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College of Communications

**ICT AND GENDER EQUITY POLICY: LESSONS OF THE MALI  
TELECENTRES**

A Thesis in

Mass Communications

by

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## Abstract

There is an urgent need for a better understanding of the interplay of information and communication technology (ICT) and the role of women in facilitating social, political and economic development. This research examines engagement of women with ICT in traditional poor, rural, communities of Mali, a least developed country (LDC). Mali was selected as the focus based on its broadly representative LDC challenges and the availability of locally and internationally collected data. This research applies the theoretical framework of international regime theory and development as freedom theory to help explain how ICT diffusion can be an empowerment tool for women in development. Women of Mali face low literacy rates, high birth rates, high infant and maternal mortality rates, and low incomes. This research found ICT applications facilitated positive change in health, education, politics and the economy in Mali. The relationship between international and national regimes in the process of negotiating problem solutions is particularly important to policy analysis of telecommunications and of gender equity. Policy in each of these areas permeates every sector of society. Challenges, obstacles, solutions and benefits of ICT development with gender equity in Mali can inform policymakers' understanding of ICT diffusion and its benefits to people in LDCs.

This analysis was based on a literature review, a survey of existing relevant research studies, a country study and a case study of the Multipurpose Community Telecentre (MCT) model for rural ICT development. The country study includes data and reports from the UNDP, ITU, IDRC, USAID and the World Bank. It incorporates history, policy, existing research, statistical human development data over time, ethnographic data, and reports of other ICT projects in Mali. Analyzed together, these data strongly suggest positive and directional change in Mali during 1990 to 2000, a period of dynamic telecommunications and gender equity policy liberalization.

The case study of the MCT in Timbuktu includes baseline communications research, on-site ethnographic research, interviews and the MCT Director's report. The Mali MCT was one of five African pilot projects initially supported by ITU, UNESCO and IDRC funds and developed with national and local community support. The MCT is a social communication center that provides ICT education and services. This research focuses on the MCT as an ICT knowledge gathering and distribution center. Influenced by international regime policies for gender equity, Mali's national machineries have implemented gender equity policy in communication access. Women participated in the design, implementation and operation of this MCT. The community open access design was found to be particularly conducive to ICT development through women's social networking. Research indicates women are keepers of indigenous knowledge systems in cultural communities. Content developed from this local knowledge base can contribute to global knowledge systems, cultural integrity and sustainability as well as to economic development. Conclusions of this study are based on findings that Malian ICT development with gender equity in the context of national and international policy engagement contributed to the positive growth in the political, educational and social sectors.

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## LIST OF ACRONYMS

AED – Association for Educational Development  
 AGI - African Gender Institute-University of Capetown  
 APC – Association of Progressive Communications  
 AIS-GWG - African Information Society Gender Working Group  
 AISI – African Information Society Initiative  
 CAFO - Coordination des Associations et ONG Feminine  
 CEDAW - Convention on the Elimination on all forms of Discrimination Against Women  
 COFEM - Collectif des Femmes du Mali  
 ECA - United Nations Economic Commission on Africa  
 ECOWAS – Economic Co-operation of West African States  
 ENDA-SYNFEV-Environment, Development, Action –Synergie, Genre et Development  
 FAO – Food and Agricultural Organization of the United Nations  
 GAIN Gender and Information Networking  
 GDI – Gender Development Index  
 HDI – Human Development Index  
 HPI – Human Poverty Index  
 ICT – information and communications technology  
 IDRC – International Development Research Centre  
 IMF – International Monetary Fund  
 INSTRAW – International Research and Training Institute for the Advancement of Women  
 ITU – International Telecommunication Union  
 ITU-D – International Telecommunication Union -Bureau of Telecommunications Development  
 ITU-TFGI - ITU Task Force on Gender Issues  
 LDC - Lease Developed Country  
 NGO – non-governmental organization  
 OAU/ AU – Organization of African Unity/ African Union  
 OECD – Organization of Economic Co-operation and Development  
 SAP – Structural Adjustment Program  
 SOTELMA - Societe de Telecommunications du Mali  
 SSA - Sub-Saharan Africa  
 TAI – Technology Achievement Index  
 TNC’s - transnational corporations  
 TRIPS – Trade Related Aspects of Intellectual Property Rights  
 UNCTAD - United Nations Conference on Trade and Development  
 UNDP - United Nations Development Programme  
 UNESCO - United Nations Educational, Scientific and Cultural Organization  
 UNIFEM – United Nations Development Fund for Women  
 UNITEs – United Nations Information Technology Services  
 UNRISD - United Nations Research Institute for Social Development  
 USAID – United States Agency for International Development  
 VITA – Volunteers in Technical Assistance  
 WIPO – World Intellectual Property Organization  
 WHO – World Health Organization  
 WTO – World Trade Organization

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Pastor Nock Yattara ministers in the Timbuktu hospital, the first home of the MCT. He shared his home, ancient artifact collection and a spiritual perspective on the MCT role in providing corporal and spiritual health in Timbuktu.

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## **Dedication**

This work is dedicated to God in whom all is possible; to my family; my ancestors, my parents and my husband, whose smile illuminates my life, to all my sisters and brothers and to my children who inspire me always to work toward the world of our dreams; to the people of Mali whose warmth and humanity continue to create a way out of no way toward that world.

## Chapter 1 – INTRODUCTION

Our human society, over 6 billion people, is experiencing transformation catalyzed by Information and Communication Technologies (ICT). Economic, social and political circumstances drive this change toward an Information Society<sup>1</sup> at widely variant speed and depth across countries, languages and countless human cultures. The transformation could proceed as an inclusive blossoming of democratic participation and cultural exchange across vast oceans of human difference or as an exclusive system of domination of the information poor by the information rich. The knowledge gap hypothesis predicts that the benefits of ICT development, could simply reinforce the privilege of the few and the disempowerment of the many without significant intervention. Proactive efforts to implement education, access and participation in ICT development with gender and other social equity goals will contribute toward realization of a healthy inclusive cyberspace and participatory Information Society. This research will examine the social, economic and political change during such proactive efforts in Mali, West Africa, a nation rich in history and culture and ranked the 5<sup>th</sup> poorest nation in the global economy.

The theoretical framework for this research includes international regime<sup>2</sup> theory as articulated by Krasner (1983) and applied to telecommunications policy by Cowhey. Other works apply this theory to telecommunications in Africa. Cogburn (2001) applied international regime theory to the South African telecommunications policy case. Gadio (1995) used the concept of epistemic communities<sup>3</sup> within the international regime theory to explain telecommunications development under economic structural adjustment in the cases of Senegal, Mali and Ghana. International regime theory also provides the policy analysis framework for the evolving policy system of norms, principles and rules for

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<sup>1</sup> Information Society is a term used to describe society within an interconnected system of human information communication networks.

<sup>2</sup> Krasner defines international regime as principles, norms, rules and decision-making procedures around which actor expectations converge in a given issue area (1983, p1).

achievement of gender equity. The gender equity regime is based on the Universal Declaration of Human Rights (UDHR). This international agreement recognizes that “the inherent dignity and the equal and inalienable rights of all the human family is the foundation of freedom, justice and peace in the world.” These human rights are equally inalienable for women and men, affirmed in the international treaty, Convention on the Elimination of all forms of Discrimination Against Women (CEDAW), and in the Nairobi Forward Looking Strategies (1985) and the Beijing Platform for Action (1995). The Forward Looking Strategies and Platform for Action were developed through the Four World Conferences on Women organized through the United Nations Fund for Women (UNIFEM). Sen’s (1999) perspective of Development as Freedom constructs the theoretical relationship between human rights and freedoms and positive social, political and economic growth demonstrated with empirical research. The human rights focus of this research is based on the human rights of all, irrespective of gender, and the right to communicate through any media included in the UDHR and CEDAW international treaty agreements.

ICT development research and programs have established a strong link between telematics and economic development. Telematics is defined as telecommunications, computers and the Internet. Research also links economic and social development. This research project explores changes in national development during a period when gender equity policy was applied to ICT access, education and technology diffusion. The research approach does not attempt to quantitatively establish a causal relationship between ICT development with gender equity and positive growth indicators such as the human development index or the technology achievement index. Change in these indicators results from a complex set of factors and circumstances and it is beyond the scope and purpose of this study to isolate the effects of any one factor. This study qualitatively examines the simultaneous developments in Mali of telematics growth and gender equity growth in the context of national social and political objectives. National

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<sup>3</sup> The epistemic community of a regime is the knowledge group with theoretical and other intellectual resources that validate and authenticate the work of the regime.

initiatives for gender equity in education, political representation and health care have combined with ICT application initiatives to achieve development goals in these sectors.

Research methodology includes a country study and an ICT project case study. The Mali country study is built from research about ICT and gender equity policies and development. The Multipurpose Community Telecentre (MCT) case study examines this ICT access model in Timbuktu as an example of cooperation between national and international regimes for implementation of ICT policy objectives. The Mali MCT was the first of many African MCT pilot projects. The MCT is an ICT development project, which provides high speed Internet access in Timbuktu, a town in rural central Mali. Access to the Internet is important as a source of networking, information and commerce. United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Telecommunication Union (ITU) and the International Development Research Centre (IDRC) of Canada agreed to subsidize the MCT for three years while the community completes its plan for sustainable MCT operation. The research questions explore how ICT change has been encouraged and supported by local and international organizations with positive results.

ICT development and diffusion have expanded rapidly in the last decade through interconnecting networks, communications equipment and socioeconomic systems. Gender inequities have accompanied development of past technologies. King and Mason (2001) argue in the World Bank report, Engendering Development that “gender inequities harm well-being and hinder development” (p73). They propose that , “improving gender equality has to be part of any sustainable strategy for development.”(p74). They also propose a three-part strategy to promote gender equality. First, institutional reform must be proactive to establish equal rights and opportunities for women and men. Second, economic development can foster and “strengthen incentives for more equal resources and participation” (p242). Third, “active measures to redress persistent disparities in command over resources and political voice ” (p249) are recommended. The well-documented relationship between gender equity and social and economic development supports the recommended actions (Mason and King, 2001, UNDP, 2001a). Though this

report supports gender equity in all development programs, the World Bank has been sharply critiqued for its lack of material support for gender equity programs in the past (Wakhungu, 2002). The World Bank and International Monetary Fund (IMF) imposed Structural Adjustment Programs (SAPs) as a funding condition for developing countries. SAPs cut public spending on social services in order to balance budgets. Women represent 60% of the world's poor and therefore bore the greatest burden of spending cuts particularly in education and health care.

The Information Society describes the social order emerging from the ICT diffusion process. International regime theory applied to the globalized information distribution system of interconnecting networks helps explain this emerging social order from the perspective of international cooperative governance. Local communities value information networks and the content they can deliver. Improved effectiveness, efficiency and sustainability of ICT systems results when they are implemented within local communications systems. Improved capacity to gather local knowledge base and disseminate its information is another important value of ICT networks to developing countries. International resources, research and oversight from international ICT regimes can aid this local bottom up effort. The Global Knowledge Partnership is a coalition effort among public and private organizations to provide such resources through ICTs.

The Information Society is not yet an inclusive society. In a world increasingly controlled through electronic communications, most people in the world still carry on lives without access. The term "digital divide" is often used to describe the gap between the information poor and the information rich. The gap of unequal capacity for and access to ICTs has been linked to unequal power relationships in economic, political, social, educational and cultural systems. This gap is one current manifestation of global economic and sociopolitical inequalities, which persist despite growth in participatory democracy. This research will not rely on the term "digital divide" but rather will explore some of the intricacies of these long-term inequalities and their effect on ICT policy in Mali. ICT policy can guide the rampant and uneven diffusion of ICTs toward

development of a more just and human information society around the globe. Solutions to local needs and problems have global implications.

If local communities want to retain an autonomous cultural space, their battleground has to go beyond local boundaries, since the space for local cultural expression is co-determined by such global policies as GATT decisions on trade in services or on intellectual property (Hamelink, 1995, p123).

For these reasons, more equitable participation in the society, economy and culture developing around information production and distribution requires local-global partnerships

ICT infrastructure is expanding into regions with no previous access to telephony, computers or the Internet. National and international initiatives for ICT development can work with wireless technologies. Policy decisions shape the diffusion, use and application of the not quite global ICT network. A truly global network of interactive information flows is possible, but is still a vision in contrast to the reality of a growing digital gap between the information haves and have-nots. Policymakers negotiate economic, social and political objectives, which often conflict. While ICT infrastructure is in development, it is important that strategies are in place for women and men to achieve equitable education, access and capacity for application of these powerful tools of the information age. Gender equity improves development and ICTs improve development. These well-researched results open the inquiry into the development impact when gender equity policy is applied to ICT development policy.

Local culture is the lens, which determines local focus on the emerging Information Society. Local focus on ICT applications and the benefits or liabilities to the community is key to implementation and sustainability of programs for ICT development. The positive externalities of ICTs experienced in the Organization for Economic Co-operation and Development (OECD) and other industrially developed nations have yet to benefit lesser-developed nations. This research examines not only a model for community ICT

access, but also a model for collaborative work among local, national, regional and international regimes of public, private and non-governmental organizations (NGO's).

Participatory Rural Appraisal (PRA) programs achieve sustainable development goals through the inclusion of local input in all program stages. The critique and response of local input is meant to function as a corrective feedback process to keep the project on the path to sustainability. PRA programs have been criticized for failure to include women as equal participants (Chambers, 1994a, b, c). Gender equity is as important to long-term sustainability of ICT development as it is to development in other sectors

The UNDP Human Development Report 2001 credits public-private partnerships with catalyzing ICT diffusion and economic growth in emerging economies. The UNDP report, Making New Technologies Work for Human Development (UNDP, 2001a) identifies the following proactive policies for a national strategy to stimulate ICT innovation:

- Technology policy can help create a common understanding among key actors about the centrality of technology to economic diversification.
- Reforms to make telecommunications competitive are vital for giving people and organizations better access to ICT.
- To stimulate technology-oriented research, governments can promote links between universities and industry - and provide fiscal incentives for private firms to conduct research and development.
- Stimulating entrepreneurship is also essential, and venture capital can be important in fostering technology-based start-up businesses.  
(UNDP, 2001a, p79).

These policy recommendations are included as global benchmarks for comparison of internationally defined goals with policy initiatives in Mali. The report has been criticized for abandoning the theme of society guiding technology adaptation to social values expressed in previous reports since 1990. Concern for the simplistic expectation that technology innovations provide solutions, irrespective of social circumstances for technological integration was also been expressed (Wakhungu, 2002).

ICTs provide tools for networking, communication of social values and problem solving applications. “Today’s technological transformations hinge on each country’s ability to unleash the creativity of its people, enabling them to understand and master technology, to innovate and to adapt technology to their own needs and opportunities” (UNDP, 2001a, p79). UNDP recently developed the Technology Achievement Index<sup>4</sup> (TAI) to measure in part, “each country’s ability to unleash the creativity of its people” (UNDP, 2001a, p79). The innovative spirit of creativity of a people cannot be fully understood or measured with the TAI. It can be better understood through deeper descriptions of technology applications to local community needs. Local innovations and indigenous technologies also require more attention than is given in the 2001 UNDP report.

The UNDP figures tell part of the ICT development story for Mali. This research also includes reports from three journeys through west, central and northern Mali. These research visits spanned political climates of one party rule, multiparty democracy transition, and seven years into the democratic transformation. Between the first and last visit, from 1990-1999 Mali initiated a program of accelerated telecommunications development, liberalization of regulatory structures and privatization of Societe de Telecommunications du Mali (SOTELMA) with support from the US Agency for International Development (USAID), Leland Initiative.

## 1.1 Objective

The objective of this study is to examine the theorized relationship between gender equity and development and between ICT and development as a means toward understanding how gender equity in ICT impacts development. This research will analyze national policy for gender equity in ICT participation and access and relate it to social, political and economic development in Mali during the period of policy change from 1990 to 2000. Mali represented many conditions common to least developed countries (LDCs):

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<sup>4</sup> The TAI is composed of measures for tertiary science and technology enrollments and patent filings.

low GDP, literacy and life expectancy, minimal ICT diffusion and government reliance on telecommunications revenues. There is a paucity of telecommunication policy research for the LDCs. Part of this research objective is to contribute to the telecommunications and gender policy literature on LDCs. Policy recommendations from international regimes influence national policy formation and have impacted Malian policy. International organizations, transnational corporations (TNCs), non-governmental organizations (NGO's) and civil and civic organizations in Mali interact on gender policy and ICT policy formation. Research on that interaction helps clarify the policy climate in Mali in the context of international regime policies.

ICT access and participation can enhance education, which is central to social development. Education policies in Mali have targeted gender barriers. Rodney (1982) has identified gender barriers to education in African countries including Mali, with the colonial legacy of female exclusion from formal education and economic systems:

What happened to women under colonialism is that the social, religious, constitutional and political privileges and rights disappeared, while the economic exploitation continued and was often intensified. It was intensified because the division of labor according to sex was frequently disrupted...since men entered the money sector more easily and in greater numbers than women, women's work became greatly inferior to that of men within the new value system of colonialism...the deterioration in the status of African women was bound up with the consequent loss of the right to set indigenous standards of what work had merit and what did not (p227).

Malian policy has encouraged cooperative efforts to restore gender equity in the education and economic systems, The Leland Initiative, Strategies for Gender Education (SAGE) project of the Association of Educational Development (AED), Learnlink, United Nations Development Programme (UNDP), UNESCO and the Norwegian Agency for Development Cooperation (NORAD) are international organizations, which have influenced the implementation of Mali's gender equity policy through the Ministry of Education. Expansion of gender equity in ICT access in Mali has increased along with education and governance access for women.

Women played a leadership role in Mali's political development. In 1991, Mali transformed from dictatorship to multi-party democracy. This political transformation has contributed to economic development. Women's political leadership today in Mali has an important role in ICT gender policy formation. Analysis of gender policy for ICT infrastructure development, education and capacity building for locally determined applications can contribute to strategy building for gender justice. ICT community access projects in Mali such as the Timbuktu MCT have challenged local communities to build connections and relationships to the global Information Society. Other telecentres modeled on this project build on the understanding of the importance of gender equity and Information Society inclusiveness.

## 1.2 Theoretical Framework

The theoretical framework for this research includes: theory underlying international documents articulating and affirming first principles of human rights, particularly the right to communicate, international regime theory and Sen's (1999) perspective on development as freedom. First principles ground the efforts to achieve gender equity and communications for all within a developing Information Society. The right to communicate included in the Universal Declaration of Human Rights (UDHR), Article 19, and the right to equity and equality for women underlying the Convention on the Elimination of Discrimination Against Women (CEDAW) are based on the theory that all human beings have certain rights that no government can legislate away. Theories of inalienable human rights and human equality underlie the Beijing Fourth World Conference on Women and the twelve Platforms for Action (PFA), which serve as development initiatives. The Section J initiative, "Women and the Media" is the platform for action, which this research will examine in the case of Mali. The Universal Declaration of Human Rights, Article 19, supports efforts to reach and provide ICT access to all based on their right "to seek, receive and impart information and ideas through any media and regardless of frontiers" (UN, 1948). The gender frontier in the

emerging Information Society is explored for Mali from the perspective of these human rights aspirations.

International regimes are emerging networks of international organizations with common principles, norms, rules and decision-making procedures, and informed by epistemic communities. International regime theory maintains that governance is a negotiation between nation states and international regimes. This theory from political science acknowledges the declining power of the nation state in a world of escalating globalization. The international regimes for telecommunications and gender equity influence national policy formation more now than in the past. International regimes seek cooperative agreements, which articulate different national, international, public and private perspectives and they attempt to negotiate workable solutions to common problems (Cogburn and Foss, 1996). International regime theory provides a framework for examination of the interaction between international and national governance and policy formation structures for ICT and gender policies.

International regime theory is developed in Regime Theory and International Relations (Krasner, 1993). Krasner elaborates on the cognitive factors impacting regime formation, including epistemic communities or knowledge based work groups. Capacity to build knowledge and share it through ICTs is a driving force for global women's networking and problem solving through ICTs. The case study of gender equity in ICT access at the MCT in Timbuktu is focused on the larger question of how women use information to better the lives of their families, communities and nation. Sophia Huyer heads the Women In Global Science and Technology (WIGSAT). She articulates the strong role of women as contributors to development in the knowledge society. Women are "possessors of most of the indigenous knowledge in developing countries...critical to community development" (Huyer, 1997, p1). Community development is the basic social unit of national development.

The UN, ITU, UNESCO, WTO, OECD, WIPO and others negotiate international agreements and are considered international regimes in their respective areas. Global

developments in telecommunications networks influence local policy. International agreements such as the WTO Basic Telecommunications Agreement have determined policy objectives for nations with emerging economies seeking participation in the global telecommunications market, the fastest growing sector of the world economy.

The UN, UNIFEM are part of the regime for gender equity. The Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW), an international treaty, commits signatories to gender equality objectives in political, social and economic affairs. The Beijing International Conference on Women established the twelve PFA's and Beijing+5, in 2000, established a progress oversight structure for achievement of gender equality in critical areas of concern. PFA Section B addresses gender inequality in access to education and training. Education is important to ICT sector participation. PFA Section J addresses the need for gender equality in access to and participation in all media communication networks. Increasing the numbers of women media content developers is one proposed strategy to achieve increased coverage of issues, which effect women, and decreased stereotype representation of women in media.

Sen (1999) developed the concept of development as freedom. Through empirical research he associates growth of freedom in society with economic, social and political growth. Gender equity policy implementation is also associated with growth of freedom for women

### 1.3 Why Mali?

Mali was the fifth poorest country in the world in 2001. Yet Mali is one of the most stable democracies in West Africa. Mali has fostered and achieved peace in domestic and regional relationships. In 2002, Mali successfully passed executive power from one democratically elected president to another, after ten years of multiparty participatory democracy. Mali has a great history of economic, political and spiritual organization, scholarship and leadership through the African empires of the last millennium (Diop, 1987). Even so, in 2001 Mali ranked 153rd out of 162 countries according to the Human

Development Index (HDI) (UNDP, 2001a). The HDI is composed of indicators for life expectancy at birth, adult literacy, primary, secondary and tertiary gross enrollment ratios and GDP per capita (purchasing power parity US\$). Mali has low literacy rates particularly for women. Yet Mali has increased adult literacy for women from 23% in 1996 to 32.7% in 1999 (UNDP, 2001a, p223). 2001 was the first year that Gender-related Development Index<sup>5</sup>(GDI) rankings were calculated for the UNDP 2001 report. Mali ranked 138<sup>th</sup> out of 146 countries according to GDI. It is important to note however that of the 191 UN member countries, 44 were not GDI ranked at all because of insufficient gender disaggregated data to calculate the GDI. Mali has expanded its regional leadership role during the 1990's in peacekeeping, economic development, and political diplomacy.

Mali is one of the world's unsung heroes of participatory democracy. In March 1991, after months of student and community demonstrations and organizing for a multi-party political system, the military fired shots that left hundreds of unarmed demonstrators dead and wounded. Citizens had remained peaceful in the face of brutal military repression. A relatively bloodless coup d'état followed which brought participatory democracy and an end to the twenty-four year rule of Moussa Traore.

Aissata Cisse lost her 21 year old daughter in the 1991 struggle for participatory democracy and gave this account.

In March 1991, the revolution started with student demonstrations for better conditions. When the army opened fire on the children...the women rebelled and said, 'We won't accept our children be killed'... I found that women had gathered in the center of town. We decide on a peaceful procession as a protest to the killings. We came out with our children to what is now called 'the Martyr's Bridge' in order to go to the city. We arrived at Patrice Lumumba Square. The army began firing. The crowd broke up. Several women were wounded... If women contributed to overthrowing the regime, it is because they have a maternal instinct and

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<sup>5</sup> GDI is composed of the equally distributed life expectancy index, the equally distributed education index and the equally distributed income index (UNDP, 2001a, p253).

they reacted immediately. The children were shot at for hours but as the women came out the men followed them...we never have the same reaction... it's the same in politics...women see the human aspect... they are more sociable than men. (Folly, 1993)

Kadiatou Sow was appointed as governor of Bamako region after the 1991 revolution.

One of the consequences of the women's struggle was the appointment of women to a whole series of appointments. If women want to see change beyond these symbols we need to think of how more women could attain decision making positions. So they must continue to fight for more girls to go to school. Every time there is an economic crisis it is the women and children who bear the consequences. Women here have developed survival strategies. A survey of the outskirts of Bamako found that 55-60% of households are headed by women. (Folly, 1993)

The women of Mali had helped catalyze political change and launched a dynamic transformation process, with an impact on all sectors of society. The work of the Collectif des Femmes du Mali (COFEM), founded in 1991, has continued the fight for women's human rights and women's voice in Malian society and politics.

By 1992, a new President, Alpha Oumar Konore was inaugurated, a new Constitution ratified and a new era began for Mali. Political progress for women characterized the changes in Mali. Universal suffrage had been instituted in 1956 before independence from French Colonial rule. By the late 1990's Mali was one of only 16 countries where women held more than 20% of ministerial positions. Women held 21% of the ministerial level government positions in 1998 (United Nations, 2000) and 33.3 % of total in 1999 (UNDP, 2001a, p239) representing a 57% increase. Policy initiatives in Mali inspired by COFEM have facilitated these positive social and political development trends

Mali represents the paradox of today's world: a rich tapestry of cultures and ancestral traditions struggling for breath and harmony in a cyclotron of technological change. The social, political and cultural integration of technology into society should be determined by the human values within the society. This important factor is often neglected by the economic drivers of technological change. The cultural power and threat of technology

are as real to some nations as the economic benefits of it are real to others. Mali represents both these perspectives in ICT development policy and in gender equity policy for ICT education, participation and access.

Mali's national commitment to the principles of the CEDAW and the Beijing Platform for Action have translated into proactive efforts to achieve gender equality, particularly in primary education but also in ICT training and access. Educational patterns, evident in most cultures including Mali, track men and not women into science and technology (Huyer, 1997). Economic bias is another factor which determines who receives ICT training. The economic issue is a gender issue, because women everywhere are disproportionately represented among the poor. ICT technology is unaffordable for most rural and many urban communities without public, private or NGO subsidies. Men have historically dominated technology diffusion from research and development to industrial and home user applications. ICTs are still primarily text based so education for ICT literacy requires basic literacy skills. Mali provides a good site for examination of diffusion of ICTs into the society, because Mali is in an early but dynamic stage of telecommunications development. An important factor in this study is the rapid reduction in the literacy rate gender gap in Mali and policies, which have contributed to this trend.

Mali was the first country to accept support from the Leland Initiative for ICT development in 1996 (USAID, 1996). The program was named for Congressman Mickey Leland killed in a plane crash while working to build US partnerships with countries in Africa. The US commitment to gender equality is part of this USAID funded program. Mali received a free international Internet link for a year, provided to private sector service providers (Jensen, 1996, p1). Mali's early adoption of Internet technology initiatives and the national commitment to achieve gender equity through the CEDAW treaty and the Beijing platforms were factors in Mali's selection as the research focus for this study.

Mali has demonstrated leadership in human rights through gender equity in building democracy, international diplomacy and innovative ICT applications for social and economic development. The research questions for this study examine the impact of gender equity in ICT development.

#### 1.4 Research Questions and Methodology

The research questions addressed in this study are:

- 1. What changes have occurred in social, economic and political development sectors in Mali from 1990 to 2000 during implementation of gender equity and ICT liberalization policies?*
- 2. How does Malian policy conform to international regime theory?*
- 3. How was the Multipurpose Community Telecentre in Timbuktu used to forward gender equity and ICT liberalization policies and increase ICT access in the rural regions of Mali?*
- 4. What additional, currently unavailable data would be useful for further analysis of MCT impacts?*
- 5. What lessons can be learned from Mali for policy applications in other LDCs?*

This research project explores changes in Malian national development during a period when gender equity policy was applied to ICT access, education and diffusion. It identifies connections that are strongly suggestive and directional with respect to a positive relationship between liberalized gender equity and ICT policies; relates these findings to international regime and gender equity theory and proposes approaches for development strategies for other regional least developed countries.

The research approach to these questions will use policy analysis, ethnographic reports and statistical data as methods of inquiry. This research rests on well-established linkages between ICT's and development and gender equity and development and examines the Malian circumstance of proactive policy for gender equity in ICT development. Malian policy for telecommunications liberalization will be identified and analyzed in the context of ITU and WTO international regime policy influences. Malian

policy for gender equity will be identified and analyzed in the context of UN, UNIFEM and ITU Task Force on Gender Issues<sup>6</sup> (ITU-TFGI) international regime policy influences. Malian compliance with the Universal Declaration of Human Rights (UDHR), the CEDAW treaty and the WTO Basic Telecommunications Agreement are the legal framework for examining the theoretical international regime approach to the interaction of Malian national and international regime policies. The influence of international regimes on the development of Malian policy and implementation programs is part of the complex relationship between national and international factors of change. The research approach to ICT development programs in Mali will focus on a case study of the Multipurpose Community Telecentre (MCT) in Timbuktu, a model of national-international collaboration for ICT development in rural areas.

The data for this research includes qualitative ethnographic research compiled from digital video, direct observation and interviews collected during visits to Mali from 1990 to 2000. It includes statistical data on Mali from documents described in the statistical literature review section of Chapter 2. These resources are used to develop the Mali country study and the case study of the MCT project. The country study includes historical analysis, ICT and gender equity policy analysis, research on gender issues in Malian education, longitudinal statistical data of the UNDP and the ITU, and ethnographic data. The country study will describe Malian policy and define local, regional and international influences on policy development in Mali within the framework of international regime theory. The relationship of communications and ICT access and participation will be examined through technology transfer programs of the Leland Initiative and the MCT. Research on ICT infrastructure and capacity building efforts in Mali will focus on the urban environment of the capital city Bamako and the rural environment of Timbuktu.

The Mali country study uses longitudinal data from the ITU Statistical Yearbook, 1990-1999 and UNDP statistics from the 2001 Human Development Report, and past reports.

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<sup>6</sup> The ITU-TFGI was formed in March, 1998. It has six working groups and prepared the gender equity platform for the 2003 World Summit on the Information Society

Mali's growth has been slow but positive according to the last decade of GDP, literacy and health indicators. Government policies have encouraged education for women and development of communications infrastructure and ICT access. Women contribute close to half the GDP of Mali. Therefore as the role of ICT in economic development expands women's access to and participation with ICTs must also expand. International and national policies demonstrate commitment to equal participation by women and have been implemented in ICT development programs in Mali.

The MCT case study is based on the author's Timbuktu MCT site visit in 1999-2000, the baseline MCT research conducted by George Scharffenberger for Pact Institute, and the 2001 report of the MCT Director, Birama Diallo. The initial project proposal papers obtained from the Minister of Culture for the Timbuktu region, Ali Auld Sidi provide definition of local community objectives for the MCT.

Problems of rural ICT development and the solution strategy the MCT can offer are examined through research conducted at several stages of development of the project. Analysis of policy development for gender equity in ICT access helps to identify obstacles and propose solutions for ICT education and access for women. Cultural, social and economic circumstances were addressed by the MCT partners with the objective of creating an accessible community ICT facility for training and operation. Local women's participation was encouraged with inclusion of women's groups in the MCT planning, reduced training fees for women and youth and provision of women instructors. MCT content development inclusive of local knowledge held by women was encouraged as an application of ICTs.

The MCT case study illustrates international regime theory in national and local application. ITU, UNESCO and IDRC supported the pilot project because of the importance of extending ICT connection to the global network through building infrastructure and local application capacity for rural communities. Mali was chosen as one of five pilot sites in Africa. Political stability and economic cooperation with Structural Adjustment Programs of the World Bank and IMF were contributing factors in

the decision. Mali's social programs initially suffered from the loss of funds redirected under SAPs. For example the nation's HDI improvement rate dropped significantly between 1985 and 1990 reflecting loss of funds for education and health care. However Mali recovered under participatory democracy and social indicators improved. Between 1990 and 1995, the HDI had increased by 3.4% (UNDP, 2001a, p158). Mali's tenacity and perseverance under the hardships of imposed SAPs and political transformation contributed to the selection of Mali as the first pilot implementation site for the African telecentres. The policy analysis of the MCT will examine sustainability factors for ICT development in an environment of gender equity through the MCT model.

Gender equity policy in Mali has historical roots strengthened by the political developments in the 1990's. Women's leadership in Mali was critical to the 1991 restoration of democratic multiparty politics after decades of dictatorial one party rule. The political empowerment of women in Mali through participation in the struggle for democracy has continued to influence Malian gender equity policy formation. Gender disaggregated development indicators on educational, political and technological participation facilitate analysis of changes in women's participation in these sectors in Mali. Research interviews conducted with women leaders in ICT development in Mali include conversations with women from UNESCO, PANOS, COFEM, AFRICARE, IDRC, ITU and the women who manage and teach at the Timbuktu MCT.

Telecommunications policy and gender equity policy in Mali have been formed under historical, cultural, political and international regime influences. This is a common and therefore important equation for policy development, which deserves closer study in developing countries. The country study will discuss these influences and their impact on Mali's internal and international relations. The case study of the MCT provides one example of Mali's policy for gender equity in ICT training during the early stage of national telecommunications liberalization and growth. The local-national-international cooperative structure of the MCT project illustrates these policy relationships for telecommunications and the complex issue of gender equity. Malian policy is country driven and local community driven while working within international regimes.

### 1.5 International Regimes and Epistemic Communities for ICT Development.

International regimes are developing in all sectors of society catalyzed by the transformation in technologies for communicating, interpreting and transmitting information across national and cultural borders. Each regime shares principles, norms, rules and decision-making procedures, which characterize its own purpose and identity. Epistemic communities of the telecommunications regime and the gender equity regime help define policy and its implementation through problem identification and solution strategy development within the work of the regime.

Human society has been both drawn together and driven apart by the swift and unequal expansion of ICTs. In 2000, only 5% of the world's population had access to the Internet (Computer User, 2000). The international regime for telecommunications led by the ITU has acknowledged that ICT diffusion must be accompanied by policies and strategies to address the already exclusionary communications system. The ITU formed the Bureau of Telecommunications Development (ITU-D) in 1989 to address ICT inequities between countries of North and South. The ITU -TFGI was formed in 1998 to address ICT inequities between women and men in telecommunications development, access and capacity .

Third World delegates to a UN Social, Humanitarian and Cultural Committee meeting, October 2000, expressed concerns that globalization is increasing inequalities between women and men. Ramachandra Reddy of India said that:

despite new initiatives and commitments, the sad reality is that the situation of the world's women is progressively deteriorating due to globalization ... societies with the greatest gender equality had grown the fastest, and it must be recognized that gender equality is critical to the development process (Sandrasagra, 2000, p1).

Gender based obstacles to ICT access can impede economic development. As businesses incorporate information technologies into administrative operations and e-commerce, ICT capacity is required as a basic skill for employment. The economies of Sub Saharan Africa (SSA) countries are structured to include equitable participation by women and men. Gender equity is therefore an important factor in economic initiatives for ICT training and work.

The twelve Platforms for Action of the Beijing Conference were initiated to improve women's access to technology, education, political process, economy and social equality. Platform for Action - Section J - Women and Media, calls for women's access to media in content development and in presentation. As more media migrate onto ICT networks of the Internet, women's voice and participation in the Information Society requires access to ICTs. Information infrastructure development efforts all across the African continent must be accompanied by sustained efforts to include women in ICT capacity building and media work, if sustainable participation in the Information Economy<sup>7</sup> is to be achieved. These efforts are essential to the achievement of the Section J initiatives. The International Telecommunications Union (ITU), UNESCO, the ECA and the International Development Research Centre (IDRC) each have policy on gender equity in ICT development programs which influences national policy and development strategy. Through the African Information Society Initiative (AISI) of the UN Economic Commission on Africa (UN-ECA) policies, which facilitate the expansion of ICT infrastructure and access are currently being implemented with commitment to gender equity.

In Mali, most women work in agriculture, which now produces 80% of the GDP. ICT diffusion and employment opportunities are developing in Mali, women's inclusion in ICT education and access has been recognized as important to economic progress. Many economic development programs in the region now include telecommunications and ICT development. SOTELMA, the national telecommunications provider, has moved toward

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<sup>7</sup> Information Economy is a term used to describe the economic sector based on information resources, their distribution and their distribution systems.

privatization and opened ICT markets to competition. As the national economy expands to include ICTs, women's participation is necessary at all levels. Exclusion of women could perpetuate a permanent underclass of agricultural and service workers, who are the wives, mothers, first line educators and health care workers of the entire population. Women are half of society so development of an Information Society in Mali or elsewhere requires full participation of women to be a balanced and fully human society.

The UN Committee on the Status of Women (UNCSW) has articulated the importance of addressing gender inequities in ICT education and access for political and economic development. Nancy Taggart and Chloe O'Gara of the Academy for Educational Development have defined the importance of and obstacles to such strategies for gender equity in ICT access.

As the "digital divide" is fast becoming a household word, the importance of women's access to information technologies (ITs) is emerging as a priority. The Internet economy's ever-increasing demand for skilled workers and innovators holds great potential to positively impact women's well being, if they gain access and relevant skills. Women in developing countries face particularly severe obstacles to access and use. Low literacy and education levels, lack of economic resources, and socio-cultural norms that discourage girls from pursuing nontraditional careers and professions hinder women's participation and leadership in the fast growing IT field (Taggart and O'Gara, 2000).

Economic contributions of women are rooted in local knowledge systems about agriculture, cottage industry and health maintenance. Inclusion of local knowledge in ICT-based knowledge management systems is important in Sub-Saharan Africa. Local knowledge systems have sustained societies and cultures for centuries. It is important, as new knowledge systems enter, that the valuable knowledge environment of past times be preserved. Women are keepers of much of the knowledge base. Though literacy for women in Mali is still low the knowledgebase for women is high in non- literary knowledge. As telecommunications development becomes a factor in economic growth, traditional and ICT literacy for women must be addressed together with local knowledge.

The ICT education of women is an important but challenging objective. Improvement of literacy for women is a prerequisite for improvement of ICT literacy necessary for access.

The English language dominance and text base of most Internet content presents an obstacle even for some literate populations. The educational potential for ICTs is the subject of much research. Some of this research establishes links between new media access and basic literacy enhancement. ICT capacity refers to the ability to operate computer equipment and to establish and utilize Internet links and communication systems. Today, ICT capacity is integral to participation in the development and operation of global economic, social and political systems. Economic participation in the global economy requires not only ICT infrastructure, but also a labor force with ICT capacity. Women are under-employed, under-compensated and under-educated in most countries of Sub-Saharan Africa. Increased ICT education for women in developing economies can improve growth within the Information Economy.

Research has established a strong link between literacy and development as measured by human development indicators. Local and global progress relies on literacy improvement for women, because of the role of women as educators and health care providers within the family. Women provide the information system most closely associated with the health and material well being of the family. All other communities are built around the family, from the local to the global community. The strength and knowledge base of the basic social unit of the family is a key factor in development and is integrally dependent on the woman's knowledge base.

ICT diffusion throughout the developed world has occurred rapidly. In the developing world the pace has been impeded by poor infrastructure for telecommunications and electrical power delivery and reliability problems with existing infrastructure. National policy protective of state owned and operated telecommunication service providers and weak national capacity for ICT application also pose obstacles to ICT development. Economic incentives provided by the market expansion opportunities of e-commerce are driving the rapid diffusion of ICTs. Location independent employment opportunities in the technology sector are another incentive for ICT growth in developing countries. The gap between those benefiting from the Information Economy and those excluded from the benefits is narrowed by ICT infrastructure and capacity development. The reality of

ICT diffusion, implementation, and integration into national systems of governance, education and technological infrastructure is based on complex economic and political issues. The emergence of a global Information Economy has brought about change to the social and economic conditions in most countries of the North. Countries of the South still lag significantly behind in ICT growth and its benefits. Research about ICT innovation, education and diffusion across economic, gender and social barriers contributes to the creation of strategies for narrowing the North/South and other gaps in ICT diffusion. National autonomy and inclusion within global economic, political, social, and cultural policy forums are necessary elements for peaceful relations and harmonious trade among nations. These forums are becoming more reliant on ICT communications. Therefore, national connectedness to the Global Information Infrastructure is becoming a prerequisite for participation and contributes to the democracy of decision-making within representative international forums. Problem solving strategies targeting gender inequities are key to the social integrity, health and economic development of the Information Society.

West African nations produce a wealth of natural resources and products but their share of the world economy is still small because the product processing which adds value occurs in the developed countries. Even oil-producing Nigeria creates more wealth for foreign oil companies than for Nigerians. West Africa is one of the least-connected regions of the world and an important site for ICT research. Women's ICT access is an important part of this research. In countries of the North, historically women are not early adopters of technology due to a set of complex factors. It took almost ten years for the percentage of women online to equal that of men in the US. In West Africa equipment and services are scarce. Senegal and Ghana have included women in the implementation of telecentres. This has fostered ICT growth and progress. Women have access to ICTs in both countries through proactive initiatives. Senegal has over 9000 telecentres<sup>8</sup> including payphone cabins, cybercafe's and full service ICT centres. Women

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<sup>8</sup> "Telecentre" here refers to public access telematics centres providing a range of services from payphones to computers, software and Internet access.

operate the majority of payphone cabin-style telecentres. Ghana has included economic and educational initiatives in telecommunications development.

In Mali, 98% of the Internet activity was concentrated in the capital city of Bamako, though the majority population lives in rural areas (Molla, 2000). National policy for ICT expansion into the rural regions has been implemented since 1997. The Multipurpose Community Telecentre project in Timbuktu was an important demonstration of the value of this policy. ICTs have encouraged rural economic growth, educational development and could potentially reduce urban migration. ICTs facilitate the economic development of Mali's rural population through enhancing traditional economic activities with information access. ICTs also offer local e-commerce and ICT-based employment opportunities. The "brain drain" of bright young minds seeking educational and employment opportunities in the city and abroad threatens rural communities in Mali. The social fabric of rural communities can be better preserved if urban migration is not required in order to obtain education or wage employment. Local civic, civil and private partnerships can develop ICT applications, which provide rural populations with enhanced economic and educational opportunities.

The community telecentre model was developed to address the ICT needs of rural communities. Timbuktu, Mali is an agricultural region located where the northern bend of the River Niger meets the southern edge of the expanding Sahara Desert. The environmental importance of maintaining rural community populations is stressed in a recent Overseas Development Institute (ODI) report. The report documents that in Burkina Faso, Mali's southern neighbor, environmental degradation reversal was achieved through rural population growth and agricultural intensification. Economic advantages of access to agricultural information, e-business and educational opportunities enhance the social and cultural advantage of preserving rural communities. Research has shown that ICT access can contribute to social, political and economic development by facilitating improved participation in communication and information exchange.

International efforts toward gender equity have contributed to the struggle to overcome obstacles to women's participation in the Information Society. The UN and organizations such as the ITU, UNESCO and the UN Economic Commission for Africa (ECA) have been particularly instrumental in moving women's issues forward within culturally diverse societies. The ECA recently published a report on “Africa and the Information Economy (Molla, 2000)”. The report describes a "globally networked information economy and society" and defines the opportunities, challenges and impact offered by the Information Economy to nations of Africa.

More urgent needs for clean water, food, health, education and shelter exist in most African countries. The argument for Information Economy development claims that basic needs for clean water and food do not compete with but rather can be better served with ICT development. ECA's strength as an African regional organization rooted in the United Nations system is shaped through its four main roles:

- Convenor of choice on issues of vital social and economic import to the region;
  - An advocate of an African-driven development agenda based on regional cooperation and economic integration;
  - The hub of a network of public officials, entrepreneurs and experts;
  - A bridge between Africa and the international development community.
- (Ben Barka, 2000)

The World Trade Organization (WTO) is an international organization with significant influence on policy for global economics and global telecommunications development. The WTO Basic Telecommunications Agreement (WTO-BTA) has become the international regime policy on trade in ICT equipment and services. The simultaneous achievement of ICT technology development and gender equity within that development can be influenced by WTO policy. WTO objectives support market economy goals of deregulation, privatization, competition and transparency. These WTO objectives are resisted by nations with government-controlled telecommunications providers. The telecommunications sector is dominated by a small number of Transnational Corporations (TNC's). National providers fear loss of control if markets are opened to competition with telecommunications, computer and media TNC's. Arguments that

challenge WTO policy to include gender equity in its policy recommendations are presented through the forums of the international gender equity regime.

The global expansion of telecommunications infrastructure and the migration of economic, social and political transactions onto the Internet produce problems as well as benefits. The information flow over the Internet remains an important issue for debate as with the old media, during the New World Information and Communication Order (NWICO) initiatives of the 1970's. The control of content transmitted over ICTs is a gender issue as well. The Beijing Section J initiatives included the issue of pornography and content dehumanizing to women. The ECA and the Africa Information Society Initiative (AISII) have identified ICT education, training, research and content development as immediate challenges. The ECA has encouraged African countries to increase information and media content outputs along with ICT expansion. The African Gender Institute (AGI), the Association for Progressive Communications (APC) and other resources produce research that examines gender equity policy in content development for African countries.

The International Telecommunications Union - Bureau of Telecommunications Development (ITU-D) Task Force on Gender Issues initiated and participated in programs to address the need for ICT education without gender bias.

The World Telecommunications Development Conference held in Valletta, Malta in March 1998 adopted a resolution, which addressed issues of gender and telecommunications policy in developing countries. This resolution called for the Development Sector of the ITU, with the leadership of the BDT, to begin a process of integrating a gender perspective in the work of its programmes.

The Task Force on Gender Issues within the BDT serves as the main organ for effecting the mainstreaming of gender issues and in collaboration with the Development Sector aims to ensure that the benefits of telecommunications and the emerging Information Society are made available to all women and men in developing countries on a fair and equitable basis. The ITU-D Sector also acts as an enabling force for the development of an active network between various types of organizations of women involved in the information and telecommunication fields, including NGOs.

The Task Force comprises BDT representatives, Member States, Sector Members, United Nations bodies, other regional/international organizations, non-governmental organizations (NGOs) and individual experts. The Task Force is an open group, welcoming all persons and organizations with relevant expertise to join and participate in its work (ITU-D, 2000) (<http://www.itu.int/ITU-D-Gender/About/Introduction.htm>, accessed 10/21/01).

UNESCO concluded its 160th Executive Board session of 2001, with proposals to reform the organization with activities "where UNESCO can make a difference. ...Providing access to basic education for all...helping bridge the digital divide...protecting and preserving cultural diversity in the face of globalization " (UNESCO, 2000 p1).

UNESCO plans to meet emerging challenges by promoting gender justice and human rights.

The International Development Research Centre (IDRC) is based in Canada but has African offices in Dakar, Senegal, Nairobi, Kenya and Johannesburg, South Africa. The Acacia initiative of IDRC has gathered data disaggregated by gender and conducted research on ICT development in several African countries. The gender and development unit of IDRC prepared a report on "Supporting women's use of information technologies for sustainable development" (Huyer, 1997). Women's education and access to ICTs in Mali has grown during a period when Mali's HDI and other development indicators have improved.

The ITU, UNESCO and the IDRC collaborated to provide part of the support needed for development of the MCT pilot projects the rest was provided by through national and local resources. As ICTs expand within developing countries, inclusion of local culture and knowledge is also an important part of the process. Internationally funded development programs have preferred model projects with predictable outcomes based on scientifically developed formulas over locally developed projects. Local culture and knowledge systems are not easily modeled but local experience with models developed within an external cultural framework can produce unsustainable results. Local knowledge and participation in projects to change social, economic, political and technological processes have demonstrated greater long-term sustainability of

development programs (Chambers, 1994c). Developing countries have knowledge and culture systems to contribute to global systems.

Since its creation in 1995, the World Trade Organization has taken a major role in shaping the global economy. The WTO Basic Telecommunications Agreement set international policy recommendations for the information sector of the economy. E-commerce over the Internet is expected to reach \$US 7 trillion by 2004 (ICT Experts, 2000). Continued global economic expansion requires telecommunications infrastructure expansion into developing countries and markets. This sector includes: goods and services of the ICT hardware and software providers; the installation, networking and maintenance systems and personnel; and information content providers. Infrastructure development and technology transfer require local education and training in order to achieve sustainable operations and maintenance of expanded telecommunications systems. The MCT pilot projects for ICT expansion in Mali have included local social and political structures in the ICT program development in order to ensure local education and training.

The international regimes for trade and development in telecommunications, and for gender equity work to facilitate the coordination of national policies and negotiate international agreements on shared principles, rules and standards to be included in national policies. An advantage of the international regime is that it provides a forum and structure for resolution of differences among nations. A disadvantage of international regime is that power relationships are never equal in the decision-making process. Therefore it is important for individual nations working within the international regime to enter the forum with well-defined national goals and policy to achieve those goals and to build alliances within the international regime. Mali built well-defined national goals early under the 1992 Constitution. Those goals included peace, human rights participatory democracy and ICT development with gender equity for national development. This study will explore Mali's national regime engagement with the international regimes for policy formation and program implementation for ICT and gender equity development.

## 1.6 Chapter Summaries

Chapter 2 reviews literature relevant to this study. The literature is grouped into three categories; 1) information and communication technology (ICT) and development; 2) gender, equity, ICTs and development 3) international development statistics and indicators, which includes data on Mali. The theoretical literature is included in the first two groups. International regime theory and development as freedom theory are applied to the analysis of Mali's national policies for gender equity and telecommunications liberalization

Chapter 3 describes the theoretical framework and methodology for the study. International regime theory as interpreted by Krasner and applied to telecommunications by Cowhey, Cogburn and Gadio frame the analysis of Mali's national policy and international relationships. Development as Freedom (1999) by Amartya Sen describes the association between freedoms within society and measures of development. Sen discusses research which empirically associates growth in freedom with growth in development. The methodology for this research includes a Mali country study and a case study of the Multipurpose Community Telecentre (MCT) in Timbuktu. Limitations and exclusions for this study are detailed in the chapter.

Chapter 4 is the Mali country study. Historical overview of Mali helps construct an understanding of some of the circumstances today in the context of centuries of multicultural communications traditions. Three eras are briefly described with a focus on gender and communications. The pre-colonial period lasted from prehistory to the late 1800's. During this period, Mali was central to the Ghana, Mali and Songhay empires of the middle ages. French colonization of Mali, then called French Sudan, lasted from 1890 to 1960. Mali achieved political independence in 1960, but the road to participatory democracy continued. The 1991 political change transformed Mali's national circumstances and laid a political framework. The dynamic social, political and economic reconstruction period from 1991 to 2000 is the focus for this research. Mali

has a history of regional and international political engagement. Mali's position within the UN, WTO, ITU, African Union (AU)<sup>9</sup> and ECOWAS are described and expand understanding of the interaction between international and national regimes in Mali.

Malian economic has been impacted by the international economic regime. Mali in spent the 1990's in compliance with World Bank and IMF SAPs. The WTO Basic Telecommunications Agreement has influenced Mali to privatize telecommunications and open infrastructure build out and service delivery to competition. The ITU represents an international telecommunications regime that implemented the MCT project in Timbuktu and has influenced ICT policy in Mali. The international gender equity regime through the UN system has also influenced policy in Mali. The Ministry of Basic Education has implemented an aggressive program for women's education with international assistance from the Association of Educational Development (AED), Oxfam and other NGO's. CEDAW (1987), Nairobi Forward Looking Strategies (1985) and Beijing Platform for Action (1995) have all been ratified by Mali.

Chapter 5 is a case study analysis of the Multipurpose Community Telecentre, Timbuktu, Mali. The project is analyzed as one example of Mali's policy commitment to implement ICT development with gender equity. The ITU is a partner in the project and part of the international telecommunications regime, which supports the collaborative design. Timbuktu history and culture set the social, economic and political circumstances in which this ICT development project has been constructed. The MCT model is a pilot for other rural ICT access sites. The MCT research includes baseline communications technology usage research conducted by George Scharffenberger of Pact Institute during 1997 and 1998. The author's on-site research visit to the MCT in Timbuktu gathered interviews, ethnographic reports and 13 hours of digital documentary footage of the MCT and surrounding region in 1999 and 2000. The MCT Director's Report was posted to the ITU website in July, 2000. It is a comprehensive progress report on the first

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<sup>9</sup> The Organization of African Unity/African Economic Community reorganized as the African Union in 2000.

two years of operation. Update information has been gathered from the MCT's own website and numerous research sources for gender and ICT development in Mali.

Chapter 6, the Conclusion, interprets the research findings from the Mali country study and the case study examination of the MCT pilot project. The country study develops an analysis of Malian policy for telecommunications development and for gender equity in the context of international regime policy for liberalization and for gender inclusiveness in development. Development indicator change over the 1990 to 2000 period is presented and analyzed. Gender equity and other human rights are priority issues in Mali's participatory democracy. Mali has coordinated national autonomy with international regimes in policy formation. The MCT project implemented national ICT and gender equity policy. Lessons are drawn from the Malian experience for development policy in other least developed countries, particularly in gender equity and ICT growth. Mali has successfully applied the lessons from the ICT development project in Timbuktu to plans for an ICT infrastructure throughout the rural nation. The progress of policy implementation programs during the period from 1990 to 2000 is interpreted through trends in social, political and economic development for Mali and the surrounding region.

## Chapter 2 LITERATURE REVIEW

### 2.1 Introduction

This chapter examines literature on theory, and prior research relevant to the examination of the ICT policy and gender equity policy in Mali. This research on change in Mali during 1990 to 2000, analyzes a period of dynamic national policy change in social networking, telecommunications, education, politics and economics. The literature relevant to this research is grouped into three subcategories:

- 1) Information and Communication Technology (ICT) and development
- 2) ICTs, gender equity and development
- 3) International development statistics and indicators

Literature on ICTs and development grounds the analysis of telecommunications policy and gender equity policy in Mali. This literature includes previous research on effects of ICTs on economic, political and social development. Historical research on Mali relevant to communications and gender issues helps contextualize present circumstances of those issues. Field research studies conducted by the international stakeholders on the design, operation and evaluation of the MCT pilot projects are included in this literature section. The theoretical framework literature is included in this section: international regime theory (Krasner, 1983, Cowhey, 1990); Development as Freedom perspective (Sen, 1999); The New International Economic Order (NIEO) (Agarwala, 1983); and a critique of the UNCTAD research summary, “Rhetoric and Reality of the New International Economic Order“ (Frank, 1984).

ICTs, gender equity and development includes research that examines the relationship between gender equity in ICT education and access and social, political and economic development. International agreements and treaties that support gender equality are part of this literature. Much of this literature supports the proposition that sustainable development requires inclusion of women in all areas of ICT innovation. Literature from

the Nairobi, Beijing and Beijing+5 World Conferences on Women provide groundwork for development of solution strategies to gender inequalities in ICT diffusion. World Bank literature links rights, resources and voice for women to improved development. It also presents research evidence that gender inequality persists in social, legal and economic institutions and hinders development from the household to the nation. The report suggests a three-part strategy: reform institutions to provide equal gender rights and opportunities; foster gender equity in economic development; and redress persistent gender disparities in resource distribution and political voice (King and Mason, 2001).

International development statistics literature included data sources from the United Nations, UNDP, UNIFEM UNESCO, the World Bank and ITU. Valuable statistics, measures of development and explication of research concepts, measures and composite indices are included in this literature. Research on methods for achieving gender equity and sustainable development in the areas of education, health, economic and technological development are part of this literature section.

## 2.2 Information and Communication Technology (ICT) and Development

The link between communications technology and development has been established through research showing positive relationships between telecommunications infrastructure growth and socioeconomic growth. Bjorn Wellenius of the World Bank describes how "telecommunications constitutes the core of and provides the infrastructure for the information economy as a whole. Telecommunications facilitates market entry, improves customer service, reduces costs and increases productivity" (Wellenius, *et.al.*1993, p1).

Research and analysis of the relationship between ICTs and development is found in literature supported by UNDP, ITU, ECA UNESCO, IDRC, the World Bank, WTO and OECD. These international organizations are part of an international telecommunications regime. Literature on international regime theory and development as freedom

perspective included in this section theoretically ground the analysis of Malian policy within a global policy environment. Commitments to and strategies for achieving gender equity in ICT diffusion of the ITU, UNESCO and IDRC are relevant in particular to the MCT case study research methodology for this study. The Information Society is growing fast but still excludes two-thirds of the world's population. This section includes literature on ICTs and economic development, the Global Knowledge Partnership and knowledge societies. The Multipurpose Community Telecentre for community access to ICTs is the case study subject of Chapter 5. Literature on this pilot project design, international support and evaluation is included. History of West Africa with a focus on gender and communications issues includes the work of Chieck Anta Diop, Ifi Amadiume, and John O. Hunwick.

### 2.2.1 UN ITC Task Force

Kofi Annan, Secretary General of the United Nations, initiated the formation of the UN ICT Task Force to address the growing problem of exclusiveness in the information society. Annan described the purpose of the UN ICT Task Force at its inauguration on November 20, 2001, "to find new, creative and quick-acting means to spread the benefits of the digital revolution and avert the prospect of a two-tiered world Information Society." (<http://www.unicttaskforce.org> , accessed 11/20/01). The task force includes representatives from civic, civil, public, private, scientific and governmental sectors of society. The UN ICT Task Force was commissioned to work for the equalization of access to ICT tools toward development of a more representative Information Society and an "Electronic Spring:"

The world's less advanced countries are at a disadvantage in the high-tech realm, but the electronic revolution may yet prove to be a springboard to development. The new global economy elevates the value of sophisticated information and information technology, while depreciating the return on raw commodities. In the process, many poor countries have become less competitive and more marginalized, and their struggle against poverty an even steeper uphill climb. Nevertheless, many proponents of digital development perceive signs of an electronic Spring. Some developing countries have become global leaders in production of hardware and software. And even in the poorest countries, access to computers and the Internet is growing fast, albeit from an extremely low base (<http://www.unicttaskforce.org> , accessed 11/20/01).

Intergovernmental authorization for the UN ICT Task Force came from the Ministerial Declaration issued by the UN Economic and Social Council (ECOSOC) in July, 2000. The Task Force objectives found further support from the UN Millennium Summit in September 2000 and the ensuing Millennium Declaration of human development goals for 2015. Jose María Figueres, former President of Costa Rica and a leader of digital development in his country, was appointed the Special Representative of the UN Secretary-General on Information and Communications Technologies in November 2000. Mandate Task Force priorities were defined by the ECOSOC 2000 Ministerial Declaration (<http://www.unicttaskforce.org> , accessed 11/20/01).

1. To forge strategic partnerships between the United Nations system, private industry, trusts and foundations, donor governments, programme countries, and other relevant international actors.
2. To pool the experiences of both developed and developing countries in introducing and promoting ICT for development.
3. To develop innovative modalities for strengthening the ICT capacity of the developing countries.
4. To assist Member States in creation of national ICT strategies, policy frameworks, and regulatory environment to ensure connectivity and universal access to ICT.
5. To promote ICT for development applications: building human resources and institutional capacity, including e-health, e-education, e-government, and e-commerce.
6. To mobilise new and additional resources - financial, technical, and human - for promoting and funding ICT-for-development programmes and projects.  
(<http://www.unicttaskforce.org> , accessed 11/20/01).

The Task Force priorities 2 and 3 are underway in Mali, through the Leland Initiative, Volunteers in Technology Assistance (VITA) and the MCT project in Timbuktu. The UN ICT Task Force offers valuable networking opportunities for

linking local and national ICT interests with international private and public resources.

### 2.2.2 Information Society

The Information Age: Economy, Society and Culture, by Castells (2000) examines the Information Society and the forces shaping it; declining statism, an expanding corporate globalized economy and the conflict between self-identity and network. The study provides a comprehensive examination of ICT development in the context of global patterns of social, political, economic and technological change. He describes a theory of ICT diffusion, which helps explain the development of the Information Society. This work describes the rise of the Information Society based on an information economy after the collapse of Soviet statism and international communism and profound restructuring of capitalism.

Volume I: The Rise of the Network Society explores how "our societies are increasingly structured around a bipolar opposition between conflict between the Net and the self" (Castells, 2000, 3). Castells defines the purpose of the intellectual endeavor is "to propose some elements of an exploratory cross-cultural theory of economy and society in the Information Age, as it specifically refers to the emergence of a new social structure " (Castells, 2000, 26). Volume II: The Power of Identity "analyzes the formation of self and the interaction of the Net and the self in the crisis of two central institutions of society, the patriarchal family and the nation-state." (Castells, 2000, 27). Volume III: End of Millennium examines historical transformations of the twentieth century, including changes in women and patriarchy, power relationships and the state.

Knowledge management is an important part of the Information Society. Local knowledge and its inclusion in ICT development programs offer opportunities for local content development and information dissemination in a global environment of knowledge values. Incorporating local knowledge into global knowledge systems can allow for re-evaluation of indigenous knowledge systems and reassessment of their value in the global context. The threat of exploitation of the local by the global is only

counteracted by locally powered autonomous political structures with the support of the regional community. Knowledge Societies: Information Technologies for Sustainable Development (Mansell and Wehn, 1998) explores the meaning of innovative knowledge societies and the benefits, risks and outcomes of ICT strategies. The Global Knowledge Partnership (GKP) is a coalition of civil and civic stakeholders in the knowledge-based economy, society and decision making regime. The GKP maintains an ongoing international dialogue over the Internet on issues relevant to the emerging knowledge society.

### 2.2.3 World Bank

A World Bank report titled EnGendering Development - Through Gender Equality in Rights, Resources and Voice, was released March 8, 2001 to coincide with International Women's Day. The World Bank publication documents research that found countries with smaller gender gaps have less poverty and faster growth. This report provides supportive evidence for the primary theme of this research: ICT development policies will be more effective in achievement of overall development when accompanied by policies for gender equity in ICT education and access.

Countries that promote women's rights and increase their access to resources and schooling have lower poverty, child malnutrition and mortality rates as well as faster economic growth and less corruption than countries that do not... they also have more transparent business and government and faster economic growth - which in turn helps to further narrow the gender gap. Engendering Development is the most extensive study yet of the links between gender and economic progress in developing countries. The report's recommendations reflect extensive research and engagement with women's groups, as well as a comprehensive on-line consultation of the draft, and a discussion of the research findings at last year's UN Special Session of the General Assembly on Gender Equality, Development and Peace for the 21st Century (World Bank Press Release, March 7, 2001).

Cross-country studies compared efforts to narrow the gender gap in education during 1960-1990 between East Asia and the Middle East and North Africa, South Asia, and Sub-Saharan Africa. Results showed that if other regions had matched the East Asian gender gap reduction efforts, the GNP per capita would have grown by 0.5 and 0.9

percentage points higher per year. The report suggests that improving rural women's access to productive resources including education, land, and fertilizer could increase agricultural productivity in Africa by 20% (King & Mason, 2001).

Nicholas Stern, World Bank Chief Economist and Senior Vice President for Development Economics says that the report provides evidence that “education, health, productivity, credit and governance work better when women are involved” and that “increasing gender equality is central to the idea of development as freedom, of expanding the choices and control that people have over their lives” (World Bank Press Release, March 7, 2001).

King and Mason (2001) assert that gender disparities are associated with poverty and gender gaps in health and education are greater in poor countries than in rich countries. Experiences from cross-country analysis and case studies show that improvement in the status of women require both economic development and institutional change. This report used country data collected since 1970. The cross-country figures include indicators for 7 countries in Africa but not Mali. The report says that societies pay a significant price for gender discrimination; greater poverty, slower economic growth, weaker governance, and a lower quality of life. Societies that adopt specific gender equity measures progress more rapidly (King & Mason, 2001).

The report encourages state intervention to promote gender equality. It identified critical roles that the state, civil society and the international community must play to fight gender inequality. Policymaker challenges were identified as: 1) the need for more gender-disaggregated data for gender analysis of all policy; 2) the need to address emerging issues including globalization and the use of ICTs to accelerate progress toward gender equality; 3) the need to broaden partnerships with civil society groups, donors and the international community (King & Mason, 2001, p271-273).

Much literature exists, which criticizes the World Bank and the IMF for their SAP and debt policies with LDCs. Hancock (1989) criticizes the aid system in Lords of Poverty.

He asserts that after fifty years of development assistance if “the only measurable impact of all these decades of development has been to turn tenacious survivors into helpless dependents, then... aid does not work”(p190). He also explains that the two African aid success cases measured only in economic growth rate, Cote d’Ivoire and Malawi suffer from huge debt, high infant mortality rate and low female literacy. He suggests to cut out the”lords of poverty...the middlemen of the aid industry” (p193) and allow “people to rediscover ways to help one another directly...guided by their own agendas” (p193). The book is heavy with examples of aid abuses and travesties but light on suggestions for how to make the transition from aid to self-determined “needs and aspirations” facilitated by rediscovered “ways to help” (p193). Since 1999, calls for debt forgiveness and relief are moving in this direction.

#### 2.2.4 Acacia and Global Connections

Acacia is the IDRC program for ICT capacity development in Africa. Heather Hudson was coordinator for Evaluation and Learning Systems, for the IDRC Acacia initiative. She was responsible for telecentre evaluation and analysis throughout Africa, including the Multipurpose Community Telecentre pilot projects, during 2000. Dr. Hudson's paper, "Designing Research for Telecentre Evaluation" was part of an IDRC Conference on Telecentre Evaluation and Learning Systems in September, 1999. George Scharfenberger’s “Telecentre Evaluation Methods and Instruments: What works and why?” from that conference is also important research literature on telecentres. In 1998, he conducted the baseline study of communications technology usage in Timbuktu, Mali prior to the beginning of Multipurpose Community Telecentre operations there. He also wrote the paper “Pilot testing of a methodology for baseline data collection and for the development of learning systems” based on the Timbuktu Multipurpose Community Telecentre research he conducted for Pact Institute.

Heather Hudson’s book, Global Connections: International Telecommunications Infrastructure and Policy (1997) sets the context of the "telecommunications revolution" and provides comparative analysis of the telecommunications sectors in the "industrialized" and "developing" countries. The concluding section examines

international regime stakeholders and policies including those of the ITU, the International Standards Organization (ISO) and satellite and cable networks. The last three chapters of the book address the promises and paradoxes of international telecommunications development including gaps in knowledge, resources, access and control. She outlines the bridging process necessary to build the Information Society as a telecommunications global village.

#### 2.2.5 Human Development Report 2001

The Human Development Report has been published each year since 1990 by the UNDP. It defines the direction of the UNDP organization and provides a resource for others working in international development. The Human Development Report 2001, Making Technologies Work for Human Development (2001a), addresses the theme of technology for development. The report sets a framework for the application of technology in pursuit of core development goals such as food security, better health and access to knowledge. Particular emphasis has been placed on Internet connectivity and access for all, building human capacity through technical education and training, enhancing healthcare and quality of life, e-governance, e-competitiveness, e-entrepreneurship, and local content creation (UNDP, 2001a). The UNDP also runs the Sustainable Development Networking Programme, which currently operates in 45 countries in all regions and is piloting telecentres, e-commerce for development, and e-governance initiatives (UNDP, 2001a, <http://www.sdn.undp.org>, accessed 10/27/01).

The UNDP created a composite data indicator called the Technology Achievement Index (TAI) introduced in the HDR 2001. The TAI includes four dimensions of technology capacity. Creation of technology is composed of indicators for number of patents and receipts from royalties and license fees. Diffusion of recent innovations includes indicators for Internet diffusion and share of exports that are high or medium technology. Diffusion of old innovation includes indicators for telephones and electricity. Human skills includes indicators for mean years of schooling and gross enrollment ratio of students enrolled in tertiary science, mathematics and engineering. The TAI provides an

important dimension to national progress and development assessment (UNDP, 2001a, <http://www.sdn.org>, accessed 10/27/01).

The UNDP HDR 2001 has been critiqued for emphasis on the benefits of new technology applications without ample consideration of the benefits of social decision-making processes, which determine technology applications. The report has a chapter on technology risks but gives insufficient attention to solving the social, environmental and resource distribution problems, which can accompany technological change. Wakhungu (2002b) examined the HDR 2001 in “Reflections on the Human Development Report 2001: The Good the Bad and the Ugly”. She acknowledges the value of national assessment of technological innovation and education through the TAI. She concurred with the need to weigh market pressures, to manage technological risks and to ensure fair global rules as stated in the report. Her critique focused on the failure of the report to address the global economy, which impedes poor nations from choosing how to adapt technologies to their national and cultural needs. She says the report also fails to examine why ecologically rich nations of the South remain poor. She questions some of the reports assumptions; that new technologies are better than the ones they replace; that biotechnology will solve problems so other agricultural practices are expendable; that indigenous alternative innovations of the South are insignificant. Contrasting the reports findings, she suggests that technology should be adjusted to meet society’s needs rather than the reverse. She listed the essential components of development as equity, sustainability, productivity, empowerment and freedom (Wakhungu, 2002b). This equation for development is also reflected in the theoretical work of others discussed later.

#### 2.2.6 International Regime Theory

International regime theory developed as scholars searched for “new ways to organize intellectually and understand international activity...in an increasingly complex, interdependent and dangerous world” (Puchala & Hopkins, 1983, p61). National and international regimes develop in part, because of the human tendency to organize. The concept of regime used here is defined by Krasner as:

sets of implicit or explicit principles, norms, rules and decision making procedures around which actors' expectations converge in a given area of international relations. Principles are beliefs of fact, causation and rectitude. Norms are standards of behavior defined in terms of rights and obligations. Rules are specific prescriptions of proscriptions for action. Decision making procedures are prevailing practices for making and implementing collective choice (Krasner, 1983, p2).

Regimes are distinguished from agreements. Regimes facilitate agreements and “the utility function of what is being maximized must embody some sense of general obligation” (Krasner, 1983, p3). International regime theory developed explanatory value in the international relations area of political science. Cowhey (1990) has applied it to the development of telecommunications policy in the context of the complex and interdependent global information infrastructure with its high capital production potential.

Cowhey illustrates a primary difference between the application of international regime theory to governing political bodies and to governing trade bodies. Political regimes now refer to an international majority norm of participatory democracy as the optimum structure for political institutions. Trade regimes such as the WTO and the many regional economic communities have free market capitalism as the optimum structure for economic institutions. The decision making process has not been a participatory democracy. The weight of economic power in the international trade regime created an imbalanced decision making process unlike the political regime of the United Nations General Assembly, one country one vote.

“The International Telecommunications Regime: The Political Roots of Regimes for High Technology” by Cowhey (1990) applied the theory of international regimes, from the international relations area of political science, to telecommunications policy development and decision-making. “Regime theory holds that even under anarchy, states have an incentive to look for solutions to collective action problems” (p170). Cowhey presents an historical analysis of the role of multilateral agreements negotiated primarily by the ITU in the development of the international market for voice, visual and data communications (p169).

Cowhey (1990) describes the three approaches to regime analysis. The functionalist approach asserts that regimes are “designed to reduce transaction costs and are shaped by strategic gaming dynamics” (p170). The international power approach considers that regimes “are a result of the influence of hegemonic power” (p170). The cognitive framework approach emphasizes regimes’ influence on “how actors define problems and their solutions” (p171). Cowhey uses each of the three in a synthesis approach.

Further, he argues that epistemic communities are “united in rejecting some alternative vision of the world,” gathered for “the exchange of information” each carrying “intellectual baggage” and aligned with politicians who “invite them into the inner circles of power”. Each epistemic community “has its own social organization and methods to reduce internal coordination problems” (p173).

Cogburn (2001) presented “Governing Global Information and Communications Policy: Emergent Regime Formation and the Impact on Africa” at TPRC, October 28, 2001 in Alexandria, Virginia. Cogburn also applies international regime theory to telecommunications policy development in the South African case. He has been actively involved in policy reform in South Africa and presents a detailed story of the process of change in the context of national and international factors and stakeholders.

Cogburn and Fodd (1996) edited Information and Communications for Development : Nationalism, Regionalism, and Globalism in Building the Global Information Society. This work reported on the GIIC Global Information Society and Development Forum held in Midrand, South Africa, May 14, 1996. The Center for Strategic and International Studies published the report.

Gadio (1995) wrote a policy analysis, Institutional reform of telecommunications in Senegal, Mali and Ghana: The interplay of structural adjustment and international policy diffusion. He examined telecommunications policy developments during structural adjustment programs (SAPs). The World Bank and IMF influenced the economic policy of developing countries to implement SAPs as a prerequisite to loans and aid funds.

Gadio's research profiles and compares telecommunication policies for Ghana, Mali and Senegal. The policies of these three countries are analyzed in the context of structural adjustment program implementation.

Hamelink (2001) wrote about the increasing role of international regimes in guiding national ICT policy:

Whether the potential to support social development will be realized depends much more on the institutional environment of the technology than on its technical features per se. Therefore analysis of the relation between ICTs and social development has to give ample attention to their policy context...it is increasingly the international policy context that takes precedence over all others, influencing even the effectiveness of action at the local level. If, for example, local communities want to retain an autonomous space for cultural policy making, their strategies must extend beyond local boundaries, since their chances of success will be affected by such global policies as WTO decisions on trade in services or on intellectual property rights (Hamelink, 2001, p1).

He stressed the importance of global institutions' decisions to foster or to hamper social development applications of ICTs:

If the potential of new information and communications technologies to promote social development is to be realized, there must be forms of governance that promote the widest possible accessibility to ICT infrastructures and services, the greatest possible diversity of information and knowledge sources, and the democratic nature of global ICT-policy making (Hamelink, 2001, p11).

Hamelink suggests that application of the criteria of good governance is equally important for international and national regimes. Openness to the control and participation of public interest institutions is necessary. Civic organizations that represent public interest issues must be strong and innovative, and facilitate well-designed programs for ICT education.

The debt crisis and international demands for debt restructuring and debt forgiveness focused attention on the World Bank and IMF policies. The One World Foundation has established an Internet gateway with research on the world debt and specific country profiles, statistics and longitudinal comparisons of spending for debt service, health and

education. One World and Benton Foundations have established the website resource for global ICT access research, <http://www.digitalopportunity.org>. The World Bank has also established a gateway, Global Knowledge for Development, as part of the Global Knowledge Partnership.

John Rose heads the Information and Informatics Division of UNESCO from the Paris Headquarters. UNESCO was part of the epistemic community and the international telecommunications regime, which developed the collaborative MCT pilot projects in Africa for rural community ICT access. His research facilitated UNESCO's part in the introduction of information and network technologies for social development in the developing world.

Johan Ernberg of the ITU presented "Universal Access for Rural Development from Action to Strategies" as part of the proceedings from the First International Conference on Telecommunications held in Washington, D.C. in 1998. The conference focused on telecommunications' role in development and established important arguments for ICT diffusion into underserved nations and communities. The business case for ICT diffusion through MCT's in the developing world is made in the Ernberg (1997a) presentation to the ITU-BDT Conference. Ernberg (1997b) also developed a report in support of the African Information Society Initiative/HITD Internet Connectivity Sub-Programme Framework presented to the ITU and UNESCO.

Anriette Eisenhuyer of Association for Progressive Communications (APC), and Mike Jensen have collaborated on telecentre best practices and analysis of telecentre development, operations and sustainability. Eisenhuyer and Jenson (2001) wrote the Telecentre Cookbook. The book includes case experiences from telecentres all over the world. It contains modular units on best practices for all aspects of the telecentre operations from the case study experiences examined.

The ITU, UNESCO and IDRC of Canada have developed the MCT model for telecommunications development and supporting research. The research literature

includes underlying theory model design and evaluation system. This model implements ICT equipment, networking and training in operations, applications, and maintenance. Progress reports and training manuals are available literature but only the MCT reports were used in this study. The MCT is a community access ICT facility, a collaborative effort between local communities and international organizations to develop sustainable and accessible ICT service delivery. These organizations have implemented gender equity strategies for the MCT. UNESCO, ITU, and the IDRC are working with local hospitals and educational institutions as well as national telecommunications companies in Benin, Mali, Uganda, Tanzania, Mozambique and South Africa to establish sustainable MCT's. Pilot projects for this model are also being developed in other developing regions outside Africa. The literature developed through these projects is meant to be shared among those working on other similar projects for ICT development. Much of it provides very practical assistance information.

Education and ICT capacity building are part of the task of the international telecommunications regime and the epistemic community, which informs it. Education is essential to ICT access and empowerment. The World Bank project, African Virtual University (AVU) has been offering distance education courses which link knowledge systems of the North with the nations of Africa via satellite and other ICT networks. This initiative concentrates on courses in business and ICT systems. World Bank AVU reports are an important part of the ICT education literature. Cisco Networking Academy Program (CNAP) is an extensive ICT training program. CNAP and AVU form university liaisons and establish curriculum. Cisco has identified

"IT training features that exclude women":

Findings from Cisco's training program suggest that where IT training is held influences women's participation. In emerging market countries, for example, Cisco's training program is often offered at technical colleges whose courses of study focus on science and technology or at universities within engineering departments. Cisco Academy instructors from these institutions note that fewer women attend because the institutions are known as technical schools and socio-cultural norms make women less likely to study science and technology fields (Taggart and O'Gara, 2000).

In June 2000, the G8 nations met in Okinawa, recognized the problem of economic obstacles to participation of developing countries in the Information Society and economy and formed the Digital Opportunities Task Force or “Dotforce.” The Dotforce initiative includes business and NGO representatives. United States representatives include Hewlett Packard and the Markle Foundation. The yearlong effort produced a final report “Digital Opportunities for all: Meeting the challenge” which includes a proposal for a Genoa Plan of Action. The report and plan was accepted at the Genoa G8 meeting in 2001. The Genoa Plan of Action calls for nine action points:

- Help establish and support developing country & emerging economy national e-strategies
- Improve connectivity, increase access and lower costs
- Enhance human capacity development, knowledge creation and sharing
- Foster enterprise and entrepreneurship for sustainable economic development
- Establish and support universal participation in addressing new international policy and technical issues raised by the Internet and ICT
- Establish and support dedicated initiatives for the ICT inclusion of the Least Developed Countries
- Promote ICT for health care and in support against HIV/AIDS and other infectious and communicable diseases
- National and international efforts to support local content and application creation
- Prioritize ICT in G8 and other development assistance policies and programmes and enhance coordination of multilateral initiatives

Material from the Dotforce listserv, hosted by the Vancouver Community Network, provides valuable resource material. The material describes convergent efforts of the IMF, World Bank, Transnational corporations (TNCs), NGOs and civil society, toward building more equitable participation in the Information Society by nations of the North and South.

Educational institutions in the US are providing cooperative education programs in the developing world to share the knowledge and technology. The University of Pennsylvania has instituted an ICT training and development project including students from engineering, computer science, geography and other disciplines.

Members of the project collect, deliver and install computer networking equipment and train Malian students in operations. One motivation of the project is to familiarize US students preparing for ICT fields, with the ICT needs in least developed countries (LDCs). The team traveled to Bamako, Mali in Summer, 2000 and 2001. The project was described in a Philadelphia Enquirer article after the first training trip. The University of Pennsylvania conducts similar training programs in its own community of Philadelphia. This model of education and service in ICT diffusion represents an important partnership of educational institutions, business and developing communities to mutually achieve a more participatory Information Society.

The work of the United Nations Information Technology Services (UNITEs) includes recent research and literature developed for facilitation of ICT growth. Research of UNITEs has verified that differences in ICT growth between countries of the North and of the South are often extreme and facilitates cooperation and collaborations across those differences.

Economic and technological development programs in Mali and the rest of West Africa are incorporating ICTs into infrastructure development plans. Institutional reform of telecommunications in Mali supported by the WTO, ITU and World Bank policies has included the creation of SOTELMA in 1989 and the separation of postal and telecommunications operations in 1990. Mali's agriculture-based economy is not yet benefiting from the Information Economy. National telecommunications policy has been building for future participation in the global information economy. The first stage of liberalization included the creation of SOTELMA as the private but 100% state owned solitary telecommunications provider. The Malian policy for gender equity in education and access to ICTs encouraged women's participation in ICT initiatives to serve national economic and social development goals. The wives, mothers, first line educators and health care workers of the entire population are integrally linked to the success or failure of any national ICT initiative.

### 2.2.7 ICTs, Development and Economics

The New World Economic Order by Agarwala (1983) presents the findings and conclusions of the sixteen-volume New International Economic Order (NIEO) library. The research and publication was done for the United Nations Institute for Training and Research (UNITAR) and the Center for Economic and Social Studies of the Third World (CEESTEM). The study examines and provides analysis of the development of the present international economy. The New World Economic Order (Agarwala, 1983) describes the struggles of the least developed countries for participation in the world economic regime and the resultant call for change. The rules on which it operates benefit some more than others, prompting the inquiry into a new world economic order. Agarwala presents suggested approaches from the various stakeholders. Transforming the World Economy (Addo, 1984) includes nine critical essays on the NIEO. One essay by Frank (1984) claims that the NIEO is dependent on and is indeed “the institutionalization of the expansion of world trade” (p199).

Development as Freedom by Sen (1999) reconceptualizes development as public policy to foster human capacities and substantive freedoms through the promotion of five distinct but interrelated instrumental freedoms: 1) political freedoms 2) economic facilities 3) social opportunities 4) transparency guarantees and 5) protective security. These distinct rights and opportunities help advance the capability of a person. In the “development as freedom” view the “instrumental freedoms link with each other” and with the “enhancement of human freedom in general” (p10). Freedoms are the primary ends of development and among the principle means. Sen presents the empirical connection that links freedoms such that they strengthen and facilitate each other. For example, social opportunities in education and health facilitate economic participation. Sen’s “freedom-centered understanding of economics and of the process of development” recognizes the “positive role of free and sustainable agency” (pp10-11).

Women’s agency in social change is integral to development (Sen, 1999). Through social movements, women have evolved from passive recipients of the necessities of well-being; water, food, health care to “active agents of change” and “dynamic promoters

of social transformations that can alter the lives of both men and women” (p189). Sen’s description of women’s agency in the development process applies directly to Mali. Since 1991, women took an active role in the movement, which led to political change.

E-commerce is expanding the economic development potential that ICTs offer through extended market reach. ICTs minimize geographic barriers to trade. This is important to lesser-developed economies with less developed transportation and communications infrastructure. Most e-commerce growth is limited to the developed nations. The distribution of e-commerce revenues from the Information Economy was 98% for the 29 Organization for Economic Co-operation and Development (OECD) nations and 2% for all other nations (ECA, 2000). Gender, race and economic status affect ICT education and access. Most countries in Africa have developing economies. Sub-Saharan African nations, excluding South Africa, have some of the lowest teledensities and lowest number of ISP providers in the world. National policies are required to confront and overcome culturally based gender barriers, particularly in science and technology (Huyer, 1998). International regime oversight of gender equity initiative in ICT diffusion can provide incentive for change but indigenous incentives to change culturally based obstacles to ICT access for women must be developed for effective, sustainable change.

### 2.2.8 Mali History

Pre-colonial recorded history of Mali throughout the last two millennia include accounts from Leo Africanus [al-Hassan b. al-Wazzan al-Zayatti] (1550), Abu al-Bakri (1067/1857), Ibn Battuta (1352-1353), and al-Sadi’s (1596-1656) *Ta rikh al-sudan* (1612-1613) translated by Octave Houdas (1964). Diop (1987, 1989) and Hunwick (1999) have examined, translated and interpreted these older accounts of cities, kingdoms and regional empires in Mali that became international centers of communication and trade. These accounts document the military, political and religious struggles in this region.

Hunwick (1999) created an English translation of French scholar Octave Houdas’ (1964) edited translation of al Sadi’s *Tarikh al–sudan* in his *Timbuktu and the Songhay Empire*.

Al Sadi wrote in 1613, about the city, which is now the site of Mali's first MCT. His accounts describe a society of prolific written and oral dialogue on scholarly, spiritual and political subjects. At the time of Al Sadi's text, the economy of Mali was still one of the strongest in the West African region, mainly because of the strength of the trade route through Timbuktu.

Senegalese scholar Cheick Anta Diop spent a life of research producing an "African historical sociology" of West Africa. In 1960 he described his project:

(N)o researcher has ever succeeded in revivifying the African past, in bringing it back to life in our minds, before our very eyes, so to speak, while remaining strictly within the realm of science. Yet the documents at our disposal allow us to do that practically without any break in continuity for a period of two thousand years...to defossilize that African history which was there at hand, lifeless, imprisoned in the documents...It permits us no longer to be surprised at the stagnation or rather the relatively stable equilibrium of precolonial African societies: the analysis of their socio-political structures presented in it allowing us to gauge the stabilizing factors in African society. One thereby understands the technical and other lags to be the result of a different kind of development based upon absolutely objective fundamental causes (Diop, 1960, 1987, pp. xi-xii).

Diop uses the theory of "a different kind of development" in Africa and contrasts it with European and American based development models. From the Eurocentric perspective these models are seen as empirically determined, universally applicable and culturally transparent. Diop's work illustrates that this perspective must be understood for its own cultural bias.

Diop (1987) describes Africa as governed by principles of political organization from the first to the nineteenth century. Constitutional monarchy existed in non-Islamicized kingdoms of Mossi and Cayor and in Islamicized Ghana, Mali and Songhai empires. Under the Mossi Constitution, the emperor comes by heredity, but must be "chosen by an electoral college of four dignitaries, presided over by the Prime Minister" (p44):

The Prime Minister invests power to the emperor... comes from an ordinary family...the representative of the people, of all the free men, all the citizens who constitute the Mossi Nation (Diop, 1987, p44).

Mossi and Cayorian constitutions reflect a political organization, which must have been in effect since Ghana and therefore probably dominated the African states for two thousand years (Diop, 1987, p47).

This model of political structure included a matrilineal determined noble emperor and a council of ministers composed of nobles, tradesmen and ordinary people. The role of political leader carried the responsibility for using the tangible powers to negotiate the intangible for the benefit of the subject/citizens. The cultural distinctions of groups coexisted with detribalized multicultural centralized political and social structures.

The best organized and most dynamic elements of society were detribalized... There were entire merchant classes in the empire of Ghana and Songhai...in the international centers of Timbuktu and Djenne (Diop, 1987, p132).

Different cultural groups became specialized in various types of work within the greater social structure of the empire. Trades and work role specialization within cultures also developed and were passed on to new generations. Mali has a long tradition of agriculture-based economy, where women contribute equally to the agricultural work force. Gender roles in Mali grow out of cultural and political traditions, struggling to meet the demands of the global Information Society.

### 2.3 Gender Equity, ICTs and Development

This section includes literature that examines the intersection of women's human rights and ICT development. The Universal Declaration on Human Rights (UDHR)(1947) affirms in Article 19, the right "to seek, receive and impart information and ideas through any media and regardless of frontiers." This right is not yet realized by much of the world's population, particularly by women. The Beijing Conference Platforms for Action (1995) affirm the principles of the UDHR, the international treaty Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) (1987) and the Nairobi Forward-looking Strategies for the Advancement of Women (1985). These documents are important international agreements to further human rights including gender equity in all sectors of society. International and national gender equity policies

promote women's use of ICTs and support the UDHR articles and other international human rights agreements. The international regime for gender equity includes the organizations that developed the documents listed above.

Beijing and Beijing+5- Platforms for Action (PFA) cover critical areas of concern for women and development. The Four World Conferences on Women have produced and inspired literature important to policy development for gender equity. PFA Section B- Women and Education defined the problem of inequalities and inadequacies in, and unequal access to, education and training. In Mali this problem has been addressed by policy developments in Mali's national machinery through its Ministry of Education. PFA Section J, Women and Media defined the problems of stereotyping of women and inequality in women's access to and participation in all communication systems. Mali reported progress on these two initiatives to the UN General Assembly Special Session (UNGASS) in June 2000.

UN Committee on the Status of Women (CSW), the Economic Commission on Africa – African Information Society Initiative (ECA-AISI) and UNESCO have produced research on ICTs and gender relevant to this study. The World Bank Report, Engendering Development (2001), included in the ICTs and development section, makes important links between gender equity and socioeconomic development. Development of social and technological networks of and for women is an important ICT networking issue impacting gender equity and ICT diffusion. Networks have become an important part of information exchange and education for women and men across borders in all areas of development. Some ICT networks whose communications are included in this research are: Womenwatch; African Information Society Gender Working Group (AIS-GWG); Gender and Information Networking (GAIN); African Gender Institute-University of Capetown; Association for Progressive Communication (APC) research; Environment, Development, Action –Synergie, Genre et Developpement (Synergie Gender and Development (ENDA-SYNFEV) and the ITU -TFGI.

Rathbeber and Adera (2000) edited Gender and the Information Revolution in Africa. is central literature for this research. The chapter by Marcelle, "Getting Gender into African ICT Policy: A Strategis View" recommends strategies to include a gender perspective in African ICT policy. Malian telecommunications and gender equity policy analysis, part of the methodology for the chapter 5 country study, refers to these suggested strategies. Marcelle recommends that African governments take five key steps:

1. Define and specify measurable goals and objectives for the ICT sector and applications. Goals should include poverty alleviation, health care, food security, environmental security, technological advance, and human resource development. Beneficiaries should include girls and women.
2. Create the necessary institutional structure to develop and steer a vision of ICTs and development and to achieve the set goals.
3. Secure advice and strengthen technical expertise in ICT related fields.
4. Develop consultative mechanisms to ensure that the process of policy formulation, implementation and review involves all key actors.
5. Develop improved capacities to review policy objectives, monitor and evaluate programs and respond to changes in the technological and socioeconomic environment.  
(Marcelle, 2000, pp 62-65)

Marcelle, Karelse & Goddard (2000) and the African Information Society Gender Working Group (AIS-GWG) researched and developed a text, "Engendering ICT policy: Guidelines for action." It included information and practical skills for achievement of gender justice in the policy formation process aimed at increasing women's participation in the ICT arena. The text was prepared for the Beijing+5 UN panel session "Dialogue on equity in the African Information Society" sponsored by AISGWG, chaired by Marcelle and held on June 7, 2000.

The Beijing +5 UN General Assembly Special Session (UNGASS) held in June 2000, reported and evaluated progress, respectively, on the 12 Platforms for Action toward achieving greater equality for women. Platform for Action - Section J - Women and Media, in the context of the original 1995 objectives and the 2000 initiatives, is now

focused on policy development for ICT education, access, and economic opportunities for women. Women's networks exponentially enhance the effects of sharing knowledge. The Beijing Platform for Action and Beijing+5- Section J – Women and Media include an ICT gender equity initiative. The fourth UN World Conference on Women held in Beijing in 1995 had been the first time many women had used computers and the Internet to communicate. Social networks and ICT networks were continuously active in dedicated rooms for ICT access during Beijing +5. ICT knowledge diffusion for thousands of women leaders from all over the globe was evident in the computer-filled rooms with women filing reports and communicating conference proceedings over the Internet.

UNIFEM organized UN panel sessions for Beijing+5, including "New Information and Communication Technologies: Building Partnerships for Women's Education and Training". UNIFEM, UNDP and Cisco Systems, Inc. jointly organized this panel, which discussed strategies for achieving ICT education and access for women. One of the panelist was Malian Lalla Ben Barka, Associate Executive Secretary for the Economic Commission on Africa (ECA). She has worked closely with the gender initiative of the African Information Society Initiative (AISA) of the ECA. Ms. Ben Barka spoke of the ECA's commitment to promote gender equality in development at the Global Knowledge Partnership Action Summit:

(T)he principle we share is that through building knowledge societies, individuals, communities and nations can reach their full potential. We believe that the most successful route to building knowledge societies is through partnership, through the sharing of information and resources to multiply the effects of individual actions and intentions...

It goes without saying that the inclusion of women is central to the concept of access. When we talk about empowerment through knowledge and using information and communication technologies to reach those typically bypassed, it is clear that concerns for women are the basic building blocks of a strategy. A knowledge society where knowledge is accessible to all will do much to ensure the participation of women in society and thus the improvement of governance (Ben Barka, 2000).

Another UNIFEM organized panel at Beijing +5 addressed "The Impact of Microcredit on the Worlds Poorest Women." Microcredit programs have been applied to efforts to achieve ICT and economic development simultaneously for women. The Grameen

Telecom, Village Pay Phone Project in Bangladesh gives microcredit to women to finance cell phones as a microenterprise, which generates income and provides phone service to rural villages. Grameen Telecom is a subsidiary of the Grameen Bank of Bangladesh, created by Muhammad Yunis. The microcredit project has grown into an international empowerment program primarily serving poor women. The literature about this project provides a profile of one of the most effective strategies yet for addressing feminized world poverty and social isolation with economic development and communication networking. Microcredit support for entrepreneurial efforts can facilitate expansion of ICTs into rural and under served areas in SSA, as it has in Bangladesh, India, South Africa, the US and many other developing regions. The Grameen model in Bangladesh is a good example of how empowering women with ICTs has brought about positive social, economic and political change along with infrastructure development. Microcredit programs have now been implemented by USAID, AFRICARE and other NGO's for women's development in Mali, including Timbuktu.

Demanding Dignity: Women Confronting Economic Reforms in Africa is a recent publication of the North South Institute. This publication documents the Phase I Achievements and projects of the Gender and Economic Reforms in Africa (GERA) Program. It highlights 13 projects carried out in 10 African countries, as well as the GERA approach to gender equality and economic justice. Mali was included in the study. In 1995, the CFA<sup>10</sup> was devalued as part of the Structural Adjustment Program. The effects on women of the 1995 devaluation in Mali, Togo and Burkina Faso showed the following results:

By studying the role gender plays in land ownership, access to capital, and paid and unpaid labour, a rather startling conclusion emerges: the devaluation of the CFA franc is not the major determinant of poverty. Instead, control over productive resources is of greater importance and is, in turn, determined primarily by gender. By ignoring the socially determined constraints that prevent women from benefiting from economic reforms, the goals of long-term growth and poverty eradication are jeopardized, and gender inequality is reinforced. These projects make two major recommendations for improving gender equality and the well-being of farmers: Educate and influence policymakers to design gender-

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<sup>10</sup> "CFA" is the French franc-based currency of francophone West Africa, including Mali.

aware economic and agricultural policies. Rural women themselves need to get organized. Backed by better analysis of the costs and benefits of the reforms, women in the GERA projects are able to advocate for change, to engage on a new level with state officials, and to create educational and public relations materials for print, radio, and TV. Women in Mali, Togo, and across Africa are entering the debate better prepared, but the task—convincing parliamentarians that gender must become a central component of policymaking—is not easy and depends upon national and international support to the groups (North-South Institute, 2001).

The recommended increase in women's education and participation in policymaking is further evidence of the need for inclusion of women in programs for ICT education and access.

The African Gender Institute (AGI) in South Africa gathers research by African women about African women on achieving gender equity, particularly in ICT development. The ECA-AISI has developed programs for gender-inclusive ICT development in the interest of building knowledge societies throughout Africa. Gender and Information Network (GAIN) is based at the University of Capetown as is AGI. GAIN has facilitated a listserv since Beijing +5 particularly focused on ICT empowerment for women in Africa. The communications on the list have been an important literature resource for assessing the strategies for addressing gender related problems with ICT access and capacity building worldwide.

Diop (1987) and Amadiume (1997) have researched history on the status of women in the economy, political life, culture and society in Mali. Diop describes the matriarchal structure of succession and inheritance. He refers to the social moral code rooted in the mother-centered family structure common within African cultures. Amadiume has researched the social history of gender roles in African societies. She critiques research focused on the centralized power structures of kingdoms and empires in societies and proposes sociopolitical analysis based on the distribution and sharing of power in small, decentralized social structures of villages. She uses ethnographic research of village life to examine gendered power relationships in local society and gendered spiritual concepts in traditional African religions.

Amadiume examines historical roles of women in all aspects of African culture. She authored Reinventing Africa: Matriarchy, Religion and Culture (1997) and Male Daughters Female Husbands (1987). She re-examines Diop's concepts of African matriarchy and explores gender in African culture. Her examples refer often to life for the Nnobi of the Igbo region, Nigeria where she has conducted in-depth social research. In her work, she traces the evolution of women's political roles through pre-colonial matriarchy and colonial and neo-colonial patriarchy. Amadiume illustrates how women's organizations have been central to social, religious and political life in many African cultures over time.

Diop's historical accounts detail military and political leadership structures with very little description of the family and village life where the roles of women are more evident in the sociopolitical structure. Amadiume (1997) describes Diop's "view of centralized political systems as the ideal type of system and their cultures as classical civilization" (p10). Amadiume examined traditional roles of women and men in village social structures. She found local village society reinforced enduring decentralized social organization patterns. Her findings contrasted the view that centralized government is the primary determinant of political reality and social organization. Today urban expansion is a phenomenon throughout Africa including Mali, but most of the population live in rural villages still. Amadiume uses case studies of traditional cultures preserved in villages of today to study historical gender roles. Her ethnographic research is based on the observation that in many rural villages, life and social structure has changed little over hundreds of years. She presents the case for the moral and social basis of African cultures resting on the central role of woman in the family and the mother-child relationship.

#### 2.4 International Development Statistics and Indicators

This literature includes recent statistics and indices with explication of their meaning. Gender disaggregated data is now collected by many international organizations. This

allows for comparison of economic, social and political effects for women relative to men and to the overall society. ICT statistics are now collected by the ITU and the UNDP. The Technology Achievement Index (TAI) described in chapter 1, was developed for countries, which had collected technology data.

ICT indicators are just beginning to appear in data of global statistical literature. Annual reports, research and statistics of the UNDP, UNESCO, UNIFEM, ITU, USAID Leland Initiative and IDRC include gender-disaggregated information important to this research. The 2001 UNESCO Statistical Yearbook contains detailed statistics on education in Mali, including science and technology education figures for women. ITU-D statistical research for the gender task force is important, because of the function of the ITU in facilitating global ICT development. The IDRC Acacia initiative research includes reports on each of the MCT pilot projects funded by IDRC, including the Timbuktu project. The Leland initiative of USAID collects statistical data on ICT development in Africa.

ITU Statistical Yearbook (2001) has longitudinal data on ICT development, usage and infrastructure for each country for the decade 1990-2000. This data for Mali is more complete than any other of the statistical resources described here. This data is valuable to the portrait of the infrastructure development in Mali during the time period of this research.

The Human Development Report 2001, Making New Technologies Work for Human Development, has statistics on each country. The Human Development Index, (HDI), Technology Achievement Index (TAI), described above, and Gender Development Index (GDI) are included. This data will be compared with previous UNDP statistics for Mali from 1990 to 2000. Trends in telecommunications and human development in Mali over the past decade can be observed in the UNDP data.

The World Bank 2001 World Development Indicators contains country data for economy, education, health and development progress including women in development

data. There are country data for integration with the global economy and regional trade bloc data for exports and imports. This data will be used to compare Mali with other regional countries. Power and Communication and The Information Age data will supplement the ITU statistical data on telecommunications infrastructure development.

Where Women Stand: An International Report on the Status of Women 1997-1998 by Neft and Levine (1997), contains graphs of longitudinal data showing world trends for women in life expectancy, employment and education. This work also charts countries where more than half the women are illiterate. Mali is included in the region of highest concentration of female illiteracy, the Northern half of the African continent.

The Statistical Record of Women Worldwide contains gender-disaggregated data on reproductive health, medical care, education and employment by occupation for Mali. The comparison of data for Mali with other regional countries will be part of developing an international regime theory based map of gender equity progress in the region.

Fitzroy Dearborn Book of World Rankings contains vital statistics and statistics on population, employment, economics, health, literacy, communications and media. In addition to figures and explication of their meaning, this resource ranks nations in relation to each other. The comparative value of examination of Mali 's position in relation to other countries is reason to include this literature. Most of the indicators are not disaggregated by gender. Section XXIV on Women and Section XXV on Global Indexes, include valuable measures for this research. World Economic outlook: IMF Survey and Statistical Abstract of the World are also resources that will be used to gather and compare statistical information.

The Economist: Guide to economic indicators-Making sense of economics published by John Wiley and Sons Inc. is a resource for interpreting economic statistics and measures. The economic indicators are primarily for the OECD countries. The statistics are not directly relevant but the interpretive analyses provide explanation of indicators. The book chapters group: economic activity measures; GDP trends and cycles; population

employment and unemployment; fiscal indicators; consumer indicators; investments and savings; balance of payments; exchange rates; money and financial markets; prices and wages. The first three chapters contain data applicable to Mali's economic profile.

Statistical and gender-disaggregated data for Mali from the sources described above contribute to the development of gender equity and telecommunication patterns and trends over the period from 1990 to 2000.

## **Chapter 3 – THEORETICAL FRAMEWORK AND METHODOLOGY**

### 3.1 Introduction

This chapter describes the theoretical framework, research approach and methodology for analysis of telecommunications and gender equity policy in Mali. This research inquiry examines development in Mali, as measured by gender equity in education, health, political and economic indicators and by ICT growth in infrastructure, access and applications during a period of telecommunications and gender equity policy reform. The theoretical framework includes international regime theory as interpreted by Krasner (1983) and Cowhey (1990) and “development as freedom” perspective of Sen (1999). These theories form part of the framework for understanding the national policy change in Mali for telecommunications liberalization and for inclusion of gender equity policy in programs for ICT development and training.

The epistemic community of the international regime provides a means for understanding power and knowledge relationships within the regime. The epistemic community is defined here as the knowledge community, which serves as the theoretical and strategic information resource for the international regime. Knowledge from the epistemic community is used to build and authenticate change of the principles, norms and rules of the regime. The resources of the epistemic community are critical to the decision making processes of the regime and to issues addressed in this research, development in gender equity and in telecommunications. Gender equity issues and telecommunications issues impact every aspect of society. The fast pace of change in global perceptions on these issues has created greater interaction with the knowledge building processes of the epistemic communities within international regimes.

The struggles of least developed countries for participation in the Information Society have been economic, political and cultural struggles. ICT infrastructure growth has stimulated hopes of inclusion in a world of free information flows where participatory

decision-making processes replace old structures of domination. Participatory knowledge sharing within the epistemic community of international regime contributes to the free flow of information. Least developed countries struggle for participation rather than marginalization. Sen's (1999) Development as Freedom interprets freedoms as "not only the principle ends of development, they are also among its principle means" (p10). Sen described the empirical connection among different kinds of freedom and defined a "freedom-centered understanding of economics" (p11). Sen identified the positive role of freedom and agency in all forms of development and in producing sustainable change.

Mali's political infrastructure, internal freedoms and national agency have developed with participation in international regimes. Sen claims the emergence and consolidation of basic and political rights can be constitutive of the process of development. Mali's knowledge input to international and regional forums has contributed particularly on the issue of human rights. Mali's agency in its own regional organization ECOWAS has catalyzed economic, political and human rights cooperation among member countries. Local agency of the community of Timbuktu in the collaborative process with international, and national regimes has been the cornerstone in the construction of the sustainable replicable MCT model in Mali. The pilot project created a gender inclusive participatory communications environment for ICT development, which illustrates both process and opportunity aspects of freedom described by Sen.

Diop's (1987) theory of African matriarchy identifies maternal lineage common to many African cultures as a historical root grounding gender equity initiatives today. Diop and Amadiume elaborate on the matriarchal social structure theory and its particular relevance to Malian culture. Amadiume's (1997) work examines the important interrelationship of matriarchy, religion and culture in Africa. It also examines limitations of Feminist theory applied to African culture in the context of race, gender, class and power relationships in Western imperialism. Amadiume's historical analysis finds women's role key to many African political transformations. This finding is particularly relevant to the political transformations in Mali over the past decade. These

political dynamics have impacted the social and economic development in Mali during the period from 1990 to 2000. Women's action and organization were integral to affecting these changes

Mali has an agricultural economy with few value added exports and therefore minimal market power with which to negotiate relationships within the WTO and other trade directed regimes. Mali must therefore struggle for voice and agency in the post-colonial environment within international regimes. The ITU regime influences global telecommunications policy and the UNIFEM regime influences gender equity policy. International regimes like the ITU and UNIFEM have encouraged participatory agency based upon the inclusive knowledge representation within its epistemic community and its internal decision-making processes. The epistemic community as a knowledge community, must rely on a broad stakeholder base of information resources for theoretical and strategic decisions of the international regime.

Ethnographic and statistical data analysis methods are employed to assess the impact of expanded ICT infrastructure into rural Mali with particular focus on gender equity in agency and access to ICTs. National freedoms, human rights and telecommunications liberalization in Mali are examined within this framework through a country study of Mali and the national policy environment. The country study includes historical roots of current circumstances and locates Mali within regional and international regimes, which influence global trade, telecommunications and politics including gender equity issues.

Case study analysis of the Multipurpose Community Telecentre (MCT) pilot project in Mali's world heritage site of Timbuktu applies policy analysis to this real world ICT development model. The case study method used here will summarize research about the communications needs, problems and solutions provided for by the MCT. The case study isolates gender equity and access issues and examines proposed and tried solution strategies. This broadly collaborative effort included local health, educational, political and business organizations, the Government of the Republic of Mali (GRM), the national telecommunications service provider Societe de Telecommunications du Mali

(SOTELMA) and the international telecommunications regime guided by the ITU. The collaborative nature of the MCT project contributes to the study of international and national regime interactions in the task of building ICT capacity toward an Information Society.

These methods are used to examine development in Mali and the impact of ICTs on economic, social and political change. The findings of the country study and case study inform the process for development of sustainable models for ICT growth. Many rural communities could benefit from access to ICTs and use them to contribute knowledge resources to the Information Society.

### 3.2 International Regime Theory

Evolving international regimes have influenced national policy formation in Mali, particularly because of globalization trends in world politics, the world economy and world communications. This trend has impacted policy change in Mali during the period of focus for this research, 1990 to 2000. Telecommunications liberalization policy in Mali has been influenced by the policy recommendations of the World Trade Organization Basic Telecommunications Agreement (WTO-BTA) and ITU. Policy in Mali for greater gender equity in education, politics and programs for ICT development and training have been influenced by the United Nations, particularly the four World Conferences on Women (WCW) and the international treaty Convention on the Elimination of all forms of Discrimination Against Women (CEDAW). Mali has ratified “all the major human rights instruments and Conventions” (<http://www.pdhre.org/projects/development2.html>, accessed 3/17/02 p2). International regime theory provides an analysis framework for understanding some of this policy change.

The initial catalyzing event for change in Mali during the 1990’s was the political transformation of the government of the Republic of Mali (GRM) from 20 years of one-

party, one president domination into participatory democracy in 1991. The development of a more inclusive political process in Mali stimulated foreign investment and increased opportunities for international political collaboration in national policy development.

The international regime theory defined by Stephen D. Krasner and applied to telecommunications policy by Peter Cowhey contributes to the theoretical framework for examination of agency and power relationship in policy decisions by the national and international stakeholders. This research will use Krasner's (1983) definition of international regime as "sets of implicit or explicit principles, norms, rules and decision-making procedures around which actors' expectations converge in a given area of international relations" (p2).

Cowhey (1990) applies international regime theory to telecommunications policy in the regimes of the ITU and the International Telecommunications Satellite Organization (Intelsat). The ITU has been negotiating multilateral agreements since 1865, the telegraph era, and Intelsat since 1964, the satellite era. Cowhey identified three indicators of regime change; change in market terms, change in state-regime power relationships and change in the epistemic community, which impacts regime principles, norms, rules and problem solving. Cowhey identifies telecommunication regime principles and their process of change. In the past the ITU regime rested on the principle that "monopolies of services and equipment were the most efficient and equitable way of providing public services domestically and internationally" (p177). State control over international communications was assumed. Three norms emerged, "jointly provided services, standardized networks and equipment and organized global commons" (p177). Global commons included the scarce radiofrequency resources of broadcast spectrum and satellite orbital slots. As the telecommunications industry has changed to adapt to the globalized free market economy, the principles, norms and rules of the international telecommunications regime have changed.

The decision-making procedure of the ITU remains a one-nation one-vote system. It has three sets of rules; legally binding international law of the ITU Convention,

administrative conference regulations, and widely accepted recommendations. The organizing principle of free trade has become the guide to reform of the ITU regime. Norms have changed as the monopoly principle changed to the competitive principle and state control changed to privatized control. Cowhey's analysis of the relationship between the ITU and individual nation states is relevant to this study. The power relationship between international and national institutions is necessarily unequal. International decision-making impacts national decisions. The ITU and the WTO-BTA have influenced telecommunications policy in Mali toward liberalization. This research will examine national agency in telecommunications policy and gender equity policy partly by identifying Malian cultural roots that explain support for certain policies which are now fostered by international regimes.

Other works apply international regime theory to African telecommunications policy. Derrick Cogburn worked in South Africa during the telecommunications liberalization process and applied international regime theory to analysis of South African telecommunications policy change. Cogburn (1998) expressed the need for:

a clear theorization of globalization and the transformation occurring in the world economy that is grounded on an empirical analysis of local realities, including the process of high technology policy formation and the exercise of state autonomy (Cogburn, 1998, p583).

The importance of local realities stated in Cogburn's work informs this study of Mali to examine the issue of state autonomy within the ITU and WTO economic and telecommunications regime and policy environment.

Gadio (1995) applied the epistemic communities approach within international regime theory to explain the spread of telecommunication reform as international policy diffusion. The analyses of the epistemic community inform the decision making process of the regime, adding validity and credibility which enhance policy diffusion. Gadio applied this approach to telecommunications policy comparison of Senegal, Mali and Ghana during the period of economic structural adjustment during the early 1990's.

Gadio used concepts of epistemic communities defined in the work of Peter F. Cowhey, Peter Haas, Ernst Haas and G. John Ikenberry.

Peter Haas is credited with the development of the approach. Rittberger (1993) says that Peter Haas “uses neo-realist, institutionalist and cognitivist assumptions to derive four environmental regime patterns “...or “distinct styles of collective management and lesson drawing associated with regime formation, persistence and change” (p.xvi). Haas examines regime pattern transformation by the emergence of epistemic communities. Ernst Haas, a scholar of international relations, organizations and regimes, is considered the “father of supranationality” as a concept. Ikenberry (1993) also focused on epistemic communities in international regimes.

Ikenberry argues that the basic logic of the “distinctively liberal Western order” organized on “economic openness, reciprocity and multilateral management” (p124) was in place before the Cold War and survives in the continued primacy of the United States. The problem of building “a durable mutually acceptable order among states with huge power asymmetries” (p124) was resolved when “binding economic and security institutions, provided mechanisms to increase confidence that the participating states would remain within the order and operate according to its rules and institutions.” He argues that the order has become more stable because “the rules and institutions have become more firmly imbedded in the wider structures of politics and society” (p124). This liberal approach of the US has mitigated reaction to the power it wields in international regimes (Ikenberry, 1999).

Cowhey’s application of the international regime theory to telecommunications policy includes his analysis of the three approaches found in regime theory literature. Gadio defines four original and important themes, which Cowhey brings into the internationalization of telecommunications reform debate. First, Cowhey claims that the epistemic community has changed from belief in and justification of state run or regulated monopoly to support for free market economy principles of competition, regulatory transparency and privatization. Second, Cowhey analyzed the General

Agreement on Tariffs and Trade (GATT) as the institution from which strategies for change can be launched. He proposes the GATT (and he predicted GATS) would serve as the regime in place of the state controlled monopoly. Third, he characterized two positions in the telecommunications reform policies “big bang” and “little bang”. The “big bang” is liberalizing regulatory reform in the three countries, which constitute a large share of the telecommunications market, the United States, Japan and United Kingdom

The “little bang” is Cowhey’s (1990) term for an approach to reform in advanced economies with five major components. The first involves “slow reduction of cross subsidies to households and small businesses” (p.189). The second reform component is redefinition of the dominant telephone company (p189). The third component of reform is a shift in focus to “provision of computer processing equipment (CPE) and enhanced services” (p190). The fourth component of reform nominally liberalizes procurement practices for “provision of network equipment” (p190). The fifth component is “that international reform mirrors domestic reform ” (p190).

Finally, Cowhey groups the marked disagreement and ambiguity in the regime literature into three approaches to regime analysis (Gadio, 1995, Cowhey, 1990). One approach emphasizes function, such as transaction cost reduction or regime design shaped by strategic gaming dynamics. A second approach is focused on regimes as the result of international power relationships. The third approach emphasizes the cognitive framework of the regime and its influence on actors’ problem and solution definition. Cowhey uses a synthesis of all three approaches and proposes “domestic politics as the primary source of regime change” (Cowhey, 1990, p173). National change can impact international change “if there is a market coalition with sufficient global influence” (Cowhey, 1990, p173). National influence on regime change also requires an “alternative cognitive framework around which to organize principles and norms of the international regime” (Cowhey, 1990, p173). These identified factors of regime change provide a framework for examination of Mali’s domestic influence on the epistemic community informing telecommunications and gender equity policy.

International regime theory has stimulated debate over national and international relationships in the context of regime functions, international power relations and cognitive frameworks within the policy formation process. That debate and the theoretical differences it manifests over the role of the nation state and the importance of national sovereignty within international relations will not be explored here in depth. It is an ongoing dialogue of regime analysis in political science. The formation of cognitive frameworks within epistemic communities in developed and developing countries is the relevant area of this dialog included in the analysis of Malian policy within the international regime. International decision-making bodies seek common interests among the diverse member stakeholders. The credibility, authenticity and legitimacy of a regime impact its ability to achieve binding decisions. The individual nation state is impacted whether its interests are well represented or marginalized in decisions made by international regimes. The epistemic community approach pursues a deeper understanding of the cross influence between the national and international regime and policy processes through a common knowledge base.

The New World Economic Order (Agarwala, 1983) describes the struggles of least developed countries for participation in the economy of the Information Society. The smallest economies have economic and cultural hurdles to overcome in attempts to participate in regime decisions within the present economic order. If national change can only impact international change when “there is a market coalition with sufficient global influence” (Cowhey, 1990, p173), then the quest for agency in the international regime is a particular challenge for least developed nations like Mali. The development of a regional economic power base with an “alternative cognitive framework” is Cowhey’s implied solution. ICT infrastructure growth has stimulated hopes of economic inclusion in a world of free information flows where participation replaces domination. Agarwala (1983) presents an overview of an eight-volume study in The New International Economic Order (NIEO). The NIEO study analyzes the development of the present International Economy. The old order operates on rules, which benefit some nations

more than others. In a world of expanding participatory democracy within international regimes, this circumstance prompts inquiry into a new international economic order.

### 3.3 Gender Equity Policy in Mali and International Regime Theory

International regime theory and development as freedom theory apply to Malian gender equity policy. Gender equity policy in Mali has been influenced by the emerging international gender equity regime. This international regime is a coalition which includes the United Nations Fund for Women (UNIFEM), the UNDP and countless international, regional and national gender focused human rights NGO's. The ITU -TFGI the UN ICT Task Force, and the ECA-AISI have worked to apply the principles, norms and rules of the international regime for gender equity to telecommunications and ICT policy. The principles, norms and rules of this regime are contained in the Universal Declaration of Human Rights (UDHR), the CEDAW treaty, the Nairobi Forward Looking Strategies of the 1985 WCW and the Beijing Platforms for Action of the Fourth WCW. The decision making process of the regime includes the United Nations and individual nation states, who choose to develop national machineries for implementation of the recommendations of the gender equity regime. The epistemic community for the gender equity regime includes all the organizations named above and many others throughout the world currently developing theory and research on gender equity efforts and their impact on development. The World Bank has joined the epistemic community on gender equity particularly with the research publication, Engendering Development. Together all of the above are building the cognitive framework for the international regime on gender equity, not without strong debate.

This research draws on the theory that human rights are universal and inalienable, underlying international documents articulating and affirming first principles of human rights. The right to communicate included in the Universal Declaration of Human Rights (UDHR), Article 19 and the right to equity and equality for women underlying the Convention on the Elimination of Discrimination Against Women (CEDAW) are based

on the theory that all human beings have certain rights that no government can legislate away. Theories of inalienable human rights and human equality underlie the Beijing Fourth World Conference on Women and the twelve platforms for action as development initiatives. The Section J initiative, Women and Media, is the platform for action, which this research will examine in the case of Mali. The Universal Declaration of Human rights Article 19, supports efforts to reach and provide ICT access to all based on the right “to seek, receive and impart information and ideas through any media and regardless of frontiers” (UN, 1948). The gender frontier in the emerging Information Society is explored for Mali from the perspective of these human rights aspirations.

The Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) commits signatories to gender equality objectives in political, social and economic affairs. Mali as an early signatory to this treaty, has worked to implement policy for gender equity in health, education and economic opportunity during the past ten years.

The Nairobi Third World Conference on Women in 1985 closed the UN “decade of the woman” launched at the First World Conference on Women in Mexico City in 1975. Equality, Development and Peace were the themes of the conference. (UN report on the Third World Conference on Women, Section II. Development, D. Science and Technology – Communications):

In view of the critical role of this sector in eliminating stereotyped images of women and providing women with easier access to information, the participation of women at all levels of communications policy and decision-making and in programme design, implementation and monitoring should be given high priority. ...The cultural media, involving ritual, drama, dialogue, oral literature and music, should be integrated in all development efforts to enhance communication. Women's own cultural projects aimed at changing the traditional images of women and men should be promoted and woman should have equal access to financial support. In the field of communication, there is ample scope for international co-operation regarding information related to the sharing of experience by women and to projecting activities concerning the role of women in development and peace in order to enhance the awareness of both accomplishments and the tasks that remain to be fulfilled (UN, 1986, Paragraph 206).

The Nairobi strategies encourage increased enrollment of women in public mass communication networks and in training and education programs for media employment. (United Nations, 1986, para 207, p62, [See Appendix 3]).

The Beijing International Conference on Women established twelve Platforms for Action (PFA) and Beijing+5 a progress oversight structure for achievement of gender equality in critical areas of concern. PFA Section B addresses gender inequality in access to education and training. Education is important to ICT sector participation. PFA Section J addresses the need for gender equality in access to and participation in all media communication networks. Increasing the numbers of women media content developers is one proposed strategy to achieve increased coverage of issues, which effect women and decreased stereotype representation of women in media.

Achievements toward realization of Section J. Women and the Media PFA include the establishment of local, national and international women's media networks for greater communications and exchange of information. ICT development, including the Internet, improved communication opportunities for the empowerment of women and girls. More women now contribute to knowledge sharing, networking and electronic commerce activities. Women's media organizations and programs have increased. Positive portrayals of women in the media are directly related to women's participation and agency in media.

Obstacles include the increase of "negative, violent and/or degrading images of women", including pornography, stereotyped portrayals, have increased in different forms using new communication technologies in some instances, and bias against women remains in the media. Poverty, the lack of access and opportunities, illiteracy, lack of computer literacy and language barriers, prevent some women from using the information and communication technologies, including the Internet. Development of and access to Internet infrastructure is limited especially in developing countries and particularly for women.

Gender equity is a human rights issue. Mali chose to become a “Human Rights Nation” in 1998 and began a sponsored program, People’s Decade for Human Rights Education (PDHRE). The organization PDHRE encourages human rights communities to pledge human rights ‘literacy,’ action for women and men to claim their human rights, dialogue on the concepts of human rights and human rights education. The national program, PDHRE Mali launched a nationwide effort to increase all human rights but particularly gender equity in education, politics, economic activity and domestic social life. Social problems in Mali manifest human rights issues. High female illiteracy demonstrates the need for programs to implement the right to free primary education in Article 26 of the UDHR. Efforts to reach workable solutions to human rights related social problems benefit from collaboration with the epistemic communities of such international regimes (<http://www.pdhre.org/pdhre/projects/development2.html> accessed 3/16/02).

The gender equity policy in telecommunications in Mali demonstrates expansion of agency and freedoms for women in the many cultural contexts of Mali. The ITU has sponsored fellowships for technical education of women and men in Mali in an effort to reach gender-balanced development in ICT capacity. Distinctive engendered cultural practices are employed to implement policy change in Mali. Local cultural norms such as dress, language and social habits have been used effectively to educate on health and other issues. The gender equity regime is based on international treaties and agreements which constitutes an evolving policy system of principles, norms and rules, but the local implementation of gender equity involves a culturally sensitive education process.

The International Centre for Human Rights and Democratic Development hosted a March 2002 meeting to identify avenues of collaboration on issues of common concern, including achievement of gender equity. Three special rapporteurs on women's rights identified a list of the international, norms and rules, which comprise part of the cognitive framework for gender equality. The special rapporteurs included the UN Commission on Human Rights, Inter-American Commission on Human Rights and African Commission

on Human and People's Rights. They issued the following Joint Declaration for International Women's Day, March 8, 2002:

Recalling that women's rights are human rights, we, the Special Rapporteurs, reaffirm our commitment to international standards of women's rights contained in, inter alia:

- The Universal Declaration of Human Rights;
- The International Covenant on Civil and Political Rights;
- The International Covenant on Economic, Social and Cultural Rights;
- The UN Declaration on the Elimination of Violence against Women;
- The Convention on the Elimination of All Forms of Discrimination against Women and its Optional Protocol;
- The Rome Statute of the International Criminal Court;
- The American Convention on Human Rights and its Additional Protocol in the Area of Economic, Social and Cultural Rights;
- The American Declaration of the Rights and Duties of Man;
- The Inter-American Convention on the Prevention, Punishment and Eradication of Violence against Women (Convention of Belem do Pará);
- The African Charter on Human and Peoples Rights, and
- The 1999 Grand Baie Declaration and Plan of Action on Human Rights (International Women's Tribune Center Globalnet #187, 3/12/2002).

These documents constitute international rules, norms and principles of the rights of women. Together with the strategies and action platforms created through the international World Conferences on Women they form the defined regime for gender equity. The Universal Declaration for Human Rights is an international agreement, which recognizes that “the inherent dignity and the equal and inalienable rights of all the human family is the foundation of freedom, justice and peace in the world.” These human rights are equally inalienable for women and men, affirmed in the international treaty, Convention on the Elimination of all forms of Discrimination Against Women (CEDAW). The Nairobi Forward Looking Strategies (1985) and the Beijing Platform for Action (1995) were developed through the World Conferences on Women organized through the United Nations Fund for Women (UNIFEM).

Sen's work (1999) acknowledged that agency and well-being are both distinctive and interrelated. The reach and power of women's agency in promoting child survival and in helping to reduce fertility rates contribute to overall development for women, men and children of the society.

The extensive reach of women's agency is one of the more neglected areas of development studies...Nothing, arguably is as important today in the political economy of development as an adequate recognition of political economic and social participation and leadership of women...a crucial aspect of development as freedom (Sen, 1999, p203).

Empirical work has brought out clearly that women's earning power, economic role outside the family, literacy and education, property rights and other aspects of agency contribute independence and empowerment "adding force to women's voice and agency" (Sen, 1999, p191).

Sen (1999) describes the evolving free agency of women as integral to development. Through social movements, women have evolved from passive recipients of the necessities of well-being: water, food, health care to "active agents of change" and "dynamic promoters of social transformations that can alter the lives of both men and women" (Sen, 1999, p189). Sen's description of women's agency in the development process applies directly to Mali since 1991. Women took an active role in the social movement, which led to political change and have continued to increase their participation in Malian political, economic and social development since that time. The promotion of gender equity in politics, education, ICT access and economic sectors of Mali is the direct result of women's agency for social change (Ba Toure, 2000).

#### 3.4 Telecommunications Policy in Mali and International Regime Theory

Telecommunications development became a GRM priority for establishment of a national political and economic communication network. Resources were also directed toward cultural, particularly educational, communications network development. International policy influence and support involved collaborations with the ITU, UNESCO USAID, IDRC and other NGO's working in communications development. Business opportunities for foreign and domestic ICT service, equipment and infrastructure companies encouraged Malian liberalization of telecommunications and trade policy consistent with WTO recommended policy. The GRM has initiated and completed ICT

projects, which represent the constructive approach to development articulated by Sen and identified with increased freedoms and agency in society.

The decentralization of the GRM is one example of Malian policy consistent with Sen's theory of "development as freedom" (1999). Strategies for rural telecommunications development have been motivated by the need to diversify political decision making, while increasing the access to shared information at all levels of government. Both processes require the development of electronic information technology infrastructure. An important partnership in the expansion of infrastructure emerged with the GRM invitation to the USAID Leland Initiative, a program to support ICT development in Africa. Early efforts developed ICTs for intra-governmental communications in the capital city of Bamako, Mali.

Efforts are now underway to expand ICTs for intragovernmental communications in the rural regions including each of the smallest political subdivisions, the political communes. Radio is the most pervasive technology for communication in Mali. For most radio is a receive-only system. The GRM policy to install WorldSpace satellite transceivers in each of the 703 political communes of Mali will expand interactive voice, email and text communication throughout the entire country, rural and urban.

International regime theory maintains that the formation of local and national policy is influenced by the emerging network of international policymaking organizations. International organizations seek cooperative agreements, which articulate different national, international, public and private perspectives and then attempt to negotiate workable solutions. This theory provides a framework for examination of emerging international governance structures affecting national policies (Cogburn and Foss, 1996). The UN, ITU, UNESCO, WTO, OECD, WIPO and others negotiate international agreements in their respective areas of interest. Global developments in telecommunications networks influence change in international, national and local policy.

International agreements such as the WTO Basic Telecommunications Agreement have helped shape domestic policy objectives for nations with emerging economies seeking participation in the global telecommunications market. Mali has not emerged as a competitive telecommunications market entrant from either the manufacturing or infrastructure development sector. Mali has developed content and applications for ICTs in government and in its largest economic sector, agriculture.

In Regime Theory and International Relations, Krasner (1993) elaborates on the cognitive factors, public and private, developed within the epistemic community, which serve the knowledge needs of the regime. Epistemic communities within Mali can use the ICT infrastructure to communicate knowledge unique to Mali. The contributions from Mali support the development of an international regime analysis of ICT and gender policy, which includes perspective from a least-developed country.

Capacity to build knowledge and share it using ICTs is an expanding phenomenon in the Information Society. Knowledge creation is linked to technological change affecting the acquisition and dissemination of knowledge. Hudson (1997) identified four major technological trends driving the global information revolution: capacity, digitization, ubiquity and convergence. These trends are evident at an early stage in Mali. Digitization and convergence of media requires capacity building. ICT access expansion, with the MCT in Timbuktu and other projects in Mali, proceeds with its focus on gender equity. Women are "possessors of most of the indigenous knowledge in developing countries, and support of their potential for contributions to S(cience) & T(echnology) are critical to community development" (Huyer, 1997, p1). With this understanding Mali has incorporated gender equity into its education policy including science and technology education.

Mali's produced or physical capital is limited by the lack of value added exports. Natural capital in Mali is either untapped or depleted. Mali once had rich gold mines but their production is low. Human capital in Mali is rich in oral and indigenous knowledge, but still low in literacy rates and school enrollment, though these figures are improving. The

mean years of schooling for those above 15 years has tripled in Mali since 1970, but only measured 0.9 years in 2000 (UNDP, 2001a). The World Bank recently predicted that without "historically unprecedented rates of progress," (UN Wire Service, <http://www.unfoundation.org>, accessed 3/28/02) half of the countries will not reach the Millennium Declaration education goal by 2015; to enroll all children in primary school and achieve universal completion of primary schooling (UNDP, 2001a). ICTs in Mali extend access to information critical to the education process. The telecommunications development policy in Mali is part of the policy to develop Mali's human capital.

Development of social capital is a political tradition in Mali. Social capital is a concept defined here as social interaction of individuals and groups, which affect the provision of public goods through human communication and organizational networks (Grootaert, 1998). "Internet effects on social capital" (Wellman, Haase, Witte, Hampton, 1998) redefined and used three types of social capital: 1) Network capital refers to relations with family, friends and co-workers that provide emotional, material, informational, and companionship support; 2) Participatory capital refers to "involvement in politics and voluntary organizations that afford opportunities for people to bond, create joint accomplishments and aggregate and articulate their demands and desires" (Wellman et al, 2001, p2); 3) Community commitment was listed as a third form of social capital, beyond organizational involvement, "when people have a strong attitude toward the community – have a motivated, responsible sense of belonging - they will mobilize their social capital more willingly and effectively" (Wellman et al, 2001, p2). Mali has strong family and community structures. Since the political changes of the early 1990's there is wider participation in political organizations. Much of the ICT infrastructure and capacity development in Mali is directed toward strengthening these three types of social capital.

Metcalf's Law states that the value of the network increases with the number of persons connected to it. Part of the value is the social capital of the human communication and interaction. Two-thirds of the world's populations are still unconnected and live in rural communities without access to ICTs or their benefits (<http://www.unicttaskforce.org>, accessed 11/20/01). Mali has policies in progress to extend ICTs to Timbuktu and most

of the rural communities using satellite and other wireless technologies. Heather Hudson and others have proposed that wireless technologies for telecommunications infrastructure in rural communities offer the greatest potential for development in SSA. The company ITXC provides satellite and Internet delivered Voice Over Internet Protocol (VOIP) long distance systems. ITXC recently secured contracts with five SSA nations for competitive long distance service delivery, including Mali's neighbors Senegal, Chad and Ghana and the largest markets on the continent, South Africa and Zimbabwe. The remote areas of the world, once impossible to reach through wire phone lines, are now accessible through wireless satellite, microwave and digital cellular radio Global Systems for Mobile Communications (GSM) technologies. Capacity building for application of these technologies requires partnerships between the technologically developed and developing nations, businesses, NGO's and international organizations, such as the Mali WorldSpace collaboration for rural commune ICT interconnection.

### 3.5 Methodology

The research inquiry of this study examines social development effects in Mali during a period of reform in telecommunications policy and gender equity policy from 1990-2000. Methodology for this study includes analysis and impact assessment of Mali's telecommunication and gender equity policy during this time. Methods of analysis include a country study of Mali, a case study of the Multipurpose Community Telecentre (MCT) in Timbuktu and analysis of ethnographic and statistical data gathered.

Policy change in Mali has been consistent with many recommendations of evolving international regimes but has also been consistent with some historical trends and cultural inclinations in Mali. Under these circumstances the coincidence of national policy and international recommendations for policy appears less hegemonic than harmonious. The expansion of ICT infrastructure and the capacity to apply it to Mali's needs has enhanced freedoms and choice options in many sectors including agriculture, politics and education. The emerging democracy of Mali has benefited from the influence of

international regimes on national policy in telecommunications and gender equity. The theoretical framework of international regime theory (Krasner, 1983, Cowhey, 1990) and development as freedom theory (Sen, 1999) help inform the study of these two independent but interactive growth processes in ICT capacity and gender equity.

### 3.5.1 The Mali Country Study

A “country study” is defined for this research as an examination of the historical, international and national influences on Mali’s telecommunications policy and gender equity policy developments over the past decade 1990 to 2000. In order to understand and interpret the lessons of Mali described in the country study, this chapter will include a history of social, political and economic roots for communications culture as it is developing in Mali today. Malian culture affects the country’s receptivity to change, technology and gender equity. Analysis of Mali’s social and political role in the West African region positions Mali in the context of the African continent and its neighbor states, particularly with regard to adoption of ICTs. Mali’s leadership in economic, educational and peacekeeping efforts in West Africa today is rooted in historical relationships of the region. The country study will locate Mali’s position in the framework of international and regional regimes for ICT development, gender equity, democratization and economic liberalization. It will analyze Mali’s policy for application of ICTs to political, economic, educational, health and cultural initiatives.

Country statistical information and data from the UNDP, ITU, the World Bank and other UN and international development databases will be used to analyze Mali’s progress from 1990 to 2000. Gender-disaggregated data on education, infant and maternal mortality, political and economic participation and ICT achievement are indicators of social, political and economic growth. USAID projects in Mali are particularly informative about telecommunications development. Mali was the first country to receive the USAID’s Leland Initiative assistance for telecommunications in Africa. The Leland documentation is good but without gender disaggregated data. Much of the UNDP data is gender-disaggregated in the 2001 Human Development Report except for the Technology Achievement Index (TAI). Education, health and technology indicators

show Mali's progress toward Millennium Declaration goals for 2015. These goals are United Nations development objectives to diminish poverty, illiteracy and health threats.

The Millennium Declaration goals to be achieved by 2015 are:

- To halve the proportion of the world's people living on less than \$1 a day
- To halve the proportion of the world's people suffering from hunger
- To halve the proportion of the world's people without access to safe drinking water
- To achieve universal completion of primary schooling
- To achieve gender equality in access to education
- To reduce maternal mortality ratios by three-quarters
- To reduce infant and under-five mortality rates by two-thirds
- To halt and begin to reverse the spread of HIV/AIDS, malaria and other major diseases
- To provide access for all who want reproductive health services
- To implement national strategies for sustainable development by 2005 to reverse the loss of environmental resources by 2015  
(UNDP, 2001a, p21-24).

### 3.5.2 Multipurpose Community Telecentre, Timbuktu, Mali case study.

The Multipurpose Community Telecentre in Timbuktu demonstrates the collaboration of international, national and local regimes to achieve the shared interests of ICT development and capacity building. "Case study" is defined for this research as a detailed examination of the MCT project, inclusive of the perspectives of the many stakeholders in the collaboration. Project problems will be defined and solutions, both implemented and suggested, will be identified. The case study will also include description of the MCT project and its significance to the Timbuktu region and the country.

The growth of agency and freedoms associated with this community project are part of this case study. Issues of telecommunications liberalization policy and gender equity policy in application to the MCT help illustrate Malian policy impact on the rural community. The definition of problems in providing a sustainable replicable ICT service community access facility include interviews with current and potential MCT users. Data and research will include the baseline study, which George Scharffenberger completed for Pact Institute, the author's site research and the MCT director's report from July,

2000 as well as data collected for specific ICT projects in the region. Scharffenberger (1998) also completed work on the evaluation process for an MCT. The collaborative process among international, national and local regimes to build a sustainable replicable MCT pilot project worked by creating a participatory communications environment. Trust, responsible agency and mutual respect among stakeholders helped build the Timbuktu MCT as a sustainable and replicable model. The cooperative work between the GRM and the international regimes has helped build out the ICT infrastructure in rural and Mali. Freedom and development have grown in Mali. Determination of the relationship between domestic freedoms and development in Mali is a subject for further research.

Because of the well-established relationships between communications and political participation, health, education and other indicators, this research does not plan to isolate cause and effect relationship between telecommunications policy and social development indicators. The changes from 1990 to 2000 in human development indicators along with gender equity indicators from disaggregated data comparison and technology development indicators from the ITU will show social change resulting in part from Mali's gender equity and telecommunications policy.

### 3.6 Limitations and Exclusions

This study is limited to answering the research questions set forth, and to suggesting lessons, which can be learned from them. While putting this information into context and interpreting it, this study touches on research in a number of related areas; however, it is not within the scope of this study to:

- Provide a generalized description of the state of e-commerce and its relationship to national development
- Compare and analyze various theories of national development
- Address in depth the current state of the debate over the "New World Communications and Information Order" or North-South politics
- Comprehensively describe the role of international organizations in development activities

- Extensively analyze theories of women's human rights or of women's role in society
- Address completely, issues with respect to literacy and use of information technology
- fully explore the possible relationships between the development of infrastructure, population centers and environmental degradation.

Each of these areas raises separate and important questions, which could be addressed more fully and fruitfully in other studies. This study includes ethnographic research on the MCT pilot project operations in Timbuktu. Field observations at the MCT site include qualitative data, written notes and analysis and digitally taped interviews and site documentation. No quantitative data was collected during the field study. Quantitative data for Mali from the UNDP, the World Bank and the ITU from 1990 to 2001 show patterns of change. Examination of women's education and access opportunities within the process of ICT growth is limited by very little available gender disaggregated data for Mali. Equipment reliability problems limited use of the MCT from 1998 until mid-1999. This study inquired about user experience during short period since the MCT became continuously operational in mid-1999. The frequent power outages were a limitation to the operations of the MCT, as well as other electronic operations in Timbuktu. This research limited its examination to Mali policy initiatives in ICT development and gender equity in ICT education, participation and access in Mali and policy initiatives in social networking, health, education and political and economic development.

## Chapter 4 – MALI COUNTRY STUDY

### BEING HUMAN IS PRECIOUS - The Hymn of the Human Rights City

Our sister where are you headed  
 I'm headed to the boat of respect  
 Our brother, where are you headed?  
 I'm headed to the boat of respect-in-return  
 And you there, you who look like our father, where are you headed?  
 I'm rushing to the boat of self-knowledge  
 And you there, you who look like our mother, where are you headed?  
 I'm running to the boat of education  
 Indeed! Being Human is precious, at every moment  
 Yes! Respect is precious, at all times  
 For sure! Respect is precious, eternally!  
 My people in the mother!  
 Let's intercede to pardon those who have been thrown off from Being Human  
 Let's steady the minds of those who have been swayed from Being Human  
 Indeed! Being Human is forever!  
 Being Human sets right the world!  
 ... by Mrs. Makalu Awa Danbele

On April 2000, several thousand citizens of Kati, Mali assembled and listened to this "Hymn of the Human Rights City of Kati." They gathered to mark a major point in a process that had started three years earlier around the idea of "Mali a Human Rights nation".

#### 4.1 Introduction

This chapter presents a country study of Mali. Country study is defined for this research as an examination of the historical, international and national influences on Mali's telecommunications policy and gender equity policy and changes in Mali's human development during the period from 1990 to 2000. In order to understand and interpret the lessons of Mali described in this country study this chapter will include a history of social, political and economic roots for communications culture as it is developing in

Mali today. Malian culture is diverse with ancient and modern influences which affect the country's receptivity to change, technology and gender equity. Analysis of Mali's social and political role in the West African region helps contextualize regional and international relationships, particularly with regard to adoption of ICTs. Mali's leadership in economic, educational and peacekeeping efforts in West Africa today is rooted in historical relationships of the region. The country study will analyze Malian policy for ICT application to political, economic, educational, health and cultural initiatives. Policy analysis will help locate Mali within the framework of international and regional regimes for ICT development, gender equity, democratization and economic liberalization.

This chapter presents historical background relevant to the national, regional and international circumstances and relationships that affect current gender equity and telecommunications policy in Mali. It also includes recent developments in Mali that have resulted in part from these policies particularly in politics, education, health and the economy. The historical background of Mali, focused on key communications and gender issues, includes relevant available research from the medieval African empires through French colonization, independence and participatory democracy of today. Mali was once central to a large transSaharan trade in salt, gold, textiles, agricultural products and livestock until the late nineteenth century. Mali still exports these products, but now has one of the world's lowest GDP's. This chapter explores the historical roots for this economic transformation and some implications for Mali in the Information Society era.

Mali's political evolution has contributed to Malian telecommunication policy and gender equity policy. International regimes and their epistemic communities are changing within an interactive environment of technological and social change and also influence telecommunications and gender equity policy in Mali. These sections compare some of the principles, norms, rules and decision-making procedures of domestic policy in Mali with those of the international regimes. Country data during the period from 1990 to 2000 is presented and interpreted in the context of policy designed to bring positive change in social, political and economic development in Mali.

The country examination begins with human rights, an integral part of the framework for rebuilding Mali. The international regime on human rights is led by the United Nations and its organizations. Initiatives for gender equity are based on “the inherent dignity” and “equal and inalienable rights of all members of the human family” which is the “foundation of freedom, justice and peace in the world” (UDHR, 1947). Mali pledged to educate for human rights 'literacy' and to support action for women and men to claim their human rights. The program to develop “Mali as a Human rights nation “ began in 1997 and involved a process of discussion, reflection, training, and coordination. The Peoples Decade of Human Rights Education (PDHRE) -International and PDHRE MALI built on strong historical foundations of Mali’s civil and civic society. Mali once led West Africa according to the 1236 CE document “Kuru Kan Fukan,” the political Charter which “defined goals of a new political culture based on work, justice and freedom” (<http://www.pdhre.org/projects/development2.html> accessed 3/16/02). The national policy focus on human rights has increased freedoms in Mali and contributed to overall development in the manner described by Sen (1999).

The medieval principles of “Kuru Kan Fukan” are evident in the policies and international relations of Mali today. The international human rights framework coupled with indigenous principles of work, justice and freedom have influenced national gender equity policy, telecommunications reform policy and regional cooperation in Mali. The international telecommunications regime led by the ITU and gender equity regime led by the UN, UNIFEM and other human rights organizations have principles, rules, norms and participatory decision-making procedures which are consistent with longstanding cultural and moral patterns in Mali. Differences and conflicts exist and continue to emerge within the international regimes but the conflict resolution process evolves with participatory input. International regimes operate on mutual consensus and agreement and thereby foster regional and international cooperation. The difficulties in national international regime conflict persist where there is rulemaking with out participation. For example, many countries pressed into implementation of structural adjustment programs had little or no input within the money-lending regime of the IMF or the World Bank. The pattern

of rulemaking without participation is a residual effect of colonialism and an obstacle to international cooperation. This study presents evidence that regional cooperation is a large part of Mali's heritage and leadership in West Africa. Work, justice and freedom guided the development of Mali's people long before Amartya Sen articulated the connections between these concepts.

The country's progress during the period from 1990 to 2000 is described using country statistical information and data from the UNDP, ITU, the World Bank and other UN and international development databases. USAID projects in Mali are particularly informative about telecommunications development. The Leland Initiative country data on Mali contributes much to the understanding of Mali telecommunications policy but is not gender-disaggregated. The UNDP data on Mali is gender-disaggregated and includes research on gender and technology developments. Education, health political participation and technology indicators, including the TAI, from the 2001 Human Development Report contribute to the description of Mali's development during 1990 – 2000. Mali has made progress toward the Millennium Declaration goals to diminish poverty, illiteracy and health threats. Much of this progress is related to ICT and gender equity development initiatives by the Government of the Republic of Mali (GRM) in consultation with the international regimes and their epistemic communities.

#### 4.2 Mali History

The brief history presented here will focus on the role of communications and gender in Mali's social, economic, and political evolution. Historic cultural roots, immediate national circumstances and the policies of international regimes each influence current policies of the GRM. A national program to develop telecommunications infrastructure, local ICT capacity and application to Malian needs is progressing toward liberalization and expansion of the telecommunications industry in Mali. The GRM policy for gender equity includes proactive efforts to improve health, education, economic and political participation for women in Mali, including through ICTs.

Part of the national objective of ICT development is to prepare women and men for Information Society opportunities through e-governance, e-commerce and distance education. With far to go, Mali aspires toward gender equity in achieving literacy and the Millennium Declaration goal of universal primary education. Literacy is a prerequisite skill for most ICT capacity building but also contributes toward building an informed national citizenry in health, politics and economics. Education policy of the GRM, implemented by the Ministry of Education, reflects an understanding of the importance of gender equity in education. Literacy for women over 15 years of age, grew from 19% in 1990, to 33% in 1999, a 74% increase. Literacy for men over 15 years of age, grew from 33% in 1990 to 47% in 1999, a 42% increase (UNDP, 2001a, <http://www.genderstats.worldbank.org/SummaryGender.asp?WhichR=country&crty=ML> I,Mali accessed 7/1/01). Women's literacy during this period has improved faster than men's literacy, which reflects the proactive policy in Mali to achieve gender equity in education. Mali has begun to apply ICTs to governance, education, health services and market information. Proactive gender equity policies for inclusiveness have begun to equalize gender ratios in government and in the classroom. Matriarchy and a moral code based on the centrality of the mother in family social structures has been a part of Mali culture since the beginning of recorded history (Diop, 1987, Amadiume, 1997).

The Republic of Mali is the nation state in the region of the great empires of West Africa from the first to the sixteenth centuries (Diop, 1987). Matrilineal succession in political structures and international cross cultural communications have been values central to many cultures of Mali over hundreds of years, according Cheikh Anta Diop and other African scholars. Mali is one of the most stable democracies in West Africa today and paradoxically one of the world's least developed economies. This contradictory reality in Mali can be better understood through historical analysis.

Mali has known greatness and great loss, political, economic and spiritual leadership and colonial and neocolonial subjugation. Mali is changing today with progress clearly evident in the regional leadership Mali has shown in telecommunications development, in

women's participation in democracy and education and in cultural and environmental preservation. Mali's GDP growth rate is currently a modest 4.8%. This is low by market economy standards of the North, but quite healthy considering Mali's drought challenged agricultural economy and political transformations.

Mali has long been home to diverse peoples, cultures and climates. The landlocked nation extends from the Sahara Desert in the north to the fertile Sahelian savannas in the south. Clockwise from the north Mali borders on Algeria, Niger, Burkina Faso, Cote d'Ivoire, Guinea, Senegal and Mauritania. The ethnic groups of Mali include Mande 50% (Bambara, Manlinke, Soninke), Peul 17%, Voltaic 12%, Songhai 6%, Tuareg and Moor 10% and Fulani, Bela, Bobo and others 5% (USAID, 2001). The land and people of present day Mali were included the Ghana Empire, the Mali Empire and the Songhay Empire and influenced the Cayor Kingdom of Senegal and Mauritania to the west and the Mossi Empire of Burkina Faso to the south. Diop (1987) notes that the relatively recent political structure of nation states developed in Europe. Current nation state borders in Africa have more relationship to colonial borders than historical political structures, which predated European colonization.

Mali established political independence from French colonialism in 1960. Since 1992, under the leadership of President Alpha Oumar Konare, Mali has initiated reform in gender equity policy and telecommunications policy related to the growth of communications needs in the participatory democracy. Efforts by least developed countries (LDC's) such as Mali are facilitated by transnational efforts for their inclusion as participants in the Information Society within a technologically interconnected but culturally disconnected world.

#### 4.2.1 Pre-Colonial Mali

Mali was described in Al Sadi's *Tarikh al-sudan* (1613). This description was translated from Arabic and French to English by Hunwick (1999).

Mali stretches along a branch of the Niger River for a distance of perhaps three hundred miles. It borders on the preceding kingdom in the north and in the south on a desert with arid mountains. In the west its limits are primitive forests that

stretch to the ocean while in the east it borders on the territory of Gao...They are the most civilized, the most intelligent and most highly regarded of all the Blacks (Al Sadi, 1613, Hunwick, 1999).

The history of Mali is a human story, rich in cultural heritage, religious passion, scholarly achievement, military conflict, political intrigue and evolution in all these areas. West African social, political and religious structures reflect the matriarchal influence of matrilineal succession and inheritance, in distinct contrast to patriarchal structures more common in European societies (Diop, 1987, Amadiume, 1997). Matriarchy in African historical sociology is identified as the “basis of our African cultural unity” (Amadiume, 1997, p23, Diop, 1987). Amadiume (1997) argues that calls for “peace, love and unity” are stabilizing factors in African society and “refer to moral compulsions of love and unity based on the spirit of our common motherhood...We are thus constructing a collective identity or consciousness based on a matriarchy” (p23). The influence of traditional matriarchy has survived Islamic and Christian religious expansion into Africa. The continued incorporation of such traditions into social structure helps explain the present role of women’s organizations in social, political and economic life in Mali. Women contribute equally with men to the agricultural production which constitutes 80% of the formal and informal economy in Mali. Religious traditions are based on a moral code based on the central social relationship between mother and child (Amadiume, 1997).

The role of women in the society was not well documented in the ancient writings. Historical writings about Mali by Al Bakri (1067), Ibn Battuta (1352-3), Ibn Khaldun (16<sup>th</sup> c.), Leo Africanus (1526) and al Sadi’s *Tarikh al-Sudan* (1613) with modern translations and interpretations by Diop and Hunwick describe military, political and religious struggles, historically male arenas of society.

Mali held centers of learning, spirituality, trade and political power. The Ghana empire from the eleventh century, the Mali empire of the fourteenth and fifteenth centuries and the Songhay empire of the sixteenth century were each highly developed centers of

power. The cities of Timbuktu, Djenne and Gao grew with the coming of Islam and the building of great mosques and universities.

The founding of the city of Timbuktu is an exceptional tale. It was named for Buktu, a woman who was “slave” to the Tuareg founders of the city. She tended the well (Tim) there, where the great river Niger meets the Sahara Desert. According to the historical scholars of the city, Buktu also kept the goods of the nomad Tuareg traders who occupied this Northern bend of the River Niger only in the summer, then traveled North across the Sahara during winter (Sidi, 2000).

After the Moroccan invasion of the Songhay Empire in 1594, decentralization of political power occurred throughout the region. Local trade with Europeans included more imports of weapons. Increased military technologies increased military conflict throughout West Africa. Millions of Africans were kidnapped, incarcerated, sent to new world colonies and forced into slave labor. Millions more died in the struggle to resist and in the middle passage across the Atlantic Ocean. The agricultural industry of the European colonies in the Americas was built on the wageless labor force of Africans.

By the mid-nineteenth century, Europeans and Americans claimed to have ended the trade of kidnapped Africans but many African countries were vulnerable with depleted populations and weakened economic and political structures. European military technology reinforced economic trade aggression to secure resources for industrialization in Europe (Rodney, 1982). These forces drove European colonization into all regions of Africa except Ethiopia. Colonization affected communications as cultures in Mali and elsewhere in Africa struggled to survive under foreign occupation. Family and gender relations within the social structure were also affected by the foreign occupation of colonialism

#### 4.2.2 French Sudan – Mali under Colonialism 1890-1960

The French colonized much of North and West Africa during the late nineteenth century and first half of the twentieth century. The French invaded Mali and met resistance but

by 1904 Mali was included in the region called High Senegal-Niger, by 1920 called French Sudan. French economic and military power redirected trade routes from the transSahara to the Atlantic coast in Dakar. Except for cattle and salt, the transSahara trade so vital from the thirteenth to the nineteenth centuries was eliminated. The French conscripted Malians into both World Wars. During World War I nomadic communities of the Tuareg were destabilized when the French requisitioned their camel herds for the war effort. This period of French colonization developed economic and trade dependency, which continues to this day. The French language was established and remains the official language of Mali. French educational standards were set for schools, which were available only to the most privileged Malians. Koranic schools continued throughout Mali during French colonialism as a parallel education system. The two parallel education systems of Koranic schools and French schools remain today (<http://www.ontheline.org.uk/explore/journey/mali/print.htm>, accessed 1/27/02).

Under colonialism, life for Malians changed less than coastal French colonies. French trade was dependent on sea travel so focus shifted to coastal cities of Senegal and Cote d'Ivoire. As a result, colonialism left Mali with more poorly developed transportation and communications infrastructure than the coastal nations.

Mali was the rice producing “bread-basket” for the French colonies:

French engineers used forced labor to build ambitious irrigation projects, rivaling the Aswan Dam in scale. Mali's importance lay mostly in its strategic position. No major infrastructure projects were attempted, other than the irrigation project on the Niger and the railroad from Dakar to Bamako (<http://www.ontheline.org.uk/explore/journey/mali/print.htm> accessed 2/1/02).

Traditional Malian customs were discouraged by the French. The “dina” was a code of conduct for dispute settlement. It was used to resolve differences, which arose primarily about land use among pastoralists, cultivators and fishing communities. The French imposed their judicial processes and disregarded the traditional codes of conduct based

on shared moral codes. This colonial behavior undermined one of the most essential social processes; that of achieving justice through conflict resolution in Malian society. (<http://www.ontheline.org.uk/explore/journey/mali/print.htm>, accessed 2/1/02). Conflict resolution has been Mali's strength in domestic political development and Mali's great contribution to regional politics.

During the colonial period technological innovation grew in Europe and was stunted in Africa. Rodney (1982) claims that:

The circumstances of African trade with Europe were unfavorable to creating a consistent African demand for technology relevant to development... it would not have been in the interests of capitalism to develop Africa...capitalism introduced into Africa only such limited aspects of its material culture as were essential to more efficient exploitation (p108).

Rodney (1982) described patterns of exclusion of women from skilled labor and from the educational preparation for it. Though colonialists in Africa “paid lip service to women’s education and emancipation” (p226) their policies led to a “deterioration of the status of women” (p226) during colonial rule. Rodney does not claim that the oppression and exploitation of women and their labor in African society began with colonialism, but rather that pre-colonial African societies included a social “contertendency to insure the dignity of women” (p226) and that “women held a variety of privileges” (p226) based on their key role in inheritance rights.

The colonial patterns described above continued during neocolonialism. A primary cause for skepticism about the digital revolution and its implementation in African countries revolves around the issue of technological self-determination.

#### 4.2.3 Political Independence and Democracy –1960 to present

In 1958 Mali took the name Sudanese Republic. In 1959 Mali linked with the Republic of Senegal, Upper Volta (now Burkina Faso) and Dahomey (now Benin) to form the Federation of Mali. In 1960 the Federation dissolved when Senegal withdrew and Mali became the Republic of Mali on 22 September. Modibo Keita became the first President.

By 1968, the economic struggles of the socialist state and dictatorial behavior of President Keita led to a coup d'etat. Moussa Traoré installed a military government. Elections were held every three years but always resulted in a landslide for Traoré's party, Democratic Union of the Malian People (UDPM). A political movement developed for multiparty democracy including women, youth, students and diverse political parties. The women of the movement formed the Collective des Femmes du Mali (COFEM) in 1991. During that same spring, Traore ordered his troops to fire upon a peaceful demonstration. Hundreds of peaceful marchers, men, women and children were killed and wounded. A group of military officers rebelled and organized a coup d'etat. The UDPM party was dissolved and Traoré was given a death sentence, commuted to life in prison. After a year of government reorganization, a new Constitution was written and civilian democratic multiparty elections were held (<http://www.tombouctou.org.ml>, accessed 1/27/02).

In 1992, Alpha Oumar Konaré was elected the first president under the new constitution approved by a popular referendum. Elections were also organized for a national Assembly. Students remained dissatisfied with university conditions and riots continued in 1993. Several official buildings in Bamako were damaged. Konaré's response set a political atmosphere of mediated conflict resolution through dialogue, which marked his two terms of office completed in Spring, 2002. The President met with student leaders and promised to work to improve the education system (<http://www.ontheline.org.uk/explore/journey/mali/print.htm> accessed 1/27/02).

During Konaré's two terms, the Government of the Republic of Mali implemented policies which have expanded telecommunications infrastructure, general education with proactive gender equity, ICT training, women's participation in media particularly radio and women's political participation as ministers and in parliament.

In May, 2002, there was a multiparty presidential election. Amadou Toumani Toure was elected from among 24 candidates with a runoff election between the two top candidates. President Toure received over 60% of the runoff vote and the support of the third place candidate. Ballot challenges were settled by the court's decision and the election

concluded peacefully with popular support for the results. This election marked the first peaceful transition from elected president from one party to an elected president from another party, a milestone accomplishment for Mali's emerging multiparty democracy.

#### 4.3 Mali, International Regimes and Regional Organizations

Mali has historical, cultural and political relations with other nations in the region. Mali's own distinctive national boundaries were recently and arbitrarily determined in 1960 at the end of French colonialism. The people of Mali share cultures with the people of other countries of the region. The modern concept of regionalization is cooperation among nation states of a region to achieve common economic and political goals. Regional alliances around common problems, interests and goals help establish a strong position from which to negotiate decisions within international regime forums. Regionalization is a "key factor of evolution in internal and international politics" (Bach, 1999, p1). Regional integration in Africa through formation of regional economic organizations occurred in two waves, during the 1960's post-independence period and recently in the post cold war era (Kennes, 1999). In 1991, the Organization of African Unity (OAU) signed the Abuja treaty on the African Economic Community. Economic alliances took precedence over ideological and political alliances in the recent wave:

Throughout the African continent the effects of globalization and regionalization combine with a crisis of the post-colonial states to reshape state society relations. This is partly attributable to the fungibility of the international, transnational and domestic dimensions of integration in Africa. Equally important is the responsibility of policies and programmes which have proved largely inefficient in stimulating positive interactions between the forces of globalization, regionalization and fragmentation (Bach, 1999, p1).

Mali was an original member of the Organization of African Unity (OAU) at its founding in 1963. In 2000 the OAU reorganized into the African Union, an international regime and policymaking body for all of Africa. The Constitutive Act of the African Union went into force on May 26, 2001 with ratification by two-thirds of the 53 member nations. The African Union (AU) functions according to principles, which include

“promotion of gender equality” (African Union, 2000, p7). The Act states that AU members are:

guided by our common vision of a united and strong Africa and by the need to build a partnership between governments and all segments of civil society, in particular women youth and the private sector (African Union, 2000, p4).

Objectives of the AU include promotion of human rights, political and socioeconomic development and research in science and technology (African Union, 2000, p6). The Executive Council coordinates policies on areas of common interest and formed specialized technical committees on “Transport Communications and Tourism” and “Industry, Science and Technology, Energy, Natural Resources and Environment” (African Union, 2000, p12). The African Union’s support for collaborative policy formation and research and development of communications technology are aligned with the African Information Society Initiative.

International regime theory has evolved through the examination of the formation of political regimes and their impact on international relations and political systems. The international telecommunications regime includes the ITU and is influenced by the Basic Telecommunications Agreement of the WTO. The international regime for gender equity includes the UN, UNIFEM and the many women’s organizations, which struggle to implement its principles, norms and rules, developed through the UN System of treaties and agreements. Research in international regime theory suggests that the nation state as a political decision making structure is becoming more influenced by international decision making structures of international regimes. These international regimes have influenced telecommunications and gender policy in Mali. The history of Mali provides evidence that international cooperation on liberal trade policy and gender equity in Mali results from culture as much as from international regime pressure.

CEDAW, ITU-TFGI, the World Bank Gender Task Force and the four World Conferences on Women have recommended gender equity policy programs in each respective sector, which Mali has committed to implement where possible. Mali has

implemented aspects of the twelve Beijing Platforms for Action and fostered progress in each area including: women's education; economic and social development; an end to violence; inclusion for women in media content development and ICT capacity building and political representation. Gender disaggregated statistics for Mali from the World's Women 2000 Report show quantitative evidence of these improvements (UN, 2000).

#### 4.3.1 International Regimes

Mali is a member of the UN, ITU and WTO, international regimes. Telecommunications policy and gender equity policy recommendations have influenced Malian policy. Mali has been a member of the UN since independence in 1960. The UN ICT Task Force has recently directed UN focus to ICT development issues for LDC's. Mali has been a member of WTO since May 31, 1995 and is party to the Basic Telecommunications Agreement (WTO-BTA) reached in February 1997. The WTO-BTA defines national telecommunications policy liberalization recommendations, which Mali has implemented as of 2002. Mali has used its regional leadership to encourage national and regional ICT development. Technological infrastructure development in Mali has helped integrate national political, social and economic communication systems. Projects are underway to coordinate such applications into regional collaborations.

#### 4.3.2 Regional Organizations

Regional organizations have an important role in coordinating the political and economic activity within their spheres. They also are important to the effectiveness of international regimes. Strong consensus positions on issues developed in regional forums and presented within the international forum have a greater chance of being incorporated into regime policy. Mali's regional organizations include the African Union, the United Nations Economic Commission on Africa (UNECA) and the Economic Community of West African States (ECOWAS).

What is now the African Union was formed as the Organization of African Unity in 1963. In 1991 it reformed to include the African Economic Community (OAU/AEC). Mali was one of the original OAU members. The OAU drafted and adopted the African [Banjul]

Charter on Human and Peoples' Rights (APHCR) on June 27, 1981. It entered into force Oct. 21, 1986. Article 8 of the ACHPR affirms that every individual shall have the right to receive information and every individual shall have the right to express and disseminate his opinions within the law. (OAU Doc. CAB/LEG/67/3 rev. 5, 21 I.L.M. 58,1982, <http://www.itcilo.it/english/actrav/telearn/global/ilo/law/africahr.htm>, accessed 2/3/02). The Africa States members of the OAU committed “to promote international cooperation having due regard to the Charter of the United Nations and the Universal Declaration of Human Rights.” The struggles for liberation were linked to the struggle to eliminate all forms of discrimination including gender:

Conscious of their duty to achieve the total liberation of Africa, the peoples of which are still struggling for their dignity and genuine independence, and undertaking to eliminate colonialism, neo-colonialism, apartheid, Zionism and to dismantle aggressive foreign military bases and all forms of discrimination, particularly those based on race, ethnic group, color, sex, language, religion or political opinions  
(<http://www.itcilo.it/english/actrav/telearn/global/ilo/law/africahr.htm>, accessed 2/3/02).

In 2001, the OAU became the African Union when two-thirds of the 53 member nations ratified the change.

The African Women Committee on Peace and Development (AWCPD) is an advisory body to the Secretary-General of the Organization of African Unity (OAU) and the Executive-Secretary of the United Nations Economic Commission of Africa (UNECA) on issues relating to gender, peace, security, stability and development in Africa. The AWCPD seeks to enhance the contribution of women to the achievements of the AU Mechanism for Conflict, Prevention, Management and Resolution (Selassie, 2002). The AWCPD Secretariat is currently in the process of gathering information for a comprehensive database of African Women Organizations or non-African Women Organizations working on the resolution of conflicts in Africa.

The United Nations Economic Commission on Africa (UNECA) has been vital to African development. In 1996 the African Information Society Initiative was formed to facilitate, catalyze and coordinate efforts for ICT infrastructure and capacity development

throughout the continent. Mrs. Lela Ben Barka from Gao, Mali, is Deputy Executive Secretary of the UNECA. At the Global Knowledge Partnership Action Summit in March 2000, she said that knowledge building for societies required interrelated processes of access to knowledge, “more than having enough of the right kinds of wires; empowerment of people through access to knowledge societies and governance, which means promoting greater transparency” (Ben Barka, 2000a, p1). She worked on the development of the AISI, which included gender equity in ICT development as one of its four main themes. Mrs. Ben Barka articulated this theme at the Global Knowledge Partnership Action Summit:

As today is March 8, International Women's Day, let me say a few things about women and the global knowledge partnership. I am very pleased that gender features prominently in the draft Action Plan that we will be considering, and that gender is one of four cross cutting issues for the Summit.

There is no question that gender analysis and action cuts across - and indeed is essential to - the definition of the three tracks of the Summit. It goes without saying that the inclusion of women is central to the concept of access. When we talk about empowerment through knowledge and using information and communication technologies to reach those typically bypassed, it is clear that concerns for women are the basic building blocks of a strategy. A knowledge society where knowledge is accessible to all will do much to ensure the participation of women in society and thus the improvement of governance (Ben Barka, 2000a, p1.)

Mrs. Ben Barka represented the ECA at the UN Beijing +5 General Assembly Special Session meeting on ICTs and gender development in June, 2000 (Ben Barka, 2000b).

The following is the forward to the ECAs Resolution 812 (XXXI): Implementation of the African Information Society Initiative, an action framework to build Africa’s information and communication infrastructure:

The information revolution, along with its attendant explosive growth of knowledge, and the related phenomenon of globalization of the world economy have brought about the Information Age, which affects all aspects of economic, social and political activity. Insufficient appreciation of this phenomenon leaves African countries on the short end of an information and technology gap, the disparity between information rich and information poor. At the urging of the member States of the Economic Commission for Africa (ECA), ECA has taken the lead in helping prepare African

countries to overcome this gap and utilize these new forces to promote social and economic growth in the region (<http://www.uneca.org>, accessed 2/3/02).

Ms. Ben Barka's home country Mali hosted the African Information Society Initiative (AISII) international ICT forum, Bamako, 2000. Mali also hosted the Africa Regional Conference, Bamako 2002, for preparation of the 2003 World Summit on the Information Society (WSIS).

The Economic Community of West African States (ECOWAS) is the regional organization for West Africa. ECOWAS became one of the first African regional organizations formed in 1975 (Kennels, 1999). Mali's President Alpha Oumar Konare was president of ECOWAS from 1999 to 2002. During that time the organization tried to expand economic cooperation and peacekeeping efforts throughout the West African region. ECOWAS worked to negotiate peace in Sierra Leone. Mali led the effort to bring the ILO into the solution of the forced child labor problem primarily on cocoa and cotton plantations in Cote d'Ivoire. Many of the children were kidnapped from Mali but it is a problem throughout the region. Mali facilitated regional organization and cooperation through sponsoring efforts and hosting international business, political and cultural forums.

#### 4.4 International Economic Regimes and Policy in Mali

Economic development is progressing slowly but steadily in Mali after a brief period of economic stasis during the 1991-1992 national political change. This was also a time of initial adjustment to "structural adjustment". As the global market economy regime develops, participation within it is still very unequal. The New International Economic Order was researched in a 16 volume series sponsored by UNITAR and the Center for Economic and Social Studies of the Third World (CEESTEM). Agarwala (1983) summarized the research, acknowledged the complexity of the international economic system, and analyzed the basic costs and benefits of NIEO. The report examined issues

of legitimacy, morality and political feasibility of the old market economy order and of NIEO. Since the fall of the Soviet Union, viable economic alternatives to the global market economy have all but disappeared. Frank (1984) critiqued NIEO as only the institutionalization of “the expansion of world trade... established and maintained through intensive political–economic repression” (p199). The involvement of LDC’s in international regimes, where their vote equals that of the G8 nations, has mitigated the realization of Frank’s critical vision.

In 2001, the developing world demonstrated more participatory involvement in world politics and economics through international regimes such as the UN, ITU and WTO. LDC’s such as Mali have contrasted the passive image of repression and demonstrated proactive involvement in national, regional and international political and economic development. The UN ICT Task Force, the Digital Opportunity Task Force of the G8 and the ITU-D exist to develop ICT market opportunities but also to address the economic inequality through developing digital opportunities through investments in infrastructure and capacity development, particularly in Least Developed Countries (LDC’s). Participatory local and national involvement in development have demonstrated greater effectiveness and sustainability of programs (Chambers, 1994a,b,c).

Mali is included in the WTO project "Integrated Framework for Trade-Related Assistance to Least Developed Countries" (<http://www.ldcs.org/mali/malicom.htm>, accessed 1/27/02). Foreign Direct Investment (FDI) growth in Mali has been supported by the UN Industrial Development Organization (UNIDO) through provision of technical assistance in trade analysis and negotiating capacity. UNIDO assisted the Government of Mali in 1996 by developing a proposal for conversion of the Center d'Assistance pour les Projets, les Entreprises et les Sociétés (CAPES) into an Investment Promotion Agency (IPA) for the consideration of the GRM. Technical assistance has been provided for under-exploited sectors, such as fruits and vegetables, textiles, food industry, mining, crafts, meat, fisheries and cultural products. UNIDO implemented a Trust Fund Project aimed at “strengthening the traditional small-scale textile industry to generate more employment for skilled artisans, especially women, to produce better quality and design

of textiles and garments.” Mali is part of a regional program to apply quality principles to the food-processing sector of the West African least developed countries (LDCs) (<http://www.ldcs.org/mali/malicom.htm>, accessed 1/27/ 02).

Mali’s economic structural adjustment program (SAP) was implemented in 1992. Structural adjustment has been a required condition for loan money from the World Bank and IMF, even from the poorest countries. The stated purpose of SAPs is to better control balance of payments on indebtedness. SAPs have been criticized for harming populations through diminished social programs. Mali experienced initial social and economic indicator stagnancy as did many developing countries after the CFA West African currency devaluation and implementation of SAPs. Legislation has been proposed in the US, which would condition the World Bank’s money from Congress on ending harmful structural adjustment policies, such as user fees for health and education, forced privatization of water and lowering of minimum wages and labor standards (<http://www.workingassets.org>, accessed 1/27/02).

The predicted economic turnaround is beginning to show in modest GDP growth rates and growth in Foreign Direct Investment (FDI). In Mali social programs suffered initially from structural adjustment (Gadio, 1995). Eventually economic growth and a reduction in financial imbalances in Mali resulted. GDP growth rates increased and inflation decreased. Restructuring, privatization and liberalization of prices were implemented. Diversification, cost reduction and production expansion of the agricultural sector has been a continuing policy. Economic growth has averaged 5%. Social sectors remained largely unchanged by the reform process from 1992 to 1995 but showed improvements in access to social services including education, after 1995 (<http://www.mbendi.co.za/indy/cotl/af/ml/p0005.htm> accessed 3/17/01).

In 1999, Mali’s population was 11.23 million. National GDP was \$US 2.6 billion and GDP per capita was \$US 246. (<http://itu.int/baseindicators/>, accessed 8/2001). In 1999, GDP per capita purchasing power parity (PPP US\$) was 753 (<http://www.undp/hdr2001>, 2001, p154). Acknowledging the debate over the value of the Human Development

Index (HDI) as a tool for assessment of improvement in the complex human condition, the HDI for Mali has continued to improve since 1985. Economic growth measured in GDP and export-import ratios barely sustain Mali's national economy within the global market economy.

Despite the economic challenge of maintaining social condition improvements under SAPs, Mali has pursued national programs for cultural historic preservation, educational development, and telecommunications development. Mali has liberalized policy with partial competition in all telecommunications sectors and privatization of SOTELMA. Standardization and regulatory transparency of telecommunications is also progressing. Mali represents the paradox of traditional societies in least developed countries working to become part of the Information Society. Provision of modern ICT access and education presents additional challenges and benefits to the preservation of precious cultural identities integrally related to ancestral systems of knowledge. Mali is working to preserve cultural heritage through the expansion of ICT tools, particularly in Timbuktu.

#### 4.5 International Telecommunication Regimes and Policy in Mali

Telecommunications policy and legislation have transformed telecommunications in Mali. The GRM controlled PTT monopoly of 1989 has now been privatized and opened to competition in all sectors. Telecommunications and transportation infrastructures were neglected during French colonialism. As discussed earlier, the French restructured trade routes from the traditional Niger River transSaharan route to the French preferred Dakar seaport route to Europe and beyond (<http://www.ontheline.org/mali/>, accessed 2/3/02). Infrastructure development in Mali has progressed more in the first ten years of participatory democracy than it did under colonialism and dictatorship for almost a hundred years. The support of the ITU-D, UNECA- AISI and national programs like IDRC- Acacia of Canada and Leland Initiative and Internet for Economic Development (IED) of USAID have influenced telecommunications policy and programs in Mali. These organizations are included in the international telecommunications regime. Each

has partnered with Mali in providing material support, consultants and fellowships for Malian capacity building in ICT regulation, engineering and applications.

This research does not detail the telecommunications history of Mali prior to 1990. Gadio (1995) provides a detailed history of telecommunications policy and infrastructure developments in Mali from the colonial era until 1992. He describes the reform agenda through the authoritarian regime of 1980's, as "clearly entangled with World Bank recommendations and directives" (Gadio, 1995, p217). Gadio conducted a comparative study of telecommunications development in Mali, Senegal and Ghana. Gadio applied the theory of epistemic communities to a comparative examination of each country's telecommunications policy development during economic structural adjustment. The theory of epistemic communities, discussed in Chapter 3 as developed by Ernst Haas, Peter Haas and G. John Ikenberry, contributed to the "understanding of mechanisms of diffusion, coordination and communication of new knowledge and new policies between different institutions" (Gadio, 1995, p2). International regimes coordinate with the help of knowledge communities or epistemic communities in an "active relationship of exchange, negotiation give and take, without ignoring the primary concern for influence and control" (Gadio, 1995, p2-3). Gadio (1995) wrote that the new Malian law shows that the GRM was "unequivocal in its desire to retain monopoly" and had "no serious plans to allow... competition on other significant services" (Gadio, 1995, p217). The advent of a new democracy, the Internet, new ICTs to provide access and international regime collaboration projects to expand Internet power, has changed much in Mali since Gadio's research in 1992. The Multipurpose Community Telecentre in Timbuktu, described in Chapter 5, provides evidence of these changes.

The GRM has completed much of the liberalization, privatization and restructuring of the telecommunications industry in Mali, consistent with recommendations from the WTO-BTA. The national policy with international support helped modernize Mali's infrastructure, encourage interconnectivity, open competitive markets and establish regulatory transparency among national telecommunications networks. The reforms created a new institutional setting and transformed the PTT. Three new entities were

established. The Societe de Telecommunications du Mali (SOTELMA) had a private management structure with capital 100% state owned in 1995. The Office National des Postes (l'ONP) was a public enterprise for postal service with a commercial and industrial status. The Societe des Cheques Postaux et Caisse d'Epargne (SCPCE), Postal Checking and Savings was formed (Gadio, 1995). A Presidential decree, Supreme Court approval and parliamentary law gave SOTELMA power to elaborate government telecommunications sector policies and "to conceive, prepare, plan and execute infrastructure development projects" (Gadio, 1995, p209). In 2000, Comite de regulation des telecommunications (Telecommunication Regulatory Committee) was established by the GRM, with procedures of operation as an independent regulator. Mali's Ministere de la communication (Ministry of Communications), also established in 2000, now makes telecommunications policy in Mali ([http://www7.itu.int/treg/profiles2/cntryprfiles/Build\\_Guide.asp](http://www7.itu.int/treg/profiles2/cntryprfiles/Build_Guide.asp) , accessed 1/27/02).

SOTELMA the national telecommunications provider was established in 1989. Telecommunication tariffs were set in 1994. In 1999 legislation was passed to liberalize the telecommunications sector. In 2000, legislation determined the declaration procedure for the establishment of networks and the operations of telecommunications services. Legislation that same year established interconnection and sharing of telecommunications infrastructure, further liberalization of the sector and privatization of SOTELMA and established the procedure and criteria for granting telecommunications licenses. By 2001, partial competition existed in local services, national and international long distance, mobile analog and digital, mobile and fixed satellite, cable TV, GMPCS and IMT 2000. By 2001, Mali also had full competition in data, paging and ISP services. ([http://www7.itu.int/treg/profiles2/cntryprfiles/Build\\_Guide.asp](http://www7.itu.int/treg/profiles2/cntryprfiles/Build_Guide.asp) , accessed 1/27/02)

Telecommunications policy in present day Mali has built upon centuries of communications centrality to the oral and written cultural traditions of intellectual, theological and political dialogue stimulated by the international transSaharan trade routes. During the last decade the political changes in Mali enabled political and

economic partnerships, which have facilitated telecommunications policy transformations and innovative ICT applications.

Mali had one of six network-mediated empowerment projects included in a 1995 research study, which measured and compared the return on investment (ROI) in telecommunications (Ruth, 1995). Six pacesetter institutions were chosen based on connectivity needs for sufficient capacity to offer basic network services: E-mail, file transfer, lists, bulletin boards and data bases. Estimates of needs for achieving sustainable connectivity were made for each institution. One of the pacesetter institutions was CERPOD, the Centre for Applied Research on Population and Development headquartered in Bamako, Mali. CERPOD is the population studies center of the Institut du Sahel (Sahel Institute or INSAH), a regional institution serving the nine Sahelian countries of the Permanent Interstates Committee for Drought Control (CILSS), Burkina Faso, Cape Verde, Chad, Gambia, Guinea Bissau, Mauritania, Niger and Senegal. Communications linkages are important for CERPOD, since it conducts studies on population, drought and other issues, which affect the entire Sahel region. CERPOD's requirement for potential Internet traffic was 500 MB/Month compared to the five other institutions, which estimated either 100 or 200 MB/Month. Of the six projects, the study concluded that:

(p)erhaps the most successful of the six is CERPOD, in Bamako, Mali, where the director of the institute, Dr. Dieudonne Ouderaogo, has made a specific management decision to provide the infrastructure, long term funding and results-oriented management leading to high volumes of message traffic and broad diffusion of Internet technology in the institute and among their partner institutes in the Sahel region of Africa (Ruth, 1995).

Findings in this research about innovative e-strategies in Mali for ICT applications were consistent with Gadio's findings. Through interviews with Malian telecommunications officials, Gadio found that they "showed a real awareness of international issues" related to telecommunications and development, investment and reform. They often referred to the Maitland report, ITU and UNDP seminar participation and the importance of keeping updated on the most recent issues in the sector (Gadio, 1995, p216).

Emmanuel Dabou was the Managing Director of SPIDER.Ltd., when it became an early non-governmental Internet Service Provider (ISP). He also heads Internet Society Mali (ISOC-Mali, [isoc-mali@sotelma.ml](mailto:isoc-mali@sotelma.ml)) chartered in June 1998, with 63 members by 2002. Development of the Internet in Mali began when SOTELMA first provided Internet access in 1992 with an X.25<sup>11</sup> line. The first client, ORSTOM, a French development aid agency, used the X.25 line to provide email service. In 1994, two private companies (BINTTA and SPIDER) also began to provide an Internet e-mail service. BINTTA's service was with RIO and SPIDER's was based on the FIDOnet/Internet email service (Dabou, 2000).

In 1996, USAID, through the Leland Initiative, helped SOTELMA provide a full Internet service by financing satellite bandwidth acquisition for 3 years and by training SOTELMA's technicians. SOTELMA then gave four licenses to the private sector in Mali to provide full Internet Service. These first companies were: BINTTA, SPIDER, DATATECH and CEFIB. The high cost of telephone calls in Mali made email the most popular service for everybody with access. "Internet users in Mali increased from 500 to 5000 in two years. Computers still cost over three times what they cost in the US" (Dabou, 2000, p1).

Problems with the development of Internet access in Mali include the infrastructure constraints of the telephone system, the high cost of computers and Internet access, electrical power outages and the difficulty of disseminating information about the benefits of ICTs. The public perception of the Internet as a development tool must be cultivated. The Internet can provide information and communication applications for development of the agricultural, health, educational and economic sectors with structured training programs. Three months delay for a phone line was average in 2000 and Internet access ranged from US\$30 to US\$100 per month for end users when SOTELMA was the monopoly provider. Some ISPs now provide wireless Internet access but at much higher

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<sup>11</sup> X.25 is an ITU-recognized protocol for user access to data networks (Frieden, 1996 p404).

costs, US\$300-US\$1000/month (Dabou, 2000). By 2002 there were eight Internet Service Providers (ISPs) in Mali. Bandwidth and Internet access costs have decreased with the pro-competitive policies and growth of ISP's in Mali.

Since 1990, much has changed in the telecommunications landscape of Mali. The ITU has cooperated on projects in Mali. Teledensity in Mali, measured as main telephone lines per 100 people, grew from 0.13 in 1990 to 0.25 in 1998 and 0.35 in 2000. In 1992, 72% of the main lines were digital. In 1998, 93% were digital. Residential teledensity, or mainlines per 100 households grew from 0.2 in 1990 to 0.5 in 1998 and 1.96 in 2000. Residential mainlines have grown from 22.0 % in 1990 to 38.7 % in 1998. The number of public payphones grew from 113 in 1992 to 983 in 1998. Many of the payphones are still located in the post office (ITU, 2000, p105, [http://www7.itu.int/bdt\\_cds/CDS/Country\\_Data.asp?Country=MLI](http://www7.itu.int/bdt_cds/CDS/Country_Data.asp?Country=MLI) accessed 3/25/02).

The ITU-D supports three projects in Mali. The MCT in Timbuktu, a pilot model for planned ICT rural replication projects, has been supported from 1998 until 2002. The ITU has assisted in planning the privatization of SOTELMA, completed in 2002. Since 1992 the ITU has supported programs for radio diffusion throughout Mali. The radio projects have been an important medium for equitable gender inclusion in content development. Radio is low cost, literacy independent and the most pervasive communication technology ([http://www7.itu.int/bdt\\_cds/CDS/Country\\_Data.asp?Country=MLI](http://www7.itu.int/bdt_cds/CDS/Country_Data.asp?Country=MLI) accessed 3/25/02).

The ITU has also supported indigenous capacity building through funding expert consultants and Malian fellowships in telecommunications development and regulation. Since 1996, 32 experts including one woman have contributed 819 days to ICT development projects in Mali (See Figure 4.1). In 1997, the year that the MCT project began, 14 experts contributed 401 days. The numbers in Figure 4.1 indicate that ITU experts decreased as infrastructure increased. Data of Figure 4.2 show ITU fellowships for telecommunications personnel development increasing then decreasing in 2000.

Figure 4.1 - ITU funded experts (gender disaggregated) 3% female (n=1:33)

Year	Days	#Experts
1996	291	7
1997	402	14
1998	150	8 (1 woman)
1999	20	1
2000	42	2
2001	14	1

Source ITU

[http://www7.itu.int/bdt\\_cds/CDS/Country\\_Experts.asp?Country=ML](http://www7.itu.int/bdt_cds/CDS/Country_Experts.asp?Country=ML) accessed 3/25/02

The ITU-D also provided fellowships for telecommunications development with increasing percentages for women between 1993 and 1999 as shown in Figure 4.2. In 2000 the total number of fellowships, time funded and percentage of women decreased for reasons that were not explained in the ITU literature. By 2000, the infrastructure and ICT capacity had increased with 255 Malians trained through ITU fellowships.

Figure 4.2 - ITU fellowships granted in Mali. 6.3 % female since 1993 (n=16:255)

Year	Total time (days)	#Fellowships Female	#Fellowships Male	Fellowships Total	% Female Fellowships
1993	1023	0	35	35	0
1994	534	0	31	31	0
1995	418	2	22	24	8.3 %
1996	762	0	50	50	0
1997	316	2	28	30	6.7 %
1998	233	6	32	38	15.8 %
1999	502	5	26	31	16.1 %
2000	52	1	15	16	6.2 %

Source ITU

[http://www7.itu.int/bdt\\_cds/CDS/Country\\_Fellows.asp?Country=MLI](http://www7.itu.int/bdt_cds/CDS/Country_Fellows.asp?Country=MLI) accessed 3/25/02

From 1996 to 2000, 3.1% of the ITU experts in Mali were female. The ITU funded Malian fellowship students were 8.5% female during the same period.

The ITU measured cellular teledensity in Mali as 0.01 in 1996, 0.04 in 1998 and 0.09 in 2000. Mali has chosen to expand wireless service through satellite, microwave and

cellular technologies. Much of the country is rural with no wireline or fiber service. Transportation infrastructure used to facilitate wiring in other countries is still minimal in Mali. Most regions have few roads and most are unpaved roads except in the main cities. While this circumstance remains, wireless may continue as the fastest growing telephone service. The television broadcasting audience has broadened from 80, 000 receivers in 1992 to 130, 000 in 1998, a 38.4 % increase. Home satellite antennas doubled from 500 in 1992 to 1100 in 1998. (ITU, 2000, p105)

One important area of change has been in capital investment. Annual telecommunications investment grew from 2.4 million (\$US) in 1992 to 24.2 million in 1998. Internet and computer use also grew. In 1995, the first ITU estimate for computers in Mali was 3,000. In 1999 that number more than tripled to 11,000. Internet user estimates by the ITU were 200 in 1990 and 10,000 in 1999. The Multipurpose Community Telecentre pilot project in Timbuktu was established in 1998 and has been fully operational in its permanent facility since 2001. This model has successfully applied ICTs to provide community information needs. In addition it has brought one of the more remote regions into networked communication with the rest of Mali and the world. Plans are underway to replicate this model as a means of providing multipurpose telecommunications services to other rural communities in Mali (ITU, 2000, p105). This project will be examined in greater detail in the next chapter.

Mali has included regional neighbors in its own knowledge building efforts to upgrade national ICT capacity. Mali hosted a regional training program through the CISCO Networking Academy (CAN) in Spring 2001. Public-private partnerships for ICT infrastructure and capacity development are recommended by each of the organizations in the international telecommunications regime and their epistemic communities. CISCO Systems gender initiative plans to increase women's enrollment in the networking academy programme. CISCO Systems is a technology company that sponsors Networking Academies in 130 countries. The academy in Mali is based at the university in Bamako. The CNA offers women a comprehensive 10 course e-learning program in math, science, problem-solving, reading and writing as well as essential Internet

technology skills. CISCO participates in the international telecommunications regime and the international gender equity regime in training partnerships with UNDP and UNIFEM. At the Beijing+5 UNGASS, CISCO and UNIFEM cosponsored the “ICT Women’s Education and Training,” the only panel session within the UN focused on the issue of ICT and gender.

In April 2001, the University of Mali and the Francophone University Agency conducted an international training session in the administration of Linux data processing networks. Linux is the open source computer operating system developed by computer and systems design engineers from all over the world. Engineers continually contribute improvements to Linux for the joy of designing the best, most universally applicable system. Linux is available for free to all users. Training participants gathered from Mauritania, Guinea, Niger and Mali. The teaching team of Malian, French and Bulgarian experts used a module focused on the installation of a local area network (LAN), integrating UNIX servers with TCP/IP regional and national permanent interconnectivity to connect with the Internet and Global Information Infrastructure. The trained network managers gained the capacity to continue lifelong learning in ICTs through the Internet and to become trainers in their respective countries (Pan-African News Agency 4/3/01 report, [www.sndp.undp.org](http://www.sndp.undp.org) , accessed 11/8/01 translation by Babelfish, AltaVista).

The telecommunications development in Mali has enabled the country to host international arts and sports events. Mali generated and hosted the Timbuktu 2000 international world music festival during January of 2000. The African Nations’ Cup 2002 soccer competition determines which African nations will go to the World Cup. The Nations’ Cup was held in Mali during January and February of 2002. Telecommunications infrastructure development was an important factor in Mali’s selection as host of the event. Satellite-delivered television broadcasts of the games were seen throughout the world. The Nations’ Cup was probably the most widely covered media event to occur in Mali since the advent of television.

Mali's fixed line and mobile communications network doubled its capacity between the capital Bamako and the remote cities of Kayes and Sikasso with the addition of a communications network designed and implemented by South Africa's Telkom. This project was planned in December, 2001 and engineered in early January 2002, to ensure effective national and international communication for the duration of the African Nations' Cup. A combined team of Telkom and specialized turn-key systems staff installed the network early in January 2002 with the support of SOTELMA. MaliTel, the country's mobile service provider was also supplied with additional bandwidth for the event. Major soccer stadiums were built for the tournament in Bamako and Kayes in the North and Sikasso in the South. National networks of satellite, fixed line and mobile communications linked the cities and stadiums with the rest of the world to bring international coverage of the world's favorite sport (BalancingAct news update #53, 2/3/02).

Electrical power or the lack of it has been an obstacle to telecommunications development. Mali has several projects to expand electrical power and provide water for irrigation in this often drought-threatened, agricultural environment. A project began in 1991 to expand the electricity sector in Bamako. The project aims to extend the electrical grid to the peripheral districts of Bamako. Organization for the Development of the River Senegal (OMVS) began Project Manantalu in 1997. The project will build and equip the hydroelectric power station of Manantalu, Mali and install an electricity transmission system interconnection to the national network of three member states of the OMVS (<http://www.ldcs.org/mali/malicom.htm>, accessed 1/27/ 02).

Mali partnered with UNDP to develop the Mali multifunctional platform, a diesel driven device that produces mechanical energy for lighting and communication. The energy is also used for agricultural processing, water pumping, electricity for welding and other income-generating tasks. Women that manage the Mali platform also earn an income from the sale of energy services. The platform is already installed in more than 80 villages around Mali and is set to expand across the West African region (Padamsee, 2002). Energy issues are gender issues. Particularly in developing countries, much of

women's time is spent gathering fuel for cooking and heat and gathering water for household and agriculture. Provision of more efficient energy resources for each of these functions creates opportunities for more efficient and productive applications of women's time (Wakhungu and Cecelski, 1995). Recognizing the gendered nature of the relationship between poverty and distribution of energy resources, the UNDP works on cross-sectoral energy issues in 70 percent of its country operations. UNDP applies an integrated approach to increase sustainable energy and heat services to meet the Millennium Development Goal of cutting extreme poverty in half by 2015 (Padamsee, 2002).

The African Global Information Infrastructure (GII) Gateway Project is a five Year \$15 million interagency effort coordinated by US Agency for International Development (USAID). It is also known as the Leland Initiative, named for Congressman Mickey Leland who was killed in a plane crash in Ethiopia while working for greater economic justice and cooperation between the US and countries of Africa. The initiative provides support for ICT infrastructure and capacity development in African countries, while encouraging constructive policy change toward international telecommunications transparency. Impact assessments of programs and policy are included in the work of the Leland Initiative. The Mali-US partnership has generated growth in telecommunications infrastructure, capacity and development of national applications.

ITU data, Leland Initiative data and UNDP 2001 Report data each show national ICT capacity growth in Mali with greater participation in the Information Society. The World Bank plans to include the University of Mali in Bamako in the World Bank tertiary distance education project, the African Virtual University, according to Shola Aboderin, AVU Liason Unit Manager (conversation with author 4/7/01). Telecommunications infrastructure development, which included recent infrastructure buildup for the Africa Nations Cup 2002, was one prerequisite condition for Mali's inclusion in the AVU.

Mali's partnership with the Leland Initiative has facilitated ICT growth and highly productive applications of ICTs to Mali's information needs. One political ICT

application is a program to extend ICT access through the 701 political communes. These communes held their first election to choose local political leadership in 2001. Most communes are in rural Mali without wire or fiber access. President Alpha Oumar Konaré pledged his full support for a program to equip each of the 701 communes with an Internet access point. He challenged his government and the donor community to choose the appropriate technologies and find adequate funding to make this a reality. USAID is in negotiations with Volunteers in Technology Assistance (VITA) and WorldSpace for rural e-mail store-and-forward systems that would allow rural Malians to send and receive emails. Worldspace has an inexpensive two-way satellite radio transmission receiver system, proposed as the technology to connect all 701 communes; rural farming areas of the fertile south, fishing regions along the Niger River and the most remote cattle and camel herding regions of the desert north. The satellite signals can send and receive email and allow limited web access through the wireless technology. USAID provided field support for the first trials of Internet access via the WorldSpace digital satellite technology.

Mali mandated two new bodies to ensure transparency for the presidential elections, April 28, 2002. The National Electoral Independent Commission (French acronym CENI) and the General Delegation for the Elections (DGE) were formed to assist the Ministry of Territorial Administration with distinct but complementary roles in supervision of the polls. Each of 24 candidates were allocated 10 minutes per week on state radio; a six-minute spot on state television, and an additional 10 minutes to field questions from a journalist on the state television. Candidates are also entitled to a quarter of a page free space in the state owned daily newspaper, l'Essor (<http://allafrica.com/stories/200204110495.html> accessed 4/12/02).

This community access to candidates and their platforms through the media and personal appearances contributed to a peaceful election and runoff election. New President Amadou Toumani Touré elected was by 65% of the voters in May, 2002. Election results were communicated through the information technologies of telephone, radio and the Internet.

USAID provided Mali's 107 community radio stations with Internet access, to bridge the technology gap and allow information from the Internet to be disseminated on FM radio. VITA completed a program in Mali, which developed educational radio drama to address locally relevant social and political issues (<http://www.usaid.gov/leland/>, accessed 1/27/02).

Mali has implemented programs with USAID, the Leland Initiative and Internet for Economic Development (IED). The strong leadership and vision of President Alpha Oumar Konare has guided Mali through growth in ICT infrastructure, capacity and application to national needs. The Leland Initiative assisted the Government of Mali and SOTELMA, the national telephone carrier in establishing affordable Internet access rates and a vigorous Internet Service Provider industry. President Konare hosted Bamako 2000, an Africa-wide high level conference to highlight both Africa's needs and opportunities in information and communication technology. USAID has provided the Ministry of Communications and SOTELMA with policy guidance in the privatization of the telecom sector in Mali. USAID influenced SOTELMA to establish special telephone numbers allowing people throughout the country to access their Internet Service Providers at local telephone rates (<http://www.usaid.gov/leland/>, accessed 1/27/02).

USAID is the only donor to sit on a commission established to develop strategies for the use of new information and communication technology, including Internet access points in rural communities. USAID facilitated the creation of the first Chapter of the Internet Society in francophone Africa, and sponsored 200 first-year memberships. USAID facilitated the creation of an association of Internet Service Providers in Mali. This association will improve access quality and reduce costs by sharing infrastructure and facilities, and will provide advocacy and training services to its members (<http://www.usaid.gov/leland/>, accessed 1/27/02).

USAID Mali is installing a high-speed wireless Internet backbone for the University of Mali. With 250 PCs in ten departments, each connected via high-speed wireless modems, the University will offer full Internet access for students, teachers and

researchers. USAID Mali established full Internet access for parliamentarians of the Mali National Assembly, by providing equipment and a wireless Internet connection. This backbone makes it possible for the University to participate in the AVU, Africa wide distance education initiative of the World Bank (<http://www.usaid.gov/leland/>, accessed 1/27/02).

The Economic Community of West African States (ECOWAS) formed the Information and Communications Special Objective (ICSO) in 1996. It identified Internet access and rural radio as its two major areas of intervention and devoted exclusive support to activities that promote access to-and use of-information. The Information and Communications Special Objective provided technical assistance for the creation of a West African Telecom Regulatory Authority (WATRA), and for the establishment of an intranet network for ECOWAS (<http://www.usaid.gov/leland/>, accessed 1/27/02).

The Education for Development and Democracy Initiative (EDDI) funds work by the USAID Information & Communications and Democratic Governance teams to bring the Internet to Parliament, allowing lawmakers and their staffs to have access to law libraries and legal and regulatory databases throughout the world, and will give the National Assembly a means to disseminate Malian laws and regulations in local languages. USAID Mali provided the Ministries of Communications, Education and Rural Development with full Internet access (<http://www.usaid.gov/leland/>, accessed 1/27/02). Training has been provided for the Malian Ministries of Environment, Rural Development, Territorial Administration and Communes, and Education. In addition, training has been provided for environmental workers (counterparts of the US Environmental Protection Agency), the Malian Volunteer Corps, Helen Keller International, the association of community radios in Mali, and a host of local and international NGOs (<http://www.usaid.gov/leland/>, accessed 1/27/02).

EDDI also funded USAID Mali to provide intensive training for University of Mali students, teachers and administrators. The training in the operations of the network helped optimize usage and applications of ICTs in developing knowledge through

scholarship at the University. The Information and Communications Special Objective provides regular Internet training courses for partner institutions developed to address the specific needs of the institutions.

USAID Mali donated 16 PCs to the Mali Chapter of the Internet Society for training and demonstration purposes. USAID Mali has donated equipment for a wireless Internet connection to the Pathfinder Foundation, which will provide Internet training courses. This Foundation was created by Dr. Cheick Modibo Diarra, a Malian-American employee of NASA who navigated the Pathfinder Mission to Mars. USAID Mali was instrumental in getting Cisco Systems to set up a regional training academy at the University of Mali. Cisco decided to establish a training academy in Mali because of USAID support to the University including the USAID funded University network (<http://www.usaid.gov/leland/>, accessed 1/27/02).

USAID IED objectives coincide with telecom policy and access changes in Mali. The privatization of the SOTELMA has improved access, lowered costs, stimulated private ISP competition and helped improve Internet services. Mali recently reduced customs duties on computer equipment from 67% down to 5%, which will make it much easier for Malians to purchase computers.

Telecommunications has helped compensate for poor transportation infrastructure in Mali. ICTs are distance transparent. Transactions, which previously required time and resource consuming travel, can now be completed over the Internet or other ICTs. Many important government, trade, health and education operations are migrating onto the Internet with expanded infrastructure. The recent buildup of telecommunications infrastructure in Mali has eased some of the effects of poor transportation infrastructure. The paved road network has improved. Asphalt roads now connect Bamako with the major large cities and some remote districts, but much of the country is still without paved road access. ICTs alleviate some of this constraint.

Mali has 27 airports throughout the central and southern, non-desert region of the country. Timbuktu has the northern-most airport in Mali. A railway connects Bamako and Dakar, Senegal on the coast through western Mali. The rains allow large boats to navigate the river Niger from August to December. Only small boats can navigate the river all the year round. The river provides fishing trade and primary transportation to many Malians. Buses connect the principal cities but most rural regions can only be reached by trucks or vans. Camel travel and walking are still the primary means of transportation across the desert regions (<http://www.tombouctou.org.ml>, accessed 1/27/02).

Television has transmitted from Bamako and some regional centers since 1983. The GRM controls radio and television. Television programs are mainly in French. Local languages are common on radio. Radio is the most heavily used communications system, reaching 75% of the population. Only one newspaper published during President's Traore's rule. An alternative newspaper appeared the day before the coup d'etat in 1991. This newspaper and three other daily newspapers now form part of the flourishing free press (<http://www.tombouctou.org.ml>, accessed 1/27/02).

Mali has sought and accepted partnerships for ICT development through the international telecommunications regime. Mali has benefited from the expertise of the knowledge community and the material support of members of the regime. Mali invited the ITU, USAID, IDRC, UNESCO, World Bank and other regime architects of the Information Society to reach across the technology gap, the cultural gap and the economic gap and forge a connection that can be sustained with continued trust and cooperation.

Regional cooperation for telecommunications development in West Africa has facilitated growth. SOTELMA and its Senegalese and Mauritanian counterparts have agreed to develop a regional fiber-optic telecommunications link. Direct calling between West African states is now possible through the fiber link. International call routing through former colonial ties in Europe has been the inefficient norm for many African countries. The fiber link is scheduled for completion in 2002 (Southwood, 2002). Economic

development in Mali has been slow during the 1990's according to global criteria. Economic growth remains at a modest 4.8% showing gradual annual increase. GDP per capita annual growth rate for Mali averaged 1.1% from 1990 to 1999. This matched the world average and exceeded the least developed country average for that same period. Between 1990 and 1999, annual imports of goods and services grew from 34% to 36% of GDP and annual exports of goods and services grew from 17% to 25%. The 5% increase in imports and 32% increase in exports during the 1990's indicates a promising trend of economic growth for Mali (UNDP, 2001a).

#### 4.6 International Gender Equity Regimes and Policy in Mali

International regimes have influenced gender equity policy in Mali. Mali has ratified all international human rights treaty agreements. The World Conferences on Women Platform for Action implementation in Mali has demonstrated progress in women's education, an end to violence against women, inclusion for women in media content development and ICT capacity building and women's economic and social development. Gender-disaggregated statistics for Mali from the World's Women 2000 Report show evidence of improvements in women's education, life expectancy and reduced infant and maternal mortality rates (UN, 2000). This section includes a description of Mali's efforts to incorporate the knowledge resources of these gender equity epistemic communities into its national programs for the benefit of Malian society.

International forums on women's issues have identified achievement of gender equity in education as a priority issue. Equal education for women and girls for building knowledge in health, employment and other areas fosters improvements in most other development indicators:

Things are really changing in the relationship between men and women in Mali. For example, if there was a meeting in a village, the men would attend, and even if a woman wanted to, the husband wouldn't allow it, and the other men wouldn't accept it. But that's changing now, and women are beginning to have their voice.

For me it's not a question of domination: I don't want to dominate any man, but I want to be free and independent, and I can only achieve this by working. And yes, I am optimistic that I will get a good job and do what I want to do. Aminata Sylla, age 15, student in Bamako, Mali (<http://www.ontheline.org.uk/explore/journey/mali/print.htm> #Speaking out accessed 1/29/02).

This hopeful account from a schoolgirl in Mali is one voice among a nation of women emerging from the most extreme circumstances of poverty, illiteracy, and infant and maternal mortality. Her voice represents the indomitable courage and strength of Malian woman who “held up half the sky” through colonialism, dictatorship and natural disaster. Malian women made significant contributions to the political transformation, which launched Mali into an era of progress unprecedented in over a century. Gender analysis of the telecommunications progress in Mali includes analysis of gender equity programs for education, media content development, and political organization and representation.

The Canadian International Research Association provides this description of gender analysis:

Gender analysis refers to the variety of methods used to understand the relationships between men and women, their access to resources, their activities, and the constraints they face relative to each other. Gender analysis provides information that recognizes that gender, and its relationship with race, ethnicity, culture, class, age, disability, and/or other status, is important in understanding the different patterns of involvement, behavior and activities that women and men have in economic, social and legal structures.

At the local level, gender analysis makes visible the varied roles women, men, girls and boys play in the family, in the community, and in economic, legal and political structures. A gender perspective focuses on the reasons for the current division of responsibilities and benefits and their effect on the distribution of rewards and incentives (<http://www.cira.org.ca/gender> , accessed 1/27/02. p1).

Mali's telecommunications policy includes programs to achieve for gender equity in ICT access, use, management and regulation of ICTs.

The study of gender equity in ICT policy in Mali begins with the identification of factors, which enable women's involvement with ICTs. These factors include women's

recognition of the benefit potential of ICTs and women's presence at all levels of ICT development: 1. planning; 2. training; 3. infrastructure; 4. network and facilities design; 5. operations management and 6. ICT applications to Malian information and communications needs. Women in the ICT planning stage can inform the process so that ICT facilities are more accessible to women. Research has shown that women are more responsive learners when there are women teachers. Women's input for infrastructure development and network and facilities design can ensure that women ICT users work in a "women friendly" environment. Women in operations management provide leadership opportunities for women with leadership qualities. Women can design ICT applications for information and communications needs relevant to all sectors but women's input is particularly important for applications to the social needs of other women, children and families.

Failure to address these factors can result in a disabling ICT environment for women. Research has shown that inclusion of women as curriculum designers and trainers significantly increases the success rates of ICT training programs for women. The gender obstacle to science and technology capacity building can be overcome through women working together (Marcelle, Karelse, Goddard, 2000).

Women and men have been involved in ICT growth in Mali. Evidence includes the first MCT pilot project staff, with two of four MCT positions held by women. The ITU sponsored fellowship program for ICT training included an increasing percentage of women until the fellowship numbers dropped in 1999. The ITU experts from 1996 to 2000 included 3.1% women, while the ITU Malian fellowship students included 8.5% women during the same period. This percentage of female ICT fellowship students is high in comparison with Mali's other educational enrollment figures for females. In 1999, female secondary enrollment was only 8% of age group and female tertiary enrollment showed no measure in World Bank data or in the UNDP 2001 Report data (UNDP, 2001a, <http://www.genderstats.worldbank.org> accessed 7/1/01).

International telecommunications and gender equity regimes are stakeholders who both work to promote and support projects aimed at the equal participation of women and men with ICT development in Mali. ICT projects have become important tools for political and economic empowerment in Mali. Policies seek to extend that empowerment equitably to women and men. Gender gaps close when gender equity benefits to all become evident. Research covered in chapter 2 (King and Mason, 2001, UNDP, 2001a) has predicted and quantified benefits of gender equity in many social sectors. Gender equity research on ICTs in LDC's is still scarce because the ICT diffusion is sparse. One example of ICT benefits in Mali comes through agricultural information for higher productivity, better pricing and more efficient distribution. The most popular radio show in Mali broadcasts current price reports on agricultural products. Gender equity in information access matters in agriculture because women produce close to half of the agricultural products, which determine 80% of Mali's GDP. ICTs improve women's access to health information. Research has shown that entire family health is improved when women have access to health information. The MCT was first set up in Timbuktu hospital for staff training and development of ICT health applications.

Telecommunications and ICT development policy can foster overall economic development through improved access to market information and Foreign Direct Investment (FDI). Women contribute equitably to the Malian economy, so gender equity in ICT development can stimulate ICT enhanced economic growth. Mali is one of the target countries included in the Women's Business Network for West Africa (WBN) established with support from USAID. The objective of the WBN is to improve the ability of African business women to use ICT to access critical market information, identify prospective business opportunities, increase sub-regional information flows and facilitate cross-border and international trade linkages. Mali and other target countries were chosen with "demonstrated experience in developing human and technological requirements for a networked association servicing businesswomen within the region." The WBN also includes Benin, Cote D'Ivoire, Gambia, Ghana, Guinea, Niger and Senegal (<http://www.pambazuka.org/newsletter.php?id=6204>, 2002). The MCT case

study chapter will detail some advantages ICTs have provided to the Timbuktu local economy and women entrepreneurs.

Mali has implemented innovative programs to include gender equity in ICT access, participation and applications development. International regimes and public-private partnership support have been essential to the planning and implementation of these programs. ICT development policy coupled with gender equity policy have reinforced support from both the telecommunications regime, particularly the ITU -TFGI and the international gender equity regime. The UN treaties, agreements and the gender equity epistemic community have each contributed to the formation of gender equity policy and implementation strategy in Mali.

#### 4.6.1 CEDAW

Mali ratified the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) United Nations Treaty in 1985. Commitment to CEDAW led Mali to participate in the World Conferences on Women. Mali established the Ministry for the promotion of Women, Children and the Family, as part of the national machinery for gender equity and implementation of recommendations of the four World Conferences on Women. The conferences were held in 1975 in Mexico, 1985 in Nairobi, 1990 in Copenhagen, and 1995 in Beijing. The 2000 Beijing +5 United Nations General Assembly Special Session (UNGASS) was held in New York in 2000 to assess progress since Beijing and create strategy for continued progress.

#### 4.6.2 Beijing Platform for Action

Mali presented its national action plan and strategy for implementation of the Beijing Platform for Action to the United Nations Secretariat. Commitment to the 1995 twelve Platforms for Action, which operationalized much of the 1985 Nairobi Forward Looking Strategies, is evident in the social and political development in Mali since 1995.

Women's political participation and education have grown significantly. Mali has one of the highest percentages of women in Parliament, and in ministerial level positions of all other African countries. In 1985 prior to the 1991 political change, women represented

4% of parliamentary seats. By 1999 that number had tripled to 12.2% (United Nations, 2000b). Women in Ministerial level positions grew to 10% in 1994 and 21% in 1998 (UNDP, 2001a).

As of May 25, 2001 Mali was one of only nineteen countries with all conditions met for implementation of the Beijing Platform for Action and compliance with the International Legal Instruments on Women. Mali had met the recommendations to: establish National Machineries; submit the National Action Plans; reply to the Questionnaire; submit a country report to CEDAW (examined in 1988) and ratify the Optional Protocol (<http://www.undp.org/unifem/> , accessed 7/7/01).

#### 4.6.3 Mali and the World's Women 2000: Trends and Statistics

The Statistics Division of the United Nations tracks statistics gathered by the many organizations and agencies of the UN and identifies trends through analysis of statistical changes over time. All four World Conferences on Women have contributed to the implementation of gender-disaggregated data collection throughout the world. The Fourth World Conference on Women held in Beijing in 1995 defined the strategic objective H.3 of the Beijing Platform for Action. H.3 calls for generation and dissemination of gender-disaggregated data and information for planning and evaluation. The World's Women 2000: Trends and Statistics (United Nations, 2000b) was published just before Beijing +5 UNGASS and distributed to all the participants in New York. It includes tables of data and narrative discussion, which interprets the country data for "207 countries or areas comprising all United Nation Member States and countries and areas with a population greater than 50,000" (United Nations, 2000b, p. xi).

Mali's population was 11.2 million people in 2000. There are 103 women for every 100 men in Mali. The annual population growth rate is 2.4. The population growth rate impacts development for women and therefore national development. As research described below shows, higher education for women reduces fertility with long-term health improvement effects. Education of women and fertility were examined in a recent

study, which included Mali and 16 other African countries. The study investigated the link between mass education (the near universal enrolment of children in primary schooling) and the fertility transition; that is, the immediate or short-term impact of education policies on family size (United Nations, 2000b, p.91). At the time of the study Mali was “far from achieving mass education” (United Nations, 2000b, p. 91) but had implemented policy toward achievement of mass education. Research has shown a direct relationship between education of women and birth rate reduction, which contributes to child and maternal health (Lloyd, Kaufman, Hewett, 1998). Mali has 46% of its population under 15 years of age and this figure is predicted to jump to 62% by 2010 (US Census Bureau, 2001). Educational policy is therefore focused on primary education to bring about change for the emerging generation. The 1999 primary education figures showed 41% female, 59% male enrollment, greater educational gender equity than ever previously recorded in Mali. The study considered the hypothesis that “mass education is effective in bringing about demographic changes, only to the extent to which improvements are not confined to boys” (United Nations, 2000b, p. 91). In almost all 17 countries the study found that enrollment for girls was increasing and the gender gap in education was decreasing (Lloyd, Kaufman, Hewett, 1998).

Mali’s Ministry of Basic Education (MEB) has committed to and has expanded education facilities to the largely underserved rural regions of Mali including Timbuktu. Major problems and obstacles to gender equity in ICT education and access include illiteracy, high maternal and infant mortality and high fertility rate. Research has shown an inverse relationship between women’s higher education and fertility and between women’s higher education and infant and maternal mortality rates. Mali has achieved greater gender equity within the primary education levels, with a national goal of gender equity and universal education.

Mali still ranks in the lowest 25% by HDI among 193 UN member nations, but has steadily increased its HDI since 1975. This research does not explore the debate over methods for quantitative data collection and statistics to measure human development. With acknowledgement of the vast literature and diverse perspectives on this subject, this

research uses the HDI measure with its limitations because it was developed and used by the UNDP. It is calculated for all countries with index data, which assists in comparative study. The largest HDI increases for Mali have been during the period examined in this study, 1990 to 2000. As previously described, this period has been one of dynamic change in telecommunications liberalization, gender equity policy, reform in education and political participation.

Figure 4.3 Human Development Index increase from 1975-1999

<b>YEAR</b>	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1999</b>
<b>Mali HDI</b>	<b>0.251</b>	<b>0.277</b>	<b>0.291</b>	<b>0.310</b>	<b>0.344</b>	<b>0.378</b>
<b>INCREASE (5yr)</b>		<b>0.026</b>	<b>0.014</b>	<b>0.019</b>	<b>0.034</b>	<b>0.034</b>

Source: Human Development Report 2001, p158

#### 4.6.4 Education and Gender Equity Policy in Mali

The GRM has moved aggressively to overcome the social and economic impedances of colonial and neocolonial patterns of gender discrimination in education described by Rodney (1982). The GRM education policy seeks to build universal education with gender equity. Mali has made slow but steady progress toward this national objective. Though still far from the goal, Mali has created more schools and increased enrollment. Proactive strategies for improving educational gender equity have increased literacy for women. Mali showed the second highest increase in secondary level female net enrollment ratio between 1985 and 1997 of the 38 African countries charted (UNDP, 1999, pp 229-32). According to the UNDP, female literacy in 1999 was 33% and male literacy was 47%. Though 67% of the world's illiterate are women, in Mali only 56% are women (UNDP, 2001). The Ministry of Basic Education (MEB) in Mali has formed constructive cooperative programs with international NGOs in order to better achieve universal education with gender equity. The Association of Educational Development (AED) and other USAID-funded programs for educational development in Mali have worked with the GRM to increase education particularly primary education.

The Academy for Educational Development (AED) recently completed a USAID funded education project in Mali. The research contributes to the Malian MEB's ten-year reform program (PRODEC) calling for greater attention to girls' education. The project objectives included teacher training and curriculum development addressing gender issues. The project focused on the education of girls and the education of educators of girls to develop greater sensitivity to gender issues in the classroom, in course content and in the greater social context of gender issues for both female and male students.

AED also conducted a study to identify current weak areas in the participation by women in the information revolution in developing countries. The study sought to identify primary objectives for more equitable participation by women and intervention strategies to achieve the objectives. Education and training of women was linked to leadership and success in information technology.

As the “digital divide” is fast becoming a household word, the importance of women's access to information technologies (ITs) is emerging as a priority. The Internet economy's ever-increasing demand for skilled workers and innovators holds great potential to positively impact women's well-being, if they gain access and relevant skills. Women in developing countries face particularly severe obstacles to access and use. Low literacy and education levels, lack of economic resources, and socio-cultural norms that discourage girls from pursuing nontraditional careers and professions hinder women's participation and leadership in the fast growing IT field (Taggart and O'Gara, 2000, p2).

Mali has shown a faster increase in the education of women than of men and a continuous increase in school enrolment overall. This shows evidence of the effectiveness of combined gender equity and educational development policy.

The African Virtual University (AVU) project of the World Bank, InfoDev, USTDA and bilateral donors considered the problem of lack of gender equity in the feasibility study for the project:

Besides the low level of access, there is a crying gender imbalance, which is most pronounced in the scientific and engineering disciplines. The extremely poor representation of females in those disciplines calls for remedial action. The extent of unmet demand and a de facto non-

representation of women in disciplines with promising employment prospects are illustrated by ...female under-enrollment in engineering disciplines, the examples of Uganda and Ivory Coast ...are illustrative of the situation, which prevails throughout SSA (<http://www.worldbank.org>, 4/10/01).

The study found that AVU was a feasible project and that greater access and equity in tertiary education, particularly in science and technology was needed.

The UN report on the Worlds Women (UN, 2000b) found that:

The gender gap in primary and secondary schooling is closing but women still lag behind men in SSA...Two thirds of the 876 million illiterates in the world are women...More women than men lack the basic literacy and computer skills to enter 'new media' professions (UN, 2000b, p85).

The report found that in Mali, the combined primary/secondary gross enrollment ratio was 20% women and 33% men; higher for women than Burkina Faso and Niger but lower for women than other surrounding countries (UN, 2000b, p87). Lowering fertility in high fertility rate countries has been found to improve reproductive health of the mother. Higher education has been found to lower fertility rate. The vast amount of research about the relationship between education and fertility has found that:

(B)asic literacy alone has little effect on reducing the number of children a woman bears ...Higher education levels show a clear inverse relationship between educational attainment and fertility (UN, 2000b, p89).

As education for women has increased, fertility has decreased in Mali. This same result has been found in studies all over the globe. Higher education is inversely related to fertility. Life expectancy has also increased for women and for men (UN, 2000b, p91).

Improved access to education, particularly for women, has improved life expectancy and increased activity for "women as agents of change for sustainable development" ([http://www.johannesburg.org/web\\_pages/africa\\_roundtable.report.htm](http://www.johannesburg.org/web_pages/africa_roundtable.report.htm), accessed 1/9/02, p4) were included among the list of achievements since the 1992 Rio Summit at the Regional Roundtable for Africa. The meeting was held in Cairo in June 2001 in preparation for the World Summit on Sustainable Development scheduled in Johannesburg, August, 2002.

Mali has programs for advancing basic education and literacy, funded by USAID through the Association for Educational Development (AED). Gender equity in educational access has received special attention. AED programs in Mali focus on the following priorities:

- Advancing Basic Education and Literacy
  - Africa Global Information Infrastructure Project (Leland Initiative)
  - Environmental Education and Communication Project (GreenCOM)
  - Project to Support Grassroots Initiative to Fight Hunger
  - Social Marketing for Change
  - Strategies for Advancing Girls Education
  - Support for Analysis and Research in Africa
- (<http://www.aed.org/news/Africa.html>, accessed 8/29/00).

The Strategies for Advancing Girls' Education (SAGE) is program of AED to provide technical and training assistance in girls' primary education for USAID Missions. In 1999, SAGE awarded a two-year girls' education intervention project in Mali and Guinea. SAGE is part of the WIDTECH project funded by the USAID Office of Women in Development (G/WID):

SAGE is designed to take a non-traditional, multi-sectoral approach to increasing involvement in girls' education. SAGE strengthens local ownership of girls' education by engaging traditional and non-traditional actors, such as the public and private sectors, central and decentralized government units, religious and business leaders, the media and non-governmental organizations, in implementing local solutions with local resources in support of girls' education. SAGE also conducts studies on educational quality and best practices for girls' education and organizes workshops that bring together policy makers, practitioners, advocates and scholars to share knowledge and disseminate strategies for advancing girls' education. The project seeks to move from dialogue on girls' education to the implementation of locally-derived solutions that engage the support of all sectors of society (<http://sage.aed.org/>, accessed 8/29/00).

SAGE developed the program in collaboration with the Ministry of Basic Education (MEB) for increasing and enhancing education for women and girls in Mali. Priority activities were selected based on a series of meetings with several groups working in the education sector, including the MEB, the community school grantees, numerous Malian NGOs, and other donors, who consistently identified particular constraints and opportunities. The activities were designed to complement each other, with each activity linked to and reinforced by the other activities.

Mali showed the second highest increase in secondary-level female net enrollment ratio from 1985 to 1997 among 33 Sub-Saharan African countries. Only The Gambia showed a higher increase. Fifteen countries showed little or no increase, or a decrease during the same period (UN-Progress of the World's Women, 2000, p 20). The World Development Indicators 2001 report gave percentages of females in the first, second and third education levels over the period from 1990 to 1998. Overall enrollment more than doubled at all levels during this time. The female enrollment ratio at the secondary-level remained at 33% from 1990 to 1998, but primary and tertiary levels showed steady ratio increases. Primary enrollment ratio for females increased to 37% in 1990-91, to 39% in 1996-97 and to 41% in 1997-98. Secondary enrollment for females increased to 14% in 1990-91, to 19% in 1996-97 and to 20% in 1997-98 (World Development Indicators, 2001, p56). Though the data does not link the increase in female enrollment ratio to increased telecommunications access, the two simultaneous independent development programs mutually reinforce progress, particularly because enrollments increase literacy, a prerequisite for ICT access.

Women in francophone Africa are expanding applications of ICTs to networking for gender equity in all sectors. The first francophone African e-conference on "ICTs for gender equality in francophone Africa" was held from January 28 until April 23, 2002. Participants from 26 countries included 16 Malian women, the second highest country representation. UNIFEM, ENDA, Oxfam and IDRC sponsored the e-conference. The role of ICTs in achievement of gender equity was a prominent issue during the three-month discussion:

Poverty is an issue of lack of resource, of knowledge and of power, and must be analyzed from the perspective of "structural inequalities", such as access to employment, health, training, information, appropriate technologies, decision spaces, etc. What are the chances of women in terms of peer exercise of authority, when they are in disadvantaged statutory position?

Information and communication issues are therefore central issues at stake, as well as the appropriation and the use of new technologies for that end. Their importance as a tool for change is now fully acknowledged in

francophone Africa, including in this forum. For women - and especially women in rural areas - the most popular (such as community radios), the fastest and the cheapest (such as ICTs) means of expression are strategic issues, for all debates of universal importance, such as citizen rights and political options, including in their global or regional dimension.

Information and communication are basic human rights, in order to protect one's needs, health, knowledge, and life. ICTs and the Internet are first-rate tools for governance and democracy (UNIFEM, 2002, p1).

Promotion of gender equality and e-governance (governance through the use of ICTs) for democratization in the globalization environment was discussed. This involves establishment of permanent dialogue with communication, information and process facilitation, between those who govern and those who are governed. Poverty and exclusion of women from solution strategy dialogue is one problem, which can be addressed through use of ICTs by women to share their concerns and views. ICTs have been used by some women's organizations in francophone Africa "to inform women on legal issues, promote their status, lobby against discrimination, act quickly and identify solutions through exchange of experiences and knowledge, solidarity and collective strategies" (UNIFEM, 2002, p1).

#### 4.7 Twenty First Century Mali

Mali is at the crest of a wave of change in social, economic, and political development occurring throughout Africa. Secretary of State Colin Powell made his first visit as Secretary of State to the African continent in spring 2001. His first stop was in Mali to meet with President Konare. Mali has grown from a country with the least developed electronic telecommunications capacity and infrastructure to a telecommunications resource for lesser-developed neighbors of the region. The recent All Africa Nations Cup 2002 soccer competition both expanded Mali's infrastructure and provided world access to an important event through that infrastructure. The ongoing ICT capacity building efforts are building on a principle of gender inclusiveness. The high percentages of women in office and high growth rates for women's enrollment, particularly in secondary

education are evidence that Mali is living the principle. Mali is providing leadership on important regional concerns, war, child labor, human rights, environmental and cultural preservation. Mali was the African Regional Conference site for the preparation meeting for the 2003 World Summit on Information Society of the ITU.

The growth of ICTs in Mali has enhanced the development of women's networks. In Mali, organizations such as COFEM and PANOS have worked to expand women's access and capacity to use ICTs as a tool. The African Gender Institute in its second newsletter described the emerging relationship between women and the Internet even in its 1998 infancy in Africa:

Women in Africa are shaping the Internet, appropriating the technologies and involving themselves in "the most powerful and immediate medium for mass communication we have ever known." ... Organizations are working together to shape the technologies, which have denied them access or not reflected their realities. Women are lobbying governments, speaking at conferences, teaching each other the technology, offering gender sensitive training in using the Internet for social activism, collaboratively building WWW sites and sharing strategies using the flexibility of electronic mail (the most accessible part of the Internet) as communicative mechanisms and platforms for social action. These projects often go beyond the Internet and include organizations without access through faxing and mailing information taken from the Internet.

African women's organizations are building information and communications technologies into their work programmes as part of strategic information dissemination. These networking tools are bringing women from across the continent together as never before. Gender-sensitive and holistic programmes have been developed by women which include combining appropriate information flow, training, research, outreach and policy (AGI, 1998, <http://www.uct.ac.za/org/agi/newslet/vol2/intercon.htm> accessed 2/7/02).

The importance of culture and its preservation through economic, social and political efforts guides UNESCO, one of the sponsors of Mali's MCT in Timbuktu. World Bank President James D. Wolfensohn (1999) spoke of the treasure of culture inspired by a trip to Timbuktu:

I became President of the World Bank, and I started traveling. And on my first trip to Africa, I visited Mali. And in Mali I discovered a place called Timbuktu. I had always thought Timbuktu was a creature of my father's

imagination. I don't know whether you have the same idiom in Italy, but in Australia, if your father wants to get rid of you, he says, "Go to Timbuktu". I thought it was some amazing place unrelated to reality. And I discovered that, once, Timbuktu was a great center and that Mali once had an empire that stretched to Egypt. And I met with young Malians, and I saw them dance, and I talked with them. And for them, this ancient past was becoming part of their reality. It was their right, it was their strength, it was something on which they could build, notwithstanding the fact that they are one of the poorest countries in Africa. And I started to think maybe culture is important to others, not just me. It may not be Etruscan, and maybe it is not the culture of the renaissance, but it is a national culture (Wolfensohn, 1999).

Education of the global community through sharing of culture in the broad sense of arts, sciences, literature and spiritual understanding will be a significant part of building the knowledge base of the twenty first century. Much of the global knowledge sharing has concentrated on building the global market economy and the global information infrastructure. Solutions to present failures of international, regional and local regimes dominated by the powerful could come from the ancestral knowledge base of those still voiceless in the Information Society. Unsolved problems require fresh approaches for solutions. Problem solving resources exist everywhere. Survival for the poor means "making a way out of no way." So the poor sometimes become the most ingenious problem solvers on the planet. Universal ICT access and capacity expands the knowledge base and the problem solving potential at all levels of society.

Mali is a country with many cultural traditions and world heritage sites recognized as human treasures nationally and internationally. Each requires extreme efforts for preservation. An important local application of ICTs in Mali is the gathering and documentation of knowledge. The MCT trains local citizens to apply ICTs to community needs. This includes recording the stores of knowledge that exist within each family of Timbuktu. Preserved literature from the universities of the Mali and Songhay empires and other collections of Islamic literature reside in Timbuktu libraries. The MCT in Timbuktu provides a library resource for electronic storage of works already underway with the Ahmed Baba Centre and the Haidara Library of Timbuktu. These works then become accessible to a world of scholars. Mali is also filled with oral culture traditions.

Stories have passed from generation to generation for centuries and embody history, legend and myth in poetry, music, dance and costume. ICTs are applied to the preservation of oral culture, which can also be shared with the global audience.

Intellectual ICT applications in Timbuktu are an important part of cultural preservation in Mali but are a small part of Malian information needs. For the 80% of the population in the agricultural sector, information needs have been well met by the farm pricing radio show developed by Observatoire du Marche Agricole (Agricultural Market Watch, OMA). OMA was begun in 1989 by Malian and American professors from Michigan State with USAID funds to help deregulate the Mali grain market. Radio reports on 58 markets around Mali are compiled daily. High and low prices for grain, crops and livestock are entered into Dell computers and emailed by solar powered equipment to regional offices. The programs listeners include 70% of the population. "Mali's homegrown information exchange has become a model for the rest of West Africa" (Sansoni, 2002, p2). Neighbors Burkina Faso and Niger are now setting up similar systems to link with the Malian system (Sansoni, 2002).

Mali has led regional and international initiatives for access and participation in an evolving world system, which has excluded nations and peoples of Africa from equitable participation for centuries. Mali continues to host international efforts, which promote dialogue on issues critical to African participation in the Information Society. The World Social Forum (WSF) met January 31 to February 5, 2002 in Porto Alegre, Brazil. The second annual WSF gathered to consider global policy from the civil society perspective alternative to those of the World Economic Forum (WEF) and make policy recommendations. The theme of the WSF, "another world is possible," challenges the untapped resource of problem solvers whose voices have not yet been heard or heeded in international forums. During the 2001 first WSF, only 50 of 14,000 representatives of world civil society came from Africa. This year ENDA of Senegal and Centre Joliba of Mali organized an African Social Forum, which met in Bamako, January 4-9, 2002. The ASF negotiated positions on issues and sent representatives and consensus resolutions to

the second annual World Social Forum, in Porto Alegre, Brazil for consideration as global policy alternatives to those developed by the World Economic Forum:

The 'Bamako Consensus', which emerged from the gathering, endorses the Charter of the World Social Forum to build a different world. Under the theme "Another Africa is Possible," participants undertook analyses, shared experiences and heard testimonies on wide-ranging economic, social, political and cultural matters affecting the African peoples. The ASF identified a number of recommendations and proposals for activists and networks to include in their work, and a steering committee is now in place to move the process forward. A report on the ASF is being prepared (pambazuka #51, Part II, 1/31/01).

Mali has taken an active peacekeeping role in many human rights struggles in the West African region. Mali President Konare has supported work for peace and security in Sierra Leone and Liberia and for an end to child kidnapping for forced labor and war. At the opening of the All Africa Nation's Cup competition in January, 2002, President Alpha Oumar Konare helped launch the "red card campaign," a multinational child protection program developed to prevent child labour exploitation particularly in the cocoa plantation industry of Cote d'Ivoire. On behalf of the campaign sponsor, the International Labour Organization, Konore honored two child workers from Mali ([http://dailynews.yahoo.com/h/oneworld/20020118/wl/africa\\_s\\_child\\_labor\\_gets\\_the\\_red\\_card\\_\\_1.html](http://dailynews.yahoo.com/h/oneworld/20020118/wl/africa_s_child_labor_gets_the_red_card__1.html), Pambazuka 50, accessed 1/24/02).

Mali's role in Africa and in the world is reaffirming its ancestry as a center of spiritual, intellectual, political, economic, social and cultural communication. Mali has shown progress toward gender equity within a social system of improved education, health and political representation indicators. The decade from 1990 to 2000 was a time of serious national commitment to gender equity within telecommunications development and social development. The policies in Mali reflect national self-determination, respect for knowledge, and national responsibility and cooperation within international regimes. Mali has moved to share political and economic growth equitably between men and women. As Mali develops within the Information Society the rich knowledge of its many cultures can be shared with the world as a resource more precious than the gold that Mali once shared with the world in the peaceful pilgrimages of its great kings.

## **Chapter 5 - MULTIPURPOSE COMMUNITY TELECENTRE, TIMBUKTU MALI - CASE STUDY**

### 5.1 Introduction

This chapter is a case study of the Multipurpose Community Telecentre (MCT) in Timbuktu, Mali. The MCT is a collaborative ICT development project, implemented jointly by international partners: the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Telecommunications Union (ITU), the International Development Research Centre (IDRC), Food and Agricultural Organization (FAO), World Health Organization (WHO), national partners SOTELMA and the government of the Republic of Mali (GRM), and Timbuktu local community organizations. The ITU, UNESCO and IDRC joined efforts to support MCT pilot projects in Africa in order to “stimulate local capacity for informed decision making...and... production of local information and knowledge to foster local development” (Scharffenberger, 1999, p1). These three organizations have institutionalized their commitment to gender equity consistent with CEDAW and the Beijing Platform for Action Section J Women and Media. This action plan calls for gender equity in access, capacity building and content development in all communications media. The objective of this case study is to analyze the effectiveness of this pilot model in providing gender equitable ICT access and application to the needs of a rural least-developed region.

The case study of the Timbuktu MCT will include a written summary of the data and research from the baseline study, the author’s site research, and the MCT Director’s 2000 report. The key issues of this case study are gender equity and local agency in the application of ICTs to local and national objectives. Gender inclusive capacity development is a core objective for achievement of local agency within the cooperative international regime environment and of MCT sustainability in Timbuktu. These issues will be examined according to the theoretical framework of international regime theory and “development as freedom” theory. Telecentre is a term defined in chapter 1 and used

to describe a range of public access ICT service distribution models from payphones in shops to centers with full service state-of-the-art ICT facilities. In this chapter, telecentre means the multipurpose community access model, which provides equipment and training for operation and application of computers, the Internet, software, scanners, copiers, printers and fax. MCT project goals as defined by the international, national and local stakeholders and the research inquiry about gender equity and social development through ICT access provide criteria for evaluating the MCT project in this case study analysis.

Preliminary communication conditions in Timbuktu were assessed in the Pact Institute baseline research. The research describes baseline communications usage conditions prior to MCT operations, for comparison with the most recent MCT service reports. Early operational experiences, problems and solution strategies are documented through accounts of stakeholders identified in the author's site research. The site research compares the observed MCT operation in the context of the knowledge community of Timbuktu, with the baseline study, subsequent MCT Director's report and recent documents from the MCT website. The international stakeholder sponsors, UNESCO, ITU and IDRC have developed research resources on the MCT.

UNESCO is one of the international sponsors of the MCT project to facilitate ICT development. UNESCO promotes education, science and culture across the globe. The three priorities of UNESCO are youth, women and developing countries, particularly Sub-Saharan Africa (Lemoine, 2000). There is a strong focus on developing ICT capacity in Africa. The MCT model was designed to provide ICT services accessible to the community with local support in design. ITU, IDRC and UNESCO provided support funds for three-years, supplementing the GRM, SOTELMA and local funds. By 2002, the MCT was self-sustaining through service revenue resources and local support. Access to information is important to community health, economy and development of an informed citizenry for the function of democracy (Lemoine, 2000).

The International Telecommunications Union has functioned as the technical standards and policy coordination body among nations since the telegraph days of 1865. It is one of the oldest international regimes to continuously work as a negotiation forum. The International Telecommunications Union, Bureau of Telecommunications Development (ITU-D) was formed in 1989 to provide support to developing countries for domestic infrastructure growth. Electronic communications had made a quantum leap in the transformation of global information exchange. Computer information processed as digital TCP/IP protocol data is packet switched for transmission over international networks. This technology and global infrastructure facilitates the translation of most forms of media into digital data. Marketing, banking, diplomacy, medicine, education, entertainment and basic human communication processes are transacted over international interconnected digital networks referred to as the Internet.

IDRC of Canada is also an international sponsor of the MCT pilot projects. The Acacia initiative of IDRC supports the development of ICT infrastructure and capacity in African countries. Training and capacity building of local residents are essential to development of a sustainable model. IDRC also has worked to develop evaluation systems, which help identify best practices and problem solving strategies for telecentres. In Fall 1998, IDRC held an international conference on telecentre evaluation, which drew researchers from telecentres all over the world. Timbuktu, as the first MCT pilot site, has been an experimental proving ground for the local community on the benefits of ICTs and for similar efforts throughout the continent.

International regimes such as the ITU and other UN organizations have pursued proactive programs to encourage national telecommunications policy to apply international standards of technical interconnectivity and regulatory transparency. Social policies, which link ICT access to political, health, educational and economic systems are also encouraged. The MCT in Timbuktu, Mali was the first implemented of five planned projects. The others in Uganda, Mozambique, Tanzania and Benin were built between 1998 and 2001. Shared project objectives include collaboration of local, national and

international organizations to develop a sustainable replicable model for provision of ICT access to rural communities in an environment of gender equity.

The similarity of purpose, design and evaluation among the five MCT pilot sites has contributed to the development of best practices through comparative evaluation systems. This serves the MCT replication process for providing ICT tools to other rural regions of each country. The MCT sister project in Uganda, the second MCT pilot, was described by Dr. Z.M. Nyiira, National Acacia Programme Co-coordinator and member of the Uganda National Council for Science and Technology:

(T)he establishment of pilot rural telecentres was quite timely in that they became focal institutions through which the decentralized local governments could access information which they badly require for district based decentralized planning and policy making. Rural telecentres are close to communities such that local administrations use them to communicate policies and policy decision to the communities... the rural telecentres... have been necessary to fill the gap that exists in information access and delivery. The national Parliament supports the idea of rural telecentres and the government sees them as potential mechanisms of agricultural technology extension and market information centres, education centres and institutions that will play a central role in improving governance and health service delivery at community level... The primary question is whether the telecentres are useful to the vulnerable poor communities. The answer is yes, because they are entitled to information. The fact that they don't get (it) does not negate the fact that they need it  
(11/28/01 email "Open Forum on Telecentres" [telecentres-l@idrc.org](mailto:telecentres-l@idrc.org)).

The decentralization of political structures in Mali allows greater autonomy for local communes but requires coordination of services and necessitates construction of an intra-governmental communication system. The four other MCT sites planned for Mali in Djenne, Zegoua, Niori and Nara, will have central nodes for full broadband Internet access as the Timbuktu site does. WorldSpace satellite terminals for two-way Internet access have been proposed for a nationwide intragovernmental communications network among the communes. The network would offer email, voice and text communications.

The MCT in Timbuktu has overcome obstacles and made progress with a dedicated local staff and community support system. Strong national commitments from the GRM and SOTELMA, have helped bridge the diverse perspectives of the international

telecommunications and gender equity regimes of the ITU and the UN with the local culture in the Timbuktu MCT site. This case study research inquiry examines the international regime process of extending ICTs with gender equity using the experiences of local ICT users and data on social development in the Timbuktu region during the period of MCT development. The five internationally sponsored pilot projects were designed so that the MCTs could learn from each other's positive and negative experiences. This chapter explores the experience of the first MCT in Timbuktu and examines results of initiatives for gender equity in local ICT capacity development. This study also found evidence of achievement of MCT objectives, a more informed citizenry and greater local knowledge creation and distribution.

## 5.2 Timbuktu History and Culture

The history and culture of Timbuktu are an important factor of this study of ICT expansion into rural regions because ICTs facilitate the gathering and preservation of knowledge. Three world heritage site mosques and thousands of ancient Islamic scribal texts have been preserved for centuries in Timbuktu and are part of our world's heritage as human society. The MCT placement in Timbuktu has extended the historical preservation of this knowledge into the Information Society.

The paradox of Mali is evident in the city of Timbuktu, "the pearl of the desert... the mysterious one... the city of 333 saints" founded by Tauregs in the eleventh century. (<http://www.Timbuktu.org.ml/pages/Timbuktu.htm> accessed 1/17/02). Now Timbuktu strives to both honor tradition and participate in the Information Society, through application of ICTs to the health, education and material welfare of the region. Timbuktu reigned as the spiritual, economic, political and cultural center of the region with only three major invasions over nearly five hundred years time. The Mossi invaded from the South (now Burkina Faso) in 1343 (Hunwick, 1999, p93). Sunni Ali, leader of the Songhay invaded in 1469 from the southeast neighbor city Gao (Hunwick, 1999, p93). Out of Morocco, Pasha Mamud invaded from the North in 1593 (Hunwick, 1999,

p221). The rest of the time was spent in relative peace and socio-economic stability with the greatest threat being occasional periods of drought. Timbuktu once held the largest library in the world. Two thirds of the world's gold once passed through its trade routes or was generously distributed as alms from Malian kings on pilgrimage to the holy city of Mecca (<http://www.ontheline.org.uk/explore/journey/mali/print.htm>, accessed 1/27/02).

Today, Timbuktu is both a best and least known world city in Africa. Its history lives in the world heritage site mosques, in the libraries preserved by the citizens and in the oral poetry epics sung by the Jeli, descendants of the Mali Empire. Timbuktu once provided the crossroads for one of the most important trade routes among North and Sub-Saharan African peoples, Europeans and West Asians. The communications culture developed from oral traditions, which entertained and educated people about history, truth and myth using song, poetry and musical instruments. Scribal culture was introduced with Islam. The literature was as much a visual art form as a document of scholarship (See Appendix 4). Knowledge and spiritual reverence grew in the desert city with a constant flow of people. Land trade routes through Timbuktu thrived from the eleventh through the sixteenth centuries. Then Moroccan invasions from the north and the European invasions from the west began to transform economics, politics and culture in West Africa. Trade routes were restructured to favor European shipping preferences and the decline of Timbuktu as a trade center followed. The transformation of Timbuktu from the trade center for most of West Africa to the place known today as a metaphor for most remote site on the planet earth will not be examined further here. It is important history explored in depth by the eight-volume UNESCO General History of Africa (1985). Diop and Hunwick have researched and written extensively on the social and political history of the Timbuktu region drawing on the historical literature discussed previously.

The cultural heritage of Timbuktu includes the Ahmed Baba Center for Research and Documentation (CEDRAB) an educational research center and library with books and sacred Islamic literature in Arabic from the thirteenth century. The municipal museum of Timbuktu opened in January, 2000. The museum exhibits include the history of the city, archeology, creative works and local handicrafts of the cultures of the region. The

Artisans' Centre provides a workplace for local artists and a local market for their creative works preserving the many and ancient cultures of the Timbuktu region, jewelry, wood carvings, leather works, weaving and textiles (<http://www.Timbuktu.org.ml/pages/Timbuktu.htm> accessed 1/17/02).

Timbuktu has remained a center for agricultural production, at the southern border of the expanding Sahara Desert. It lies on the north bend of the Niger River, sometimes compared to the Nile because of its fertile flood plane extending south of Timbuktu including Mopti and Djenne. A small canal links Timbuktu with the Niger port city of Kabara. The agriculture products of rice, millet, potatoes, sweet potatoes, lettuce and squash support the Timbuktu economy. Timbuktu is still an important site for trade in salt from the Taoudenne mines north of the city and livestock driven through the region in summer by the nomadic cultures.

Regional alliance structures of West Africa remain important to Mali and to the national policy formation process. The regional organization Economic Community of West African States (ECOWAS) provides a political and economic power base from which to negotiate trade, political and environmental policy within global forums of international regimes of the UN, WTO, World Economic Forum and the ITU. Mali's President Konare has led ECOWAS in efforts to bring peace to Sierra Leone and Liberia, promote children's human rights with agreements to end child kidnapping for labor exploitation on cocoa plantations in Cote d' Ivoire and promote an end to trade barriers among ECOWAS countries. The telecommunications infrastructure development of Mali since 1996 has served the process of international dialogue and negotiation of regional problem solutions.

Mali has entered an agreement with Burkina Faso and Niger to create a joint brigade, which will check the movement of light firearms in their countries, secure people and goods at border points, and provide humanitarian aid to the needy. Timbuktu is strategically near the borders shared by Mali, Burkino Faso and Niger. The communications infrastructure built in Timbuktu as part of the MCT project facilitates

Mali's strategic role in the implementation of the joint brigade. Mali's military press director, Abdoulaye Coulibaly said the primary mission of communications, health and logistics units will be humanitarian, to provide food, health and emergency services to needy populations in the three countries (<http://www.allafrica.com>, IRIN, accessed 3/5/02).

Collectiv des Femmes du Mali (COFEM) has continued to struggle for equal political rights and representation for women throughout Mali since 1991. COFEM has a Timbuktu chapter. The Coordination of Women's Associations and NGO's (Coordination des Associations et ONG Feminine - CAFO) is another women's organization in the Timbuktu region. CAFO had 30 women participate in the Pact Institute baseline study. CAFO has been an active local partner in gender equity development and progress at the MCT in Timbuktu.

Mali has led regional and international initiatives for access to and participation in an evolving system of international regimes. Mali's growing ICT infrastructure has facilitated this participatory process. Equitable participation by African countries in most world forums has been a struggle. Mali has shown political leadership through ECOWAS working for greater participation of the West African region in the UN, ITU, AU and ECA. The AU has negotiated more reasonable and efficient networks in telecommunications and transportation so that intraAfrican traffic no longer must pass through Europe, a vestage of colonial dependency. The fiber-optic project partnership between Mali, Senegal and Mauritania is one example. Trade objectives often provide incentives to bridge cross-cultural difference and negotiate social, political, military and economic relationships. Mali has one of the least significant trade profiles in the WTO regime. Its primary export is unprocessed agricultural produce, without value added. Demonstrating another vestage of colonialism, most of Mali's manufactured goods are imported. However, in an environment of political democracy, voice and participation are theoretically not dependent on economic power. Therefore, Mali's negotiating power within the international regimes must be through non-economic powers of moral, cultural, intellectual and spiritual strength, which Mali has in abundance.

Mali recently demonstrated the struggle to present national perspective in global forums with the African Social Forum (ASF). International regimes impact national policy more now in the globalization environment and national perspectives must be included in the formative decisions. New structures for greater participation are required. About 200 organizations from around Africa, including representatives of NGOs, trade unions, women's organizations, farmers and young people's groups met in Bamako, Mali, for the ASF. The following report on the ASF meeting describes some of what was presented to the World Social Forum:

(G)lobalization is just a new and more acceptable term for imperialism, that double standards were being applied with the selective imposition of rules about trade to the detriment of Africa. They expressed concern that the "New Partnership for Africa's Development" (NEPAD) was based on accepting the neo-liberal analysis and strategies of the rich countries and was therefore not acceptable as a basis for planning Africa's future.

The importance of the African Social Forum was in presenting development in Africa as a political issue about power to decide on Africa's future. For too long development has focused on the physical consequences of this unjust world order and has limited itself to addressing the lack of water, health, incomes, basic services etc. This has led to NGOs becoming instruments of neo-liberal globalization that have colluded in undermining the state by providing services and using funding destined for them (Firoze Manji, 2002).

Kofi Annan addressed the World Economic Forum directly and sent an emissary with his address to the World Social Forum. He called for dialogue between the two groups and a more participatory structure including representatives from civil and civic society. The use of ICTs as tools for increasing participation in democratic and representative governance structures, national and international has facilitated the possibility of such a dialogue.

The GRM set up an ICT application program for rural local election results to be sent over the Internet to the Election Commission in Bamako. The Electoral Commission of Mali facilitated collection and tabulation of election results through computers and the Internet. Facilities such as the MCT in Timbuktu and the planned ICT facilities in all 703

communes of Mali represent a step toward creating more interactive political communications, and national unification with enhanced participation in democracy through e-governance (Balancing Act # 98, email received 2/25/02).

ICTs in Mali are now used to increase communication and participation in political, economic and social networking. Mali's infrastructure is expanding but the vast rural areas present an ICT development challenge. The MCT model for rural ICT access was designed to allow greater local voice in national forums, as part of Mali's process of political decentralization. The MCT model has also enhanced Mali's voice within international forums, particularly those interested in the results of this pilot program. With international support of funds and knowledge, the MCT has facilitated ICT applications to national democracy, telemedicine, education and the economy. This has helped strengthen national institutions and created greater inclusiveness in this multicultural nation. The reports, which follow, describe how the MCT in Timbuktu has enhanced freedom and agency for farmers, artisans, herders, students, medical workers and scholars, through providing information and the power of networking through information and communications technology.

The following sections include research on the MCT model and the selection of Timbuktu as the site of the first MCT. The Pact Institute baseline research on Timbuktu's ICT usage patterns for telephone, radio, television and letters was completed before the MCT began full operations in 1998. The author's site research was completed after the first six months of continuous MCT operations, December 1999. The MCT Director's report was completed after the first year of continuous MCT operations in Timbuktu, July 2000.

### 5.3 MCT Model and Pilot Site Selection

The Multipurpose Community Telecentre was developed as a model for provision of ICT equipment and training meant to facilitate rural development through access to

information, communication and learning resources. Internationally sponsored MCT pilot projects in Africa are now operating in their respective rural communities; Timbuktu, Mali; Malanville, Benin; Nakaseke, Uganda; Mozambique; Tanzania and South Africa.

The international-national-local partnership directed ICT expertise and material resources toward implementation of the MCT project. Community social capital resources were committed to develop the community applications for the ICTs and the plan for funding the MCT beyond the three-year international funding period. Community partners were the ground level facilitators of the MCT. The international partners provided expertise, funds, equipment and high-speed telecommunications infrastructure at the initial stage. The local partners worked to raise the funds for permanent site construction. Local partners were also responsible for building an operation, which would be technically and economically self-sustaining. The MCT provided capacity building through ICT training in the operation and application of computers, the Internet and other ICTs. MCT training also addresses long-term objectives of content development and technical innovation. Key local stakeholders were offered staff training in ICT applications for their own organizational needs. This plan helped build the user base necessary for economic sustainability. The MCT was designed to serve Timbuktu and the surrounding region while rural infrastructure expansion continued.

The international and local stakeholders demonstrated commitment and policy to encourage gender equity in access to the MCT. Gender equity policy in MCT operations also addressed greater gender issues in the society such as education, political and economic participation. The ITU Telecommunications Development Bureau (ITU-D) has worked to solve gender equity problems of communications access and capacity building through the ITU-TFGI. UNESCO defined ICT development in 2000 as a priority for the new millennium. Gender equity is one the top three priorities of UNESCO along with youth and development (Lemoine, 2000). International partner IDRC Acacia project has focused development efforts in Africa on ICTs and described the specific objectives for the MCT model in Timbuktu:

1. to create a telecentre that is genuinely Malian and for the community of Timbuktu, and to develop test methods, strategies and policies that reassure this;
2. to evaluate the social, economic and cultural impact of the MCT on community, regional and national development; and
3. to contribute to a better national and international understanding of the importance of ICTs for rural development.

The MCT was designed to serve the whole community. The first groups in Timbuktu to participate and train with the MCT had well defined information and communication requirements. Library researchers, educators, merchants, artisans and health care professionals were targeted at the beginning to seek MCT benefits of the Internet networks, electronic commerce, distance education and telemedicine (<http://www.idrc.ca/pan/tele65230.html>. accessed 11/28/01, translated from French by altavista and the author).

The ITU, UNESCO and IDRC selected the countries for MCT pilot projects. Each country selected the national telecentre sites. The Government of the Republic of Mali (GRM) identified five cities as sites for telecentres: Timbuktu, Djenne, Zegoua, Niori and Nara. Timbuktu was the first MCT site chosen by the GRM because of its important historical, intellectual, spiritual, political and strategic position in Mali. Timbuktu was also chosen because of the need for greater communication between Timbuktu and Bamako and with the rest of Mali. Timbuktu was also the only site of internal military conflict in Mali since independence, during the highly transitional period from 1990 to 1994. The greatest national crisis and subsequent accomplishment for the GRM democracy has been the negotiation of a peace settlement with the Taureg of northeastern Mali in 1994. The GRM hoped to preserve the fragile peace process through enhancing communications capacity between the most remote region of the country, and other regions.

Timbuktu has intellectual and cultural resources with information to share among world scholars. It is a main city in the most rural region in Mali. World Heritage Site Mosques and centuries old scholarly works held in Timbuktu libraries have cultural value not only for Mali but also for world knowledge systems. The American Embassy in Mali set up

funding in January 2002 for preservation of Islamic manuscripts that documented the regional peacekeeping role of pilgrimages from Mali to Mecca. The city and region had the least developed telecommunications infrastructure for ICT services. These factors contributed to the selection of Timbuktu for the MCT site. The success of the MCT will help determine the model for further ICT service expansion into the rest of rural Mali.

The MCT pilot project in Mali was designed in partnership with local Timbuktu organizations including SOTELMA, Timbuktu Regional Hospital, city government, the agricultural cooperative, educational institutions - Ahmed Baba Centre, Haidara Lyceum, women's groups of CAFO and the local Artisans Association. Timbuktu is one of eight political regions in Mali. The community collaboration model for ICT development is an initiative focused on local control and sustainability.

The Multipurpose Community Telecentre provides information resources on Timbuktu and the MCT on its website (<http://www/tombouctou.org.ml> ). Webmaster and MCT technical advisor Kalifa Dembele regularly updates the website. The MCT now resides in a permanent facility built by the community of Timbuktu. It has become economically sustainable and accessible to the community and to visitors. The MCT has been used to create a better environment for teaching and research in Timbuktu. The MCT has expanded telecommunications access for the Timbuktu region. The staff aspires toward development of an interactive multimedia communication facility. Ongoing community input creates an interactive corrective feedback system for improvement in service to community needs. The MCT provides services and training for email, Internet access, word processing, printing, fax, copying, website design and other small business applications (<http://www.Timbuktu.org.ml/> accessed 11/29/01).

Since the development of personal computers in the 1980's and the expansion of Internet service to the public in the early 1990's, the benefits of these innovations were yet to be realized in the developing world, including most African countries. The ITU has collected statistical indicators on ITU member countries for information technology since 1990. Indicators for personal computers, Internet hosts and estimated Internet users were

negligible or not estimated by SOTELMA in Mali from 1990 to 1995. In Mali much change has occurred for the entire country since 1995. Personal computers grew from 3000 in 1995 to more than three times that five years later, 11000 personal computers in 1999. Internet hosts measured 1 in 1998. Then SOTELMA opened the ISP market to competition and there were eleven by the next year in 1999. Internet user estimates were 200 in 1996 and by 1999 had increased by a factor of 50 to 10,000 users.

Rapid growth and diffusion of ICTs in the North has transformed the operation of business, political and social communication systems. Countries like Mali can only participate internationally with the prerequisite ICT development. Expansion of telecommunications infrastructure and ICTs described above has occurred in Bamako. Models for urban ICT expansion are far more prevalent than for rural ICT development. The MCT project development helped bridge the gap in ICT infrastructure, access and capacity between urban Bamako and rural Timbuktu. These factors have focused international interest and attention on the MCT pilot projects.

#### 5.4 MCT and Gender Equity in Mali

Women's leadership in the MCT process has been encouraged through creation of an environment supportive of gender equity in ICT education, access and participation. The staff of six includes a woman business manager and a woman ICT training instructor. Since training programs began in 1998, 36% of trainees have been women (Diallo, Engvall, 2000). By 1999 over forty people had been ICT trained at the MCT including six librarians (Sidebe, 1999). The telecentre model provides public access to ICT training and operations in a community center structure, where social reinforcement of benefits and assistance in problem solving can occur. These are important factors of a supportive technology teaching and learning environment for women (Taggart and O'Gara, 2001).

Rokia Ba Toure was Regional Director of the Panos Institute, West Africa with programs in Mali, Senegal and Ghana. She had been an early member of COFEM and spoke of the importance of radio for women as a means of communication. She created and ran training programs for women in radio, which developed technology skills for content creation and operations. She also trained the women in radio journalism so that they could develop radio news reports inclusive of women's issues throughout the country. More young women are enrolled in school than ever before, but more than half the adult female population in Mali is still illiterate. Text-based ICT training for computers and the Internet are literacy dependent. Radio broadcasting and listening are literacy independent (Ba Toure, 2000). Radio and TV broadcasting of information from Internet browsing allows more literacy transparent access to information resources. This application is now part of the MCT because of the UNESCO donation of a "radio in a suitcase."

The MCT staff and the national team responsible for ICT expansion into rural areas continue to build their ICT capacity. September 2001, Mali participated in the first UNDP and Hewlett Packard-developed ICT management training partnership held in Burkina Faso. Mali received a "radio in a suitcase" for the Timbuktu MCT, donated to encourage the production of programs using the information resources of Internet. The suitcase radio is a complete broadcasting unit, which can also be used as a production studio. So the MCT facilities expanded to include radio broadcasting. Radio staff can produce "radio browsing" programs, which allow phoned-in information requests to be researched immediately on the Internet and broadcast over the radio. All four radio stations of Timbuktu broadcast simultaneously Timbuktu's first radio browsing program, produced in French, Tamacheq and Songhay:

The theme chosen by the producers was "world heritage" and the programme browsed the World Heritage Centre's website, discussing the site's contents with a local expert in charge of safeguarding the many monuments of Timbuktu which has been on the World Heritage List since 1988. In this way, the entire community has access to online information in their own language, explained and contextualised. Radio browsing programmes raise awareness of the value of Internet and encourage listeners to make use of the telecentre's computers (UNESCO WebWorld

Newsletter, 9/14/01, <http://www.comminit.com/pds01-2002/sld-3999.html>, accessed 2//7/02).

The radio broadcast unit greatly expands the power of the MCT to respond to written or telephoned information requests and widely disseminate Internet information responses to the community. The Pact Institute baseline research found that 70% of the Timbuktu population surveyed listen to radio broadcasts at least once a week (Scharffenberger, 1998).

Gender equity in education, employment and politics is an important recognized policy goal in Mali. Women in Mali are still undereducated and underpaid. They receive inadequate health care affecting infant and maternal mortality rates. Changes in these patterns are occurring but full equality for women in Malien society is an aspiration not a reality. Women's representation in government has improved with 12.2 % of Parliament and 32% of Government Minister posts held by women. Change for women in Mali impacts the whole community, because of the social role of women as prime health care givers, educators and providers of basic needs like water, food and fuel.

The MCT initiatives to expand telecommunication access for women have been effective according to the most recent MCT Director's report. Telecommunications access contributes to social, political and economic development by facilitating improved participation in family, community, educational, economic, employment and political communication and information exchange processes. Sustainable development requires equitable gender inclusion in telecommunications access. Timbuktu baseline research found that prior to the MCT, gender equity in some communications technology usage patterns already existed, particularly among the young. More women than men made weekly telephone calls in the 45-54 age group. Also weekly telephone usage increased directly with years of schooling across gender (See Chart 2).

Women are equal participants in the work force of Mali in the informal and formal sectors of the economy. Increased ICT capacity, like literacy, stimulates economic growth through providing greater information access. Therefore increased literacy and access to ICT capacity building for women should benefit the economy. The proactive

staff hiring policy resulted in 33% women staff at the MCT. The MCT demonstrated that women teachers enhanced women's participation in the technology training programs (UNDP, 2001a). The MCT clients are 36% women. This represents a higher ratio of women to men than the secondary and tertiary school enrollment ratios in Mali (Diallo and Engval, 2000, UNDP, 2001).

The following sections report on three MCT research projects conducted in 1998, 1999 and 2000. Each contributes to the understanding of MCT operation at various stages of development. Each presents aspects of the interrelationship of international regime policy with national policy and local culture.

#### 5.5 MCT Baseline Research - Pact Institute 1998

In December 1998, the first MCT pilot project began operation in the hospital of Timbuktu. Pact Institute worked with the MCT pilot partners to develop a methodology to monitor and assess the multiple learning needs of the MCT. George Scharffenberger of Pact Institute oversaw the completion of the baseline survey to develop a community information and communication profile for the MCT. This research was conducted during the initial development phase of the Timbuktu MCT before it was fully operational.

The project documentation defined "development of local capacity for informed decision-making" and the "production of local content and knowledge to foster development" as MCT objectives (Scharffenberger, 1998, p1). The baseline data included survey responses from 212 subjects including 98 high school students. Leaders of twelve community organizations were interviewed. Focus group discussions were held with six groups with potential to be MCT users: high school teachers, tourism operators, leaders of women's groups, artisans, medical professionals and youth. The information collected was immediately useful to the MCT planning team and was valuable for evaluation of the overall pilot project (Scharffenberger, 1998, p1).

The research found that the people of Timbuktu were not in communications isolation. Of those surveyed, 25% used the phone once a week or more. Merchants and tourism workers frequently used phone and fax. Radio was used once a week or more by 70% and television by 58%. Though local television broadcasts had only been available for two years, the medium was as popular as anywhere else. Most households did not have television receivers but would view programs outside the home. Newspapers were used by 45%. Educators and health care professionals were particularly unsatisfied with information availability, relevance, cost and reliability. Adult information priorities were ranked education, professional development, religion and health. Youth priorities were ranked health, religion, education and news/sports. Several groups asserted the importance of the MCT as a means for Timbuktu to “tell its own story” (Scharffenberger, 1998, p2). There was little concern voiced for the impact of outside information on local culture. Considerable difference existed in phone and television use according to gender, age and income. Middle-aged men in commerce and civil servants had the highest telephone usage. Gender difference concerns were voiced in focus groups. Women public administration workers stated that, “they were much less likely to have access to a department telephone or fax than male counterparts” (Scharffenberger, 1998, p2).

Enthusiasm for and expectations of the MCT were high. The MCT was expected to help reduce costs, increase access to professional information and provide stronger linkage between Timbuktu and external markets and partners. Community recommendations for the success of the MCT included: keep prices low; staff provide a warm welcome; and make training and support available; manage the MCT well and “get it right the first time”; “provide quality services for the business and tourism sectors as a way of gaining income” (Scharffenberger, 1998, p3). The MCT had a formidable challenge to find “the balance between promoting access to external information and providing a platform for communication by the community of Timbuktu outwards” (Scharffenberger, 1998, p3). The stated concern with assuring two-way information flows with ICTs is reminiscent of the primary issue in the New World Information Order debate of the 1980’s.

The research recommended ongoing data collection by the MCT through user logs, periodic surveys, interviews and focus groups to serve the “learning needs” by establishing a “learning system” for the local MCT management and the growing international community of telecentre managers (Scharffenberger, 1998, p3).

The impact of international regimes on the policy in Timbuktu is reflected in the research results on gender equity and communications. Internationally encouraged and nationally implemented programs to accelerate female enrollment ratios in all educational levels have brought positive change. The Pact Institute research found that telephone usage varies directly with education level irrespective of gender, so as education level for women increases so should communications technology usage if ICT patterns follow telephone technology patterns. The MCT Director’s report shows results consistent with this prediction with high ratios of women MCT clients using the literacy-dependent ICTs.

#### 5.6 MCT Timbuktu Research – Author 1999-2000

What follows is the account of the author’s research visit to the MCT from December 1999 through the Timbuktu 2000 millennium celebration. The literature available on the MCT pilot project design was part of the preparatory research for this in-country implementation research visit. The author’s visit to the MCT site included meetings and interviews with the MCT staff, clients of the MCT and community leaders and foreign NGO directors. These recorded experiences provided valuable perspective on the in-vivo workings of the MCT at an early stage of development.

Arrangements to visit the MCT and record interviews with staff had been made through preliminary email communications with Birama Diallo, director of the MCT. The staff and clients of the MCT seemed to welcome the research visit. The staff seemed proud of what had already been accomplished with the MCT. The clients, local and foreign, all seemed appreciative of the MCT facilities. We had permission to record our interviews

and experience with a Sony DSR-PDP11 digital video camera. While in Timbuktu we also arranged to interview directors of American NGO's Africare and Islamic African Relief Association (IARA) and British based NGO, Action Recherche Developpement Initiatives Locales (ARDIL) as well as local community religious and political leaders. In Bamako we interviewed the Panos Institute, West Africa director and COFEM member Rokia Ba Toure. Panos Institute is a media development organization with the motto "information and communication for one culture of democracy and one citizenship of peace." On our return to Dakar we recorded interviews at IDRC, and UNESCO.

### Timbuktu Journal

Tuesday, 12/21/99

We had spent three days in Dakar prior to departing for Timbuktu. In the city we observed many of the estimated 9,000 telecentres in Senegal. Most were small entrepreneurial venture phone shops run by women. Some near the city center and Cheick Anta Diop University of Dakar had computers, Internet, fax and printing services. Our cousins and hosts had reliable phone service at their home in the Dakar suburbs, not uncommon in middle-income regions of the city. We made several walking tours of the city, the shoreline fish market, the artisans market and the University of Dakar. Phone shops were everywhere.

Wednesday, 12/22/99

We departed Dakar by train and slowly progressed east to the Senegal Mali border. Senegal had an abundance of phone shop telecentres, even in the smallest villages along the train route. This was not the case after we crossed the border. In Mali, every train stop and village had markets with fresh produce and necessities such as shoes, bowls, cloth. "Telecentre" signs indicating a payphone were scarce. We saw no phone shops along the route except in several larger towns in Mali, such as Kayes. While we were on the train there was a coup d'etat in Cote d'Ivoire. We all found out about it from the

portable radios that many of the train passengers carried. When the news first broke, the train remained in the town for several hours before resuming the journey.

12/ 24/99

We arrived in Bamako after 6pm on Christmas Eve. The city had grown and developed much since our last visit. In 1991 Bamako was a very different city. The coup d'etat in Mali had just occurred, ending twenty-three years of Moussa Traore's rule and beginning multiparty democracy. At that time almost a decade ago we traveled a dirt road from Bamako to a small village Sirakouro Dounfing, about 10 km out of the city. During that visit we brought school supplies for the village school: pens, pencils, paper, crayons, paints. We spoke with the school headmaster. He was grateful for the materials but said that the school had been closed for months due to lack of funds. The people of the village hoped the school would open again soon.

Now in 1999, as our train pulled into the outskirts of Bamako, we stopped in a moderately developed but strangely familiar place. As we looked to the north hillside we saw the village school of Sirakouro Dounfing, which was now part of the city of Bamako. The school that had been closed in 1991, was now thriving. Three new buildings and two soccer fields were filled with young uniformed students. This vision spoke volumes of the transformations that had occurred here under participatory democracy. The area was no longer a small rural village but a suburb with light industry and communication towers on the hilltops

From the balcony of our high-rise hotel we saw the ancient river which has nourished transported and bathed millenniums of West Africans. Nearby under moonlight, we also saw the high-rise headquarters of the power company, Energie du Mali and of the telecommunications company SOTELMA. On our way to the airport we passed along a modern boulevard of corporate offices toward the new airport. Many Transnational Corporations (TNC's) from Europe, Asia, Saudi Arabia and the US have operations in Mali now. During the turmoil of 1991, neither this boulevard nor the TNC headquarters existed.

12/25/1999-1/2/2000 -Timbuktu

We flew along the Niger and the Bani Rivers to Timbuktu, Mali. We traveled over farms and desert, characteristic of this savannah region called the Sahel. We traveled over the Bandigiara plateaus of the Dogon people, whose ancient mystic culture has survived European and Arabic invasions over centuries. We hoped to explore the spiritual and historical significance of this region of West Africa as well as visit the international telecommunications collaboration, the MCT

Timbuktu had been a spiritual, economic, cultural and political center during the middle of the second millennium. This northern bend of the Niger River is a region rich in agriculture production. Droughts and desertification are constant environmental threats. The city was important to the development of transSaharan trade and communications with other regions of the world including Europe, Middle East and the Americas. The MCT had been initially set up in the Timbuktu hospital in 1998. At the time of our research trip, the telecentre was operating in the Hotel d' Ville or town hall. The MCT offered computer, Internet access, printing, copying, fax and phone services. Classes in Information and Communications Technology (ICT) were offered to train people of the town and region to operate and apply the MCT services to their lives and work.

The ICT services of the MCT were in high demand during the time of our visit because there were hundreds of visitors to the city from all over the world, including many journalists. This was the time of the millennium change. We stayed at the Hotel Bouctou, visited the Ahmed Baba Centre, and Catholic Church as well as the several ancient Mosques and many tomb shrines of the "333 Saints." The center of town is a circle with a statue of Al Farouk, the mystical guardian of the town. We heard the legends of Timbuktu throughout our visit.

Just after arrival in Timbuktu we watched a youth soccer game and met Ali Ould Sidi, geographer, historian and Minister of Culture for the Timbuktu Region as he watched the game with his two daughters. We had seen him on the PBS documentary, "The Road to

Timbuktu”, produced by Henry Louis Gates. Ali Ould Sidi and friend Abdel Kader Haidara had been the Timbuktu scholars interviewed in the film. Henry Louis Gates contributed to the construction of a new climate controlled library to house Mr. Haidara's family collection of ancient Islamic books. We visited the library site, then near completion. Some of the Arabic works in the library collection date back to the fourteenth century and were probably written and used at the Timbuktu universities of that time.

We walked through Timbuktu and learned much about the spiritual, intellectual and social history of the region. We heard the myth of Al Farouk the guardian spirit of Timbuktu. He rode to Timbuktu on a white horse as a messenger of Allah sent to find the heart of Islam on earth. He first went to place of Jingereyber Mosque. He started to pray on rosary beads but was startled by a dog bark. He did not finish the prayer but became the angel guardian of Timbuktu. The local myths seemed distant from the ICT project purpose of the research visit yet deeply connected to the oral history culture of Mali.

Mr. Abdel Haidara was from a family of collectors of ancient Arabic manuscripts and worked with the Ahmed Baba Documentation and Research Centre (CEDRAB or Ahmed Baba Centre) in Timbuktu. He invited us for dinner with Ali Ould Sidi and Alfadoulou Abdoulahi a researcher and linguist at the Ahmed Baba Centre. We shared English, French and Arabic translations of the evening discussion about the history and future of Timbuktu, the valuable ancient and modern information resources and the role of the MCT in Timbuktu's future. On March 16, 2000, Alfadoulou Abdoulahi, sent a manuscript from 1269 CE as a jpeg file by email (See Appendix 5). Electronic scanning and storage are part of a long-term project for ancient document preservation underway at CEDRAB. The message was a test of the recent CEDRAB Internet connection through the MCT but also a research exchange between CEDRAB and Penn State initiated through the MCT.

Multipurpose Community Telecentre

Monday, December 27, 1999

We walked to the Multipurpose Community Telecentre in the city hall and spoke with two staff teachers from the MCT training program, Margurite Fau and Kalifa Dembele. The MCT facilities at the time included 6 Dell computers, laser printer, fax machine, scanner, photocopier, overhead projector and screen. On our first visit to the MCT there were fourteen people: four staff and ten clients; seven women and seven men. Some were working on the equipment, some received assistance from staff. One woman was playing solitaire on the computer. We also met Malle Diaharra, the office manager and MCT accountant. She also assisted us with sending emails from the telecentre and showed us the rate sheet for other services.

Tuesday, December 28, 1999

On our second visit, Brehima Sidibe, Assistant Director of the MCT was interviewed. Forty people had already been trained at the MCT during its first year, in spite of some startup technical difficulties. Problems included the troubleshooting of technical difficulties from setup to operation. The frequent power outages of Energie du Mali, the national electric company were another technical obstacle to smooth operations. The staff was well trained. Kalifa Dembele was the maintenance engineer for the MCT. He was also webmaster and able to train others on website setup. The staff and clients were proud of the telecentre. On our arrival the second day several people came to inform us that we had received a response to our outgoing email. Thanks to the MCT and the attentive staff all our upcoming meetings in Bamako were set. Brehima Sidibe was also the webmaster. The MCT website was considerably updated after the MCT moved to its permanent facilities the following year.

Wednesday, December 29, 1999

Africare, Timbuktu, director Ann Wessling operates microcredit programs in the region for economic development. In 1997, the UNHCR ran a refugee microcredit program. When the refugee circumstances stabilized the program was picked up by USAID and

operated by Africare only in the Timbuktu cercle<sup>12</sup>. Development of a long-term model for Timbuktu requires lots of experimenting and assessment. Africare has a flexible lending policy. Loans are granted to any project that seems viable: small commerce, women's agriculture, fishing. Africare still uses Internet provided through Spider, the longest operating ISP in Mali outside of SOTELMA. The Internet is important for access to literature, reports, backstopping and contact with colleagues, donors, family and friends. The MCT ISP service "will probably be fine once the MCT direct link to Bamako is installed." Most NGO's will then probably switch to the MCT ISP. SOTELMA is doing rural expansion and "the lines go down a lot whenever a new rural town is being wired." Areas up to 65 miles from Timbuktu are now wired. The local military have wireless and Iridium phones, which don't work well. Africare sometimes uses CODEM radio from Mission Aviation to send voice, fax and disk material (Wessling, 1999).

Pastor Nock Yattara was interviewed as a community and religious leader. He was born Muslim in Timbuktu of the Bela people. The Bela have historically lived in a caste structure of servitude to the Tuareg. This became illegal under the 1992 political system. Nock became a Christian minister, earned an MS in Economic and Community Development at Eastern College in Philadelphia and returned to Timbuktu. His ministry included the Regional Hospital of Timbuktu across the street from his home. He observed the setup of the first MCT at the hospital and the first ICT training conducted there. He said the hospital "has the building and the equipment but lacks medicine and personnel." (Nock, 1999) This reinforced the need for telemedicine, which offers the few young and inexperienced doctors there access to more experienced doctors with expertise to enhance the quality of healthcare provided by the hospital.

The hospital serves the entire rural desert north region of Mali. It is particularly stressed in times of draught. Disease and epidemic risk are high. Pastoralists have lost their

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<sup>12</sup> "cercle" or circle (English) is a small political unit of the region similar to a US county. The cercles are divided into communes similar to a US township. Mali is divided into 8 Regions and the District of Bamako, 49 Cercles and 703 communes

animals and farmers their crops. The Timbuktu population swells well beyond 30,000 during drought. The MCT is a public health communications system necessary to the large community it serves and available now for better response to natural disaster (Nock, 1999).

Tuareg rebellion from 1990 to 1994 was centered in Timbuktu and Gao. The Tuareg argued for reestablishment of the caste system, establishment of Islamic law in Timbuktu and a share of Bamako controlled national political power. The Bamako government and President Konore prioritized a negotiated political settlement and restored peace to the region. The need for political communication was clearly identified. The MCT is a regional centre for political communication (Nock, 1999).

Pastor Nock shared his thoughts on “the three best things about Mali”:

A traditional Malian writer said that when an old man dies its like a library which burns. First, the older you are the more people need you (maybe because there are not computers). Here there is pride in being an old person. Second, for economic needs, there is no social security but our families. People hold each other strongly. No one can be in need if you still have family. Misery is less. It is economic but not a moral misery. The third best thing about Mali is the deep faith in God. Christians and Muslims work together (Nock, 1999).

These three traditions at work in Timbuktu and throughout Malian society, are among the precious resources Mali has to offer the rest of the world. Communications through the MCT can offer the “connected” world access to some of these resources.

We visited the many markets in town and saw some of the beautiful art work: wood-carving, musical instruments, jewelry, leather work, sculpture, ceramics, cloths and hand made clothing. The Artisans Association of Timbuktu was part of the local MCT planning team. Artisans preserve local culture and produce valuable goods. The artisans hoped to use the MCT for direct sale of their work so the creator reaped the benefits rather than the middlepersons. Artists and artisans had also found that marketing through e-commerce directly from Timbuktu secured a higher price than selling through retailers in Bamako.

Adrian Arbib was a British photojournalist for the Observer and the Guardian covering the millennium celebrations with Ali Farka Toure, Malian Jeli<sup>13</sup> and world music artist. Adrian had used the MCT to send his material back to England. He was delighted that the MCT was operational in time for Timbuktu 2000. Without the MCT he would have had to “bring film and heavy bottles of developing materials”. His team had a computer and a satellite phone but the technology was too slow for sending pictures. At the MCT he was able to send digital photos of Ali Farka Toure performing in the desert on New Year’s Eve, for the January 1, 2000 newspaper printed in England (Arbib, 2000).

On the last days of the millennium we rode into the desert on camels guided by a holy man who had made his Hajj to Mecca. Camels and goats ran free and grazed the few patches of grass in the dunes. The mystery of the earth and electricity of the night were never more present. It was clear that the people of this place had much to communicate with the world, not just because new technology was available but because a deep tradition of communication could be extended.

January 2, 2000

As we departed from Timbuktu airport with the foreign journalists, we observed that all flight and passenger information was hand-written. There were no computers or Internet access at the airport or at the office in town where we had reconfirmed our reservations. Though the benefits of networked ICTs had just begun to touch this rural place, their potential stood likely to be realized in the hands of this community.

Seven months after the Timbuktu research visit. The report from the MCT Director was posted to the ITU-D website. The report confirmed much of what had been observed and anticipated from the January research and some unanticipated accomplishments of the

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<sup>13</sup> “Jeli” is the Bambara word for a Malian oral historian responsible for communicating the ancestral stories in poetry and song to succeeding generations. The French term is “griot”.

MCT and staff, particularly in gender statistics, revenue generation and community ICT applications.

#### 5.7 MCT Director's Report, July, 2000

Birama Diallo director of the MCT and Lars Engvall of the ITU wrote the 2000 report on the Community Telecentre in Timbuktu, Mali. It was posted on the ITU website in July. Mr. Diallo works for the National Executing Agency of the MCT, SOTELMA. At the time of the report, MCT funding partners included the ITU, SOTELMA, ORTF (TV Mali), UNESCO, IDRC, FAO, WHO, GRM Ministries, Timbuktu authorities and NGO's. Services offered by the MCT were listed as computers, Internet access, fax, print, copy, scan and anticipated radio broadcasting (Diallo & Engvall, 2000)

The target groups for MCT usage included the local libraries, schools, the Museum of Timbuktu, Timbuktu Hospital, the Artisans Association, tourism agents, the agriculture cooperative, youth and CAFO, the association of women's groups. MCT operations officially began in 1999. The telecentre benefits from the national support of the ministries of communication, culture, tourism and education, together with regional and municipal authorities (Diallo & Engvall, 2000).

Financial support for the startup phase of the MCT was decided at a round table, organized in Bamako on December 8-10, 1997. This meeting resulted in an agreement on contributions of \$433,000 by the national partners including \$278,000 in telecommunications investment by the Société des Télécommunications du Mali (SOTELMA). The international budget totaled \$423,000 including the contributions of two additional partners, the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) (Diallo & Engvall, 2000).

In addition to the community development component, this project will develop telematics applications to preserve and disseminate the documentary and historical

heritage of Timbuktu, which will in turn contribute to the development of tourism and thus to the viability of the MCT. The MCT owned by the municipality of Timbuktu, and the new municipal library, are closely affiliated as information providers and information users (Diallo & Engvall, 2000).

The telecentre serves libraries, museums and hospitals through existing networks. For example, the local library is part of a network to promote literacy and reading and will identify new applications for the telecentre. It will also act as the intermediary by which “downstream libraries” including those in schools are linked to the Internet and national library databases. In this way schools will be interconnected and their access to information greatly enhanced (Diallo & Engvall, 2000).

The pilot phase would develop an appropriate fee and pricing structure for services to business, local authorities, local groups and the public. ICT applications would include provision of information on: commerce, weather, local research studies on agriculture and opportunities for rural development (Diallo & Engvall, 2000).

SOTELMA has plans to build telecentres in the other four identified sites. At the local level, the telecentre is managed by the municipal authorities with a local management committee and a user group. At the national level, a steering committee will develop the national telecentre strategy and will work with working groups on each of the major applications of health, education and agriculture. During the pilot phase SOTELMA agreed to subsidize local telephone calls and to waive fees for connections and licenses. This allows all Internet access to be provided at local call rates (Diallo & Engvall, 2000).

As part of the start-up activities, a workshop was organized in Timbuktu in May 1998 to develop training plans for the various user groups. Some 40 representatives, including local Malian partners and user groups, participated in the workshop. An international volunteer conducted the initial training for a month and a half. Training occurred in the temporary site of the Timbuktu Regional Hospital, while awaiting the construction of the

permanent home of the MCT. The structure was completed by the local community in an attractive setting in the center of Timbuktu. Exterior and interior photos of the MCT are now featured on the website (Diallo & Engvall, 2000).

The report reiterated the important role of women in society and family. It affirmed the commitment to women's education and training at the MCT. A special project application team has been assigned to develop ways to promote the role of women in the MCT. The obstacles and successes of the MCT described in the Director's report are consistent with the author's findings seven months earlier. Greater community access to the MCT requires greater population literacy and ICT training, more consistent power delivery and a local epistemic community to develop innovative ICT applications to Timbuktu needs. Action plans to address each of these obstacles are underway. The ongoing community input process has helped expand the ICT benefits. The MCT has become an economically and technically sustainable community telecentre providing gender equity in ICT access.

### 5.8 MCT Case Study Analysis

The MCT staff in Timbuktu developed multimedia ICT tools and provided ICT training and capacity building for greater community access. The staff has worked to extend ICTs to the surrounding communities since 1998. The training programs offered by the MCT have helped integrate ICTs into the service of communications needs of the city and surrounding region. The merging of radio and Internet access has expanded the dissemination of important information in Mali. Information is gathered from sources now including the Internet and radio is used to communicate the information to the greatest number of people. The community of Timbuktu has found ways to solve local problems with ICT applications.

The international regime supported the MCT and gender equity in its design, development and operations through the ITU, UNESCO and IDRC. National

implementation of the international regime recommendations was made at the risk of conflict over questions of power, agency, freedoms and national sovereignty. The international MCT partners represent the international telecommunications regime but worked with cultural sensitivity in local application by including broad-based local input. The UN through UNIFEM, the four World Conferences on Women and the CEDAW treaty has coordinated the establishment of an international regime on gender equity. The broad international participation by women in the regimes decision-making process helped build a multicultural decision making environment reflected in regime principles and recommendations. UNIFEM has taken a proactive approach to policy formation for gender inclusive ICT development programs.

The principles of human rights defined in the Universal Declaration of Human Rights are to be equally protected for women as for men through development of national machineries with that purpose. In Mali, COFEM and other women's organizations such as CAFO in Timbuktu and the national teams for the World Conferences on Women, have worked to keep gender in focus within national policy. This is evident in the national education policy and is reflected in the political representation statistics at the ministerial level. The Nairobi Forward Looking Strategies and Beijing Platforms for Action call for greater voice for women in the traditional media and the new media of ICTs. The MCT has made progress in its training and service delivery for women with a training gender ratio of 36% women. Positive gender equity results at the MCT have developed in part from the national policy influence of the international gender equity regime.

The ITU is an international regime with influence on both telecommunications policy liberalization and gender equity policy through the ITU-TFGI. The ITU offered policy consultation and material support for Malian infrastructure and capacity development. This contributed to the positive growth of the MCT in Timbuktu as a gender inclusive project.

Mali has initiated development of information networks throughout the country to facilitate political communication and e-governance among the regions, cercles and communes. This project builds on the success of the MCT rural ICT development. Technologies available now through WorldSpace and other wireless providers make this plan for a nationwide ICT network both feasible and affordable to the communes.

The Pact Institute baseline research identified farmers as the group that made the greatest use of telecommunications in Timbuktu before the MCT (Scharffenberger, 1999). The benefits of enhanced information access after the MCT and adequate rainfall contributed to a surplus of grain production in Mali for the 2002 season. Cereal production for the 2001-2002 crop year rose by 24% from the previous years. The cereal supply led to an overall food surplus in Mali (anonymous, <http://allafrica.com/stories/200202220478.html>, accessed 2/23/02). The MCT radio broadcast operation has helped farmers and herders work out centuries old lifestyle conflicts.

The “radio in a suitcase” given to the MCT from UNESCO has become a powerful communication tool for peace and community building in Timbuktu. This region is economically dependent on livestock herding and agriculture. The 1990 –1994 cultural and political conflict between the pastoral Tuareg and the farming Songhay erupted in outbreaks of violence, otherwise very rare in Mali. A social application of radio involved using information to resolve the conflict. After successful campaigns on health, democracy and environmental issues stimulated by national or international organizations, the radio station initiated a plan to try and defuse the tension between nomadic herdsmen and settled farmers. Farmers were encouraged to post notices on the radio, announcing when their harvests had been completed so that the nomads would not drive their herds across the un-harvested land and destroy crops.. Radio listeners were encouraged to let local authorities know of incidents so they could step in at an early stage before the violence escalated. The radio station broadcast a series of sketches, which used a common local saying, “if the yolk and the white of an egg don't agree, the shell will crack!” Local people appreciated the reduced community tension through this media initiative (Adam, 2002).

The MCT project has helped focus national resources on infrastructure and capacity development in this rural site of historical treasures and national pride. The ICT facilities have been applied to local problem solving and preservation of local knowledge recognized as a global resource. The Ambassador's Fund for Cultural Preservation of the Bureau of Educational and Cultural Affairs, U.S. Department of State, provided support for the preservation of Islamic manuscripts that date from the 13<sup>th</sup> century through the Timbuktu Manuscripts Project in Mali. Some of the preserved texts are based on Qur'anic teachings on tolerance and conflict resolution that were used by 'ambassadors of peace,' a corps of Islamic diplomats or Holy Men, who traveled across Africa en route to Mecca (U.S. Dept of State, 2002). The material from the historical Islamic manuscripts in Timbuktu inspired a series of articles on conflict resolution and tolerance also sponsored by the U.S. Embassy (U.S. Dept of State, 2002).

The MCT has made contributions to the community. The MCT in Mali was designed as a model for lesser-developed countries to build ICT capacity in rural environments and participate in global ICT systems. The problems defined and solution strategies employed provide valuable lessons to build a knowledge base with which to evaluate similar projects in rural regions. MCT experience in addressing gender issues in ICT development provides evidence to help evaluate the effects of women's inclusion in ICT education and access on social indicators in the local community. The theory that policies of gender equality foster human development in all forms has been strongly supported by the World Bank research Engendering Development report. Equitable inclusion of women and men in ICT development can produce a more human social experience of ICT diffusion, which also contributes to social development (<http://www.Timbuktu.org.ml/pages/presenta.htm>, accessed 1/15/02).

Some project objectives have been achieved as seen in the MCT Director's report of July, 2000 and subsequent reports obtained from the MCT website. The MCT is the property of the community of Timbuktu housed in a facility built by the city, which includes a library and community radio station. A group of staff trainers and applications

innovators continue to expand the capacity for ICT development benefits to the community.

The MCT is economically viable and accessible for all the community of Timbuktu and visitors. The MCT price to print a page is \$1 US. Internet access including email costs \$3 US per hour. ICT training prices are \$50 US for one month. Women and unemployed youth receive a 20% discount on training costs. These prices are still prohibitive for many of the poor, especially the refugee residents. The MCT can be used for development of a better environment for teaching, learning and research in Timbuktu. Of the 1000 quarterly users, 36% are woman and 60% are youth. The high usage among women and youth promises to accelerate the development of ICT applications into the community. The MCT created its own website, <http://www.Tombouctou.org.ml>. Website development is now one of the course offerings of the MCT, particularly beneficial to local entrepreneurs and artisans (<http://www.Tombouctou.org.ml/pages/presenta.htm>, accessed 1/15/02).

UNESCO launched the Global Community Telecentre Resources web portal in 2002 to facilitate communications among working community telecentres world about experiences and resources related to practical telecentre implementation and management. The Timbuktu telecentre is included as part of the online service which contains research and annotated resources useful to community telecentres, multimedia centres and other local information and informatics initiatives. Local ICT based content produced by these initiatives are presented to help stimulate innovation in ICT based solutions to local needs ([http://www.unesco.org/webworld/build\\_info/gct/index.shtml](http://www.unesco.org/webworld/build_info/gct/index.shtml), accessed 5/27/02).

Connection of the CSCOM satellite and other health centers through the Timbuktu MCT facilitated telemedicine. Distance medical expertise support can improve performance of the small, young staff of doctors and medical personnel at Timbuktu Hospital who must conduct necessary procedures with little experience. The Internet connection provided the technology for teleconferencing to allow for the expertise of specialists to assist the local medical teams.

Connection of the six libraries to the MCT allowed for two-way communication of information among the scholarship centers within Timbuktu and those throughout the world. Distance education courses from the Ahmed Baba Centre, the Haidara Lyceum and others can now be accessed internationally.

Electronic commerce opportunities have expanded entrepreneurial reach for the work of local craftsmen and artisans. Jewelry, wood, ceramic, leather and fabric works are produced in the region but markets are difficult to develop for rural residents. Artisans had articulated the problem of diminished commercial value for art created in Timbuktu but transported through middlemen to Bamako. Local merchants and artisans expected greater value for works accessible over the Internet directly from Timbuktu than for the same works purchased retail from Bamako. For this reason, access to the MCT for website development to reach the global markets can expand the economy for regional artists (Scharffenberger, 1999).

The MCT was a pilot project and therefore experimental. The positive results of capacity building within the first five years of the MCT indicate that continued development of ICT applications research has value for the community. The MCT community education program continues to create new applications of information resources. Staff training also continues as evident in the development of the MCT website. The website has grown from 1999 when it had limited accessibility to three text pages with some color graphic images. In 2002 the site included eight links to informative reports on the MCT operations, contact information, the history of Mali and Timbuktu, and a full color photo sequence of the permanent MCT site and the fourteenth century Jingereyber Mosque. The website is also accessible from links on the international partner websites, ITU, UNESCO and IDRC.

Replication of the Timbuktu MCT model for other rural communities of Mali is part of the long-term telecommunications development plan. Successful results of the studies undertaken during three years of experimentation of this model have encouraged plans to

setup Internet access sites in all the 703 political communes of Mali. The estimated cost of the installation of a small MCT is 2,050,000 CFA (\$4100 US), considered by the government to be within the means of the communes. Local communes can subscribe to the MCT of Timbuktu for Internet connectivity or with private ISP's. Competition is bringing Internet access costs down and increasing the demand.

(<http://www.Tombouctou.org.ml/pages/presenta.htm>, accessed 1/15/02).

Mali has been able to move from a least-connected country to an emerging member of the Information Society with hopes of expanding its economy to include e-commerce and other ICT opportunities within that society. In the early days of telephone diffusion the time span between urban and rural connection was often many decades. In one decade Mali has been able to implement policy to develop ICT infrastructure in the urban centers and ICT projects to extend ICT access and capacity to the majority rural population. The Timbuktu MCT has been an important part of this policy initiative, which successfully integrated international regime policy recommendations with national policy for greatest benefit to the people.

### 5.9 The Malian Model

One reason for the success of Mali's MCT is the strong social structure grounded in family and spirituality and a healthy democratic political structure in the process of decentralization for greater local decision-making. Mali has demonstrated policy leadership and innovation in planning and implementation of ICT national development with the MCT project. The MCT provides a good working model for other least-developed countries implementing policy and projects for ICT development. The development of national vision, implemented into policy allowed Mali to keep the purpose of ICT applications Malian while sharing international regime network and policy support.

In May 2002, Mali hosted the conference to prepare and coordinate African policy for the ITU World Summit on the Information Society to be held December 2003. President Alpha Oumar Konare cautioned Africans to meet the challenge, study ICTs and their applications or face a “new form of illiteracy” (Balancing Act, Issue 103, 4/7/02, p3). Mali’s policy seeks to build both traditional literacy and ICT literacy with gender equity particularly for the young.

Mali’s traditional strength has been the strong social organization, based on family, community and honor of the elders and ancestors. The simultaneous pursuit of policy for ICT growth, gender equity and cultural preservation presents a challenging model for other developing countries. Participation in the Information Society and economy must permit preservation of precious cultural identities crucial to the social integrity of each nation’s people. Mali has demonstrated national agency and integrity while working cooperatively with international regimes, which represent global political and economic power. This model is important for least developed countries whose power lies not in global political influence or percent of the world economy but in the basic human dignity of principled agency with cultural integrity within world forums.

## Chapter 6 - CONCLUSION

This study addressed the following research questions:

1. *What changes have occurred in social, economic and political development sectors in Mali from 1990 to 2000 during implementation of gender equity and ICT liberalization policies?*
2. *How does Malian policy conform to international regime theory?*
3. *How was the Multipurpose Community Telecentre in Timbuktu used to forward gender equity and ICT liberalization policies and increase ICT access in the rural regions of Mali?*
4. *What additional, currently unavailable data would be useful for further analysis of MCT impacts?*
5. *What lessons can be learned from Mali for policy applications in other LDCs?*

This research project explored changes in Malian national development during a period when gender equity policy was applied to ICT access, education and diffusion. The research findings identified connections that strongly suggested a positive relationship between gender equity and liberalized ICT policies and between these policies and social, economic and political development. These findings relate to international regime theory through the relationship between the international telecommunications regime of the ITU and the international trade regime of the WTO. The WTO-BTA trade policy has influenced national telecommunication policy of Mali and all nations seeking greater participation in the Information Economy. The research findings are consistent with theory that links gender equity to development. The findings also suggest development strategies for other regional least-developed countries, which include formation of policy for gender equity in ICT development.

This research examined social, economic and political development in Mali during the period of policy reform in telecommunication and gender equity from 1990 to 2000. It particularly examined the role of gender equity policy for ICT access and participation in overall development. The majority of Malians live in the rural areas, while most ICT

infrastructure growth has been in the urban areas. The Timbuktu MCT research found that this model provided ICT access for rural information needs with gender equity. Governments were challenged to develop proactive policies for a national strategy to stimulate ICT innovation by policy recommendations from the UNDP 2001 report. Technology policy in Mali helped to create a common understanding among those with ICT access about the centrality of technology to economic diversification for agriculturally dependent Mali. Timbuktu artisans for example have begun to use ICT access for e-commerce of their hand-crafted goods. Mali has privatized SOTELMA and the ITU considers all sectors of the telecommunications market open to partial or full competition. For Mali, the competitive telecommunications environment has increased access and decreased cost for Internet access. Technology-oriented research has been encouraged by the government through its efforts to establish Internet linkage between the University of Mali and industry. Telemedicine initiatives and Internet based training programs have provided incentives for private firms to conduct research and development in Mali. ICT based entrepreneurship has been stimulated by telecommunications growth not only for telematics service providers in a growing market but also for small business operations. Venture capital has been drawn to industry for development of the technology-based sector of the Malian economy.

International regime theory applied to the Malian policy circumstance illustrates the process of policy formation, which must negotiate national and international relationships. The telecommunications and gender equity policy formation process in Mali engaged national and international regime functions, power relations and cognitive frameworks. Theoretical differences over the role of the nation state and the importance of national sovereignty were worked through during the creation of working relationships for project-oriented partnerships, such as the Timbuktu MCT. The international relations fostered between Mali's national structures and the international regime policy formation structures for telecommunications and gender equity helped prepare Mali to facilitate negotiation of other regional problem solutions such as forced child labor the need for greater transparency in economic trade regulation.

The cognitive frameworks for the epistemic communities for telecommunications development and gender equity development have evolved to include greater representation from developing countries. The UN ICT Task Force assumed the mission of the Digital Opportunity Task Force at the June 2002, G8 meeting, which demonstrates the trend toward a more representative knowledge community. International decision-making regimes found common interests with Mali in building ICT networks and integrating them into the national political and social structures. The ITU has the ability to achieve internationally binding decisions because of its credibility, authenticity, legitimacy and longevity as a regime. This research found that Mali as a nation state defined and represented its interests within the international telecommunications regimes. Mali's achievements of ICT growth and of greater gender equity in education, training and political representation of women developed out of Malian cultural inclination to build international relations peacefully and to share social power between men and women. International regime support of Mali was also essential to the process. Malians working with innovative ICT programs are now part of the epistemic community on creation of rural ICT access and participation in the Information Society. This community includes members of the ITU, UNESCO, IDRC, AU, ECA, AISI, USAID and other international public and private organizations. International regime theory applied to Malian policy helped illustrate some of the problems with and methods for successful negotiation of the policy formation cross influences between the international regime and the national regime in Mali.

Mali has developed through the enhancement of freedoms with gender equity in a participatory democracy with proactive policy on human rights. Reports of the Presidential election in April 2002, described massive participation by voters, posting banners and wearing clothing creatively designed to express the political ideals of each of the 24 Presidential candidates. The political respect for diversity in 2002 strongly contrasts the repressed environment in 1990 when Mali was still under a dictatorial one-party system. The interrelated instrumental freedoms defined by Sen include: 1) political freedoms 2) economic facilities 3) social opportunities 4) transparency guarantees and 5) protective security. These have been particularly advanced in Mali from 1990 to 2000.

The push for equal access to primary education for all has developed momentum for positive change in women's capacity in many sectors of society. The ICT liberalization and development in Mali have enhanced political, social and economic freedoms and communications among all sectors of society. Further research on the nature of the relationship between national freedoms and development in Mali is recommended.

The research findings answered some aspects of the questions addressed in this inquiry. Though ICT diffusion is rapidly occurring in Mali, the ten-year period is a short time to evaluate changes in gender equity patterns. Policy change in both telecommunications and gender equity has resulted in positive growth for ICT applications to politics, education, health and economic growth in Mali. Research findings for each question will be discussed in the context of theory and policy.

*1. What changes have occurred in social, economic and political development sectors in Mali from 1990 to 2000 during implementation of gender equity and ICT liberalization policies?*

Mali has achieved growth in most sectors of development. Economic growth has been modest but positive, averaging 4.5% growth per year. Agricultural production has improved with the information access provided through ICTs. Political participation has increased, particularly for women. There were 24 candidates in the 2002 Presidential election. ICTs facilitated the determination of the 2001 and 2002 election results for the 9 Regions, 48 Cercles and 703 political communes in Mali. The Internet, telephone and radio were used to transmit voting results in the 2002 presidential election. Modest improvement in all health indicators has shown increased life expectancy, and reduced infant and maternal mortality rates in Mali. Gross enrollment ratios have improved for primary, secondary and tertiary education. With greater rates of improvement for women, gender equity in these ratios has also improved.

National development in Mali showed positive change during the 1990's. Mali's progress toward all the Millennium Declaration goals for 2015 was slow but positive. The only exception that this research found was that the purchasing power parity (PPP)

was greater in 1979 than in 1999. Poverty reduction has occurred along with increased agricultural production. Nevertheless, positive growth rates for many development indicators for Mali are not sufficient to achieve all the Millennium Declaration Goals by 2015. ICT development with proactive efforts to achieve greater gender equity corresponded with positive outcomes. Improvement in the human development index and the inclusion of a technology achievement index for Mali in the first UNDP application of this TAI indicator provide evidence of growth in Mali. Mali was one of the few least developed countries with sufficient technology data for calculation of the TAI. Among UN member states, 45 had no TAI included in the 2001 UNDP report.

Many factors are responsible for the positive developments in Mali. The evolution of participatory democracy has increased freedom and agency for men and women in Mali. Mali's progress is consistent with the positive relationship between freedom and growth predicted by Sen's theory of development as freedom. Democracy catalyzed cultural and social rejuvenation, which contributed to economic growth in Mali. GDP in Mali grew from \$0.66 billion US in 1990 to \$1.5 billion US in 1998. This represents a 232% increase over eight years (ITU, 2001, p105).

The political decision to liberalize telecommunications policy and expand the infrastructure and domestic capacity has facilitated the application of ICTs to politics, business, education and cultural communications, with positive results. Mali now has partial or full competition in all sectors of telecommunications service. Mali has built ICT policy informed by indigenous knowledge and policy consultations with epistemic communities of international telecommunication regimes. Cooperative programs with the ITU, UNESCO, UNDP, IDRC and USAID helped Mali expand telecommunications infrastructure and capacity while maintaining the focus of national and cultural integrity in ICT applications. This research found that during the policy collaboration process between the international telecommunications and gender equity regimes and their own national regime, Mali's regional leadership in negotiating solution strategies to regional problems increased substantially. In May 2002, Mali hosted the African Regional Preparatory Meeting for the 2003 World Summit on the Information Society. The

Bamako 2002 Declaration from this meeting included the Gender Caucus Statement of support for WSIS and for action to eliminate gender based inequities in ICT access. Mali's national development and international participation in all sectors, particularly regional diplomacy have been overall national achievements.

Mali formed an agreement with neighbors Senegal and Mauritania to collaborate on a fiber optic line for cross-country communications. These countries will now be free of expensive call routing through former colonizer nation France. Freedom from the costly inefficient technological post-colonial tethers has resulted from the negotiation of an agreement between an international regime and the three national regimes. International regime theory and the perspective of development as freedom help explain two independent but interactive growth processes in ICT capacity and gender equity development in Mali.

## *2. How does Malian policy conform to international regime theory?*

Policy change in Mali has incorporated the recommendations of evolving international regimes to form policy consistent with Malian culture. Coordination of national policy and international recommendations for policy has generated a momentum for expansion of ICT infrastructure and the capacity to apply it to Mali's needs. Enhanced freedoms and choice options in the political, educational, health and economic sectors have grown with both the emerging democracy of Mali and with the ICT infrastructure. The influence of international regimes on national policy in telecommunications and gender equity produced positive results for Mali and the region. The ICT coupling of radio with Internet access has improved information distribution among people of the Timbuktu region and the entire population. The agricultural information program is the most popular radio show in Mali, most likely because of the industry and the perseverance of the people to create positive change through greater information access. Technological connectedness has helped increase social, political and cultural connectedness in Mali.

Malian gender equity policy is consistent with the human rights regime of the UN and the African Union. Mali has served as an example to other countries through its commitment

as a human rights nation and its efforts to safeguard children from forced labor. Women's rights are human rights. Mali honors all international rights agreements including UDHR and CEDAW. The Democratic government and the people of Mali place great value on human rights and have led regional efforts to protect those rights. Mali has a tradition of principles of human rights manifested in the 1236 C.E. political charter Kuru Kan Fukan, which documented a political culture of work, justice and freedom. Amartya Sen associates freedoms in society with development. Freedom and justice have been highly valued in Mali's strong social structure for centuries. Consistent with Sen's concept of development, the increase of freedom and agency has stimulated improvements in telecommunications and other sectors. Though Mali's status as a least developed country based on economic criteria will likely continue, evaluation of social capital, non-literary human capital and natural capital in Mali combine to form a different equation for development.

Proactive programs to achieve gender equity resulted in primary education enrollment ratios of 41% in 2001. Estimates for gross enrollment ratios for females in 2002 reached 53%. Mali had the second highest rate of increase in secondary female net enrollment between 1985 and 1997 of 33 Sub-Saharan African countries included in the study. The Malian Parliament has 12.2 % women. Ministerial level positions are held by 33.3% women. One woman entered the 2002 presidential race. COFEM and other women's organizations have been a part of the ICT training in Bamako and in the Timbuktu MCT. The political structure of Mali was one of the first sectors to develop ICT infrastructure and capacity to apply ICTs to administrative and national networking operations.

Growth and development in women's education and political participation in Mali have paralleled increase in women's access to ICTs. Family health indicators, infant mortality, maternal mortality, and life expectancy have slowly and consistently improved over the decade. Policies in Mali have encouraged participatory programs by soliciting community input and proactive efforts to include women. This participatory approach in all sectors of development has fostered democracy and gender equity. Malian efforts in cooperation with international gender equity regimes to implement policy

recommendations of the UN World Conferences on Women have built a progressive environment for gender equity in Malian society.

The MCT reported 36 % of the clients trained and using ICTs were women. Recent gender-disaggregated data for economic performance was not found in the literature but health and education indicators predict that economic indicators for women will improve. The work of the women of the MCT has made a valuable contribution to the understanding the application of ICTs by women to the social networking process, particularly in Africa. Further research in this area needs to continue as ICT access expands to include more women in African countries. The lesson from this research to development policy makers is that the application of gender equity policy with positive results in one sector in the case of Mali created a positive ripple effect in many other sectors.

*3. How was the Multipurpose Community Telecentre in Timbuktu used to forward gender equity and ICT liberalization policies and increase ICT access in the rural regions of Mali?*

The MCT has brought public access to ICTs to the Timbuktu region. The local community involvement from the planning stage to community ownership has also facilitated specific applications of ICTs to local community problem solutions. The ICT tools have brought the benefits of a networked society to the ancient and mysterious city. Gender equity in staff, training and client base was an objective built into the design of the MCT. This research found that the application of gender equity policy in the MCT fostered telecommunications growth as well as social, political and economic growth in the community.

Participatory democracy has been enhanced with a more informed citizenry in Timbuktu. The voter turnout in the 2001 Timbuktu election was 90%, higher than any other cercle in the region. Cultural analysis of the Timbuktu region shows a high level of human connectedness in the community through communications patterns with and without technology. The Pact Institute baseline research of communication use before the MCT

was operational showed high usage of the technologies available. Research of the 1999-2000 visit showed a sharp rise in the use of the ICTs at the MCT and in the revenues generated during the period of the Timbuktu 2000 events. Increased ICT usage continued in the subsequent months of 2000. This is consistent with the long history of international cultural exchange, particularly knowledge exchange, in Timbuktu and the river regions of Mali.

The MCT was a successful policy collaboration of international, national and local regimes to achieve common goals. The respect for local participatory development and evaluation of the MCT contributed to its local ownership and sustainability. The positive profile of the MCT in the community also contributed to its success. The proactive efforts to overcome inertia on gender exclusion from technology projects led to a more gender friendly environment and greater participation by men and women. The resource of trained residents has worked to develop innovative applications of the multimedia technologies to the needs of the community. The initial international regime support was essential in the startup phase and gradually reduced as the community developed its own agency in the MCT progress. Timbuktu is now more connected to the world and has tremendous creative gifts to share.

The preservation of historical records, oral, scribal, printed and electronic is important to our understanding of meaning of humanity in the Information Society. This is particularly true of information from Africa, the birthplace of humanity. The information held in Timbuktu is part of our world human heritage. ICTs have already begun to transform the social, political and economic landscape in Mali and throughout Africa. Congolese filmmaker Balufu Bakupa-Kanyinda completed a documentary *Afro@digital*, co-produced by UNESCO in 2002. The 52-minute documentary explores how digital technology has changed the lives of Africans. Challenging questions are raised about the use of technology in fashion, music, film, television, research, politics, and governance. "Technology is about a whole mind set" and Africans have much to say in "documenting humanity's memory" (<http://www.unesco.org/webworld> , accessed 4/9/02, p1).

*4. What additional, currently unavailable data would be useful for further analysis of MCT impacts?*

The ICT facilities in the Timbuktu region have been used in the 2002 National Election and for economic development by artisan entrepreneurs and by members of the agricultural association. Data on the economic and political impact of these ICT applications is not yet available to the general research community. According to this author's knowledge, data has been collected at the MCT but has not yet become accessible through publication. Gender disaggregated data has also been collected on usage and training but the MCT report on progress since 2000 is not yet available through the ITU. Such data on the MCT project could benefit further research and LDCs engaged in telecentre ICT development projects. Gender-disaggregated data on educational, medical and economic applications of the ICTs at the MCT could contribute to the assessment of broader MCT impacts on the livelihood and well-being of families, communities and the region served by the MCT.

*5. What lessons can be learned from Mali for policy applications in other LDCs?*

The Multipurpose Community Telecentre in Timbuktu has implemented liberalization policies to increase ICT access with gender equity in the rural regions of Mali. This pilot project has accomplished many objectives which are applicable to other LDCs, where the majority of the population live in rural communities. It has provided community access to information for the benefit of rural communities. It has also demonstrated a working, sustainable, replicable model for ICT access expansion for other rural communities. Internet and Internet telephony communications through telecentres are more affordable than traditional phone communications in many LDCs. The research found that this model, when adapted with local input to the needs of the community, created an accessible and interactive information and communication system. This system was responsive to communications and information problems with innovative ICT solutions.

The lessons for LDCs considering the telecentre model for ICT development in rural communities include: 1. local input is essential to sustainability and applicability of ICTs

within the community; 2. training and local capacity building in hardware and software maintenance and applications enhance the value of ICTs to the community; 3. gender equity in training, access and operations help integrate the technology more fully into the social fabric of the community; 4. longterm communications cost savings result from the initial local investment; 5. local, national and international regime cooperation requires mutual respect and produces valuable global connections.

The country study found that Mali has a history of peaceful international and national relations. Mali's role in the trans-Saharan trade developed a multicultural society with diversified production. Knowledge production centered in the medieval universities of Timbuktu has a continuous history but became disconnected from world knowledge systems during colonialism and during the early post-colonial period since 1960. The political developments toward participatory democracy reflect 21<sup>st</sup> century norms but are also organized around principles of the Kuru Kan Fukan, work, justice and freedom. The benefits of ICTs to reconnect Mali to the world knowledge system hold promise for Mali but also for the entire Information Society.

Further research is needed on ICTs and gender equity in the developing world. This requires collection of gender-disaggregated data on training, access, usage and application of ICTs to family and community life. Research can examine and compare ICT development models that reach beyond the educated and propertied demographic of early adopters. Individual entrepreneurs and franchised operations own and operate ICT shops, cybercafe's and other structures for trade in ICT services. The MCT is only one model for providing community access to ICTs.

Research exists on the relationship between ICTs and development. Further research is needed to determine the relationship between domestic freedoms and development in the ICT sector in Mali and other LDCs. This research requires gender-disaggregation of data because in many cultures vast differences in freedoms still exist between men and women.

Women, youth and the poor benefit from information access. The inclusion of gender-disaggregated data for the TAI can help identify areas for development toward a gender equitable Information Society. Research to document effects of ICTs and information access on these populations in developing countries has been sparse. Research on ICT access for women, youth and the poor in the US has found positive effects on economic, technological and political development. Technological applications have the power to change society in positive ways only when human vision applies those technologies to unsolved problems. Women, youth and the poor require proactive policies for education and training in ICTs. Research on how women incorporate communications technology into political and economic factors of family and community life can inform policymakers. Research on their information needs and the obstacles they encounter can contribute ideas for ICT expansion into underserved communities. Previous research including this research predicts that greater attention to local applications of ICTs will increase project sustainability and increase understanding of the social impact of ICTs on all sectors. The success of Mali's MCT was interrelated with the strong social structure grounded in family and spirituality. The health of the democratic political structure in the process of decentralization and the growth of local decision-making have stimulated a new era for Mali which illuminates lessons for progress applicable to other countries. This knowledge incorporated into policy can produce economic and social benefits for the Human Society. The greatest lesson from Mali is perhaps the human contribution made through the policy efforts to link ICTs and gender equity with human development. Human rights poet, Mrs. Makalu Awa Danbele has articulated this Malian aspiration. After seeking mutual respect, self-knowledge and education, the Malian Poet suggests:

Let's steady the minds of those who have been swayed from Being Human  
Indeed! Being Human is forever! Being Human sets right the world!

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## APPENDIX 1 - MALI, SENEGAL. GHANA - VITAL STATISTICS

	<b>Mali</b>	<b>Senegal</b>	<b>Ghana</b>
GNP, 1997 (US\$, billions) (Ghana, 1998 all )	2.7	4.8	7.3
GNP, avg. annual growth rate, 1996-97 (%)	6.6	5.4	4.6
GNP per capita, 1997 (US\$)	260.0	540.0	390.0
GNP per capita, avg. annual growth rate, 1996-97 (%)	3.5	2.5	1.9
Population, 1997 (millions)	10.3	8.8	18.5
Population growth rate, 1980-97 (%)	2.6	2.7	3.0
Infant mortality rate, 1997 (per 1,000 live births)	118	70	65
Life expectancy at birth, 1997 (years)	50	52	60
Female-Male difference	4	4	3
Primary school enrollment ratio, net, 1996 (%)	28	58	--
Male	33	64	--
Female	22	52	--
Youth illiteracy rate, 1997 (% of population age 15-24):			
Male	34	43	22
Female	49	62	40
Safe water, population with access, 1996 (%)	48	50	56
Energy use per capita, commercial, 1996 (kg of oil equiv)	NA	302	383

(<http://www.worldbank.org/html/schools/regions/ssa/mali.htm>)

(<http://www.worldbank.org/html/schools/regions/ssa/senegal.htm>)

(<http://www.worldbank.org/html/schools/regions/ssa/ghana.htm>)

## **APPENDIX 2 - NAIROBI FORWARD LOOKING STRATEGIES SCIENCE & TECHNOLOGY AND COMMUNICATIONS**

### **REPORT OF THE WORLD CONFERENCE TO REVIEW AND APPRAISE THE ACHIEVEMENTS OF THE UNITED NATIONS DECADE FOR WOMEN: EQUALITY, DEVELOPMENT AND PEACE**

Nairobi, 15-26 July 1985 - Nairobi Forward Looking Strategies -  
United Nations, New York, 1986

#### II. Development (pp56-63)

##### Science and technology

###### Paragraph 200

The full and effective participation of women in the decision-making and implementation process related to science and technology, including planning and setting priorities for research and development, and the choice, acquisition, adaptation, innovation and application of science and technology for development should be enhanced. Governments should reassess their technological capabilities and monitor current processes of change so as to anticipate and ameliorate any adverse impact on women, particularly adverse effects upon the quality of job.

###### Paragraph 201

The involvement of women in all of the peaceful uses of outer space should be enhanced, and effective measures should be undertaken to integrate women into all levels of decision-making and the implementation of such activities. In all countries special efforts should be made by Governments and non-governmental organizations to provide women and women's organizations with information on the peaceful uses of outer space. Special incentives should be provided to enable women to obtain advanced education and training in areas related to outer space in order to expand their participation in the application of outer space technology for peaceful uses, especially in the high-priority development areas of water, health, energy, food production and nutrition. To achieve these goals, increased opportunities and encouragement should be given to women to study science, mathematics and engineering at the university level and to girls to study mathematics and science at the pre-university level.

###### Paragraph 202

Women with appropriate skills should be employed at managerial and professional levels and not restricted to service-level jobs. Special measures should be taken to improve

working conditions for women in the science and technology fields, to eliminate discriminatory classification of jobs and to protect the right of women to promotion. Efforts should be made to ensure that women obtain their fair share of jobs at all levels in new technology industries.

#### Paragraph 203

Major efforts should be undertaken and effective incentives created to increase the access of women to both scientific and technological education and training. To achieve these goals, efforts should be made by Governments and women themselves to enhance, where necessary, the change of attitudes towards women's performance in scientific fields.

#### Paragraph 204

The potential and actual impact of science and technology on the developments that affect women's integration into the various sectors of the economy, as well as on their health, income and status, should be assessed. Relevant findings should be integrated in policy formulation to ensure that women benefit fully from available technologies and that any adverse effects are minimized.

#### Paragraph 205

Efforts in the design and delivery of appropriate technology to women should be intensified, and attention should be given to the achievement of the best possible standard in such technologies. In particular, the implications of advances in medical technology for women should be carefully examined.

#### Communications

#### Paragraph 206

In view of the critical role of this sector in eliminating stereotyped images of women and providing women with easier access to information, the participation of women at all levels of communications policy and decision-making and in programme design, implementation and monitoring should be given high priority. The media's portrayal of stereotyped images of women and also that of the advertising industry can have a profoundly adverse effect on attitudes towards and among women. Women should be made an integral part of the decision-making concerning the choice and development of alternative forms of communication and should have an equal say in the determination of the content of all public information efforts. The cultural media, involving ritual, drama, dialogue, oral literature and music, should be integrated in all development efforts to enhance communication. Women's own cultural projects aimed at changing the traditional images of women and men should be promoted and women should have equal access to financial support. In the field of communication, there is ample scope for international co-operation regarding information related to the sharing of experience by

women and to projecting activities concerning the role of women in development and peace in order to enhance the awareness of both accomplishments and the tasks that remain to be fulfilled.

Paragraph 207

The enrolment of women in publicly operated mass communication networks and in education and training should be increased. The employment of women within the sector should be promoted and directed towards professional, advisory and decision-making positions.

Paragraph 208

Organizations aimed at promoting the role of women in development as contributors and beneficiaries should be assisted in their efforts to establish effective communications and information networks.

(United Nations, 1986, Para 200-208, p56-63)

**APPENDIX 3 - Fourth World Conference on Women, Beijing, 1995**  
**Platforms For Action - Section J - Women and the Media**

22. *Achievements*: The establishment of local, national and international women's media networks has contributed to global information dissemination, exchange of views and support to women's groups active in media work. The development of information and communication technologies, especially the Internet, has provided improved communication opportunities for the empowerment of women and girls which enabled an increasing number of women to contribute to knowledge sharing, networking and electronic commerce activities. The number of women's media organizations and programmes has increased, facilitating the aims of increased participation and promotion of positive portrayals of women in the media. Progress has been made to combat negative images of women by establishing professional guidelines and voluntary codes of conduct encouraging fair gender portrayal and the use of non-sexist language in media programmes.

23. *Obstacles*: Negative, violent and/or degrading images of women, including pornography, stereotyped portrayals, have increased in different forms using new communication technologies in some instances, and bias against women remains in the media. Poverty, the lack of access and opportunities, illiteracy, lack of computer literacy and language barriers, prevent some women from using the information and communication technologies, including the Internet. Development of and access to Internet infrastructure is limited especially in developing countries and particularly for women.

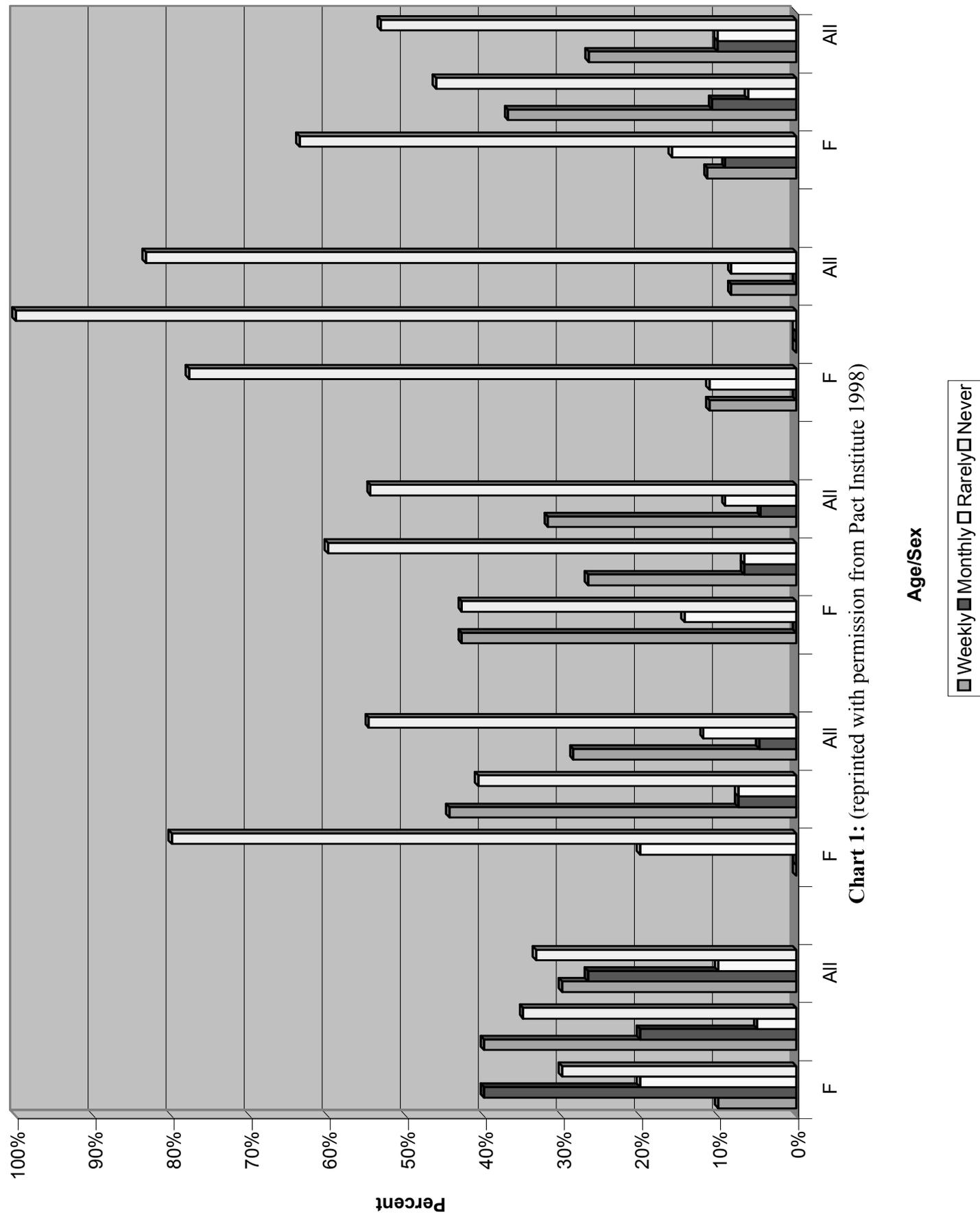
Source: <http://www.unifem.un.org>, accessed 11/1/01



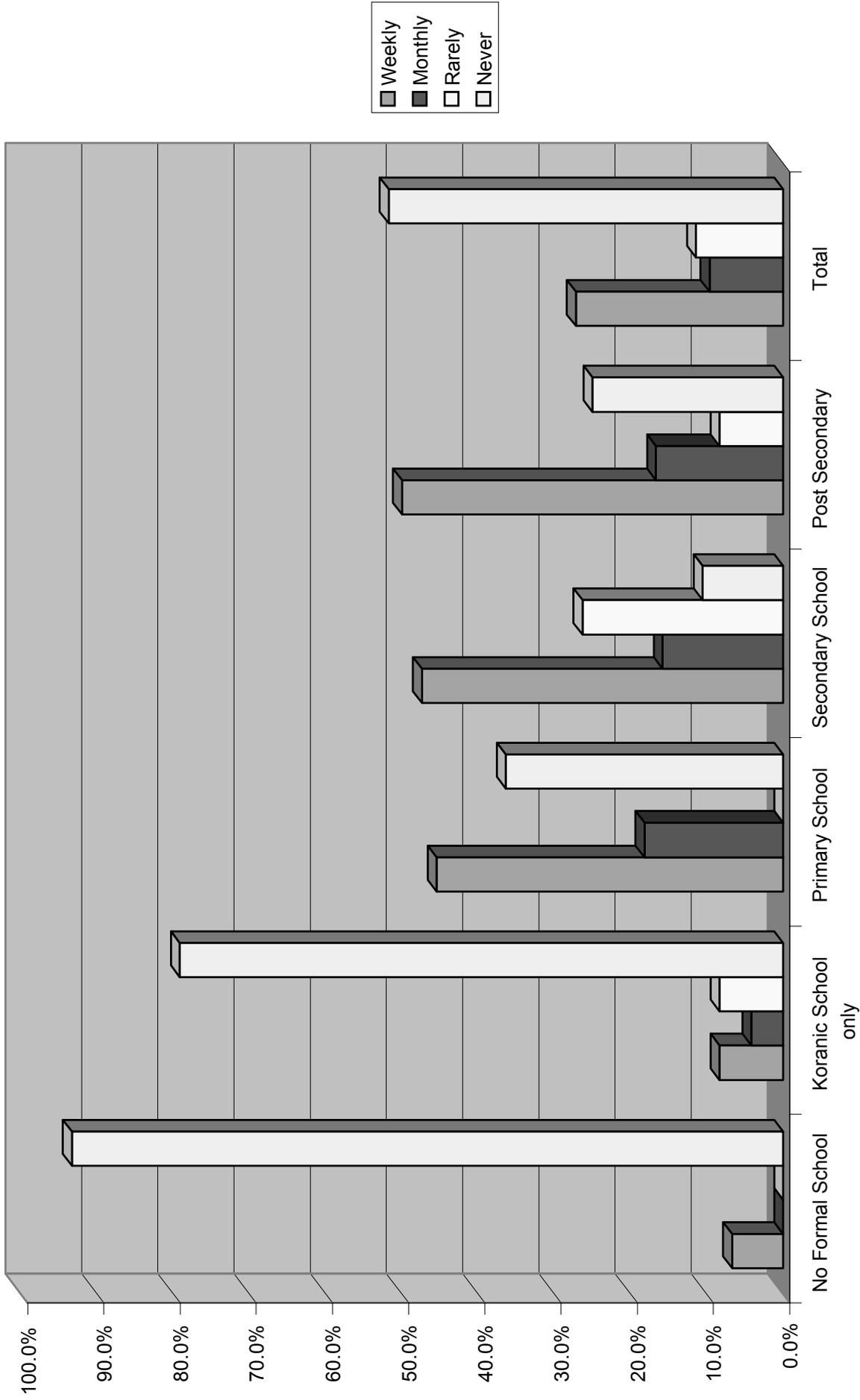
## APPENDIX 5 – Position of African Women in relation to ICTs

### Gender Caucus Statement For Inclusion in Bamako 2002 Declaration The African Regional Preparatory Meeting For the World Summit on the Information Society

1. For many women in Africa, the challenge is to overcome a double burden of marginalisation. The marginalisation of Africa is characterised by increased poverty, lack of infrastructure, conflicts, deepening rural/urban disparities and high illiteracy. Women's burden is heavier in all these aspects because women represent the majority of the poor and illiterate. The relative high cost of access to ICT facilities and equipment as well as the unavailability of access to funding and credit also contribute to this burden. Further, the unavailability of appropriate technologies designed for an African context exacerbates the problems of women's access and participation in ICT and in the Information Society. Gender discrimination excludes the majority of women from benefiting from the opportunities that ICTs offer as a tool and catalyst for development and all human enterprise.
2. The ICT sector is dominated by values which favour profit over human well being. This lack of concern for human development objectives does not augur well for women in Africa. Within the firms, markets and institutional contexts through which ICTs are diffused, power relations do not advance women's empowerment and the agenda of the few groups representing the interests of gender equality and human development in policy processes are marginalised. These groups occupy low status and are seen to have little relevance. In addition, women are underrepresented in all aspects of decision-making in operations, policy and regulation. Unless this dominant culture and its related practices are changed, rapid diffusion of ICTs will contribute little to gender equality and human development for the world's majority.
3. The failure to achieve greater equity in access to the Information Society poses greater risks that the African region and women in that region will fall further behind, becoming more marginalised and excluded. The Information Society as it is presently constituted does not reflect different women's concerns, needs and interests and fails to recognise and protect women's human rights and dignity. This failure is leading to the imposition of external models and perspectives that will aggravate present conditions of poverty and exclusion. The concept on the Information Society as it stands now, leads to an absence of an African, and an African women's perspective.
4. Women are seen as passive receivers of information rather than actors able to shape and contribute to decision making and policy formulation in general and in the ICT sector in particular. African women are able to contribute to the formulation and implementation of creative solutions to the digital divide and are legitimate partners and actors in building an Information Society in Africa.
5. ICTs and the upgrading of human capacity are increasingly considered to be agents for development. It is, therefore, critical to ensure equal access and gender equity in the Information Society. Increased access to ICTs can uplift African women's livelihood through:
  - Greater access to and control of local and international markets for African women producers and traders
  - Employment and other profit-related opportunities which do not require a physical presence thereby allowing women to combine the care economy with their professional roles
  - Promotion of health, nutrition, education and other human development opportunities
  - The capacity to mobilise for women's empowerment and societal well being.



### Frequency of Telephone Calls Outside Timbuktu (by education group)



**Chart 2:** (reprinted with permission from Pact Institute 1998)

Frequency of Telephone Communications (by stratified sample)

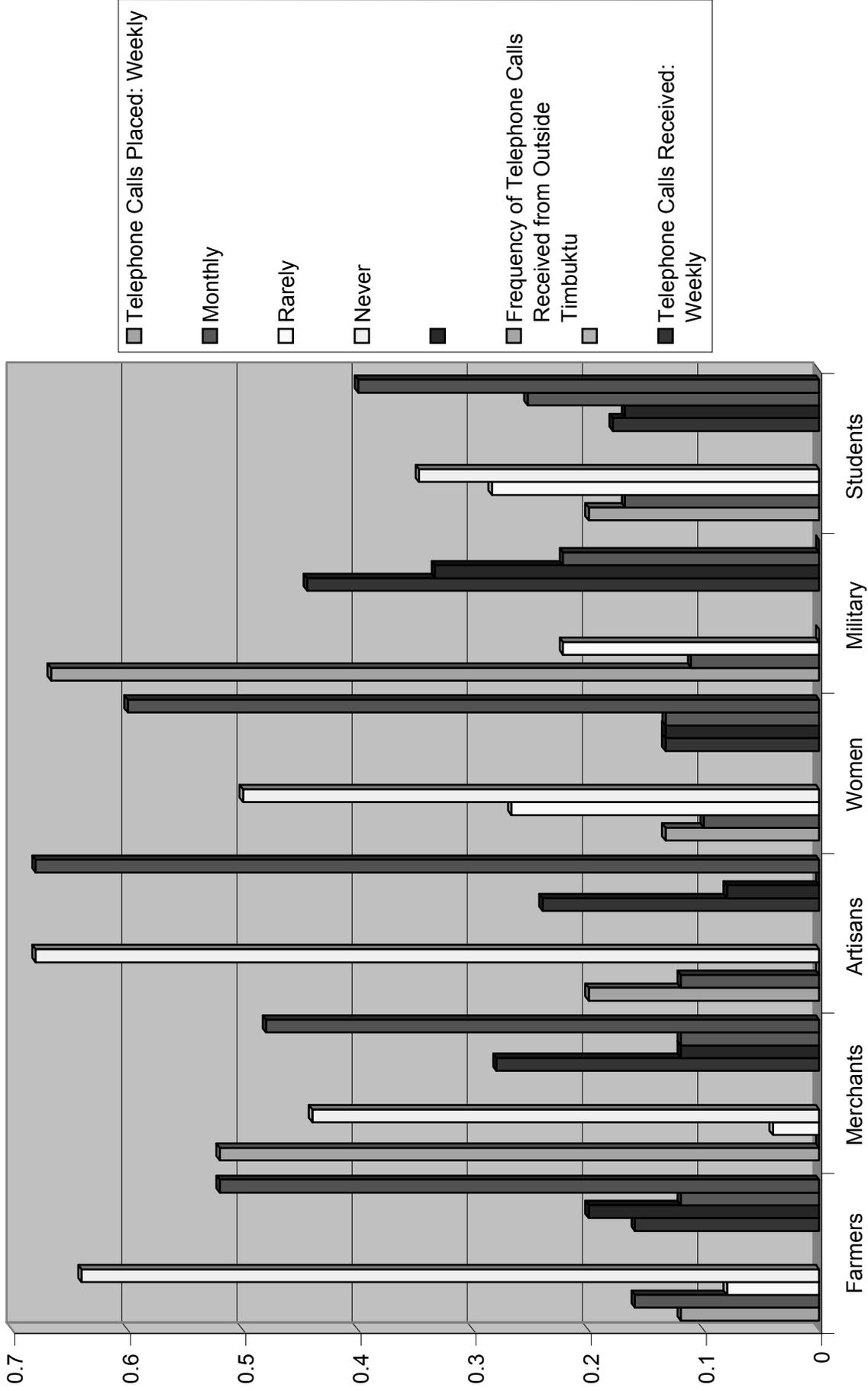


Chart 3 : (reprinted with permission from Pact Institute 1998)

Purpose for Telephone Calls to Outside Timbuktu (by age and sex)

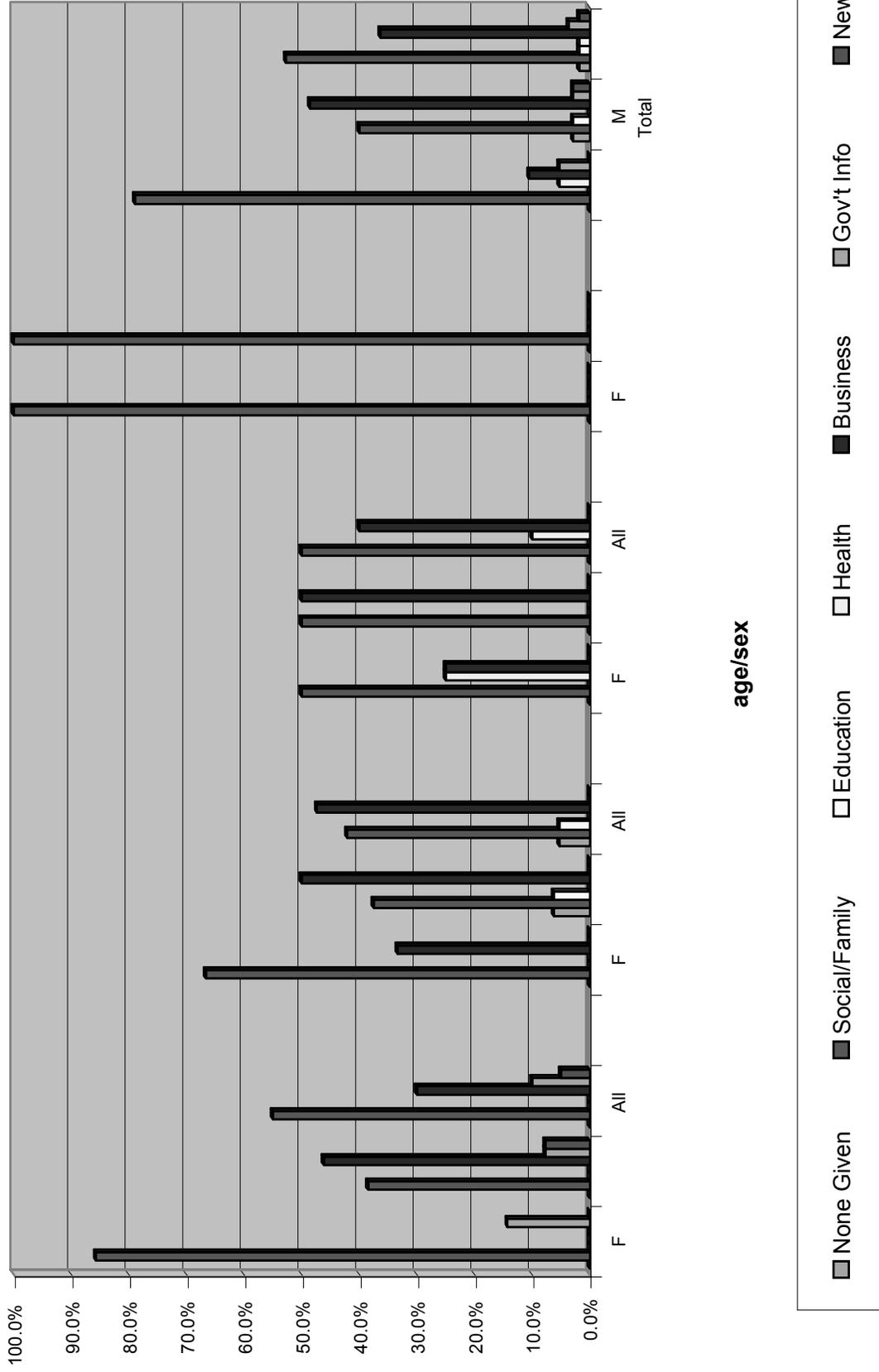


Chart 4: (reprinted with permission from Pact Institute 1998)

## Vita

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