondary training opportunities throughout the Kingdom. Under the umbrella of CDTC, there is an

	integrated network of institutions: • Tonga Institute of Education (TIOE) • Tonga Institute of Science and Technology (TIST) • Distance Education and Communication Centre (DECC) • Tonga National Form 7 (TNF) 7 (1991-1998) • Tonga National Youth Congress (TNYC)
43. Funding	At post-secondary level the government is responsible for over 50% of the facilities and training; the remainder are managed by non-governmental and private organisations.
44. % population completing tertiary education	Most school leavers will undertake some form of post-secondary education.
45. % graduates completing education out of country	Over 200 students (all disciplines) per year are awarded international scholarships, through government and donor funding.
46. % graduates completing education through distance education	Very few graduates. Majority through face-to-face methodologies.
47. % graduates completing education with access to ICTs	Few graduates complete education as computer literate.

EDUCATOR TRAINING AND DEVELOPMENT SYSTEM INFORMATION

48. % graduates entering education profession	Fair percentage of graduates. The country produces the necessary amount of teachers each year.
49. Basic qualification for entrance into profession	In order to teach, the minimum entry requirement currently is a three-year diploma. However, many inservice teachers do not have the required qualifications and a large group are upgraded each year.
50. Further training and development requirements for educators	Upgrade training programme available for teachers to improve personal levels of education.
51. Exposure of educators to distance education methodologies	Little
52. % education graduates completing education with access to ICTs	Fourteen computers serving 346 students ensures that a small percentage of the graduates will be computer literate.
53. % educators with home access to ICTs	Very small
54. Incentive mechanisms to encourage use/ownership of ICTs among educators	None

SCHOOLS AND ICT INFRASTRUCTURE

55. Sufficient schools and classrooms	Yes
56. Sufficient learning materials and textbooks	No, although the Ministry is working to address this. A large printing press within the Ministry assists in printing

	resource materials for schools.
57. % schools with access to electricity (grid or alternative)	Majority of schools have some form of electricity access.
58. Education Ministry/government involvement in provision of electricity to schools	None
59. % schools with telephone access (fixed or mobile)	Most schools do not have own phones, although most have access to community phones.
60. Education Ministry/government involvement in provision of telephony to schools	None
61. % schools with access to Internet	Very small
62. Education Ministry/government involvement in provision of Internet to schools	None
63. % schools with at least one computer	In 2000, all secondary schools indicated possession of at least one computer and one printer each.
64. % schools with access to classroom/lab of computers	Very small, mostly within the secondary school system.
65. Education Ministry/government involvement in provision of computers to schools	No current assistance. However, government assistance to non-government education authorities is made in various forms. The most visible is the duty-free importation privilege which allows non-government education authorities to apply for duty-free importation of materials and equipment intended for educational purposes.
66. % population with access to Internet	Low
67. Cost and accessibility of Internet access	The Internet provided by Tonga Communications Corporation (TCC) and is available widely, although most effectively in Tongatapu. Costs are indicated below, and are beyond the reach of the majority of the population.
68. Telephony and international communications access provision	Through TCC. See Interview below.
69. Internet service providers	TCC
70. Variety and costing of Technologies available for Internet access	Limited technologies: dial-up and local leased lines.

ICT IN EDUCATION AND DISTANCE EDUCATION ACCEPTANCE AND USE

71. Education Ministry policy regarding use of ICTs in education system	No current policy, although ICT integration encouraged.
72. Education Ministry acceptance and willingness to introduce and use ICTs	Acceptance and willingness evident.
73. Perceived value of ICTs in education process	ICTs considered valuable in order for students to have the same opportunities as those in developed countries.

74. Current and/or planned use of ICTs in primary education	Computers are currently installed in a few primary schools, however mostly for administrative purposes. There are no formal Ministry plans, but they want to ensure Teacher Resource Centres have computers and the Internet.
75. Current and/or planned use of ICTs in secondary education	More administrative computers are found in secondary schools. The use of ICTs in the teaching of Computer Studies is encouraging the development of ICTs in other subject areas, although there are no formal Ministry plans.
76. Current and/or planned use of ICTs in tertiary education	Some ICT use in tertiary sector, although by no means a priority yet. Plans for ICT University may change that situation.
77. Current and/or planned use of ICTs for pre-service educator training	Plan to increase exposure to ICTs at TIOE.
78. Current and/or planned use of ICTs for in-service educator training	No current use.
79. Consideration of use of ICTs to supplement/complement/replace learning materials for curriculum delivery	ICTs considered to play supplementary and complementary role to learning materials.
80. Consideration of use of ICTs to supplement/complement/replace learning methodologies	ICTs will have impact on changing teaching and learning methodologies in the long term.
81. Consideration of use of ICTs for communication between learners and others, within the school, country or internationally	Communication, for administrative, educational and collaborative projects purpose seen as major driving force for the introduction of ICTs.
82. Current school/national project interventions (e.g,. school-to-school projects, schoolnet):	None
83. Current participation in international projects (e.g., ThinkQuest, iEARN)	None
84. Identified sources of funding for ICT in education	Government, international aid agencies and ex-student associations seen as key funders for ICT developments in schools.
85. Possible involvement of private sector	Immature private sector seen as small contributor. Examples of prior support to educational institutions evident, although not prolific.
86. Expectations of COL and this feasibility study	Would like to see COL support the large-scale introduction of ICTs in the schooling system in Tonga, particularly through equipment provision and teacher development.

SPECIAL INTERVIEW: HON. DR. K. TUTOATASI FAKAFANUA, MINISTER OF EDUCATION, KINGDOM OF TONGA

The Minister noted his welcome of ICT initiatives generally, as advances in this area would assist in developing Tonga further. Such ICT initiatives were also highly supported by the Prime Minister and the Crown Prince. Further technical vocation development was essential. He indicated his desire to establish a Technical ICT University, for which he was receiving feasibility assistance. He noted that the telecommunications industry in the country was making encouraging strides. Notably, the Crown Prince has established a telecommunications company as a possible competitor to the monopoly telecom provider, and will probably offer ISP services. There is a general aspiration to connect all schools to the Internet, although interventions to provide computers and the Internet were currently on an ad hoc basis. He noted that there was a large usage of radio as a medium in education. Most of the computers currently supplied to schools were through their own initiatives and those of their parent-teacher associations (PTAs). As far as schools are concerned, they want to offer free Internet access to schools as soon as possible.

SPECIAL INTERVIEW AND SITE VISIT: MS. ʻALISI KATOANGA, PRINCIPAL, TONGA INSTITUTE OF EDUCATION (TIOE), TONGA

The Tonga Institute of Education (TIOE) has been located at the old Viela Hospital since 1972. These facilities are in a bad state of repair, and they are in need of improvement. They do have telephone and electricity access. Despite this, the staff and students are positive about their learning experiences. The Institute, catering to 346 students, receives a lot of external assistance, although this is not obvious. TIOE offers a three-year primary school diploma, in addition to a three-year secondary school diploma. An entrance requirement is a Form 6 certificate. Graduates of the New Zealand bursary exam proceed to Year 2 of the respective courses. TIOE also offers a graduate diploma in Teaching and Learning for current teachers as an intensive part-time upgrade course. They also manage other in-service programmes. The Institute graduates 100 new teachers per annum. A small number of scholarships for international study focused on education are available.

The Institute regards computers as a future priority area. Presently, Computer Studies is offered as an elective course in the secondary school diploma in order to facilitate the teaching of Computer Studies from Forms 3 to 6. However, they would like to introduce computers as an elective in the primary diploma course in future. They also regard the introduction of technology as a new school subject at Form 6 level a welcome advancement, with the subject progressively being offered to the lower forms. The Institute has two small computer labs, with a total of 13 computers. The computers are older, although recently upgraded. Students can also use the computers after hours. There is, however, no Internet access for students, even in the library (which doubles as the National Library). The library has two additional computers, one for student use and one for the librarian's use.

SPECIAL INTERVIEW: MR. TIMOTE KATOANGA, MANAGER ENGINEERING, TONGA COMMUNICATIONS CORPORATION (TCC), TONGA

Tonga Communications Corporation (TCC), a new corporation, has one shareholder, namely government. Previously two telecommunications companies operated, with a government company offering local services, and Cable and Wireless offering international services. These companies have now merged, and Cable and Wireless has now withdrawn. However, two new telecommunications licences will be awarded, with the Crown Prince's company, Ton Fon, highly regarded to win one of them.

TCC offers a range of telecommunications services. These include local and international telephony, AMPS mobile telephony (200 subscribers) and data services. They are currently the only Internet service provider (ISP), but will soon have competition with the new licences to be awarded. They have international satellite access through IntelSAT at 174' E. They can offer local leased lines for data, although no wireless or mobile services are available. There are a variety of monthly subscription plans for commercial Internet dial-up services: The Home Plan, at T$20 including two hours; Professional Plan, at T$30 for five hours; and the Exec Plan at T$70 for 13 hours. TCC hosts servers and domain, and offers an Internet café for casual use. The Tonga Domain Controllers are Tonic, a Crown Prince Company. TCC is currently planning an upgrade to their infrastructure, including their fibre backbone. This will include the launch of a new GSM mobile service by Christmas 2001.

For schools and educational institutions, they can currently offer a T$1200 per month 32 Kbps analogue leased line service for T$300 per month. This is a great saving, however few schools can take advantage of this. They are considering wireless solutions to assist schools, but that would have to be cleared with the licensing authority, located in the Prime Minister's office. The Government may want to offer free Internet access, but as an independent corporation, TCC's Board of Directors will need to make the decision. As a business they have be sustainable, although they are most willing to assist in evolving ICTs in schools.

SPECIAL INTERVIEW AND SITE VISIT: MS. LATA LANGI, PRINCIPAL, AND DAVID WHYTE, COMPUTER TEACHER, TONGA HIGH SCHOOL, TONGA

The school is currently undergoing a difficult time, as a large part of it burned down recently. A new school is being built, but they are currently having many classes in large marquee tents. One of their two computer centres was destroyed in the fire, and thus the school will have to start with developments again. The school was not insured, so the equipment lost will not be easily replaced.

The school has 752 students enrolled from Form 1 to Form 6. The Tonga National Form 7, although operating in association with Tonga High School, has a separate campus. The school achieved a 96% pass rate in the last Form 5 exam, and a 76% pass rate in the Form 6 exam. The school currently admits the top level of student achievers in Tonga (in government schools), administered by the government. Student life is active, with extramural activities including band, sports and cultural activities. They confirmed that the government funds teachers and learning materials. The PTA, as well as ex-students, many of whom are based abroad yet continue to support the school, cover all other expenses. They receive limited local funding. They have received funding previously from international aid agencies.

In their one remaining computer facility they have 26-networked computers. In addition, they recently received a donation, from which they should be able to rebuild about 20 Pentium computers. In their new facility, they will be installing a FreeBSD Server, which will act as a gateway. They are currently negotiating with Tonga Communications Corporation (TCC) for access to the Internet for the school. A big issue with their school, as well as with other local schools, is maintenance and technical skills. The computers are constantly being used, from Form 4 to Form 6, mostly for computer literacy and Computer Studies. The teachers are very keen to use the computers more widely, but they do not have sufficient facilities to cater to the demand. Until now, they have not participated in any international ICT-based collaborative projects.

David Whyte maintains that there is an active Computer Studies Teachers Association that can spearhead major ICT developments in the schools. He notes that Queen Silothe College, a girls' High School, has excellent computer facilities, in addition to Tupo High School and the Mormon school.

SPECIAL INTERVIEW AND SITE VISIT: DR. TU'IPULOTU KATOANGA, PRINCIPAL, TONGA COLLEGE 'ATELE, TONGA

Tonga College is an all-boys school, catering to 917 boys from Form 1 to Form 7. A staff of 51 teaching and 12 non-teaching staff serves the school. The College is extremely active in encouraging extramural activities and brass band. As with Tonga High School, the College is government-funded, yet a strong PTA and ex-students' network ensure the school has its additional needs met. Communication networks with ex-students are very strong. There are currently two government high schools in Tongatapu, namely Tonga High School and Tonga College.

The school has had computers for nine years. They have 26 computers in a computer lab, and four administrative computers. The computer lab has a small server, although the machines operate in a peer-to-peer network. There is only one Internet connection in the school, connected to the headmaster's computer, which is used for research and communication. They would like to extend this to the students, as they see benefit in terms of information retrieval and communication. They acknowledge that it will have to be carefully monitored. The headmaster believes that ICTs introduced on a larger scale will influence teaching and learning methodologies. Currently the computer lab is used for Computer Studies at Form 5 and 6 levels, and computer literacy at Form 7 level. Senior students often make use of computers in preparing their projects. There is little formal integration of ICTs in the classroom now. In 2002, the school will be offering a new subject, Technology, and they hope that this will encourage the further integration of ICTs. They have a qualified computer teacher who would also like to see the introduction of technical computer courses. They have noted that government has prioritised Maths, Science and Technology, and that Tonga College is in the forefront in delivering on these priorities.

SITE VISIT TO TONGA DISTANCE EDUCATION AND COMMUNICATIONS CENTRE, INCORPORATING INTERVIEWS WITH HON. SI'ATUKIMOANA VAEA, PLANNING OFFICER, TONGA DISTANCE EDUCATION AND COMMUNICATIONS CENTRE AND MR. BRIAN LANGI, OFFICER-IN-CHARGE, TONGA COMMUNITY DEVELOPMENT AND TRAINING CENTRE (CDTC)

The meeting with representatives of the Tonga Distance Education and Communications Centre (DECC) and Tonga Community Development and Training Centre (CDTC) took place at the DECC facility in Noku'alofa.

The centre (CDTC) established by government for the expansion of training and widening of educational opportunities benefited from a one million dollar project funded by Australia. The centre was able to carry out more training programmes towards diploma certificates in accounting and agriculture and other trade areas. Courses that have been offered over the years at basic level include:

- Plumbing
- Carpentry and joinery
- Garage supervisors in private sector
- Basic computer skills

It has also been involved in wider community-based training and education opportunities.

CDTC operates in conjunction with all the post-secondary vocational centres in the country. This includes the DECC, which offers a computer centre venue for training, whether courses arranged by itself or outside entities. They are running a one-year certificate and two-year diploma in Information Technology. They also offer short-term courses for government and private sector. They generally charge T$5 per head per hour in order to meet the budget. The centre certainly has the opportunity to generate more income through larger community access.

DECC has two computer labs located in one facility, comprising 40 computers. They have a huge PeaceSat satellite dish, but it is not operational. Thus, there is no distance education being offered in conjunction with modern ICTs. They do have broadcast editing equipment, and they broadcast some radio programmes from the facility. In addition, they offer Computer Maintenance for Ministry computers, and have offered computer maintenance courses in the past. They have no full-time instructors, but use part-time instructors. They do not have Internet access, although have plans to gain access in the near future.

SPECIAL INTERVIEW AND SITE VISIT: TONGA INSTITUTE OF SCIENCE AND TECHNOLOGY (TIST), TONGA

The Tonga Institute of Science and Technology (TIST), also known as the Tonga Maritime and Polytechnic Institute (TMPI) under the umbrella of Tonga Community Development and Training Centre (CDTC) offer courses on general engineering, automotive mechanics, and various marine vocational courses at basic and intermediate level. They cater to over 100 students in each of the major divisions, Maritime and Technical, per annum. They do not offer computer-related courses

Some of the courses involved include Mechanical Engineering and Instructor Training; Automotive Engineering and Instructor Training; Marine Engineering; Industrial Welding and Instructor Training; Practical Seamen's Training; Catering; Industrial Arts; Carpentry; Electrical Electronics; Panel and Paint and Plumbing, etc.

ANNEXURE F – VANUATU COUNTRY PROFILE

INTERVIEWEE/S AND SOURCES

1. **Mr Johnny Marango**, Research Officer, Ministry of Education, Youth and Sports
2. **Mr John Gideon**, Senior Education Officer, Projects, Ministry of Education, Youth and Sports
3. **Richard Hall**, Managing Director, and Thierry Gapp, Marketing Consultant, Telecom Vanuatu Limited (TVL)
4. **Moulin Tabouti**, Deputy Principal, National Institute of Technology (INTV)
5. **Jilda Olsen**, UNELCO – unofficial comment not authorised
6. **Mr. John Niroa**, Principal, Malapoa College
7. **Beverley Sands**, Principal, Central Primary School and Junior Secondary School
8. **Kalnaure Kalfatak**, Principal, Ulei Junior Secondary
9. **James Kalo**, Deputy Principal, Onesua Presbyterian College
10. **Education 2000 – The Annual Report of the Ministry of Education, Youth and Sports**, **Government of the Republic of Vanuatu**
11. **Statistical Annual Book Year 2000, Primary and Secondary Education**, Ministry of Education, Youth and Sports, Government of the Republic of Vanuatu
12. **UNESCO EFA Country Report (Vanuatu)**
13. **Organisation Chart** of the Ministry of Education
14. **1999 Population Census Preliminary Result Report**
15. **Vanuatu: Provinces** – Map
16. **Vanuatu Telephone Directory**, 2001
17. **TVL Lagoon School Launch**, Video
18. **National Institute of Technology**, Information Brochure
19. **Dorling Kindersley Atlas of the World**, 1998

GENERAL COUNTRY FACTFILE

1. Official country name	Republic of Vanuatu
2. Date of formation	1980
3. Capital	Port Vila
4. Population	186,678 (Census, end of 2000). Luganville (Santo) and Port Vila (Efate) are considered urban, the remainder of the country rural. 21.5% of the population reside in urban areas.
5. Total area	12,190 km^2
6. Number of islands	82
7. Geography	Mountainous and volcanic, with coral beaches and dense rainforests. Cultivated land along coasts.
8. Density	16 people per km^2
9. Languages	Bislama, English and French
10. Government	Multiparty republic

11. Economy	Majority of the rural community is involved in subsistence farming activities. Copra and cocoa largest exports, but now declining. Beef and forestry exports growing. Recent upsurge in tourism industry. Offshore financial services are also important.

MINISTRY OF EDUCATION

12. Minister	The Honourable Jacques Sese
13. Head of Department/Director-General	Mr. George Andrews
14. Structure	Five divisions currently reporting to DG viz. Administration, Policy and Planning, Institute of Education (Curriculum, Examinations, Inspection and Teachers College), Primary Education and lastly Secondary, Technical and Further Education
15. Other	Currently undertaking Comprehensive Reform Project (CRP), incorporating Education Master Plan

PRIMARY EDUCATION SYSTEM INFORMATION

16. Primary education definition/scope	From preschool to Year 6, with each level being age-appropriate up till about 12 years of age
17. Typical school description	Traditional building consisting of classrooms, meeting places and sports fields. Mostly government schools, often on community land. Also number of mission schools and other private schools.
18. Funding	Primarily government funded. Three classes of schools: government, church and private. Very few schools, mainly church and private schools, were assisted by the government. Government covers costs of teachers as well as school grant for government-aided schools. Compulsory contribution by parents towards running of school. Preschool education is completely funded by communities. The annual education budget is over Vatu2,000 million per annum, representing approximately 25% of the total government budget. In addition, over Vatu 400 million is aid-in-kind from various donor sources.
19. Number of primary schools	Out of the 376 existing primary schools, 72% were government schools, 21% church assisted, and 7% private. At secondary level, out of the 39 existing schools, 59% were government schools, 26% church assisted, and 15% private (1997). In 2000, there were 398 primary schools registered.

20. Number of children in system	Compulsory 10 years of education, although difficult to enforce in rural areas. There are 35,083 children in primary education (2000), of which 3.5% are enrolled in private schools.
21. % age-appropriate children in system	Some resistance in rural areas due to value of children as labour for agriculture, although over 95% of children now attend school.
22. % population completing primary education	The survival rate for those entering Year 1 that reach Year 5 is 64.6% on average (1998).
23. Average class size	In 1998, 1188 total primary school teachers gave a ratio of 1:28.9.
24. Key learning outcomes for primary education	Students sit exam at Year 6. Due to shortage of secondary schools, learners that do not meet standards move on to Rural Training Centres. Key areas for examination are Maths, English and General Studies (Bislama, the widest spoken language is not examined and is not spoken at schools).
25. Key education methodology for teaching and learning	Traditional teacher-student relationship, with teacher as source of knowledge.
26. Use of audiovisual aids in classroom	Videos and televisions are available in urban areas. Not much other use of technology.
27. Promotion and involvement of learners in extracurricular activities	Vernacular teachers present in pre-primary schools for teaching in culture and tradition. Sports and various other activities encouraged.

SECONDARY EDUCATION SYSTEM INFORMATION

28. Secondary education definition/scope	From Year 7 until Year 13 (English system) and Year 14 (French system), with each level being age-appropriate up till about 19 years of age.
29. Typical school description	As above
30. Funding	As above
31. Number of secondary schools	At secondary level, out of the 39 existing schools, 59% were government schools, 26% church assisted, and 15% private (1997). In 2000, there were 58 secondary schools registered.
32. Number of children in system	In 1998, of 4952 students taking the Year 6 exam, only 47% were admitted to Year 7. This is up from 23.8% in 1990, showing an improvement in levels of education. A total of 8458 students were in the secondary school system in 2000, of which only 49 were in Year 14.
33. % age-appropriate children in system	No exact statistics. However, factoring survival rate in primary education, and admittance rate above, less than 30% of students enter secondary school, and a large percentage of these drop out.
34. % population completing secondary education	Only a small proportion in Year 10 go on to Year 11 and higher. As above.

35. Average class size	There are 8,458 students being catered for by 545 teachers, giving a ratio of 1:16. However, as many of the teachers are part-time specialist subject teachers, the average class size is much larger.
36. Key learning outcomes for secondary education	Two exit points in the secondary school system. Year 10, with key subjects being English, French, Maths, Science, Social Science and Agriculture. Year 12 students in the English system take the Pacific senior secondary exam (PSSC) and Year 13 students can take the New Zealand bursary examination. In the French system, The Lycée Louis Antoine de Bougainville tests the achievements of its students through internal examinations monitored by the Rectorate of the University of New Caledonia at Years 13 and 14.
37. Key education methodology for teaching and learning	As above
38. Use of audiovisual aids in classroom	As above
39. Promotion and involvement of learners in extracurricular activities	Drama, debating, public speaking, music, and sports, such as football, volleyball and basketball.

TERTIARY EDUCATION SYSTEM INFORMATION

40. Tertiary education definition/scope	Post-secondary education, although it could also refer to post-Year 10 education.
41. Key mechanism for education delivery	As above and below.
42. Number and type of tertiary institutions (including University of South Pacific)	USP extension centre offers basic courses face-to-face, as well as comprehensive certificates, diplomas and degrees by extension (at a distance) from Suva, Fiji. USP offers three types of programmes: foundations studies, equivalent to school Grades 12 and 13; tertiary level extension studies in units of vocational and degree programmes; and short continuing education programmes in specific skills. Vanuatu Teachers College (VTC) offers two-year diplomas. Vanuatu Institute of Technology offers certificate and diploma courses in range of commercial and technical fields. Although not tertiary, there are about 44 small, privately operated Rural Training Centres (RTCs) that were established by communities, church groups and private interests.
43. Funding	Subsidised education, although majority of funding for studies from students or bursaries.
44. % population completing tertiary education	No statistics available, although very few complete tertiary education.

45. % graduates completing education out of country	In 2000, 52 scholarship students completed tertiary education. Countries in which they completed studies included Papua New Guinea (15), Fiji (13), New Zealand (7) and New Caledonia (6).
46. % graduates completing education through distance education	Exact statistic unknown, although it is small.
47. % graduates completing education with access to ICTs	Most students will have had some form of access at these three institutions

EDUCATOR TRAINING AND DEVELOPMENT SYSTEM INFORMATION

48. % graduates entering education profession	Fifty-five new teachers graduated from VTC in 2000. In 2000 there were 1,594 teachers in service in the country, of which 406 were secondary school teachers.
49. Basic qualification for entrance into profession	Previously, Year 10 leavers with a two-year diploma could teach. Now, entrants into profession have Year 12/13 and two years of Teachers College. However, as at 1998, only 46.5% of primary school teachers were certified (and qualified) to national standards.
50. Further training and development requirements for educators	No formal compulsory upgrading. Voluntary upgrading, or Ministry-determined upgrading prevails.
51. Exposure of educators to distance education methodologies	Teachers have been qualified equally at USP, VTC and overseas, thus many would have had access to distance methodologies.
52. % education graduates completing education with access to ICTs	Very small. No exact statistics.
53. % educators with home access to ICTs	Very small.
54. Incentive mechanisms to encourage use/ownership of ICTs among educators	None, although computers purchased for schools via the Ministry are exempt from VAT.

SCHOOLS AND ICT INFRASTRUCTURE

55. Sufficient schools and classrooms	Reasonable. Some renovation taking place via EU funding. Normal growth requires additional schools especially in urban centres.
56. Sufficient learning materials and text books	No

57. % schools with access to electricity (grid or alternative)	The monopoly electricity provider is UNELCO, a joint government and French-owned company. There appears to be no service obligations to under-serviced areas, and no discounted rates to educational institutions. The majority of primary schools in rural areas do not have electricity. Most secondary schools have electricity, although through the use of generators. There is some use of solar energy. Generally electricity is available to Efate and Santo only, and then only to urban and peri-urban areas. Santo has access to hydroelectric power. Grid electricity will soon be extended to Malekula and Tanna. A new power station was built in Port Vila in the nineties.
58. Education Ministry/government involvement in provision of electricity to schools	Small solar electricity project underway funded by JOCV (Japanese funding), and a few other agencies, encouraged by the government. Government also provides generators to government and government-aided secondary schools.
59. % schools with telephone access (fixed or mobile)	Large number of schools have fixed telephone access. Mobile access only available in Port Vila, although not used by schools. Detailed interview with TVL reported below gives greater insight.
60. Education Ministry/government involvement in provision of telephony to schools	None
61. % schools with access to Internet	Thirteen secondary schools and eight primary schools have access to the Internet. The number will increase in the future. This is despite an offering of free Internet access to schools, including call charges by Lagoon Internet, a division of TVL.
62. Education Ministry/government involvement in provision of Internet to schools	Involvement is in the pipeline, although not sure about payment for equipment. Would like to see ICTs becoming more prominent in schools.
63. % schools with at least one computer	Small number of schools, although figure unknown.
64. % schools with access to classroom/lab of computers	Less than 10 schools that are known.
65. Education Ministry/government involvement in provision of computers to schools	No current assistance but it is in the pipeline to work with NGOs to support the schools. Most officers do not have access to Internet except the Director-General and the scholarships office.
66. % population with access to Internet	Very small. One provider is licensed to operate, namely TVL. The costs are reasonable for a developing country, although less than 1000 people currently have access to the Internet.
67. Cost and accessibility of Internet access	Access availability based on telephone infrastructure. Of 8000 installed lines in the country, only 1000 service the rural areas. In terms of cost, latest tariffs on the Web, but beyond reach of majority of population.

68. Telephony and international communications access provision	TVL is the monopoly provider in the country, although a stable and growing provider. They provide a wide range of services throughout the country, although focused mostly on urban areas (as a commercial provider, jointly owned by the government and private international providers). Microwave and satellite television is available (through Telsat Pacific) at about Vatu100,000 for entire system.
69. Internet service providers	One provider is licensed to operate, namely TVL, marketing the services under the name Lagoon Internet. They have sufficient bandwidth to cater for large growth due to infrastructure put in place to attract online gaming concerns.
70. Variety and costing of technologies available for Internet access	Leased line and dial-up access available. TVL is willing to consider alternate technologies.

ICT IN EDUCATION AND DISTANCE EDUCATION ACCEPTANCE AND USE

71. Education Ministry policy regarding use of ICTs in education system	No policy currently.
72. Education Ministry acceptance and willingness to introduce and use ICTs	Willingness evident, but no plan in place. Would like to start with secondary schools.
73. Perceived value of ICTs in education process	Seen as valuable tool for communication and information retrieval.
74. Current and/or planned use of ICTs in primary education	As above
75. Current and/or planned use of ICTs in secondary education	As above
76. Current and/or planned use of ICTs in tertiary education	As above
77. Current and/or planned use of ICTs for pre-service educator training	As above
78. Current and/or planned use of ICTs for in-service educator training	As above
79. Consideration of use of ICTs to supplement/complement/replace learning materials for curriculum delivery	Yes, although not evident.
80. Consideration of use of ICTs to supplement/complement/replace learning methodologies	Not perceived
81. Consideration of use of ICTs for communication between learners and others, within the school, country or internationally	Express understanding of value, although not practised in schools yet.
82. Current school/national project interventions (e.g., school-to-school projects, schoolnet):	None found

83. Current participation in international projects (e.g., ThinkQuest, iEARN)	None found
84. Identified sources of funding for ICT in education	Donor agencies are seen as largest contributor to additional educational initiatives, although they currently have many active projects attracting their resources. It was noted that there was certainly a pool of resources that could be tapped to ensure ICT access in school grows.
85. Possible involvement of private sector	Small private sector, which was not currently incentivised to contribute to education. Some companies had contributed in the past, and may well be encouraged to support ICT infrastructure to schools.
86. Expectations of COL and this feasibility study	To assist with implementation of ICTs in the country's schools.

SITE VISITS AND SPECIAL INTERVIEWS

SPECIAL INTERVIEW: RICHARD HALL, MANAGING DIRECTOR, AND THIERRY GAPP, MARKETING CONSULTANT, TELECOM VANUATU LIMITED (TVL)

Since a deal reached in 1990, Telecom Vanuatu is owned in the following proportions: one-third government, one-third Cable and Wireless and one-third France Telekom. The company is currently profitable and employs 180 staff. It has a monopoly for all voice and data services, and thus also owns and manages the only Internet service provider, Lagoon. It offers a full range of services, including:

- National and international telephony
- Local and international leased lines circuits
- Dial-up Internet access
- Third party secure hosting
- Full range of Web services
- AMP wireless

With the U.S.$5 million upgrade of their switches due in January 2002, they will be able to offer the following services in addition:

- ISDN
- Frame relay
- GSM mobile telephony

Telecom Vanuatu operates on a cross subsidisation model, due to large rural population and service provision requirements placed on the operator. There are approximately 1000 lines to the rural areas, in a point-to-multipoint digital network, spanning over 400 miles north-south. Despite this, major access problems still exist for some for the remote islands, with few islands having no access. On others people have to travel long distances to a telephone. There are approximately 8000 lines in the country; there is currently a 34 Mb link to Santo. The problem in the country is that there is little infrastructure development co-ordination, so all providers work independently.

No DECT has been implemented, but there is planning to implement GSM in certain places. First implementation of GSM will take place in Efate, Santo, Tanna and Malekula due to power grid restrictions. They are expecting good uptake of GSM, and will use the pre-paid model. It will replace the wireless AMPS network, currently servicing approximately 370 customers in Port Vila. Roaming agreements will be reached within the first few months. GPRS may be implemented.

Currently there is no Internet via satellite option, and also no VSAT operating in the country. These are options though for extremely remote areas. Intelsat is the international provider of their bandwidth for all services. For Internet, leased line circuits are available in Vila and Santos. There is a fair take up of access by organisations like WHO, banks, BTO, etc. They receive a good quality of service. The country has good international bandwidth due to international gaming operations and has recently obtained its own IP addresses, so it is currently dual-routing. Voiceover IP (VOIP) is not legislated against, and it will happen. The government will, however, not allow resale of VOIP services cutting standard telephony services. A positive step to reduce need for VOIP is by lowering costs for international telephony. The current tariff structures are on the Web.

TVL offers free Lagoon School Internet to schools, on request. The 56 Kbps service operates from 7:30 a.m. to 11:30 a.m. and from 1:30 p.m. to 4:30 p.m., Monday to Friday. This free service includes the telephone costs. The only cost involved is phone line rental, of approximately Vatu 1,200 per month. In addition to this service, TVL has assisted various schools to get a computer and modem. They understand the value of Internet to schools, and have thus embarked on this project. Currently 15 schools on five islands have access. In addition to TVL's contribution, others have been identified, and TVL has tried to encourage the formation of an schoolnet-type operation. Apparently Peace Corps can get free laptops from AOL and NGOs in Australia can get donated refurbished computers. The British GAP students can also provide maintenance for the computers, particularly in rural areas. Various agencies are currently active on the island, including British High Commission (solar power for schools), Peace Corps (over 40 volunteers), JOCV (volunteers work in rural areas), French Embassy (Francophony on Internet), AusAID, INTV (solar), AFD, AUF, New Zealand High Commission, UNESCO, CUSO, EU, etc. Service organisations also active on the island include Rotary, Kiwanis and Lions, which are also involved in small volume co-ordinations of some donor activity. A Pacific island network was also heard of.

The company is willing to participate further to accelerate and grow the use of the Internet in schools.

INTERVIEW AND SITE VISIT: MOULIN TABOUTI, DEPUTY PRINCIPAL, NATIONAL INSTITUTE OF TECHNOLOGY (INTV)

INTV is a vocational college, offering courses to students from Year 10. Access to selected students from Rural Training Centres and certain experienced workers (lacking formal training and educational background) is allowed. Courses are offered in English and French, in the following disciplines: Mechanical, Electrical, Joinery, Building, Tourism, Hospitality and Business Studies (offered from Year 11). Entrance is via an entrance examination.

INTV is funded through a government grant and school fees are charged to students. There are currently 518 students enrolled in full-time and part-time courses. Unfortunately, the country economy dictates that there is not enough enterprise to employ all students (only one-fifth of students will find employment on completion of full-time studies).

In Business Studies, there is a choice of Administration or Accounting from Year 12. Computer literacy and application is part of the Business Studies course. Approximately 120 students per annum are becoming

computer literate through these courses. They do not currently run specialised IT technical courses, and they certainly experience problems with PC repair and maintenance, indicating a general lack of support infrastructure. INTV is certainly open to introduction of new courses. They have Internet access via TVL, and students are starting to use the connectivity.

The deputy headmaster appears to value the role that the Internet can play in education and is willing to support the introduction of school networking in its broader sense.

SCHOOL SITE VISIT: MALAPOA COLLEGE

Malapoa College is recognised as the leading government-aided secondary school in Port Vila (and the country), offering Year 7 to Year 13. There are currently 492 students in the school, of which one-third are in boarding. The headmaster reports a staff complement of 35, with lots of staff movement as the Ministry determines staff placements. The headmaster exuded a zeal for his school, as well as for the use of ICTs in the school. The school has electricity, telephone and fax capability, all charges being paid for by the school. They also have satellite TV for reception of additional educational resources being broadcast.

Besides a computer centre, there are six staff access computers, seven computers in the library, and computers for the administrative and management team. The school purchased all the computers, although a few were donated. Basic maintenance is meant to be funded through profits from the school canteen. The computers are not currently networked, but progress is being made in this direction. The school has had computers for some time: originally Acorns, but 15 new computers replaced these more recently. Not all students currently access the computers through formal lessons, although they have plans to change that. Internet access is currently available to the headmaster and in the library, where students have access. In the computer centre, the largest block of time is for Year 12 students taking Computer Studies for the Pacific senior secondary exam, an optional subject. The technology group also uses the computers. They have a varied amount of software.

The site maintenance of the computers in their school and on the island in general to be problematic. They have not introduced computers across the curriculum en masse yet, as they do not want the process to be disruptive, they have few computers, and they do not have sufficient knowledge and skilled staff. The headmaster wants to see better administration internally and in connection with the Ministry through effective EMIS systems being implemented. They have engaged in some teacher-to-teacher communication via the Internet with New Zealand teachers, but there has been limited collaboration between students at the school and those elsewhere.

The headmaster seems to think that the private sector is limited in the country, and is also not interested in social development projects. There is little assistance given to schools, apart from the donor agencies.

SCHOOL SITE VISIT: CENTRAL PRIMARY SCHOOL

Central Primary School, located in Port Vila, at one time offered only primary-level education, but now also has a pre-primary school and a junior secondary school, offering education to 540 students up to Year 10. The government-aided school has 18 full-time teachers, in addition to a few teacher aides and the librarian. The school has electricity and telephone lines. The school fees are set at Vatu17,000 per term (three terms) for primary school.

The school has a networked computer centre (consisting of PCs and Apple Macs) and three computers for administrative use. The Apple Macs are old and need replacing. Of the PCs, seven were donated last year by the private sector. They have not installed and used the Internet yet, although they are aware of the free access via TVL. Staff are not very computer literate and thus there is hesitancy. However, the computers are used from Year 1, with mouse practice starting the process, and then with a wide variety of games and software to enrich all learning areas, such as Maths and speaking. Each child has access to using a computer for at least one hour per week. The headmistress, Beverley Sands, reports the computers being particularly useful to assist with remediation and reinforcement for learning weaknesses. She believes that the Internet can be useful as a communication tool and to widen the worldview that children hold. Currently, the school exchanges letters with other schools via post.

SITE VISIT: ULEI JUNIOR SECONDARY

Ulei provides secondary school education to 160 students in a rural setting, some distance away from Port Vial on Efate. The school has six subject teachers (not all full-time). The four classes have approximately 35 students each, and have boarding facilities for a large part of the school population. The school fees are Vatu37 000 per annum, and appear to have developed a strong sense of community around the school. Students also participate in a variety of sports and music. They are encouraging more girls to be enrolled. The school has a generator to provide electricity, and does have a telephone.

There is presently only one computer in the school, and it is used by the headmaster and other teachers. They do have an Internet connection, but report slow access. They would like to have more computers due to the future need for students to be computer literate and to have access to employment in town. In addition to the computer class, they want a specialist teacher, as the current staff is not trained. They perceive the value of ICTs in the provision of teaching and learning resources and in communication.

SCHOOL VISIT: ONESUA PRESBYTERIAN COLLEGE

This government-aided church school is located at the furthest point from Port Vila on the island of Efate, catering for 450 students from Year 7 to Year 12. Year 13 is not offered due to lack of facilities. This boarding school attracts students from all over the country, and not only from Efate. The school has a reputation for high standards of acceptance and level of education. It is under the authority of the Presbyterian Church, has 32 teachers, of which six are ex-patriot teachers. The school offers a large selection of compulsory and choice subjects in the junior and secondary levels. They have seen the value of transforming the Industrial Arts and Home Economics courses into a new technology course, in line with international trends.

Additional learning resources are provided via television and videos, satellite TV (CNN, installed by Telsat) and a well-stocked library. The school has no grid electricity, but has a generator that is operational at different times in the day. They do however have a telephone, although the quality is poor and is affected by the weather, having an impact on the Internet access.

The school has five computers in the library for student access (not networked and no Internet access), five administrative computers, one in the staff room, and nine in the computer lab (networked and one connected to Internet). They received the computers through agency donations and private purchase. They presently do not offer formal computer classes because there is no skilled teacher. They also listed support as poor on the island, but said that there were companies to assist when necessary, particularly computer network services (CNS) and Packnet. They do not have much software and offer little integration of the technology across the curriculum. However, they want to see the use of computers move into the classroom. The deputy

headmaster viewed the Internet as valuable for information access, communication, provision of current affairs and news, and for research. He saw the Internet having a role in changing teaching and learning methodologies, and having a positive impact on teacher preparation, research and administration.

ANNEXURE G – USP INTERVIEW

SPECIAL INTERVIEW WITH PROF. RAJESH CHANDRA, DEPUTY VICE-CHANCELLOR, UNIVERSITY OF THE SOUTH PACIFIC, SUVA, FIJI, ON SATURDAY 25 AUGUST 2001

Professor Chandra is also currently Acting Vice-chancellor at the University. His responsibilities include USPNet, distance education and all ICTs at the University and its extension centres. He is also very involved through his position in regional activities concerning education and ICTs. He was departing for a forum in New Caledonia regarding the development of further policy for telecommunications for the region. This was a further step in the process, following various meetings and forums in recent years. He would give feedback on some of the information and papers from this forum to assist with this feasibility study, and was willing to comment on the overall COL study once it reached draft stages.

Regarding Fiji, overall ICT infrastructure is much better than in other Pacific nations. However, little liberalisation of the telecoms industry has taken place. Although computer ownership is fairly high, there is still a poor use of ICTs in government, and thus a lack of understanding as to how ICTs can benefit the nation. They should therefore be encouraged. Some schools have computers, although access is generally limited. Internet costs are also fairly high, although the general sense is that Internet access is no longer a luxury. A fair number of Internet cafés were seen around Nadi. As far as the monopoly in telecoms, Fintel controls international bandwidth and access, and Telecom controls local access. Both companies have now been placed under another government agency, ATH, a superannuating fund.

USP has the most developed ICT infrastructure in the South Pacific, due to its use of ICTs to deliver distance education via USPNet. USPNet appears to be the largest experiment in using ICTs to deliver distance education, similar only to GDLN (World Bank's Global Distance Learning Network). USP also has the largest number of computer professionals in one organisation in the South Pacific. USP administers the .fj domain. It has 3.2 MHz of international bandwidth from Intelsat to meet its needs and those of the extension centres, bypassing telecom. They have 4x128 K and 12X64 K channels. Fiji Telecom provides 384 Mb Internet access, which is consumed over the entire network. In addition, they are linked via satellite to approximately seven institutions in Asia. The licence to operate this extensive network is limited to USP activities. Currently only seven of the 12 member countries have awarded licences for USPNet to operate in their countries, but they cannot stop the service being provided, because of the representation of all Ministers of Education on the USP governing body. The University takes a regional approach, ensuring no one country has dominance. Currently, USP students must go to the centres in each country to gain access to USPNet, in effect limiting the power of the USPNet distance education model. They would like to extend the centres further in each country, and have a trial in Fiji planned. They also have a commercial company through which they can take on additional ICT-related work.

Professor Chandra believes that a version of USPNet for schools can and should exist, but there are currently limitations imposed on USP in terms of usage. They have the capacity to make it a reality, but need support from the various countries. USP could certainly play a pivotal role in making school networking in the South Pacific a reality. He supports the development of strong national schoolnets, with a regional approach being

less beneficial than in the University's case. USP could certainly host content for schools, mirroring the sites in the individual countries.

For additional information, please check on the Pacific Telecommunications Council (PTC) and Pacific Islands Telecommunications Association (PTA) Web site.

ANNEXURE H – PACIFIC ISLANDS NETWORK

PROJECT OVERVIEW

PACIFIC ISLANDS NETWORK (PIN)
LINKING SCHOOLS IN THE PACIFIC ISLAND COUNTRIES THROUGH THE INTERNET

SUMMARY

Most of the Pacific island countries have not yet crossed the digital divide – many pre-university schools do not have computers, and few are on the Internet. The Pacific Island Network (PIN) is being organised by the Hawaii Division of the United Nations Association, in co-operation with a number of groups working in related areas, to assist schools in these countries to access the Internet. Funding in the order of U.S.$250,000 is being sought for a two- to three-year programme to introduce computers and related services to schools and students in up to 10 island countries, allowing them to access the Internet and making a contribution to the development of the region.

THE REGION

There are more than 20 small island countries and territories in the Pacific Basin. For this project they have been split as follows (approximate population in brackets parentheses):

Project partner countries (10 in all)
Polynesia: Samoa (165,000), Tonga (98,000), Niue (2,000), Cook Islands (19,000), Tuvalu (10,000),
Melanesia: Solomon Islands (285,000), Fiji (780,000), Nauru (11,000), Vanuatu (169,000)
Micronesia: Kiribati (72,000)

Associated Countries and Territories
U.S. flag (10 in all)
American Samoa (54,000). Federated States of Micronesia: Chuck (50,000), Kosrae (8,000), Pohnpei (35,000)
Yap (11,000), CNMI - Northern Marianas (78,000), Guam (145,000). Marshall Islands (54,000), Palau (16,000)
Hawaii, (1,150,000)
French dependencies (three in all)
French Polynesia (219,000), New Caledonia (196,000), Wallis and Futuna (14,000)
New Zealand dependency (one)
Tokelau (2000)

All of these countries will be invited to participate in the network that links schools. Project support for computer labs will be provided in the 10 participating countries since the Associated Countries and Territories have access to support from the U.S., France and New Zealand. Of the 10 partner countries, Fiji, which has almost half of the total population, has tertiary institutions and reasonable Internet facilities and will be dealt

with as a special case. Five countries, Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu will be the initial target areas. Each of the very small countries, Cook Islands, Nauru, Niue and Tuvalu, has special conditions that will be taken into consideration in developing appropriate programmes.

PLAN OF ACTION

Preparatory stage – 2001

1. The project was discussed with a number of representatives from the region at the Pacific Telecommunications Conference in Honolulu in January. This included a presentation at a meeting of the Francophone countries and territories.

2. The Pacific Islands Telecommunications Association (PITA) is holding a meeting in Guam in April to discuss co-operation in the region including development of Internet communications. The project has been invited to send this information note for discussion at the meeting.

3. From January to May 2001, an essay contest is being organised in co-operation with the UNESCO office in Apia in which seniors in high schools in the 10 partner countries will write essays on the current situation in their schools and on the potential impact of improved access to computers and the Internet for students.

4. A model project linking Samoa College in Samoa and Campbell High School in Hawaii will provide a computer lab with 10 computers and connections to the Internet to Samoa College (April to May), train teachers in Samoa (May to June) and exchange of teachers' visits between Samoa and Hawaii (July to August) to discuss use of the Internet in a collaborative project. This project is funded by Schools on Line.

5. A review will be made in co-operation with UNESCO on the potential impact of the Internet on the culture and traditional values of the region and steps that will assure that the impact will be a positive one.

6. A planning meeting of representatives of the 10 partner countries is proposed in Samoa in late 2001. PITA, PREL, the Peace Corps, Cisco, UNESCO, Schools on Line and other co-operating groups as well as observers from the associated countries and territories will be invited to participate. (Cisco has committed to establish two or three units of its Cisco Networking Academy Program in the least developed countries of the region: Kiribati, Samoa, Solomon Islands, Tuvalu and Vanuatu.) Participants will visit the model computer lab at Samoa College and discuss and approve a plan of action for the coming two years. Each participating country will present its own status report and project plan.

Operational Stage – 2002-2004

7. At the above meeting a co-ordinating committee made up of representatives of partner countries, associate members and co-operating groups will be set up. It will communicate regularly via the Internet. Initially the secretariat of this committee will be in Samoa, and steps will be taken to get support to service this operation.

8. Computer labs will be established in partner countries based on the experience with the Samoa lab. Training in the use of computers and the Internet will be carried out in-country and through exchange of personnel. The Schools on Line Internet Learning Centre Model will serve as the basis of the programme, with adjustments to meet the special needs of each country. This will be the major cost.

9. Based on the co-ordinating committee meeting, steps will be taken to establish a regional mechanism that will supervise and monitor continuing activities. This could be linked to an existing regional group such as PITA or SPREP. There will be a high degree of local and regional involvement at all stages to assure the full

participation of the countries, the schools, the teachers and the students. The success of the programme will depend not only on equipping schools in these countries but also on the way that the programme is presented and carried out taking into account the special needs and sensitivities of the region.

10. The people of the Pacific island countries and territories make up less than 0.001% of the earth's population but occupy more than 30% of the surface of the earth. Their economic future is limited by small dispersed populations and modest resources. The digital divide serves to further limit the future of the region and its children. This project, with a very small investment, can make a measurable positive impact on a vast region, and can make an important contribution to the future of its children and youth.

PACIFIC ISLANDS NETWORK – STATUS REPORT (SEPTEMBER 2001)

The Hawaii Division of the United Nations Association of the USA (UNA-USA) is developing programmes to promote Internet communications in the Pacific island countries. UNA-USA has 175 chapters and more than 22,000 members in the country. It major mission is to make the activities and concerns of the United Nations known to the public, and to carry out programmes in areas of interest and concern to the U.N. The activities of the Hawaii Division give some emphasis to linking the United States to the Pacific island countries.

The Pacific Islands Network (PIN) is a programme to link pre-university schools in Hawaii and the Pacific Island countries through the Internet. Initially the links will be between pairs of schools within the region and will allow communication on the teacher-to-teacher and student-to-student levels. Students will be expected to participate in online collaborative projects involving interaction among students in a community, a country or a number of countries for the purpose of sharing experiences and knowledge. Special attention will be paid to factors that link the island countries (social, cultural, historical, geographical) etc., and to activities that can be integrated into the school curriculum.

The project will operate on two levels. The first will involve schools that are already on the Internet including those in U.S.-affiliated entities that are served by PREL (Pacific Resources for Education and Learning) and the Francophone territories. The second phase will involve countries like Samoa, Cook Islands, Tonga and Vanuatu that have limited infrastructure. Some of their schools have computers and provide training in the use of computers, but most are not yet on the Internet. These schools will be assisted in upgrading their infrastructure (computers, local networks, telecom connections, etc.) and in becoming familiar with the procedures and potential of the Internet.

One school link involves Samoa College, a government high school in Samoa, and two high schools in Hawaii. With support from Schools on Line, a California-based non-governmental organisation that provides equipment and support to schools with limited facilities, Samoa College has been provided with a computer lab and the necessary training to allow its students to actively participate in the Internet.

The collaborative activity for this project is of special interest. Natural hazards such as earthquakes, tidal waves, sea level changes and typhoons are an ever-present threat to the people of the island countries. An international project is currently under way at Stanford University that will bring attention to the impact of natural hazards, and develop approaches for dealing with them <www.crowdingtherim.org>. The project schools in Samoa and Hawaii will participate in this programme both directly and through the Internet, and will review and analyse the role of their schools in dealing with natural disasters. Thus the project will not only help the schools and students to learn about the use of the Internet but will also contribute to a better understanding of one of the great threats to their societies.

Other projects are under development including links between private schools in Samoa and Hawaii and between French-speaking schools in Vanuatu and schools in Hawaii that teach French. Contacts are also being established with schools in the Cook Islands that are coming onto the Internet.

In all of these links the telecommunication component is critical, and special efforts are being made to involve the national telecom facilities at all stages. For example, Telecom Vanuatu has agreed that it will provide free connections and free time to all schools in Vanuatu that develop Internet links.

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ANNEXURE I – ICT SPONSORS IN THE PACIFIC ISLANDS

UNA-USA HAWAII DIVISION

PACIFIC ISLANDS NETWORK (PIN)

More than 20 groups that sponsor ICT-related programmes in the region are listed along with brief notes on these programmes. It is proposed to create a database that will link the home pages of these groups, and in addition will have a one- or two-page summary of the interests and activities of each group as they relate to the use of the Internet in the schools. Each group will edit and revise its entry and users will have an interactive link with individual entries or with the database as a whole. Details on this are being worked on.

ASIAN DEVELOPMENT BANK (ADB) <www/adb.org> with headquarters in Manila, is a major source of development funding in the Asia-Pacific region Although most ADB support is in the form of loans to governments, some technical assistance (grant) funding is available, as in the case of the recent grant of $300,000 for an assessment of information and communication technology in the developing countries of the Pacific (PMDC). These countries include Cook Islands, Fiji, Kiribati, Republic of the Marshall Islands, Federated States of Micronesia, and Nauru. Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. The ADB project will assist the PDMC governments in assessing their ICT readiness and in preparing the framework for ADB involvement in the sector. There will be a three-day workshop in Manila in mid-2002, involving about 20 participants from the region to review consultant reports and to make recommendations. (See also Japan Fund)

THE CISCO NETWORKING ACADEMY PROGRAM <www.cisco.com/education> is designed to foster student development and exposure to information technology. It teaches students to design, build and maintain computer networks. Academies currently operate in some 83 countries including PNG, Fiji, American Samoa and Guam, and one is being installed at the National University of Samoa in co-operation with the United Nations Development Programme.

THE COMMONWEALTH OF LEARNING <www.col.org> is a Vancouver-based group that supports and promotes the use of ICT in all parts of the education and training system. COL is carrying out a feasibility study in the Pacific Islands, with initial emphasis on the Commonwealth countries (Fiji, Kiribati, Nauru, Samoa, Tonga, Vanuatu) to consider establishing a schoolnet structured for the region. The study reviews the current ICT infrastructure including schools and telecommunications companies, and will result in

recommendations and a plan of action. It is being carried out in co-operation with the Pacific Islands Network.

COMPUTERS FOR KIDS <www.catii.com> is a Hawaiian programme that provides recycled computers to schools in Hawaii and the region. Helping Hands Hawaii makes arrangements for the distribution of these computers to schools. Computers can be made available to the Pacific Island Countries and Territories.

THE EAST-WEST CENTRE (EWC) in co-operation with the University of Hawaii Community Colleges, is organising a technical training programme for technology managers from the Pacific islands. This will consist of a series of two-week intensive courses at the EWC for about 10 middle technicians from Pacific Island countries. The five core areas for the first programme are computer networking; UNIX; Web development; JAVA; and computer-aided design. The first courses are planned to begin in May 2002. (See also the Pacific Islands Development Program which is located at the EWC.)

INFORMATION TECHNOLOGY PACIFIC NETWORK (ITPACNET) is a working group that meets annually to link and harmonise the information technology programmes of eight regional groups in the Pacific Basin including the South Pacific Applied Geoscience Commission (SOPAC) <www.sopac.org.fj> in Fiji and the South Pacific Regional Environment Program (SPREP) <www.sprep.org.ws> in Samoa. These groups (which will be listed separately in the proposed database) are co-ordinated and linked by the Secretariat of the Pacific Community (SPC) <www.spc.org.nc> in Noumea. The Pacific Information and Communication Techologies: Need Assessment and Strategy Planning Workshop was held in Noumea 27-31 August 2001. The workshop report emphasises the need for appropriate education and training, the installation of ICT in schools and increased use of and support for ICT at all educational levels.

INTERNATIONAL EDUCATION AND RESOURCES NETWORK (iEARN) (www.iearn.org) is an Internet network of over 3,000 schools in 65 countries throughout the world. Activities include curriculum-based and teacher-designed co-operative online projects on areas of broad interest. Schools in the Pacific islands will be given free access to iEARN and can participate in iEARN projects.

INTERNATIONAL TELECOMMUNICATIONS UNIONS (ITU) <www.itu.org> sponsors the Internet Training Centres Initiative for Developing Countries (ITCI-DC), a multi-million dollar project aimed at closing the gap in Internet and a "new economy" skills in developing countries. Under the initiative, ITU plans to establish 50 training centres to provide skills in Internet protocol (IP) networking and services by July 2003 in existing non-profit institutions in developing countries. Fifteen sites are expected to be operational by the end of 2001, another 20 by the end of 2002 and a further 15 by mid-2003. Each centre initially involves a partnership between the ITU, industry partners, relevant government agencies, not-for-profit training institutions and local service providers. At the end of the project, however, it is expected that each training centre will be sustainable and self-financing.

The ITU in co-operation with PITA, is organising a meeting in Melbourne, Australia 10-13 October 2001 to review "Regional Internet Issues in the Pacific."

The JAPAN FUND FOR INFORMATION AND COMMUNICATION TECHNOLOGY (JFICT) is a grant of about U.S.$10 million from Japan to be administered by ADB. The basic objective is bridging the growing digital divide in Asia and the Pacific. The Fund will help establish a centre for learning, information, communication and knowledge in the Asia-Pacific region and will support activities on three main areas: creating an enabling environment for ICT, building human resources, and developing ICT applications and information content.

Although the Fund is for all of Asia and the Pacific, it is noted that the Pacific Islands Summit in Tokyo in April 2000, and the follow-up Pacific Islands Academic Summit in Okinawa, gave high priority to development and application of information technology in the Pacific islands, and it is expected that the Pacific islands will receive important support from the Fund.

PACIFIC CENTRE FOR ADVANCED TRAINING AND TECHNOLOGY (PCATT)
The PCATT <www.hcc.hawaii.edu> is based at Honolulu Community College and includes a consortium of community colleges in Hawaii dedicated to developing and providing training in advanced technology applications in Hawaii and the Pacific Rim. Honolulu Community College also is the centre in the region for the Cisco Networking Academy Program, and has working links with a number of Academies in the region. (See sections on Cisco and the East-West Centre).

PACIFIC ISLANDS DEVELOPMENT PROGRAM (PIDP), a programme of the East-West Centre, conducts research and training activities in the Pacific island countries. It serves as the secretariat for the Pacific Islands Conference of Leaders. Research priorities give some emphasis to the role of culture and tradition in development as well as to expanding trade and investment in the region. The PIDP Web site is a major source of up-to-date information on the countries of the region.

PACIFIC ISLANDS NETWORK (PIN) is a programme of the United Nations Association of the USA, Hawaii Division to promote links between pre-university schools in Hawaii and the Pacific island countries via the Internet. The programme has been in operation for more than a year and a number of links have been established. As the programme evolves it is hoped to establish a regional group or mechanism that will co-ordinate and monitor the links.

PACIFIC ISLANDS TELECOMMUNICATIONS ASSOCIATION (PITA) <www.pita.org.fj> links more than 20 of the small island states for the purpose of improving, promoting, enhancing, facilitating and providing telecommunications services in the Pacific Basin. It has an office in Fiji and meets at least twice annually, once in conjunction with the January meeting of the Pacific Telecommunications Council in Honolulu. Some members of PITA are actively supporting the use of the Internet in schools, and for example, Telecom Vanuatu provides free connection and free online time to participating schools. ITU/PITA are co-sponsoring the meeting on "Regional Internet Issues in the Pacific Basin," in Melbourne 10-13 October, 2001 and it is expected that use of the Internet in the schools will be one of the issues considered.

PACIFIC RESOURCES FOR EDUCATION AND LEARNING (PREL) <www.prel.org> is a non-profit corporation funded by USDOE, located in Honolulu, and serving the 10 U.S.-affiliated entities in the Pacific region. It has active programmes promoting use of the Internet and distance learning via the Internet, and these programmes are designed to meet identified educational needs and priorities in the region.

PACIFIC TELECOMMUNICATIONS COUNCIL (PTC) <www.ptc.org> is an international non-profit non-governmental organisation with the mission to promote development of telecommunications and related industries in the Pacific region, with emphasis on developing countries. The PTC , which is located in Honolulu, organises an annual regional conference there each January, dealing with telecom-related developments and issues in the region. It has information on the situation in each country, and contacts with each country's telecom providers all of which are members of the PTC. The January 2002 meeting in Honolulu will offer the opportunity to discuss the school links with the telecom authorities of participating countries.

PEACE CORPS (www.peaceccorps.gov) has an active programme in the Pacific islands, involving some 130 volunteers. Although all are not working on Internet-related projects, most of the volunteers are very familiar

with the Internet and are in a position to assist schools in their project areas to install and become familiar with computers and the Internet and participate in training programmes in the region.

PEACESAT (PanPacific Education and Communication Experiment by Satellite) (www.peacesat.hawaii.edu) is a public service satellite telecommunications network linking the Pacific Islands. Administered by the Telecommunication Information Policy Group (TIPG) of the Social Science Research Institute of the University of Hawaii, PEACESAT conducts surveys and research on telecommunications policy in the region and organises related training. One goal is to improve the quality and access to telecommunications at affordable costs, with some emphasis on health and education. PEACESAT has access to the GOES-7 satellite and has satellite stations in most countries of the region, although all are not fully operational. There are T-1 connections between the PEACESAT Network Operations Centre at UH and Guam and the Commonwealth of the Northern Marianas Islands. Technical staff visits the countries of the region on a regular basis and monitors the situation in each country.

PEACESAT has telecommunication connections to American Samoa to which the main schools and research institutions are connected. From American Samoa there is a direct cable link to the National University of Samoa with a connection to the main hospital in Apia. Services provided are voice and video-conferencing, electronic mail and access to the World Wide Web and the Internet.

ROTARY INTERNATIONAL has chapters throughout the world, including those in Hawaii, Samoa and Fiji, all of which carry out projects to support development. For example, Rotary chapters in Hawaii and Samoa are active in providing computers to schools, and can provide useful services on a number of levels.

SCHOOLS ON-LINE <www.schoolsonline.org> is a programme to provide cost-effective and accessible technology to under-served children and youth in schools throughout the world. It has been active in more than 15,000 schools in the United States and is broadening its activities to other countries. It can provide computer centres equipment and technical support to schools and has a staff of trained teachers to help implement project-based learning programmes. Currently it is setting up a computer lab at Samoa College in Samoa.

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) <www.undp.or> promotes information technology on a number of levels, including working with Cisco Systems in the establishment of the Cisco Networking Academy at the National University of Samoa and the Samoa Polytechnic Institute. The United Nations Information Technology Service (UNITeS) makes use of U.N. volunteers to train groups in developing countries in the uses and opportunities of IT. The sustainable Development Networking Programme (SDNE) also has an important IT component. UNDP funds are available for IT projects in each country programme where this is a priority.

UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANISATION (UNESCO) <www.unesco.org> UNESCO has an office in Samoa that links and serves the Pacific islands in its areas of competence. The staff includes a regional adviser on communications. UNESCO sponsors the Pacific Youth Forum, which brings together youth from the 14 countries to work in areas of common interest. Consideration is being given to develop Internet links with Forum members as a preliminary step in linking schools in the region.

WORLD BANK <www.worldbank.org> has a number of related programmes including World Links for Development (WorLD) that links more than 1200 schools in 40 countries. The International Finance Corporation (IFC) has established the Global Information and Communication Technology Group and, in co-operation with Softbank Corp of Japan has a programme to spawn start-up Internet companies in some 100 developing countries. The Information for Development programme <www.infodev.org> supports a

wide range of programmes including a Conference Fellowship Fund that supports meetings on information and communication technology for development and Regional Gateway Planning Grants to assist regional groups to develop related programmes and activities.

September 2001

ANNEXURE J – DRAFT PACIFIC ISLANDS REGIONAL INFORMATION AND COMMUNICATION TECHOLOGIES STRATEGIC PLAN

VISION

Information and communication technologies for every Pacific Islander.

INTRODUCTION

This strategic plan has been developed from the policy document and will be further updated.

GUIDING PRINCIPLE 1: ICT WILL BE USED TO INFORM AND CONNECT PACIFIC ISLAND POPULATIONS AND ENSURE THAT THEY BENEFIT FROM FLEXIBLE AND APPROPRIATE EDUCATION AND TRAINING.

Pacific island countries and territories (PICTs) are characterised by their remoteness, dispersed populations, and limited human resources and institutional capacity. As a result, opportunities for participation in sectoral applications are limited. Improvements in access, awareness, human resources development and usage are required for populations of PICTs to take their full place in the global knowledge society.

Policy 1.1: Awareness of ICT and computer literacy at all community levels will be promoted and developed while safeguarding existing social and cultural values.

Strategy 1.1: Promote greater awareness of ICT

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Develop high level "champions"	**Education Sector / Regional Organisations**	**2002**
Use local theatre groups for ICT promotion	**NGOs**	**2002**
Involve community centres in ICT use	**Community centres**	**2002**
Establish user groups	**Governments / Private sector / Individuals / Professional institution**	**2002**

Policy 1.2: PICTs will develop and retain a knowledgeable ICT workforce that will be able to contribute to the maintenance and further development of ICT.

Note: This draft strategic plan has been edited from the original for publication. Please check the Web site (see References) for updates to this plan.

Strategy 1.2: Develop and retain knowledgeable workforce in ICT.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Obtain baseline information	**Statistics sector**	**2002**
Review and build ICT in school curriculum (from elementary/primary/secondary level)	**Education sector/ Curriculum development Units**	**2004**
Train the teachers/trainers	**Teacher training institutions**	**2003**
Install ICT in schools	**Education sector**	**2003**
Develop self-contained mobile access points for ICT	**Government/Businesses**	
Create Internet cafés/training centres	**Government/Businesses**	**2003**
Develop corporate partnerships	**Government/Businesses/NGOs / Educational Institutions**	
Utilise capacity in existing institutions and build additional capacity to cover gaps	**Government/Businesses/NGOs/Educational Institutions**	**2003**
Develop or strengthen quality assurance and accreditation systems	**Education sector/Universities**	**2003**
Promote private sector involvement in education and training	**Government/Businesses/NGOs/Educational Institutions**	**2003**

Inhibitors

There are several inhibitors ranging from inadequate awareness of the importance of ICT and its contribution to lack of information on country and community needs. The cost of ICT equipment and services is generally more expensive than in other parts of the world. Communication is an essential part of tele-education, therefore cost effective and reliable communication systems are needed.

Policy 1.3: ICT strategies will be developed and/or strengthened in a flexible manner to facilitate human resource development, capacity building, and reduce professional isolation of Pacific Islanders at all educational levels and especially in rural and remote communities.

Strategy 1.3: Facilitate human resources for Pacific islanders.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Assess community needs.	**Government**	**2002**
Increase ICT use and support at all educational levels.	**Government / Private sector / NGOs**	
Ensure widespread availability of HRD opportunities.	**Government / Private sector**	
Develop exchange / vocational programmes.	**Government / Education sector**	
Develop distance education programmes.	**Educational sector / Universities**	
Ensure widespread knowledge dispersal.	**Government**	
Reduce professional isolation through the use of ICT in all sectors to promote the retention of professionals, especially in remote communities.	**Government / Professional associations**	

Inhibitors
It is common knowledge that trained people have a tendency to migrate to countries with better opportunities. It is therefore important to have incentives to retain them.

Policy 1.4: Everyone will have equal opportunity access to ICT without barriers, with special regard to women, the disadvantaged, the disabled, under-represented minorities, and those in rural and remote communities.

Strategy 1.4: Provide equal access to ICT.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Identify barriers, target groups and their needs	**NGOs / Governments**	**2002**
Develop equal-opportunity legislation	**Government**	**2003**
Government intervention (open subsidies)	**Government**	**2002**
Consideration of disabilities for service provision	**Government / Private sectors / Educational sector**	**2002**

Policy 1.5: Recognising the value of information, Pacific people will have the opportunity to contribute to the global community through the promotion of the rich Pacific cultural identity and diversity.

Strategy 1.5: Develop opportunities to contribute to the global community.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Demonstrate economic benefit.	**Private sector / Government / NGOs**	
Appropriate e-commerce.	**Private sector / Government**	
Develop publication competitions of local content.		**2002**
Encourage cross-linkages for culture and custom promotion.		
Encourage local content in ethnic languages.	**Government / NGOs**	**2002**
Establish virtual communities with dispersed populations nationally or internationally.	**Government / NGOs**	**2002**
Encourage online provision of local media.	**Private sector / Newsgroups**	**2002**
Develop and promote online forums.	**Government / Private sector**	**2002**
Establish national and regional portals.		

Inhibitors

There is a lack of government funding and other support to ensure that Pacific islanders contribute to the global village. Individuals tend to retain and restrict the free flow of information. Regulatory framework and inadequate legal provision for e-commerce can constrain its development.

GUIDING PRINCIPLE 2: APPROPRIATE ICT INFRASTRUCTURE TO SUPPORT DEVELOPMENT FOR PACIFIC ISLANDS.

Access to basic telecommunications and the Internet is generally more expensive in the Pacific island countries and territories (PICTs) than in other parts of the world. These higher costs have negative impacts on development of essential services such as education, health, and greater economic opportunities.

Policy 2.1: Regional and national ICT networks and support infrastructure will be reliable, secure, fast, cost effective and adaptive.

Strategy 2.1: Develop national and regional high speed networks.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Investigate installation of a broadband submarine cable loop linking the nations of the Pacific community.		
Investigate adaptive technologies for existing infrastructure (xDSL, PLC).		
Establish performance standards and monitoring procedures to assess quality of service, and establish a dispute resolution procedure.		
Reduce prices to increase number of customers.		

Investigate alternative delivery mechanisms to match demand. **Explore horizontal co-operation to integrate services.** **Develop monitoring procedures to assess the quality of service.**		

Policy 2.2: PICTs will encourage private sector investment in ICT infrastructure and promote competitive markets for ICT service provision, where appropriate.

Strategy 2.2: Provide regulatory framework to encourage private participation in infrastructure and competitive markets where appropriate.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
(PICTs will work with business to obtain cost-effective access to the telecommunications services it requires to improve competitiveness and market reach?) **Review legislation to allow competition and increase flexibility where appropriate to maximise benefit to communities.** **Provide a stable regulatory environment to encourage private investment.** **Review duration of licences.** **Explore opportunities for private participation in infrastructure and develop an action plan.**		

Policy 2.3: PICTs and regional organisations will co-operate to promote a regional approach to consideration and adoption of global ICT standards.

Strategy 2.3: Participate in development and exchange of ICT standards.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Regional organisations continue participation in ICT Working Group and similar forums. **Encourage national participation in ICT Working Group.** **Establish and maintain an ICT policy advisory service in an appropriate regional organisation.**		

Policy 2.4: Regional and national institutions will work with service providers toward practical universal Access to ICT.

Strategy 2.4: Develop ICT infrastructure to promote universal access.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Establish universal access and universal service definition country by country, service by service. **Develop national network to reach universal access where appropriate.**		

Policy 2.5: PICTs and regional organisations will co-operate to improve access and lessen the financial burden that development of ICT imposes on governments, non-government organisations and businesses.

Strategy 2.5: Identify / develop entities to provide expertise in ICT.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Recruit and retain ICT professionals. **Review curricula.**		

GUIDING PRINCIPLE 3: EASY ACCESS TO INFORMATION THROUGH ICT WILL STRENGTHEN CO-OPERATION BETWEEN STAKEHOLDERS TO ENSURE GOOD GOVERNANCE, TO DEVELOP THE PRIVATE SECTOR AND TO IMPROVE SERVICE DELIVERY.

Development of new methods in commerce, education, and public administration in PICTs is inhibited by limited human resources and institutional capacity and the high cost of information management systems. Co-operation between the three spheres of social, economic and civil activity is essential to overcome these constraints.

Policy 3.1: Governments, the private sector, NGOs and regional organisations will expand their use of ICT for interaction with their stakeholders, dissemination of information and promotion of the principles of good governance and sound business planning.

Strategy 3.1.1: Develop an ICT plan.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Develop national ICT plans. **Develop business and corporate plans with specific reference to ICT.**		

Policy 3.2: Development of community access to local content will be encouraged for all fields of information.

Strategy 3.2.1: Promote ICT awareness.

Strategy 3.2.2: Encourage ICT skills development.

Strategy 3.2.3: Facilitate community access to ICT.

Strategy 3.2.4: Address affordability of ICT technology.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Develop regulatory framework to address access constraints. **Develop and conduct awareness programmes.** **Enhance existing and establish new community technology centres.**		

Policy 3.3: ICT action plans will be actively monitored to identify their impact on national and regional development.

Strategy 3.3.1: Continually evaluate ICT plans and its impacts.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Evaluate success of ICT plans and programmes addressing their social, economic, environmental and cultural aspects.		

Policy 3.4: Governments, the private sector, NGOs and regional organisations will be encouraged to adopt appropriate management information systems for effective decision-making.

Strategy 3.4.1: Identify appropriate management information systems.

Strategy 3.4.2: Develop appropriate standards for hardware software, data formats.

Strategy 3.4.3: Develop appropriate regulatory framework for data sharing, copyright.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Explore digitisation of media collections. **Collect information pertaining to development priorities to improve decision-making processes.** **Develop training programmes in support of above strategies.**		

Policy 3.5: Governments, the private sector, NGOs and regional organisations will actively co-operate to acquire and maintain ICT resources in order to optimise the overall regional development investment.

Strategy 3.5.1: Encourage partnerships in ICT development in all levels.

Strategy 3.5.2: Encourage the appropriate sharing of ICT resources and data between all stakeholders.

Strategy 3.5.3: Undertake assessment of existing resources and appropriate needs by all stakeholders.

Strategy 3.5.4: Develop and maintain training policies and programmes to ensure ICT resources are properly managed.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Conduct inventory and research into appropriate needs. **Consider the introduction of non-discriminatory cost-recovery mechanism for public services.**		

Policy 3.6: Governments, NGOs, regional organisations and the private sector will actively co-operate to ensure that ICT policies are integrated in the development policies of all other relevant sectors.

Strategy 3.6.1: Adopt cross-sectoral approach within government and the private sector to ensure consistent policy development and implementation.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Regularly reviews of national sector policies that include participation by all stakeholders. **Encourage sharing of experiences through cross-sectoral meetings.** **Attendees of relevant meetings should disseminate the relevant information across sectors.** **Governments should facilitate cross-sectoral participation in meetings and conferences including representation from the private sector.**		

GUIDING PRINCIPLE 4: ICT POLICIES AND REGULATIONS WILL BE APPROPRIATE TO THE PEOPLE AND CULTURES OF THE PACIFIC ISLANDS.

ICT and related legal and regulatory frameworks in most PICTs are either outdated, insufficient or non-existent to meet the challenges and opportunities made possible by rapidly developing information and communication technologies. Adaptation is needed urgently at the national and regional levels, based on a sound technical understanding and a realistic assessment of fundamental benefits, to ensure that the greatest

possible economic and social benefits are gained from new developments while protecting social and cultural values.

Policy 4.1: Regional and national institutions will co-operate in the development of ICT regulations that are consistent with international and national laws, regulations, technical standards and obligations.

Strategy 4.1.1: Develop widespread and open consultation mechanisms.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Require monitoring and reporting by CROP ICT Working Group. **Integrate ICT issues into all other sectoral plans and policies.** **Create awareness.** **Seek funding assistance.** **Include wide range of stakeholders in consultations.**		

Strategy 4.1.2: Develop legislation.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Draft a regional model legislation based on sound technical understanding and international experience. **Review/develop national legislation and regulations to ensure all ICT services are treated consistently.** **Assist at national level.** **Identify expertise.**		

Policy 4.2: Appropriate ICT and related regulatory frameworks will be developed that benefit the specific cultures, customs and economies of the people of the Pacific.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Incorporate gender issues in ICT policies. **Incorporate multi-generation issues in ICT policies.** **Encourage local content and local language at**		

national level. **Develop mechanism to ensure benefits to the stakeholders.** **Recognise conventional and indigenous intellectual property rights.** **Establish targets for community access.** **Develop community awareness programmes to maximise benefits and minimise adverse social impacts.** **Review confidence and meaning of statistics.**		

Policy 4.3: ICT and related regulatory frameworks will be developed, based on legislation, to address socially undesirable activities.

Policy 4.4: ICT and related regulatory frameworks will promote open and non-discriminatory access to publicly accessible networks where appropriate.

Pacific Islands Regional Strategic Plan	**Strategy**	
Activities	**Identifiable Actors**	**Deadline**
Ensure regulations are technology-neutral to allow for cross-sectoral technologies. **Review communications tariff regulations to maximise benefits to communities.** **Ensure a stable ICT regulatory environment to protect investors.** **Governments to maximise accessibility to public information.** **Allow access to networks for all service providers and users of information.**		

Policy 4.5: National ICT and related regulations will balance and protect community and individual interests, including privacy issues.

Pacific Islands Regional Strategic Plan	**Strategy**	
Activities	**Identifiable Actors**	**Deadline**
Review existing and model legislation. **Review/develop national technical standards and regional interoperability.** **Ensure cross-sectoral regional and national co-ordination.** **Ensure legislation meets national requirements.** **Support authenticity and security of transactions.**		

Support effective online presence and citizen rights.

Policy 4.6: PICTs and regional organisations will take a pro-active approach to representation and advocacy in regional and international forums in order to promote partnerships to resource the development of ICT for all Pacific islanders.

Pacific Islands Regional Strategic Plan	Strategy	
Activities	**Identifiable Actors**	**Deadline**
Foster regional and international partnerships. **Identify information on regional and international forums.** **Conduct regular regional forums.** **Promote awareness of national benefits of ICT.** **Investigate membership opportunities.** **Employ existing infrastructure (e.g., USPNet).** **Nominate appropriate technical representatives.** **Ensure ICT committees have cross-sectoral representation.**		