

# **Higher Education Development for Ethiopia: Pursuing the Vision**

**A WORLD BANK SECTOR STUDY**



**Document of the World Bank**

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## FOREWORD

Analysis of the various economic and social sectors that comprise a developing nation's economy, along with policy assessment and prescription, is a longstanding activity of the World Bank. But until recently, relevant experience from elsewhere in the world, or "good practice," was rarely provided to the client Government in the course of these analyses.

At the beginning of the new millennium, this changed. The World Bank expanded its operational mission to include documentation and diffusion of "things that work" in the various spheres of national development. Reflecting this change, the Bank has come to see itself as a "knowledge bank" as well as a development investment bank.

The study presented here therefore seeks not only to assess Ethiopia's higher education expansion and reform strategy and identify potential shortcomings. It also strives to include reference to what works in similar circumstances, and to formulate its recommendations on that basis.

The World Bank team was led by Gary Theisen and included Eleni Albejo, Tom Coyle, Luis Crouch, Getahun Gebru, Fred Hayward, Jamie Merisotis, Southsavy Nakhavanit, Bobak Rezaian, and William Saint. The Bank's Country Director for Ethiopia was Ishac Diwan and its Sector Manager was Laura Frigenti. Peer reviewers for this study were Jamil Salmi (HDNED), William Smith (AFTP2), and William Cummings (George Washington University). Comments were also contributed by Jill Armstrong (AFCET), Jee Peng Tan (AFTHD), and John Van Dyck (AFCET).

The Bank team worked closely with government counterparts in addressing questions of critical importance and in formulating strategies and alternatives that reflect the realities of the Ethiopian social, political and education context. This iterative process of problem definition and solution-seeking will hopefully enhance the practicality of the analysis and the sustainability of the recommendations. Members of the Ministry-nominated counterpart team were: Ato Aleazar Tilahun (Lecturer, Ambo College), Dr. Tegene Negesse (Coordinator of Graduate Studies, Debu University), Ato Assefa Berhane (Tigray Educational Bureau), Ato Seifu Abasambi (Head, Finance and Budget, Jimma University), Ato Tesfaye Dagne (Lecturer, Bahir Dar University), Ato Awdenegest Moges (Lecturer, Debu University), and Ato Abebe Haile (Planning Expert, Jimma University). The work of both teams was guided and facilitated by Dr. Teshome Yizengaw, Vice Minister for Education. The preliminary results of this study were presented to the collected presidents of Ethiopian universities and senior staff from the Ministry of Education in October 2003. Copies of this report were shared with university leaders and academic staff during Bank team visits to seven higher education institutions in December 2003.

The relative length of several sections of this report reflect the high degree of importance attached to these topics by Ethiopian officials and their request to the Bank team for detailed analysis and advice: the block grant budget formula, and management skills development. The discussion of information and communications technology reflects the Bank's concern about efficiency in this area, and the potential for an expanded role by the universities in capacity development outside academic campuses. A conscious decision was made to keep these sections longer for purposes of clarity.

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## **EXCHANGE RATE**

USD 1.00 = Birr 8.65  
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## **ACRONYMNS**

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AAU	Addis Ababa University
DLC	Distance Learning Center
EFA	Education for All
EHESI	Ethiopian Higher Education Strategy Institute
ESDP-II	Education Sector Development Program, 2002/03 – 2004/05
ESSR	Ethiopia Social Sector Report of 1998
ETC	Ethiopian Telecommunications Corporation
EthERNet	Ethiopian Educational and Research Network
FTI	Fast Track Initiative
GER	Gross Enrollment Rate
GOE	Government of Ethiopia
HEI	Higher Education Institution
ICT	Information and Communications Technology
MDG	Millennium Development Goals
MoCB	Ministry of Capacity Building
MOFED	Ministry of Finance and Development
MOE	Ministry of Education
NPRC	National Pedagogical Resource Center
QRAA	Quality and Relevance Assurance Agency
TVET	Technical and Vocational Education and Training
VSO	Voluntary Service Organization, United Kingdom

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# Higher Education Development for Ethiopia: Pursuing the Vision

## EXECUTIVE SUMMARY

### The Context and the Challenge

Although Ethiopia possesses a 1,700 year tradition of elite education linked to its Orthodox Church, secular higher education was initiated only in 1950 with the founding of the University College of Addis Ababa. This university and other subsequent higher education institutions strived, with considerable early success, to meet international standards. But as the 20<sup>th</sup> century drew to a close, Ethiopia's higher education system found itself regimented in its management, conservative in its intellectual orientation, limited in its autonomy, short of experienced doctorates among academic staff, concerned about declining educational quality, weak in its research output, and poorly connected with the intellectual currents of the international higher education community.

Recognizing these shortcomings, Ethiopia is currently engaged in a highly ambitious effort to re-align its higher education system in order to contribute more directly to its national strategy for economic growth and poverty reduction. Its achievements over the past five years have been little short of extraordinary. The reforms have targeted all levels: the overall system, the institutions, and the academic programs.

The foundation for major reform has been provided by ratification of a new Higher Education Proclamation by Parliament in June 2003. At the *institution* level, the new Proclamation awards substantial autonomy has been awarded to universities. Future recurrent funding will be provided in the form of block grants defined on the basis of a funding formula. University Boards and staff will choose their own institutional leaders, and non-academic staff have been de-linked from the civil service. Strategic planning, income diversification, and information and communications technology (ICT) development are being encouraged to meet the fiscal, space and instructional requirements of the on-going and planned expansion in enrollment .

At the level of *academic programs*, new degree courses are being introduced in response to anticipated labor market needs that underpin the nation's economic development strategy and to prepare its citizens for democratic participation in civic and social affairs. Graduate program enrollments are expanding rapidly in the effort to increase the supply of academic staff for the expanding system. To shore up quality in the classroom, a series of national and local pedagogical resource centers are being set up to encourage instructional innovation and to assist less experienced lecturers. Incorporation of ICT into instruction and as a vehicle for accessing the global network of information will add greater efficiency and depth to the learning process.

These reforms would comprise stunning achievements in any country, but are all the more significant in one of the world's most impoverished nations. Ethiopia clearly understands that economic growth in the 21<sup>st</sup> century will be driven by the nation's performance in raising its levels of national productivity in comparison to its economic competitors, and it is determined to make up the ground lost over the past two decades because of political instability and economic stagnation.

## **Recommendations: Pursuing the Vision**

The above examples illustrate the breadth and ambition of the government's current vision for higher education reform. They also suggest that the system's current need is not for further reform, but rather: (i) to design effective implementation strategies and action plans for operationalizing the reforms; (ii) to strengthen national capacities to carry out those strategies; and (iii) to ensure that the reforms are fiscally sustainable within the overall sector budget and within the financial resources available to higher education; (iv) to foster greater private sector involvement in the higher education expansion program; and (v) to improve the linkages between the labor force demands of an emerging knowledge economy and instructional programs offered at the universities.

The analysis and recommendations of this report seek to advance these five objectives. The main themes of this Executive Summary constitute the main issues identified for policy attention over the coming five years: HIV/AIDS, system financing, expansion and access, educational quality, management, and information and communications technology development.

### **o HIV/AIDS**

HIV/AIDS should be the foremost concern for both the Government and the university community because it holds the potential to undermine the country's increasing investments in education. AIDS now exists within all regions of Ethiopia. The estimated national infection rate is 10.8%. This rate is substantially above the 5.0% level at which infection tends to expand rapidly and exponentially. Tertiary education communities are particularly vulnerable to HIV/AIDS due to their age group (which constitutes the peak period for sexual activity and consequent risk of HIV infection), close physical proximity, relative autonomy from adult or community supervision, and inclination towards sexual networking. This vulnerability introduces a sizeable risk to the expected returns on investments made by families and government in the education of tertiary students. Indeed, AIDS now constitutes a new and irreversible form of "brain drain" in Africa. In spite of this risk, universities in Ethiopia have not yet established institutional policies or programs for the management and prevention of HIV/AIDS. If this is not done quickly, the benefits of the government's higher education reform program will be diminished.

- The Bank team recommends that the Ministry of Education require each university to develop its own set of institutional policies for the management and prevention of AIDS on their campuses, which could then be approved by the respective university's governing Board. If needed, funding for this process could be sought from the national AIDS prevention program, or from the expected World Bank-financed project for the development of Ethiopian higher education.

### **o FINANCING**

Since the year 2000, public investment in education has risen as a share of GDP from 3.2% to 4.5%. This level of financial effort is higher than the 3.9% registered for Sub-Saharan Africa as a whole. Education expenditure has also increased as a proportion of the overall government budget from 9.5% to 16.8%. This still falls below the general range of 20% to 25% for most developing countries, suggesting that scope remains for a further increase in the government's education financing effort. At the same time, the share of the education budget devoted to higher education has risen from 14.9% to 23% in response to the recent rapid expansion of this sub-

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sector. This is slightly higher than the 15% to 20% range used as a Bank guideline, but not unreasonable as a temporary measure in light of the significant tertiary capital expansion program currently underway.

Annual recurrent expenditures per university student are roughly 7,457 Birr (USD 860) when government-provided food, lodging and health care are included, and 5,801 Birr (USD 671) when student welfare subsidies are excluded. This latter level of educational investment is very low in comparison to Sub-Saharan Africa (USD 1,500) and to neighbor countries such as Kenya (USD 1,800), Tanzania (USD 3,236) and Uganda (USD 800).

Government provides virtually all of the financing used to run the public tertiary system. Full time students pay no significant tuition fees, although part-time and private students do so. This custom is increasingly at odds with prevailing practice in other African countries, especially in the Anglophone sphere, where various forms of student cost-sharing are emerging. The government has recognized this by indicating in the new Higher Education Proclamation that cost-sharing will be a key component for the future financing of tertiary education development. Accordingly, government introduced a university graduate tax in September 2003 designed to recoup gradually the cost of meals and lodging, together with a small portion of tuition costs.

This cost-sharing initiative is an important precedent in light of projected budgetary shortfalls for the education sector. Research conducted for the Bank's Public Expenditure Review and Country Status Report (2003) suggests that the education sector as a whole may be facing a significant financing gap if MDG and ESDP-II goals are to be achieved as planned. Annual expenditure plans for the education sector (including higher education) total roughly 5 billion Birr per year, compared with current spending (2002/2003) of about 3.5 billion Birr. In other words, the projected funding gap is a sizeable 40%.

This shortfall has several important implications. First, not all plans within the education sector can be paid for, and difficult choices will have to be made between competing needs within the education sector. Second, more aggressive efforts are required to find ways of reducing or sharing costs, particularly within higher education. Third, substantially more foreign assistance will be necessary. Lastly, the education sector's share of the federal budget will need to be increased, creating the associated challenge of how to reduce spending elsewhere in the budget.

Within these parameters, any national tertiary system would be hard pressed to expand enrolments rapidly while maintaining levels of educational quality. Ethiopia faces a double challenge in that it seeks to accomplish this while also introducing major reforms in institutional governance, management and curriculum. If the bold vision contained in the new Higher Education Proclamation is to have any chance of success, the solution to this double challenge will have to be found in the financing strategy that underpins and supports these reforms. This financing strategy is currently comprised of (i) expanded private provision; (ii) increased cost-recovery; (iii) introduction of a funding formula; (iv) improved efficiency of resource use; and (v) increased donor contributions. The following recommendations seek to strengthen the efficacy of this strategy.

### **Private Provision:**

- The Bank team recommends that expansion of private tertiary institutions be more actively encouraged in order to make the burden of higher education expansion borne by government more bearable. A near term goal might be to double the share of private enrollments from the current 21% to 40% by 2010.

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- To help achieve this goal, the Bank team recommends that Government provide stronger incentives for the expansion of private tertiary education (e.g., access to land, more generous customs exemptions for the importation of educational materials) and also extend quality-enhancing support to private institutions identified as needing improvement (e.g., participation in the National Pedagogical Resources Center, leadership and management training, creation of a fund for remedial actions).
- Consistent with the recent Higher Education Proclamation, the Bank team recommends that structured quality assurance and accreditation activities be put in place to protect the public from fraudulent and questionable quality providers that may emerge in the midst of rapid private expansion.

### **Cost-Sharing:**

- The Bank team recommends that the public expenditure budget “bulge” anticipated in higher education over the coming decade be attenuated through the progressive introduction of up-front charges for student welfare services such as feeding, accommodation and health services.
- In addition, the Bank team recommends that Government think more carefully about the problem of applying the new graduate tax to self-employed graduates than is evidenced in the current Cost-Sharing Regulation.

### **Funding Formula:**

- The Bank team strongly recommends that the funding formula be used largely to compensate for core costs, and not be employed to create additional incentives of any kind. Such a funding formula is suggested on page 36.
- The Bank team recommends that additional incentives, if desired, be provided through a non-base or top-sliced fund that encourages innovation or rewards improved performance against each institution’s own benchmarks.
- As a result, the Bank team recommends the combination of a simple but targeted formula for base funding with one or more incentive pools of non-base funds for policy steering as the most appropriate approach to funding the higher education system.
- A funding formula requires unit cost estimates that are fairly robust. For this reason, it is recommended that government immediately set aside funds to strengthen up-front data collection and information management systems, and to include these funds as an earmarked add-on to the block grant for base funding.
- Once data definitions and information systems are established, the Bank team recommends that the Ministry begin the process of collecting the data and implementing the new information system on a pilot basis. Only after this pilot phase would it be realistic to consider the inclusion of institutionally generated cost data in a funding formula.

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### Resource Use Efficiency:

- With regard to enrollment growth, the Bank team recommends that first-year intake be expanded at progressively slower rates, beginning at about 14%, then dropping to 10%, and so forth, until reaching 3% per year. This will be necessary in order to avoid overshooting the capacity of the system's currently expanding physical facilities.
- The Bank team recommends that professional business and financial management expertise from outside of the university system should be employed in a few experimental cases, preferably in one or two of the newer and smaller universities, in order to determine the effectiveness of using private sector professional expertise.
- The Bank team recommends that institutions consider substantially increasing their present recurrent budget allocations for "Maintenance and Repairs." The recent major construction program represents a huge investment that needs to be carefully maintained in order to gain the maximum use of these assets for the longest possible time. Current allocations for "Maintenance and Repair" are minimal and often are used for other purposes, resulting in very little regular maintenance work, insufficient to keep facilities in effective functional condition.

### Donor Partnerships:

- The Bank team recommends that development partners increase their support for Ethiopia's higher education expansion and reform program because of the quality and appropriateness of reform objectives, and because of the temporary public expenditure budget bulge expected over the next several years.

### o EXPANSION AND ACCESS

Ethiopia's tertiary level gross enrollment ratio (GER) of 0.8% in 2000 places it among the lowest ranking countries of the world, as does its 62 tertiary students per 100,000 inhabitants. The current tertiary level GER for Sub-Saharan Africa is 4% with a regional average of 339 students per 100,000 persons. As a result, professional and technical capacities of all types are extremely limited in Ethiopia, and development prospects have been stunted by these capacity shortages.

Women's access to higher education has been severely limited. In 2001/2002, women accounted for only 16% of degree enrollments in regular and evening programs of public institutions. Notably, just 7% of graduate students are women. More worrisome is the fact that barely 7% of academic staff in public tertiary institutions are women, thus depriving the tertiary education system of a fully proportionate share of the country's best female intellects, and its women students of sufficient role models for mentoring and guidance. In comparison, the Sub-Saharan average for women's participation in degree programs is roughly 35% and the proportion of women academic staff is about 20%.

- Consequently, the Bank team recommends that a special scholarship fund be established to support the graduate studies of Ethiopian women.

Against this backdrop, government's policy decision to expand tertiary enrollments is the correct one. However, this will not be financially possible if expansion is based exclusively on the progressive replication of the existing publicly funded residential campus model.

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- The Bank team therefore recommends that system expansion be pursued through the conscious differentiation of institutions by educational delivery system and cost structure.

Under this approach, the higher education system might eventually be configured as follows: one national research university specializing in graduate training (i.e., Addis Ababa University); several regional universities offering degree training in development disciplines relevant to the region's economy; numerous private institutions providing demand-driven education; a collection of shorter cycle colleges that host applied certificate and diploma programs, and various types of print-based and technology-based tertiary distance education.

Many of the elements for such a differentiated system are already in place, although more conscious effort is needed to shape and balance this system. The principal omission lies in the area of tertiary distance education, which is very poorly developed to date. To rectify this shortcoming, the following actions are recommended over the next five years:

- Organize a three-day informational seminar for higher education leaders on the methodology of distance education, including its strengths, weaknesses, benefits, and risks. The purpose would be to build understanding of how distance education might effectively complement existing higher education programs.
- Organize several short in-country training courses on specific skills of distance education for interested university staff. Ask institutional leaders for help in identifying motivated candidates. These courses should address: the management of distance education, curriculum and instructional design, materials production and distribution, and student support services.
- Select 10 to 15 of the best performing participants in these training courses to undergo formal MA degree training in distance education. These studies might best be undertaken *at a distance* in order to give these students personal experience with what distance education means to an individual.
- This core of MA program graduates could then be employed to staff local academic programs on distance education in Ethiopia so as to multiply national capacities to deliver tertiary education at a distance.

### ○ QUALITY

Three factors suggest that levels of educational quality may be declining. First, expenditures per student have contracted over the past decade. Second, the proportion of senior academic staff with doctoral degrees has been weakening within the system. Consequently, the short term generation of sufficient numbers of academic staff, trained at the necessary levels, may be the single most difficult challenge currently faced by the higher education expansion and reform program. Third, rapid enrollment expansion is inevitably bringing progressively less qualified students into the system. Current efforts to double the size of undergraduate student numbers, and to carry out an even greater expansion of graduate training, run the risk of lowering quality further unless major quality assurance efforts are incorporated into the expansion process.

To this end, it is critical to establish effective quality assurance capacities at the national and institutional levels. This is a vital yet complex process that will require careful planning, decisions about types of standards and methods to be used, a time-table for implementation of its parts, and thoughtful consultations to insure its legitimacy. Establishing an effective national

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quality assurance and accreditation process will need to be carried out in stages over the next three to five years at both the national and institutional level. In the discussion below, recommendations are made about what should be done both at the national and institution levels.

### **National Level:**

- The Bank team recommends that academic staff development, especially within the newer universities, be designated as a high priority if educational standards are to be maintained, and a culture of research to be nourished, in the midst of rapid expansion. A steady increase in the proportion of staff with doctoral degrees also holds the key to successful attainment of the ambitious enrollment goals for graduate programs. Graduate training based on the “sandwich” model is recommended as the most cost-effective way of implementing this undertaking.
- At the national level, several actions are needed: (1) Establishment of a formal mechanism to grant permission (i.e., registration or licensure) to tertiary education providers to operate and offer tertiary level degrees or programs for a limited period of time (e.g. 2-5 years) subject to accreditation. Actual recognition of degrees is conditional on accreditation within a specified time period. (2) Creation of a legal foundation for quality assurance, accreditation, and educational consumer protection. (3) Establishment a Quality and Relevance Assurance Agency. (4) Definition of the mission, goals, authority, and responsibilities of the Agency. (5) Definition of the requirements for accreditation and the procedures for attaining it. (6) Establishing a timetable for setting up the full range of quality assurance and accreditation processes including re-accreditation of colleges and universities already approved under the current quality review system (e.g. every five to seven years).
- Establish a Labor Market Observatory (ideally within the Higher Education Strategy Institute) to monitor labor market demand for graduates, to assess graduate performance on the job, and to disseminate these findings to tertiary institutions.
- Require the National Pedagogical Resource Center to produce a strategic plan and work program for improving the teaching skills of academic staff within both public and private institutions, and ensure that these activities are funded.

### **Institutional Level:**

- Establish and activate Pedagogical Resource Centers charged with developing the pedagogical skills and supporting the teaching of academic staff.
- Establish the practice of periodic academic reviews based on internal self-assessments.

### o **MANAGEMENT**

Because human and financial resources are very scarce, Ethiopian universities will be well served by efforts to develop the efficiency and efficacy of their management. Management skills development may be the single most important short-term goal for the higher education system. The following recommendations address the needs for both management efficiency and for management efficacy through training at all levels of responsibility.

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### **Management Efficiency:**

- A target staff/student ratio of 1:18 for the overall system is recommended as an appropriate goal for the near future.
- Contracting out of non-academic services needed by universities could also be given serious consideration. The permanent employment of large numbers of non-academic staff is costly and inefficient. Such out-sourcing is increasingly common among African universities, and typically includes the following services: provision of student meals, management of residence halls, computer maintenance, campus security, university vehicle maintenance and repair, care of the grounds and gardens, and minor facilities maintenance.
- An analysis of facilities use could be carried out by the Ministry in collaboration with institutions to determine how well institutions are utilizing existing facilities and the extent to which more efficient facilities use might help to accommodate expanded enrollments.

### **Management Training:**

- Good institutional management begins at the top. This means that the university Board must be comprised of competent persons who understand their roles and responsibilities as Board members. These responsibilities have recently changed as a result of the greater institutional autonomy awarded by the Higher Education Proclamation. Given the number of universities created in recent years and the prospect of more in the near future, the Bank team recommends that *a systematic program of orientation be undertaken for all university Board members.*
- Establish a locally designed leadership development program of 2 – 3 years duration for university presidents that recognizes their unique status, their special needs, and their difficulty in attending structured courses off-campus. A tailored one-on-one senior mentoring program is recommended as the best way to accomplish this.
- Organize short applied management training courses in Ethiopia each year for the foreseeable future (e.g., five years) that target senior university managers, including head librarians. Courses might usefully address such topics as financial planning and management, institutional communications, human resource management, conflict mediation, and basic computer skills. Where high quality local training expertise does not exist, these courses could be organized by experienced international experts, or through institutional partnerships with organizations that possess the requisite experience.
- At the same time, it is recommended that a longer term strategy be initiated to develop the “next generation” of university leaders and managers. This will involve identification of talented younger academic staff with demonstrated management skills who would be given opportunities to develop their potential further. In time, this pool of individuals would be expected to emerge as competitive candidates for future university management responsibilities.
- The Bank team further recommends that an office of strategic planning be established within the Ethiopian Higher Education Strategy Institute to support the development of strategic planning capacities within the universities. Among its duties might be training, technical assistance, and analysis of institutional and system data on the performance of higher education system. EHESI staff might usefully include a trained strategic and financial planner familiar with data collection and quantitative analysis of the educational data.

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- With regard to financial management, the Bank team recommends that training be provided at both the national and institutional levels, with special emphasis on preparing individual universities for effective control of their own budgets under the impending move to formula funding and block grant allocations. As part of this process, financial management software that is designed for use by university planners (including presidents) as well as institutional financial officers should be identified, acquired and introduced to the universities along with the necessary training of staff.
- **INFORMATION AND COMMUNICATIONS TECHNOLOGY**

Information and communications technologies (ICTs) hold the potential to enable higher education systems to enhance teaching and learning experience, improve access to educational resources and programs, expand distance learning opportunities, and reduce the costs of education in the long term. For this to happen, various prerequisites are necessary. These include: supportive government policies and an enabling regulatory environment for ICTs; robust telecommunications and information technology infrastructure; strong human resource capacity development in new technologies; clarity of educational sector objectives and the role of ICTs in facilitating achievement of those objectives; strong buy-in from students, teachers, and administrators; a sustainable funding base; and an institutional culture that motivates and rewards collaboration, information sharing, partnership and innovation.

In the effort to establish these prerequisites, the Ethiopian Government has launched an ICT Capacity Building Program. Part of the effort under this program addresses the need to increase the role of ICTs in higher education. To this end, the Ministry of Capacity Building, in partnership with the Ministry of Education, has commissioned Addis Ababa University to produce a “Connectivity Master Plan” for networking of the institutions of higher education throughout the country, and for establishment of the Ethiopian Learning and Research Network (EthERNet). The main objective of EthERNet is to provide state-of-the-art electronic communication services at the national level by connecting all of the academic and research institutions to one another, and to the global Internet. This would enable resource sharing, information exchange, and access to various common databases throughout the system.

The following major steps are recommended in order to formulate a strategic development plan for ICT-enhanced higher education in Ethiopia:

- Develop a sector strategy (ICT Development plan) for mainstreaming the use of appropriate ICTs in higher education. This could be done in parallel with the installation of institutional networks that is currently under way, and could inform the future development, expansion and use of applications and programs consistent with sector objectives and strategy.
- Identify linkages and areas of overlap between the higher education network and other ICT-assisted secondary and post-secondary human resource development programs (e.g. *SchoolNet*, *WoredaNet*, *DLC-Net*, *TVETs*, etc.). Particular efforts are needed to achieve very close collaboration with the ICT program team of Ministry of Capacity Building in order to ensure maximum complementarity between programs.
- Identify very clearly the owners of each initiative and its sub-components, and establish an agreed line of accountability for implementation and delivery of each initiative (e.g. who is responsible for what, where, and to what extent for the design, development,

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implementation and maintenance of infrastructure, applications, training, management, etc. of each ICT initiative/activity/program). Specifically, the installation of networks at campus and institutional levels could be accompanied by adequate training of staff responsible for management, maintenance and use of the networks.

- Define the priority areas for application and use of ICTs with respect to higher education sector objectives (e.g. improved quality, increased enrollment, better administration and records keeping, cost recovery, new revenue streams, wider accessibility, improved teaching/learning and research, etc.). This may require additional studies and inputs from similar experiences in other universities, particularly in those that may have a setting similar to Ethiopia (e.g. University of Dar es Salaam, Eduardo Mondlane University in Mozambique).
- Prioritize (phasing, sequencing, selectivity) and develop realistic scope and implementation schedules for the roll-out of ICTs. This is particularly important with respect to programs that are initially supply-driven (e.g. EthERNet).
- Implement campus-wide, institutional and national higher-education network infrastructure consistent with the level of readiness of each institution (i.e., rolling out the network based on the absorption capacity of local staff for managing and maintaining the network, rather than based on pre-defined or vendor-specified schedules).

### Conclusion

Five essential conditions must be guaranteed by the national policy and regulatory frameworks in order for the currently unfolding higher education reform to produce its expected impacts. These essential conditions are enshrined in the new Higher Education Proclamation but have yet to be put into practice. Therefore, the above recommendations are intended to support this implementation process. These essential conditions are:

- Diversification of revenue sources. This is necessary in order to ensure adequacy of tertiary (and overall education sector) funding, to share the financing burden beyond public resources, to introduce a more business-like and efficient institutional management culture, to encourage mutually beneficial university partnerships with the surrounding community, and to avoid the risk of budget distortion.
- Formula funding. This is necessary in order to steer institutional performance progressively towards the goals of the government's higher education reform.
- Institutional autonomy. This is necessary in order for university managers to be able to plan strategically, to implement their chosen strategies, and to possess the freedom of action needed to do what they believe needs to be done in order to improve the performance of their institution while remaining accountable for their performance.
- Block grant allocations of public subventions. This is necessary in order for institutional managers to be able to marshal their financial resources behind the priorities and goals of their strategic development plans and effectively lead their institutions.
- Quality Assurance. This is necessary in order to hold institutions ultimately accountable for their performance in teaching and to provide students with a guarantee that they will receive a certain standard of education in return for their investment of time and resources.

## EXECUTIVE SUMMARY

Worldwide experience suggests that the absence of any one of these five essential conditions is likely to jeopardize the entire reform undertaking. The Ministry of Education and its higher education reform implementation team are therefore urged to do all that is in their power to ensure that these essential policy and regulatory requirements are put in place and effectively implemented.

To these five elements of a national policy framework, a sixth requirement must be added: a cadre of visionary leaders and capable managers who can guide universities through the coming reforms and seize the opportunities they will create. This need cannot be addressed through legislation or the recruitment of expatriate staff, but must be met through sustained local capacity building efforts. It therefore stands, together with AIDS prevention and the production of adequately trained academic staff, as one of the most important immediate actions necessary to ensure the success of the higher education reform program.

# Higher Education Development for Ethiopia: Pursuing the Vision

A WORLD BANK SECTOR REPORT

## THE CONTEXT AND THE CHALLENGE

Although Ethiopia possesses a 1,700 year tradition of elite education linked to the Orthodox Church, secular higher education was initiated only in 1950 with the founding of the University College of Addis Ababa. During the following two decades half a dozen specialized technical colleges were established to address training needs in agriculture, engineering, public health, and teacher education. These institutions hosted an educational culture that was heavily influenced by its long informal association with the Orthodox Church (Wagaw 1990). In their academic organization, they were somewhat more American, and less British, than higher education systems in the former British colonies of East Africa. Strikingly, tertiary enrollments totaled only 4,500 in 1970 out of a national population of 34 million. The resulting tertiary enrollment ratio of 0.2% was among the very lowest in the world. The skilled human resources available to generate and guide development in one of Africa's largest and poorest countries was therefore miniscule in relation to the enormity of the task.

The nation's new higher education institutions strived, with considerable early success, to maintain international standards. But the cost was high, with wastage rates approaching 40% in the late 1960s (Wagaw 1990). Awareness of the need for reform began to grow, as demonstrated by the 1964 decision to require one year of community service of all university students prior to graduation. But these incipient reforms were truncated by political events.

In 1974, a socialist military coup overthrew the government of Emperor Haile Selassie and established an oppressive regime known as the "Derg" (i.e., committee). The Derg adopted many of the radical ideas espoused by the university community – land reform, nationalization of industries, linguistic independence, creation of a national communist party, rural service for university students – but ultimately alienated many students and academics. This opposition coalesced into a bloody urban guerrilla movement (the "white terror") that was severely repressed by the Derg (the "red terror"). The Derg consequently blamed the university system for corrupting Ethiopian values and an intense anti-intellectual climate prevailed. Government intervention in university affairs expanded, including security surveillance, repression of dissent, mandated courses on Marxism, prohibition of student organizations, appointment of senior university officers, and control of academic promotions. Three notable outcomes ensued over the following two decades. Intellectual life atrophied on campuses, academic brain drain increased, and the country's education system became largely cut off from the western world.

As the 20<sup>th</sup> century drew to a close, Ethiopia found itself with a higher education system that was regimented in its management, conservative in its intellectual orientation, limited in its autonomy, short of experienced doctorates among academic staff, concerned about declining educational quality, weak in its research output, and poorly connected with the intellectual currents of the international higher education community. The reform pressures that had begun to build in the 1960s, only to be suppressed by the Derg in the 1970s and 1980s, returned to the fore with the establishment of democratic government in 1994. This time the reform of higher education was embraced as a critical national need by the government of the day.

### **Higher Education Reform**

Ethiopia is currently engaged in a highly ambitious effort to re-align its higher education system in order to contribute more directly to its national strategy for economic growth and poverty reduction. Its achievements over the past five years have been little short of extraordinary. The reforms have targeted all levels: the overall system, the institutions, and the academic programs.

At the *system* level, six (soon to be eight) public universities now stand in place of the previous two-university “system.” As the result of an aggressive expansion policy designed to raise the country’s miniscule tertiary enrollment ratio to more respectable levels, total enrollments have more than doubled from 39,576 in 1996/97 to 91,834 in 2001/2002. Private provision has been initiated and encouraged as a key aspect of this expansion strategy. Some 37 private tertiary institutions now enroll 21% of all tertiary students. Government introduced student cost-sharing in September 2003 through a deferred payment taxation mechanism for all future graduates. It has also created three system-wide supervisory bodies with respective responsibilities for further policy development, quality assurance, and improved pedagogy. All of this – and more – has been ratified in a new Higher Education Proclamation approved by Parliament in June 2003. The legislation paves the way for implementation of new reforms and development of innovative procedural mechanisms to realize the vision framed by the Proclamation.

At the *institution* level, substantial autonomy has been awarded to universities by the new Proclamation. Future recurrent funding will be provided in the form of block grants defined on the basis of a funding formula. University Boards and staff will choose their own institutional leaders, and non-academic staff have been de-linked from the civil service. Strategic planning, income diversification, and information and communications technology (ICT) development are being encouraged to meet the fiscal, space and instructional requirements of the on-going and planned expansion in enrollment .

At the level of *academic programs*, new degree courses are being introduced in response to anticipated labor market needs that underpin the nation’s economic development strategy and to prepare its citizens for democratic participation in civic and social affairs. Graduate program enrollments are expanding rapidly in the effort to increase the supply of academic staff for the expanding system. All existing diploma programs (16% of public enrollments in 2001) are being transferred to technical colleges over the coming two years so that universities may concentrate on degree training. A major review (involving stakeholders) and upgrading of university curricula has just been completed, adding courses in civics, ethics, communication skills, community outreach, and entrepreneurship, among others. A new oversight agency will monitor both the quality and the relevance of academic programs. To shore up quality in the classroom, a series of national and local pedagogical resource centers are being set up to encourage instructional innovation and to assist less experienced lecturers. Incorporation of ICT into instruction and as a vehicle for accessing the global network of information will add greater efficiency and depth to the learning process.

These reforms would comprise stunning achievements in any country, but are all the more significant in one of the world’s most impoverished nations. Ethiopia clearly understands that economic growth in the 21<sup>st</sup> century will be driven by the nation’s performance in raising its levels of national productivity in comparison to its economic competitors, and it is determined to make up the ground lost over the past two decades because of political instability and economic stagnation.

A comparison of the vision outlined by the new Proclamation to the conditions that characterized Ethiopian higher education in 2000 illustrates the enormity of the reforms now underway. Previously, less than one percent of each age cohort reached the level of higher education. Government routinely appointed university presidents and vice-presidents. All non-academic staff were civil servants managed by the national civil service commission rather than by university executives. Line item budgets prevailed and institutional allocations were increased incrementally from one year to the next with little or no relation to enrollments or educational quality. Additional income generated by institutions was deducted from their government subventions, thereby creating a strong disincentive for income diversification. Quality assurance was a much less explicit concern. Students paid no tuition fees, and also received free food and lodging as part of their university admission.

These and other examples illustrate the breadth and ambition of the government's current higher education reform efforts. They also suggest that the system's current need is not for further reform, but rather: (i) to design effective implementation strategies and action plans for operationalizing the reforms; (ii) to strengthen national capacities to carry out those strategies; and (iii) to ensure that the reforms are fiscally sustainable within the overall sector budget and within the financial resources available to higher education; (iv) to foster greater private sector involvement in the higher education expansion program; and (v) to improve the linkages between the labor force demands of an emerging knowledge economy and instructional programs offered at the universities.

These five goals shape the analysis and recommendations contained in this report. Discussion begins with a brief overview of the socio-economic situation in Ethiopia with specific attention to the education sector. The tertiary education sub-sector is then assessed in more detail, followed by a specific examination of performance in the financing of higher education. Next, seven critical sub-sector issues are discussed at length. These are: HIV/AIDS, the proposed funding formula, management capacities, educational quality and relevance, quality assurance capacities, information and communications technology applications, and physical facilities. The report concludes with a short summary of its main policy recommendations.

### ***Importance of Higher Education to Development***

Poverty alleviation in Ethiopia requires sustained economic growth, good governance, and political stability in order to be effective. Growth derives from skilled human resources and national productivity increases leading to greater country competitiveness in the regional and global economy. Productivity gains are generated by national innovation systems in which tertiary education institutions play a fundamental role. These institutions determine levels of capability within the country's pool of higher level managerial, scientific and technical expertise; the effectiveness with which global knowledge is accessed and applied in the solution of local development problems; and the standards of quality within lower levels of education. The quality of secondary school teachers is a direct reflection of the quality of training they receive in universities. Therefore, if poverty is to be reduced, Ethiopia's tertiary institutions will have to improve their performance and expand their service delivery. Specifically, they must operate more effectively under severe resource constraints and orient themselves to demands of the knowledge economy and to the growing emphasis on national capacity development. Clearly, higher education development will not by itself lead to poverty reduction. But in combination with strategic development of the economy and labor force, it can contribute to job creation and higher productivity, thereby expand resources and opportunities for the poor.

In this context, the Government of Ethiopia can fruitfully focus on helping its tertiary education institutions become more innovative and responsive to the requirements of a globally competitive knowledge economy. Three factors justify continuous public support for systems of higher learning. First, investing in tertiary education benefits society in many ways – including long-term returns from basic research, technology applications, and greater social cohesion – that are crucial for economic development. Second, qualified secondary graduates who are unable to proceed to higher learning either because they are women, are poor, or are from distant regions or marginalized ethnic backgrounds, need enlightened government intervention to enable them to have equal opportunities for access. Lastly, tertiary education plays a key role in supporting the expansion and diversification of basic and secondary education; for example, by training new teachers who will help countries deliver on their 2015 Millennium Development Goal of providing every girl and boy with the opportunity to complete a primary school education. It is estimated that because of growth in the lower levels of the school system, the education sector alone could absorb over fifty percent of all university graduates at present.

From a policy perspective, the World Bank has concluded that governments might usefully see their role as one of guiding the system in response to global and local changes (World Bank, 2002). Three fundamental components of this steering process are: first, shaping a coherent policy framework to institute proactive, meaningful reforms to take advantage of the opportunities presented by the knowledge economy and the ICT revolution; second, providing an enabling regulatory environment aimed at fostering innovation, stimulating the private provision of education, instituting quality assurance mechanisms, financial accountability for public institutions, and intellectual property rights; and third, offering appropriate financial incentives to steer institutions towards quality, efficiency, and equity goals. This study addresses Ethiopian higher education through the lens of these concerns.

### ***Purpose of the Study***

This study was undertaken between 2002 and 2003 by World Bank staff and consultants at the request of the Ethiopian government (Ministry of Education). Its purpose was to recommend the most promising implementation alternatives for the government's new tertiary education reforms, and to identify priorities for subsequent government and World Bank (IDA) investments in tertiary education. The study focused on assisting government to achieve its primary objectives in university reform: identifying financial mechanisms and formulae for resource generation and allocation to universities in order to ensure long-term fiscal sustainability; creating mechanisms for improving the accountability, autonomy and innovativeness of institutions; assessing options to strengthen university management and administration; and outlining possibilities for strengthening the quality of faculty and instruction.

### ***Methodology and Data Sources***

This study is based primarily on data and statistics contained in recent Government of Ethiopia and World Bank documents. A literature survey also identified other relevant references. All of these are listed in the bibliography. These sources were enriched by primary data collection at the university level based on several questionnaire surveys, by site visits, and by conversations with key participants in the tertiary education system. Data tables were then constructed and analyzed by the study team. Subsequently, these data were employed in simple models used to test the assumptions of the proposed graduate tax and to identify promising avenues towards financial sustainability for the tertiary system. Basic facts were confirmed with ministry officials whenever possible. Otherwise, assumptions were based on interpretation of available data.

## ***Organization of the Report***

Analysis of higher education development in Ethiopia, and of the vision that guides its future course of growth, begins with a sketch of the demographic, economic, and social context in which higher education is situated. It then reviews the overall education sector wherein higher education operates, and describes the country's tertiary education sub-system. Specific assessment of tertiary education financing and the proposed funding formula follow. Discussion then turns to management capacities and efficiency, noting the particular challenges posed by HIV/AIDS. Educational quality and relevance, including some comments on distance education, and overall quality assurance capacities are then addressed. The government's ambitious efforts to introduce and quickly expand access to information and communications technologies are the next topic of discussion, including the higher education system's likely role in this initiative. Matters of physical expansion and better facilities utilization constitute the theme of the final section. A short review of the study's principal policy recommendations serves as the conclusion.

## **CONTEXT: DEMOGRAPHIC, ECONOMIC, SOCIAL**

*Population.* Ethiopia's total population stood at 67.7 million persons in 2002 and is growing at 2.4% per year. Fully 84% of the population is rural. Average family size is 5 persons.

*Labor force.* The labor force is estimated to total 32 million persons. Fully 80% of these are engaged in agriculture, much of which is of subsistence nature. Just 8% of the labor force works in industry or construction. An additional 12% are occupied in government and services.

*Economic performance.* Average GDP expansion for the 1992/2002 decade was 5.5% annually. However, agriculture grew at a much slower rate of 2.5% during this period. Inflation has been contained at under 5%. Income is more evenly distributed in comparison to other Sub-Saharan Africa countries, with a Gini coefficient of 0.28.

*GNP per capita.* Ethiopia's GNP per capita currently stands at USD 110 compared to USD 480 for Sub-Saharan Africa as a whole. During the 1990s, per capita income grew at an annual rate of just 1%, but has recently increased to around 2.4%.

*Structure of the economy and sector performance.* Agriculture contributes 52% of GDP, whereas industry's share is 11%. Coffee accounts for fully 60% of export earnings. Per capita exports in Ethiopia were only USD 15 in 1999 compared to a Sub-Saharan average of USD 163. At present, Ethiopia hardly participates in the global economy.

*Prospective areas of future growth.* The government is pursuing an economic growth strategy based on agriculture-led development that emphasizes rural roads, technology transfers to improve crop and animal production, rural extension and credit programs, irrigation development, and fertilizer supply. This agricultural thrust is complemented by efforts to enhance overall labor productivity through better education and health services, to foster an emergent private business sector, and to reform selectively aspects of the civil service concerned with taxation efficiency, decentralized planning and service delivery, communications, and quality assurance in standards, weights and measures. Export promotion will concentrate on leather, textiles/garments, cut flowers, coffee, tea, and tourism development.

*Poverty.* The 2000 census indicates that 44% of the national population live in poverty, i.e., on a per capita income of one dollar per day or less. In addition, just 17% of housing units possess

sanitary facilities. Outside of the capital city, only 40% of persons have access to clean water. Nationwide, 52% of persons have access to health care, 13% have access to electricity, and 64% of households own less than one hectare of land.

*Education.* Only 24% of the adult population has completed primary education. Access to education has favored males over females, with 46% of men achieving literacy in comparison to only 25% of women. Primary education enrolls 64% of the relevant age group, secondary education enrolls 12%, and tertiary education enrolls just 0.8% (ESSR, 1998). The latter is among the very lowest in Sub-Saharan Africa, and therefore in the world.

*Health.* Infant mortality is 116 deaths per 1000 live births. HIV/AIDS prevalence was 10.6% in 1999 (17% in urban areas) and some 3 million persons are living with AIDS. Life expectancy is just 44 years. AIDS orphans will likely pose a particular challenge for the country's education system in the years ahead.

The Government of Ethiopia recognizes that human capacity development at all levels is one of their most important development objectives. The newly created Ministry of Capacity Building has committed USD 100 million over the coming five years to strengthening the skills of civil servants, semi-skilled workers, and private sector entities through skill development partnerships. Expansion and improvement of university level training is seen as a critical component of this overall capacity transformation in the country. The Ministry of Education is mid-way through its second Education Sector Development Program (ESDP II-2002-2005), which places principal emphasis on expansion of basic education (46% of the sector budget) followed by development of the university system (23% of the budget).

## **EDUCATION SECTOR OVERVIEW**

*Structure of the Education System.* Education is not compulsory in Ethiopia. Before 1994, general education covered twelve years of schooling. This was divided into primary (grades 1-6), junior secondary (grades 7-8), and senior secondary (grades 9-12). Subsequently a new curriculum was introduced that offers ten years of general education. The new structure consists of eight years of primary education (divided into two four-year cycles: basic and general) leading to the Primary School Certificate, followed by two years of general or first cycle secondary education (grades 9 and 10) that concludes with a school leaving examination. Students may then pursue one of two educational streams. One path is two years of second cycle or preparatory secondary education (grades 11 and 12) that is directed towards university admission. The other is a technical/vocational path. Technical and vocational training run in parallel with the second cycle of secondary education, taking one to three years to complete, depending upon the program. The TVET stream is intended to produce semi-skilled workers by absorbing the majority of the non-university stream of grade 10 graduates. Higher education consists mainly of a newly instituted three-year undergraduate degree program. Graduate degrees are currently offered at only two institutions: Addis Ababa University and Alemaya University. The two-year diploma programs by universities, colleges and specialized institutions are being phased out at the university level over the next two years and being relocated as part of upper secondary cycle of TVET. The academic year runs from September to July and the language of tertiary instruction is English.

*Size and composition of education sector enrollments.* The primary education system (grades 1-8) currently enrolls 8.1 million students in just over 12,000 schools that employ 126,882 teachers. The secondary system (grades 9-12) has 764,000 students in 455 schools with 14,091 teachers.

Primary education is expected to grow in net terms (growth over and above cohort population growth) by approximately 3% per annum until 2015, the target year for meeting the MDG goal. Higher education enrollments include 35,000 public residential students in six universities and some 3,013 academic staff.

*Public vs. private provision.* Non-government schools played an important role in the education sector prior to major political change in the mid-1970s. At that time nearly 30% of education capacity was private. After a two decade hiatus in which the former government emphasized public provision, private service delivery is again being recognized as an important, and necessary, part of the nation's education system. Nearly 2,000 non-government schools are currently in operation with enrollments of over 560,000 students. NGOs and religious organizations operate 41% of these schools, 35% are "public" schools (formerly private but nationalized in the 1970s), and the remainder are for profit or service special interest groups such as members of the international community. Collectively these schools account for 5.3% of primary enrollments and 2.4% of secondary enrollments. Private tertiary colleges and institutes, 37 in number, enroll 19,091 students, or 21% of total tertiary students. None of these institutions receive government subsidies but faculty and administrators have been invited to participate in government funded training sessions and workshops.

*Selected education indicators.* The last five years have seen remarkable growth and change in the Ethiopian education system. Primary enrollments have skyrocketed from 5.0 million in 1996/97 to 8.1 million in 2001/2. The Gross Enrollment Rate (GER) in that period has increased from 42% to 61%. Success in expanding basic education has, however, come at price in terms of education quality. Average section size in government primary schools has increased from 52 in 1997/98 to around 73 in 2001/02, with numerous cases of section sizes in excess of 100. Grade one dropout rate is 27%. Grade 1-8 repetition rate is over 9% and has been marginally increasing in the last three years. Student-textbook ratios are improving slightly but still are more than 2:1 in most subjects in most elementary grades. Secondary school enrollments have also nearly doubled from 468,000 (1996/97) to 764,000 (2001/02), increasing the secondary level GER to 12%. But the percentage of qualified secondary teachers is only 37%. This shortcoming has a direct impact on the quality of instruction given at the secondary level and is an indirect product of the low cohort enrollment ratio at the university level (about 0.8%).

*The Education Sector Development Program.* To address these shortcomings, government has launched an Education Sector Development Program for 2002/03 – 2004/05, commonly referred to as ESDP-II. Among its various targets, ESDP-II intends to more than double undergraduate enrollments (from 35,000 to 80,000), and quadruple graduate enrollments (from 1,350 to 6,000) in the three-year target period. The undergraduate expansion goal is likely to be realized, but with impacts similar to that facing primary education: strain on fiscal resources and management capacity, shortage of qualified staff, and concern over the quality of learning. The demand for higher education is evidenced by the 39,000 students who are taking university courses as part-time students in the evening. Cultural and social impediments to women's education are reflected in enrollment percentages: only 19% of full-time students (largely residential) in public universities are female whereas 24% of part-time (non-residential) public students are female.

ESDP-II calls for a substantial increase in TVET over a four year period, including the construction of 71 new technical schools. Enrollments are projected to increase from 38,000 students to 130,000 by 2004/05 at a cost of nearly USD 36 million per annum. In addition, a larger parallel program is being undertaken for mass training in agriculture. Government's goal is to expand TVET to absorb 40 % of grade 10 school leavers by 2012 – a total of 200,000 students annually. The recently completed Public Expenditure Review coordinated by the World

Bank estimates that this rate of expansion would require an investment of 450 million Birr (USD 51.7 million) per annum by the year 2010 and would require an additional 300 million Birr (USD 34.5 million) per annum in capital investments.

At a per student unit cost nearly 4 times that of secondary education (USD 460), it is doubtful whether this target is either advisable or sustainable. This fact is highlighted because it demonstrates the fiscal pressure that is being placed on the sector as a whole by its competing internal demands for expansion. It also emphasizes the need for pragmatic cost-recovery, efficiency and careful planning at all levels of the sector, especially in post-secondary education where unit costs are much higher than for the lower levels of the system. Because of the relatively high cost of university training and the significant subsidy given to it, the use of public resources should be carefully scrutinized in terms of social rates of return and equity.

*Government expenditure on education.* Over the past three years, public investment in education has risen as a share of GDP from 3.2% to 4.5%. This level of financial effort is higher than the 3.9% registered for Sub-Saharan Africa as a whole (see Table 1). Education expenditure has also increased as a proportion of the overall government budget from 9.5% to 16.8%, largely at the expense of military expenditures. This still falls below the general range of 20% to 25% for most developing countries, suggesting that scope remains for a further increase in the government's education financing effort over the coming years. At the same time, the share of the education budget devoted to higher education has risen from 14.9% to 23% in response to the recent rapid expansion of this sub-sector. This is slightly higher than the 15% to 20% range used as a Bank guideline (World Bank, 2002), but not unreasonable as a temporary measure in light of the significant tertiary capital expansion program currently underway. Government investments in TVET have also grown over this period. Consequently, the budget share channeled to primary education has declined from 55% to 46% during the period.

**Table 1.**

**Government's Funding "Effort" for Education**

	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
Education share of GDP	2.5	2.5	2.5	2.6	2.5	2.8	3.4	4.3
Educ. share of GoE budget	14.5	14.3	15.6	12.0	9.5	14.4	16.8	18.8
Higher Educ. Share of Educ.	15.0	15.8	?	?	14.9	18.0	18.0	23 ?

Source: Ethiopia PRSP; ESDP-I Appraisal Document

*Returns to Education.* The private and social returns to education investment are substantial in Ethiopia at all levels, including higher education. This was confirmed through an analysis of earnings functions conducted for the Education Sector Development Project-I in 1996. Earnings rise with each school level, more or less doubling with each level achieved. A considerable increase in earnings is gained in moving from no education to the completion of primary education. In rural areas, little increase in earnings results from the completion of primary school, but earnings triple between primary and the completion of secondary. In urban areas, the increase in earnings from primary to secondary is less than the rise between no education and primary, or the increase from secondary to university. The rate of return to education by level of education, calculated at that time (see Project Appraisal Document, Annex 4), is as follows:

**Table 2.**

***Rates of Return to Education Investments, 1995***

Rate of Return	Primary	Secondary	Tertiary
Private	25%	24%	27%
Social	15%	14%	12%

*Source:* Project Appraisal Document, Ethiopia Education Sector Development Project, 1998, Annex 4 (derived from Ethiopia Household Income, Consumption and Expenditure Survey and Welfare Monitoring Surveys).

As the global knowledge economy has developed and spread over the past decade, rates of return to tertiary education have been increasing in a number of countries. New research by undertaken jointly by UNESCO and the Organization for Economic Cooperation and Development shows that the rates of return to investments in higher education, particularly within Latin America, have been steadily rising (UNESCO/OECD, 2003). The World Bank highlights Argentina, Brazil, Mexico and Colombia as examples of this new trend (World Bank, 2002). In Colombia, for example, the rate of return to tertiary education doubled to 18.1% between 1980 and 2000 (Blom and Hansen, 2002). These trends are likely to ripple out into Africa over the coming years.

## **TERTIARY EDUCATION SUB-SECTOR**

Tertiary education plays an important conditioning role in poverty reduction. It does this in four ways. First, tertiary education alleviates poverty through the direct contributions to economic growth generated by its influence on a nation's productivity and international competitiveness. It achieves this by training a qualified and adaptable labor force, by assisting the nation to access and generate new knowledge, and by adapting global knowledge for local use. In this way, it helps to determine living standards.

Second, tertiary education reduces poverty through redistribution and empowerment. Specifically, it generates empowerment through the building of social capital and facilitates redistribution by expanding opportunities for employability, income, and social mobility.

Third, it strengthens the entire education sector. Tertiary institutions train (and re-train) teachers, school principals and system managers. Their staff play a major role in curriculum development and evaluation for primary and secondary education. Their researchers analyze education performance, identify problems, and provide policy advice.

Fourth, tertiary education contributes importantly towards the attainment of the Millennium Development Goals. Its research and technology engender improved food supply and rural incomes. Tertiary institutions train the professionals – doctors, nurses, teachers and administrators – who will oversee and implement MDG activities. In addition, they foster relevant capacities in science, applied technology and community service.

In this context, Ethiopia's *Sustainable Development and Poverty Reduction Program* (2002) provides various recommendations and considerable inferential guidance to the tertiary education

sector concerning its role in the country's poverty alleviation efforts. Its specific recommendations include the following:

- Improve provision of tertiary education in deprived areas of the country.
- Introduce tertiary cost-sharing and cost-recovery to increase the financial resources available for system development.
- Improve system management capacities to achieve greater cost-effectiveness, including the training of 200 higher education managers and the introduction of a financial management system.
- Open new academic programs in areas needed for economic development and strengthen overall teaching skills.
- Expand graduate programs.
- Establish system oversight bodies, including an Institute for Higher Education Policy and a Quality and Relevance Assurance Agency.

In addition, the *Sustainable Development and Poverty Reduction Program* – through the overall strategies it proposes – also provides guidance concerning priority areas of tertiary curricula that will need to be developed in order to produce the skilled human resources necessary to achieve its goals. The main emphasis is on the agricultural disciplines of agricultural engineering, crop production, animal production, and agricultural research and extension. Other disciplinary areas are also indicated for attention. Principal among them are health sciences, education, economics, business administration, and civil and electrical engineering.

### ***System Size and Configuration***

Ethiopia's higher education system is currently in the midst of a sweeping transformation. Until 2000, this system was comprised of just two universities, 17 colleges, a total of 31,000 students, and a small supervisory department in the Ministry of Education. Today, it embraces 6 universities, 9 technical colleges, 5 teacher training colleges, 37 private tertiary institutions, and three system oversight agencies (Higher Education Strategy Institute, Quality and Relevance Assurance Agency, National Pedagogical Resources Center). Total enrollment in 2001/2002 was 91,719 students. Of these, 38% were regular residential students, 41% were non-residential evening students, and 21% were private students. The largest public institution is Addis Ababa University with 14,687 undergraduate and 1,165 graduate students. In addition, there are four junior teacher education colleges and 14 teacher training institutes. The principal public tertiary institutions are listed in *Attachment 1*.

Universities operate on a semester system. Two semesters of 16 weeks each comprise the academic year, which runs from September to July. An academic credit system is used, and students normally take 15 to 18 credits each semester. A total of 101 credits is required for graduation and degree award is normally achieved after three years.

By 2006, the government expects to have 8 public universities that enroll 10,000 residential degree students apiece. To achieve this, the existing public diploma programs will be transferred to technical colleges, and the existing number of public degree students will be quadrupled. The flow of secondary graduates suggests that demand will not be lacking for these additional places, and the ESDP Phase II construction program is expected to have sufficient physical facilities largely in place by 2005. The principal constraint on reaching this ambitious enrollment target is

likely to be a shortage of academic staff. This matter is discussed further below in the section on Educational Quality (page 55 ff).

### ***Private Tertiary Education***

Private tertiary education is a rapidly expanding part of Ethiopia's higher education system, increasing by 40% between 1999/2000 and 2001/2002. Private tertiary institutions in Ethiopia are a relatively new phenomenon. Virtually all of them have been established within the past five years. Today some 37 private colleges and institutes (not all of them accredited by the Ministry of Education) enroll 21% of the nation's higher education students. The majority of these institutions are quite new, enroll 500 students or less, and offer training in specialized areas such as accounting, business administration, or information science. The remainder range in size from 1,000 students up to a maximum of 7,100 students at Unity College.

All of the private colleges offer diploma programs, a half dozen of them have mounted degree programs, and one has initiated a Master's degree program. These private institutions offer diverse educational programs often not available in the public institutions, provide access to growing numbers of students who might otherwise not be admitted to tertiary education, enable a significant expansion of tertiary enrollments at very little additional cost to government, provide client-oriented instruction focused on the shifting needs of the job market, and attract a high proportion of women students (almost 50%). Tuition fees run from Birr 2,500 – 3,500 a year (USD 300 – 450).

During a phase of rapid national enrollment growth, private providers constitute a critical component of the government's higher education expansion strategy. In addition, the private institutions represent important portions of enrollments in certain disciplinary areas. For example, private colleges teach three out of four business students and also three out of four computer science students in the country. They also train half of all law students. Recently, some private college graduates have established a new software services firm that earns foreign exchange through the international sale of its services.

Private tertiary institutions face various obstacles in their efforts to grow and expand their services. One is the lack of clarity regarding the import tax exemption they are reportedly entitled to for the importation of instructional materials, chiefly books. Some have been required by customs officials to purchase business import licenses in order to obtain their goods. Others have been told they must present an authorization letter from the Ministry of Education. In several reported cases, imported goods have been returned to the original suppliers because of the private institution's inability to pay the requested duty charges. Another difficulty concerns the near impossibility of obtaining loan financing for business expansion. Because these institutions possess little in the way of tangible collateral, they are rarely able to obtain bank loans. Even access to the International Finance Corporation of the World Bank Group has been closed to them by government policies that restrict the use of IFC resources to only those export-oriented enterprises that are capable of earning foreign exchange.

In an effort to address these obstacles, private tertiary institutions have recently formed their own association, called the "Ethiopian Private Colleges Forum." The Forum's member institutions hope that it will permit a more coordinated response to common problems, encourage the sharing of information and experience, and facilitate dialogue with the Ministry of Education and other government officials.

In light of its higher education expansion goals and their associated costs, *Government is advised to seek additional ways of encouraging the private provision of higher education*. In at least 15 countries of the world, private education constitutes 50% or more of enrollments.<sup>1</sup> In an additional 14 countries, it accounts for 25% to 50% of total enrollments.<sup>2</sup> Encouraging private providers to play a greater part in Ethiopia's current expansion program, while ensuring that timely and developmental mechanisms for quality assurance are in place to safeguard quality, is therefore recommended for Government's policy consideration.

### ***Institutional Organizational Structure***

The principal management structures of university administration include a Board, Senate, Academic Commissions, and Department Councils. The Board reviews and approves the plans and budgets of each institution to be submitted to the government, evaluates the implementation of educational programs, and submits suggestions to the Ministry of Education. Members of the Board are the representative of the Ministry of Education or Regional Government (chairperson), and other members as determined by the institution's charter (i.e., representatives of the regional government, of the beneficiaries of the products and services of the institution, and notable personalities). The Senate prepares the institution's strategic plan, sets policy on academic matters, approves new courses, ratifies changes to the academic structure, awards academic promotions below professorship, and determines the type and amount of service charges (other than tuition fees). Each university is managed by a president and two vice-presidents (academic and administrative). They are appointed by the Ministry of Education upon recommendation of the university's Board and serve a five-year term. (Higher Education Proclamation, 2003).

### ***Basic Indicators***

*Access.* Ethiopia's tertiary level gross enrollment ratio (GER) of 0.8% in 2000 places it among the lowest ranking countries of the world, as does its 62 tertiary students per 100,000 inhabitants. The current tertiary level GER for Sub-Saharan Africa is 4% with a regional average of 339 students per 100,000 persons. As a result, professional and technical capacities of all types are extremely limited in Ethiopia, and previous development prospects were stunted.

*Unit Expenditures.* Annual recurrent expenditures per university student are roughly 7,457 Birr (USD 860) when government-provided food, lodging and health care are included, and 5,801 Birr (USD 671) when student welfare subsidies are excluded.<sup>3</sup> This latter level of educational investment is very low in comparison to Sub-Saharan Africa (USD 1,500) and to neighboring countries such as Kenya (USD 1,800), Tanzania (USD 3,236) and Uganda (USD 800).<sup>4</sup>

*Financing.* Government provides virtually all of the financing used to run the public tertiary system. This includes the provision of free non-academic services to regular students comprising meals, lodging and health care. Full time students (32% of all students) pay no significant tuition

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<sup>1</sup> Belgium, Brazil, Chile, Colombia, Dominican Republic, El Salvador, India, Indonesia, Japan, Korea, Mexico, Netherlands, Peru, Philippines, Venezuela (World Bank data).

<sup>2</sup> Argentina, Armenia, Czech Republic, Hungary, Jordan, Malaysia, Nepal, Nicaragua, Paraguay, Poland, Romania, Russia, Thailand, United States of America.

<sup>3</sup> All public enrollments were first converted into full-time equivalent (FTE) student numbers using a factor of 1.0 for regular students, 0.2 for evening students, and 1.5 for graduate students. This yielded an FTE of 44,217 students for 2001/2002. The recurrent budget for tertiary in 2001/2002 of Birr 324 million was added to income from evening student tuition fees assumed to be 50 Birr per student. Student welfare costs were assumed to be 2,000 Birr per student.

<sup>4</sup> Taken from various World Bank project documents.

fees, although part-time and private students (the majority of the total enrolled) do so. This custom is increasingly at odds with prevailing practice in other African countries, especially in the Anglophone sphere, where various forms of student cost-sharing are emerging (Johnstone, 2003). The government has recognized this by indicating in the new Higher Education Proclamation that cost-sharing will be a key component for the future financing of tertiary education development. University officials recognize that not only is the provision of food and housing a huge burden on their budget (15% of all recurrent expenses), but it also raises a serious social equity issue since 99.2 % of the population (of generally poorer youth) are excluded from this welfare subsidy. Accordingly, government has introduced a university graduate tax in September 2003 designed to re-coup gradually the cost of meals and lodging, together with a small portion of tuition costs. The proportion of costs to be recovered through this mechanism will be adjusted after three years in light of experience gained.

Non-residential evening students are charged tuition of 30 to 50 Birr per credit hour, or 90–150 Birr (USD 10–17) for the normal three credit course load taken each semester. Some institutions charge evening students additional fees of 26 to 58 Birr per credit hour for laboratory courses.

*Gender.* In 2001/2002, women accounted for 16% of *degree* enrollments in regular and evening programs of public institutions, but 32% of *diploma* enrollments in these same programs. Notably, 53% of *private* tertiary students are female. This is likely due to the fact that most private institutions are located in Addis Ababa where women students can more easily live at home, thereby allaying the possible protectionist concerns of parents. However, only 7% of graduate students are women. More worrisome is the fact that just 7% of academic staff in public tertiary institutions are women, thus depriving the tertiary education system of a fully proportionate share of the country's best female intellects, and its women students of sufficient role models for mentoring and guidance. In comparison, the Sub-Saharan average for women's participation in degree programs is roughly 35% and the proportion of women academic staff is about 20%. *Consequently, it is recommended that a special scholarship fund be established to support the graduate studies of Ethiopian women with an interest in academic careers.*

*Internal Efficiency.* The drop-out rate among higher education students has been between 10% and 15% in recent years, with the largest losses occurring in the first year of study (Abebayehu, 1998). This is reportedly due to difficulties in adjusting to campus life away from home.

*Regional Access.* In the effort to nurture a greater sense of national identity, the government has adopted a policy of admitting a representative mix of students from the country's eleven administrative regions on each university campus. Because this policy often requires students to study at a site some distance from their home, the government has decided to maintain its policy of providing food and lodging to regular residential students, while gradually recovering this cost by means of a graduate tax. Although system-wide data are not available on the effects of government efforts to promote regional access to higher education, intake data for the country's largest university (AAU) for the 2002/2003 academic year indicate rather wide variation in access rates by region. However, the proportion of entrants by region is approximately equal to the proportional distribution of Grade 12 students across regions, with the exception of those from SNNPR. It is probable, therefore, that these disparities reflect differences in population size, access to education, and quality of education among the different regions rather than any gross failing of the current higher education access policies.

**Table 3.**

***Distribution of First Year Intake, AAU, 2002/2003***

<u>Region</u>	<u>No. of Students</u>	<u>Percent</u>	<u>Percent G12 Students out of total G12</u>
Addis Ababa	381	25	22
Afar	10	1	1
Amhara	273	18	15
Benishangui-Gumuz	8	1	1
Dire Dawa	21	1	1
Gambella	1	0	1
Harari	25	2	1
Oromiya	473	31	30
SNNPR*	174	11	21
Somale	10	1	1
Tigray	141	9	6
TOTAL	1,517	100	100

\* Southern Nations, Nationalities and Peoples Region

Source: Education Statistics Annual Abstract, 2001/2002

*Equity Issues.* The very limited data available on this subject suggest that the Ethiopian higher education system is characterized by inequitable access similar to that found in other African countries. The National Household Income, Consumption and Expenditure (HICE) Survey of 1999 indicates that 71% of tertiary students come from households in the top income quintile. Given significant differences in income and education attainment levels across regions in Ethiopia, access to higher education often favors students from upper income homes, especially those from urban areas in the most prosperous regions. These regional imbalances in access hold serious long-term implications for the development of high level leadership in under-served areas and consequently for their ability to participate fully in the political life and social policymaking of the country. If these inequities are left unattended, the seeds of political instability might begin to germinate over the longer term.

The government has demonstrated its concern with this potential problem through recent and continuing actions. The creation of four new universities in 2000 was an explicit effort to move access to higher education away from the capital city and into the various regions. The two new universities slated for creation in 2004 will continue this decentralization process. In addition, government has proposed to include increased enrollment of disadvantaged populations as one of the factors in the new funding formula for universities expected to go into effect in 2005. Also, it has resisted recommendations to introduce up-front cost-recovery fees for university students as a way of helping to finance the current expansion because of its concern with the equity impact of such a policy on less advantaged regions and households.

### ***Supply and Demand for Tertiary Graduates***

*Labor Market Demand.* A 2001 survey of 192 employers in seven regions of Ethiopia (Budu, 2002) found that employers encountered greatest difficulty recruiting new staff in the areas of business administration, engineering, computer science, and law. A separate ranking of disciplinary demand on the basis of the actual number of advertised vacancies indicated a high demand for teachers, agriculture and forestry, health services, business administration, and computer science. On the government side, the Ministry of Capacity Building issued in April 2003 a National Capacity Building Plan for the coming five-year period. Training priorities in the public sector are related to civil service reform, decentralized service delivery, information and communications technology development, justice system reform, tax reform, and urban management. The implications of these priorities for tertiary level training target the areas of financial administration, public administration, law, communications, information technologies, health sciences, education (teacher training), urban planning, electrical engineering, telecommunications, agriculture, and livestock production as priorities for investment in quality, relevance and expansion.

The Ministry of Education is currently undertaking a preliminary analysis of labor force requirements in relation to the need for educational training and skill preparation. The results of this and other labor market studies are critical to ministry level planning. Ethiopia can ill afford to produce graduates who have low marketability, especially when the public is bearing the most of the cost of their education. Expansion of facilities, investment in equipment, and curricula reform all need to be guided by empirical assessments of national development priorities and the labor market skill mixes required to achieve them.

Recommendation: The Ministry of Education, through the new Higher Education Strategy Institute, is strongly encouraged to initiate regular, detailed surveys of the demand/supply balance for university graduates. The survey, to be conducted at least once every three years, should collect information on job vacancies, salary structures, unemployed graduates, tracer study comparisons of public and private university graduates, employer satisfaction with graduate employees, demand for specific skills, etc. Although a good education also has intrinsic rewards that are worth pursuing, the magnitude of Ethiopia's public investment in individuals mandates that those investments be carefully monitored and that university education be adjusted periodically to ensure that social and economic objectives as well as individual aspirations are realized. Some countries have created a higher education labor market "observatory" for this purpose and this model might usefully be adapted for application in Ethiopia.

*University Supply of Graduates.* The total number of degree graduates produced by Ethiopia's tertiary education system has tripled from 1,472 in 1992 to 4,571 in 2002. As shown in Table 3, the disciplinary distribution of degree students has shifted somewhat over the past decade. Enrollment shares of business/commercial/social science disciplines have risen at the expense of agriculture, natural sciences, and (to a lesser extent) engineering. To a large extent, this reflects the recent aggressive entry of private colleges into the former areas.

**Table 4.**

***Tertiary Enrollment Distribution by Discipline  
(percent)***

<b>DISCIPLINE</b>	<b>1992-1993</b>	<b>2001/2002</b>
Commercial/social science	25	43
Agriculture	17	9
Engineering/technology	16	12
Education	14	15
Natural Sciences	14	5
Health/medical sciences	11	8
Law	--	3
Other	3	5*
TOTAL	100%	100%

\* Roughly half this amount is computer science.

Source: *Ethiopia Social Sector Report*, 1998.

Trends in secondary level output suggest that the demand for access to higher education will increase substantially in the future. In fact, some 256,000 students took the National School Leaving and College Entrance Examination in 2003. Due to the rise in the number of qualifying students from secondary schools, the admission rate of applicants to higher education institutions has fallen from 45% in 1997 to 26% in 2001. Tertiary admission is clearly becoming more competitive, even in the face of rapid expansion.

In countries which have traditionally had a very low coverage of primary education, such as Ethiopia, one finds that as progress is made towards achieving Education for All, the competition – and thus the need for selection – for *publicly financed* upper secondary education and tertiary education will increase sharply. The Ethiopian labor market for higher education graduates will remain limited in an economy where 80% of the labor force is engaged in agriculture and the civil service appears amply staffed. Only rapid economic growth will provide both the financing required to expand the system *and* an increase of gainful employment opportunities necessary to employ the rising numbers of graduates.<sup>5</sup>

Recommendation: Government is strongly encouraged to analyze well in advance the impact that the drive for EFA will have on the rest of the education system, and to make its citizens aware of the politically charged choices that will need to be made for public financing of post-EFA education. The growth and financing scenarios presented later in this report are an initial effort to demonstrate the types of policy options that will need to be explored.

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<sup>5</sup> It is worth noting that roughly a century ago, many of today's industrialized countries had tertiary enrollment ratios similar to what Ethiopia has today, but they (with the exceptions of Italy and Russia) had less than 50% of their labor force in the agricultural sector and they all had achieved universal primary education (Fredriksen, 1984).

**Recommendation:** Against the backdrop of expanding access to basic education, government's policy decision also to expand tertiary enrollments is the correct one. However, this will not be financially possible if expansion is based exclusively on the progressive replication of the existing publicly funded residential campus model. *It is therefore recommended that system expansion be pursued through the conscious differentiation of institutions by educational delivery system and cost structure.* Under this approach, a "pedagogical model" for the Ethiopian higher education system might eventually be configured as follows: one national research university specializing in graduate training (i.e., Addis Ababa University); several regional universities offering degree training in development disciplines relevant to the region's economy; numerous private institutions providing demand-driven education; a collection of shorter cycle colleges that host applied certificate and diploma programs, and various types of print-based and technology-based tertiary distance education.

**Brain Drain.** The combination of poverty, economic stagnation, and periodic political repression has created a long-standing trend of academic brain drain in Ethiopia. It is estimated that as many as half of all academic staff were lost to brain drain during the 1990s (Aredo and Zelalem, 1998). In this context, capacity building in Ethiopia has been a double-edged sword: large numbers of well-educated Ethiopians continue to leave the country in pursuit of higher paying, more attractive jobs in the region and abroad. Government needs to take measures that not only focus on expanding the supply side, but that also address the demand side by retaining and using effectively those who are trained.

Although emigration losses constitute a risk for any future academic staff development efforts, it should also be recognized that the Ethiopian diaspora represents a potential resource of significant magnitude for Ethiopian universities. Consequently, public efforts could usefully be made to attract expatriate Ethiopian academics to provide specialized university courses during the northern hemisphere summer vacation period (June – August). Also, some experimentation with "virtual" collaboration over the Internet in course design and delivery should be encouraged. Inspiration for such a program may be found in a recent Nigerian initiative entitled the "Nigerian Experts and Academics Diaspora Service" (NEADS). This new undertaking aims to promote the attraction, development and retention of Nigerian academics and experts for the purpose of national development. Specifically, it seeks to create 240 six-month positions each year for Nigerians abroad to participate in national higher education and research programs. It will focus specifically on the disciplinary areas of medicine, engineering, agriculture, and applied sciences.

### ***HIV/AIDS***

HIV/AIDS holds the potential to undermine the country's substantial investments in education. When it affects teachers, it reduces the supply of education services. When it affects students and family financial resources, it weakens the demand for education. AIDS now exists within all regions of Ethiopia. The estimated national infection rate is 10.8%. This rate is substantially above the 5.0% level at which infection tends to expand rapidly and exponentially. Tertiary education communities are particularly vulnerable to HIV/AIDS due to their age group (which constitutes the peak period for sexual activity and consequent risk of HIV infection), close physical proximity, relative autonomy from adult or community supervision, and inclination towards sexual networking. This vulnerability introduces a sizeable risk to the expected returns on investments made by families and government in the education of tertiary students. Indeed, AIDS now constitutes a new and irreversible form of "brain drain" in Africa. In spite of this risk, universities in Ethiopia have not yet established institutional policies or programs for the management and prevention of HIV/AIDS.

**Recommendation:** The Ministry of Education should require that each university develop its own set of institutional policies for the management and prevention of AIDS on their campuses, which should be approved by the respective university's governing Board.

Institutional policies for the management of HIV/AIDS cover a range of important actions, ranging from establishing a management information data base (on absenteeism, health center visits, medical benefit expenditures, student drop-outs, etc.) to a review of regulations on sick leave, confidentiality and the rights of persons living with AIDS, from student counseling services to awareness programs, and from curriculum content to testing facilities. A fuller survey of present university policies on HIV/AIDS in Africa appears in Otaala (2003). A number of African universities have now undertaken to produce clear policy statements on AIDS-related management issues. These include the University of Namibia, the University of Botswana, and many of the South African universities. The Association of African Universities has recently produced a "toolkit" for guiding university managers in the identification of and response to AIDS-related management issues on their campuses (Chetty, 2003). It is recommended as a useful resource for universities that wish to develop their own policies on HIV/AIDS.

In addition to this specific recommendation, other complementary actions are encouraged. Preliminary results from a major study of HIV /AIDS in the Ethiopian education sector were recently presented to the Ministry of Education. The study indicates that:

- Some 10,000 teachers are HIV positive and some 22% of attrition is due to AIDS.
- Recruitment of teachers needs to increase by 16% annually to achieve EFA goals in the presence of HIV/AIDS.
- As in other countries, absenteeism is likely to have a bigger impact on education supply than mortality, with the equivalent of 1035 teaching years being lost to Ethiopia in 2002.

The implications for universities, while not defined in the report, are clear: (i) overproduction of graduates will be required to offset anticipated losses of secondary school teachers and graduates working in other sectors; (ii) Ministry of Education and university officials need to develop an integrated strategy for the dissemination of new HIV/AIDS awareness materials, and to create university courses that are designed to equip students and academic staff not only with knowledge, but also with the skills and values to protect themselves.

Among the ways that universities can avail themselves of opportunities to limit HIV/AIDS are:

- Ensure that HIV/AIDS content is integrated into all academic course areas, and especially in the curriculum for graduate teachers;
- Future teachers of biology who are responsible for HIV/AIDS instruction in high schools should be given special training on how to teach HIV/AIDS prevention;
- Student counselors and peer counselors need to be trained in HIV/AIDS counseling;
- Campus student clinics should offer free condoms to students and faculty in a non-threatening way and facilitate voluntary testing;
- HIV/AIDS prevention needs to be part of the institutional information marketing service.

The HIV/AIDS report also notes the unsatisfied demand for materials on HIV/AIDS (teacher guides, textbooks, supplementary readers, model syllabi, etc.) from the Ministry of Education. Materials currently in use have been obtained from other sources, such as the health sector and NGOs. Therefore, as a first step to implementing some of the specific suggestions noted above,

universities, together with the Ministry of Education, are encouraged to develop and implement effective responses aimed at protect graduate teachers trained in HIV/AIDS prevention and protection of students and staff generally (e.g. counseling, access to VCT). In addition, the MoE is encouraged to develop and implement a work place policy to protect staff at all levels.

## **TERTIARY EDUCATION FINANCING**

Any national tertiary system would be hard pressed to substantially expand enrolments while maintaining levels of educational quality. Ethiopia faces a double challenge in that it seeks to accomplish this while also introducing major reforms in institutional governance, management and curriculum. If the bold vision contained in the new Higher Education Proclamation is to have any chance of success, the solution to this double challenge will have to be found in the financing strategy that underpins and supports these reforms. Before turning to this important matter, let us look first at expenditure patterns and revenue trends within the tertiary system.

### *Expenditure Patterns*

How are government revenues employed in the provision of tertiary education? Could the allocation process be made more efficient? What are the cost implications of the current tertiary education expansion and reform program? These are the topics for discussion in this section.

*Institutional Allocations.* Budgetary allocations are currently related quite closely to enrollment size, although with some exceptions. On the one hand, Addis Ababa University housed 19% of enrollments, but received 41% of the tertiary budget. It is unlikely that such a discrepancy can be explained purely by the special needs of the AAU's graduate programs. On the other hand, Debu University hosted 14% of enrollments, but received just 9% of the tertiary budget. Most of the remaining institutions received a budget share that was slightly smaller than their share of enrollments. Such possible inequities are expected to be addressed by the new funding formula scheduled for introduction in 2005.

The mix of academic programs provided by institutions varies considerably from one to the other, and it is well known that the costs of instruction tend to be higher in some areas (e.g., engineering, medicine, sciences) than in others (e.g., education, business administration, social science). This suggests that institutional allocations should not only consider enrollments as a reference point, but also the distribution of enrollments among the different academic programs and the respective costs of each program. Such unit costs have not yet been calculated in Ethiopia, but they will soon be needed. This point is discussed further in the following section on the proposed funding formula.

*Per Student Allocations.* The previous point notwithstanding, it is possible to calculate the average recurrent expenditure per student for the tertiary system as a whole, and also for each institution. This calculation provides a very rough indicator of potential quality and potential management efficiency. As such, it may point out the possibility of certain problems, but it cannot by itself constitute evidence that these problems exist. For that, more investigation is needed.

To calculate per student allocations, enrollment numbers were first converted into an estimate of full time equivalent (FTE) students to enable standardized comparisons.<sup>6</sup> Per student calculations were undertaken for each of the eight main public tertiary institutions. The results are presented in Table 5. They show that even when student numbers are standardized and evening fee income is included, significant differences in expenditure per student remain apparent among institutions. The most well endowed institution, Addis Ababa University, is able to spend almost double the amount available to the least endowed institutions. Since the number of graduate students has been weighted additionally and any graduate fee income excluded from consideration, the explanation for this sizeable difference must be sought elsewhere. To estimate the *academic* expenditure per student, the unit expense figures for each institution can be reduced further by Birr 2,000 which represents feeding, lodging and medical services.

**Table 5.**

***Expenditure per FTE student by university, 2001/2002***

<u>University</u>	<u>Regular Enroll.</u>	<u>Evening Enroll.</u>	<u>Grad Enroll</u>	<u>FTE students</u>	<u>Budget Allocation ('000,000)</u>	<u>Est. Evening Fees</u>	<u>Total revenue ('000,000)</u>	<u>Expense per student</u>
Addis Ababa	6,403	8,284	1,165	9,808	111.7*	6,213,000	117,913,000	12,022
Alemaya	2,877	1,814	140	3,450	22.2	1,360,500	23,560,500	6,803
Bahir Dar	3,108	6,098	--	4,328	24.7	4,573,500	29,273,500	6,764
Debut	3,839	1,415	--	4,122	29.2	1,061,250	30,261,250	7,341
Jimma	3,720	1,629	--	4,046	34.0	1,221,750	35,221,750	8,706
Mekelle	2,791	3,335	--	3,458	27.1	2,501,250	29,601,250	8,560

\* AAU budget allocation reduced by Birr 24 million earmarked for Black Lion Hospital.

Source: Education Statistics Annual Abstracts

*Institutional Expenditures.* Analysis of how institutions employ the resources provided to them can help to determine how effectively they focus on their main mission of teaching and research, and how efficiently the institution is managed. The overall composition of university recurrent budgets in 2002/2003 is presented in Table 6 below. No major misallocations in the composition of university spending are apparent. The share for student welfare is large, but not excessively so in comparison with other African countries that provide this benefit to students. University managers realize that such welfare benefits represent a significant tax on their budgets, and they acknowledge that the administration of campus cafeterias is time-consuming. In recognition of this, the costs of student food and lodging have been included in the calculation of the recently approved graduate tax.

<sup>6</sup> For FTE calculations, all regular residential students were assumed to be full time students carrying an academic load of 15 credit hours per semester and therefore represented 1.0 FTE. All evening students were assumed to be carrying a course load of 3 credits and therefore constituted 0.2 FTE apiece. Graduate students were assumed to represent 1.5 FTE apiece in recognition of the generally higher cost of graduate education.

**Table 6.**

**Composition of University Recurrent Budgets, 2002/2003**

<u>Salaries</u>	<u>Student Food</u>	<u>Education Materials</u>	<u>Other Supplies</u>	<u>Services</u>	<u>Maintenance</u>	<u>Capital in recurrent</u>	<u>Grants</u>
40%	15%	10%	11%	9%	5%	6%	4%

Source: Public Expenditure Review, vol. 1

- *Salaries versus non-salary items*

When resources are in short supply, institutions often concentrate them on maintaining staff in the assumption that they are the core resource for teaching. In doing so, however, they may deprive staff of the educational materials, maintenance, and other inputs they need in order to teach effectively. In many African countries, the economic crisis of recent years has led universities to concentrate an unnecessarily high portion of their budgets on staff remuneration, sometimes as much as 65% or more. In contrast, a salary share of around 40% is considered to be a more appropriate reference point. Budgetary analysis carried out during the recent Public Expenditure Review indicates that Ethiopian universities have spent approximately 40% of their budgets on salaries since 2000/2001. It is noteworthy that the salary share in institutional budgets has evolved favorably downwards from its 59% share in 1995/96.

- *Teaching/research versus student support/non-academic expenses*

However, the universities spend 15% of their budgets on student feeding, which is not a true educational expense. They also provide student housing and medical services out of their recurrent budgets. Analysis conducted under the Ethiopia Country Status Report on education (CSR) indicates that these combined student welfare expenditures may consume as much as 20% of the recurrent budget of universities. These resources could be far better used to increase the amounts spent on educational materials (currently just 10%), to provide greater support for research (amounts not readily discernible but reportedly quite small), and to expand access to information technology on campuses. In recognition of this, the graduate tax introduced in September 2003 includes these non-academic costs in calculating the amount charged to students.

- *Staff salaries and remuneration policies*

Until the advent of the new Higher Education Proclamation, academic staff were hired on two year contract terms and their salaries were oriented by civil service pay structures. Non-academic staff were employed directly by the civil service. These arrangements made it extremely difficult to reward non-academic staff for good performance or to penalize them for non-performance. They also made it almost impossible for universities to compete with the national labor market for professional skills in short supply, creating disincentives that encouraged brain drain. The Proclamation will now enable university management to employ staff directly, and to determine their salaries and conditions of service. This is a very positive step. But its benefits will only accrue fully to the institutions when each of them is able to establish transparent annual systems for staff performance evaluation. This suggests that professional training in human resource management should be initiated as soon as possible within the institutions.

## **Revenue Trends**

- *Public financing of tertiary education*

Total university spending in the 2002/2003 budget was planned at Birr 681 million (USD 79 million). Of this amount, 36% was allocated to capital investments. This rather large share is the result of the substantial building program associated with the current expansion of enrollments. The recurrent budget for universities has also grown rapidly in recent years, doubling since 1999/2000. To some extent, this is due to enrollment increases, and to the incorporation of new institutions into the budget (e.g., the Black Lion Hospital, with annual running costs of Birr 24 million, now included with Addis Ababa University).

- *Income Generation*

Revenues from university income generation activities are difficult to document due to inadequate record-keeping, likely encouraged by the former government practice of reducing university budget allocations by the amounts of income generated. The main sources of revenue appear to be the evening courses and contracted short courses. Addis Ababa College of Commerce reportedly produces one-third of its recurrent budget from such fees, but Addis Ababa University produces only about 7%. In addition, it is estimated at the agricultural colleges at Jimma and Awassa may generate one-fifth of their recurrent budget from agricultural production (Kastbjerg, 1999). In the future, expanding interest in the delivery of distance education courses may become a further source of income. In the effort to stimulate more aggressive income generation efforts by universities, the government has proposed to include certain incentives to this end within its proposed new funding formula for higher education. However, bookkeeping in this area will have to improve considerably before this aspect of the formula can be employed.

- *Donor Contributions*

Government's ESDP-II program is supported by multiple bilateral and several multilateral donors, including the World Bank. Committed external resources to the education sector in 2001/2002 totaled USD 154 million. Donor contributions are expected to grow slightly over the next three to five years until they stabilize at about 35% of the sector budget. Very strong synergy exists among the donors who have united to support government's sector development strategy, largely through sector budget support. In the near future, the majority of donors, including the World Bank, will be providing resources for basic and secondary education through budget support for the Poverty Reduction Strategy. However, overall foreign assistance for the education sector is surprisingly low, comprising just 7% to 10% of total development aid over the past five years (World Bank, 2003).

The absolute level of donor support for higher education in Ethiopia is very low. Over the past five years the World Bank has been by far the largest contributor of development assistance to the higher education sector, providing USD 11.7 million through its ESDP credit (i.e., USD 2.3 million per year). The Governments of Netherlands and United Kingdom will be providing targeted technical support to the Quality and Relevance Assurance Agency and the Ethiopian Higher Education Strategy Institute. The governments of China and Italy will be providing limited, focused support to two technical colleges. Thus, the anticipated Bank credit for post-secondary education will be the principal source of external funding for government's higher education reform program over the next five years. This leads to the following recommendation:

*Increased donor support for Ethiopia's higher education expansion and reform program is recommended because of the quality and appropriateness of reform objectives, and is necessary because of the projected budget bulge expected over the next several years.*

Donor contributions might usefully be targeted on the following needs: establishment of Higher Education Strategy Institute, the Quality and Relevance Assurance Agency, and the national and institutional pedagogical resource centers; the expansion of graduate training; the introduction and use of information and communication technologies; the creation of capacities for tertiary distance education; and institutional linkages or partnerships between Ethiopian and non-Ethiopian universities. Among these, assistance to the new system support agencies is the most critical short term need, because the entire reform effort will be put at risk if these agencies do not perform their roles effectively. A particular challenge for them will be the recruitment of good quality staff and their ability to draw upon good practices elsewhere in the world for guidance in addressing Ethiopia's higher education needs.

### ***Cost Sharing and Sub-Sector Expansion***

The financial reforms now being introduced in the Ethiopian higher education sector are highly commendable. The mechanism of cost-sharing via a "graduate tax" deserves recognition for its innovativeness both in Ethiopia and more generally.<sup>7</sup> If it works well, it should make the higher education system more accessible, more equitable, and more efficient in the allocation of social resources. It should also have positive spill-over effects on the internal managerial efficiency of institutions, which in turn will allow for greater access. However, potential pitfalls are also present in how this scheme is currently structured, both at the conceptual level and at the level of implementation.

Cost-sharing based on the current "graduate tax" is a positive step, but its impact will not be felt immediately because it takes a minimum of four years for enrollees to graduate and then start repaying through the proposed cost-sharing recovery scheme. If one assumes a tax of 10% of income for up to 15 years (as indicated in the Higher Education Cost-Sharing Council of Ministers Regulation), with some 35% of graduates exempt for various reasons, then cost-sharing would reduce the budget share of higher education in total public education spending by only 1 percentage point in 2008 or 2009. This is true in any scenario regarding growth of enrollment or growth of GDP.

While cost-sharing does not help much in the short run, if implemented at the level of a minimum of 10% of income and under the above-stated assumptions, it does have a very large impact in the later years. By the year 2020, for example, the share for higher education in total education spending would be some 4 to 5 percentage points lower with cost-sharing than without it (e.g., 18% as opposed to 23%, or 16% as opposed to 21%, depending on other assumptions). The

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<sup>7</sup> The graduate tax was introduced in the 2003/2004 academic year. It covers government's full costs for student meals, accommodation and health services, plus 15% of estimated tuition costs. The total amount is Birr 1,700 per year (USD 196). Payments will take place at a flat rate regardless of income category until the individual's agreed share is fully recovered.

income from cost-sharing would then represent a significant and fairly reasonable 20% of the total cost of running the higher education system in the outlying years, say towards 2015 or 2020.<sup>8</sup> (See *Attachment 2* for these calculations).

The terms defined in the Higher Education Cost-Sharing Council of Ministers Regulation, however, do raise some concerns.

First, the minimum tax rate is set to 10%. This is very large by international standards, and especially so in a low-income country. For the university-educated person it will represent a very large increase in taxes, leaving less for other forms of consumption and investment. Such a large increase in taxes is not a trivial issue. The amount is large enough to have economic impacts, and certainly can cause negative effects in the important markets where university graduates purchase goods and services, such as the real estate market. Yet, if the tax rate is reduced, then, all other things being equal, cost-sharing will decrease in its contribution to total higher education revenue generation.

Second, teachers (and possibly other categories of labor deemed to be of public interest) are exempted from the graduate tax. This is an attractive, but risky principle. The ideal is to pay teachers as much as is needed to secure their services, and then to tax them at the same rate as their peers are taxed. Opaque cross-subsidies of this type are generally to be eschewed, because they make the fiscal system much less transparent and may encourage other public employees to demand similar benefits. If teachers were not exempted, the cost-share would yield around 25% more revenue than in the baseline (where it yields some 20% of the total cost of running the system), depending on one's assumptions as to the numbers of graduates that are teachers. *This would permit a reduction in the minimum tax from its current level of 10%.*

Third, the current discounts for the up-front, lump-sum payment (pay as you go) that would free the student from having to pay the graduate tax after graduation, seem too low to serve as a viable incentive. The discount is 5% for students who pay up front as they study, or 3% for paying in the first year after graduation in a lump sum (Articles 5.1 and 5.2). But for a student who has the cash to pay up front, it would be far more rational to place the money in an interest-bearing account, accumulate some interest, and use the accumulated interest plus principal to pay the tax later (or simply pay the tax through the payroll, and use the principal and interest to compensate themselves for the tax payment). Whether people actually carry out these mechanical transactions or not is immaterial. The point is that it will strike most people as irrational to pay up front if all that one saves is 5%. This will mean that income from the lump-sum payments will tend to be small. This is one reason why the cost-sharing will not help much with the cost bulge of the mid-2000s.

Fourth, the proposed system is not clear on what the administrative procedures are for the self-employed. It may be true that in the very short run graduates will tend to be employed by the state or by formal sector companies that are large by Ethiopian standards. But one has to note that: (i) the real impact of the cost-sharing mechanism over the longer term, and (ii) as more and

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<sup>8</sup> In assessing the impact of cost-sharing, the best approach is to use total (i.e., capital plus recurrent) costs in the denominator. A complete definition of cost-sharing normally includes capital costs. In the private sector, for example, a company that did not consider its capital costs in its pricing would soon go broke. However, no company would attempt to recover the expense of its start-up capital costs from its first group of customers, and higher education should not either. But over a longer period, partially pro-rated across a wide client base, the consideration of capital costs makes sense and the MoE is encouraged to revisit this issue.

more graduates join the labor force, many will find it convenient or necessary to go into self-employment, either of a professional nature (lawyers, doctors, accountants, etc.) or entrepreneurial (in various personal services or in commercial intermediation, typically).

Recommendation: Government should think more carefully about the problem of taxing the self-employed graduates than is evidenced in the current Cost-Sharing Regulation.

Finally, it is important to note several factors that may reduce the possible yield of the graduate tax. They have nothing to do with regulation as such, and much to do with university internal efficiency. Specifically, the yield of the graduate tax is greatly reduced, relative to the need for cost-sharing, if the number of graduates relative to total enrolment is low. In Ethiopia, at present, the ratio of graduates to total enrolment is only approximately 15%, in a context where the average length of programs is about 4.2 years, yielding an optimal graduation ratio of about 22%. In other words, only some 75% of final year students seem to graduate, thus limiting the cost-share contribution of the tax by at least 25%.

### ***The Estimated Cost of the Tertiary Expansion and Reform Program***

- *Establishing a reasonable rate of growth for tertiary education*

Ethiopian higher education enrollment has been growing at approximately 15% per year in the past decade or so, with an acceleration in trend during the last few years. Furthermore, the construction project of the period 2001-2005 will add, by 2005, approximately 160% (or 20% cumulative per year) to the undergraduate enrollment capacity that existed in 2000. This rate of growth would not be sustainable over the longer term, even though it might be during a spurt such as the one caused by the capacity expansion of 2001-2005. But what rate might in fact be fiscally sustainable *and* economically and socially justifiable? What does local and international evidence suggest?

The rates of return on tertiary education, both private (approximately 27%) and public (approximately 12%) are reasonably high and, importantly, reasonably close to the rates of return for both primary and secondary education, at least as of the last time these rates were measured (see World Bank 1998). This suggests that as of the late 1990s and early 2000s, the outputs of the sector were reasonably balanced between primary, secondary, and tertiary—albeit balanced at an extremely low level. The implication is that balanced growth will tend to keep the right proportionality of returns. Furthermore, if more of the public cost of tertiary education can be passed on to beneficiaries, it may be possible to expand supply without lowering the social returns.

According to the EFA-FTI projection exercises, the Gross Enrollment Ratio for secondary education as a whole would expand from approximately 11.6 in 2001 to 15.3 in 2015, for a change of 3.7 points. A cross-country regression analysis of the sensitivity of the tertiary gross enrollment ratio to the lagged (4-year lag) secondary gross enrollment ratio reveals that for every percentage point increase in the secondary gross enrollment ratio there tends to be a ½ point increase in the tertiary ratio. This is a strong relationship ( $t = 15$ ). (The coefficient of this relationship decreases to ¼ point if only poorer countries are included in the cross-country regression.) This in turn suggests that the change in the tertiary gross enrollment ratio ought to be approximately 1.75 points (around ½ of 3.7). Since the Ethiopian tertiary gross enrollment ratio is currently estimated to be 2.6, the target by 2018 (given the four-year lag between secondary and tertiary) should be 4.4% if the coefficient is ½, or 3.6% if the coefficient is ¼. With population growing at 2.7%, this implies a growth in tertiary enrollment of approximately 5% per

year between 2003 and 2018 (if tertiary adjusts to secondary with a coefficient of  $\frac{1}{4}$ ), or to 6.5% (if the coefficient of adjustment is  $\frac{1}{2}$ ).

Thus, a balanced growth approach, together with a policy of cost recovery, would seem to justify a rate of enrollment expansion of 6% per year. But while this might be supported from educational or developmental points of view, and thus, from what one might call the “demand” side, the question arises as to whether this sort of expansion is fiscally sustainable. Might this rate also come into conflict with other goals, and, if so, how one might possibly adjust the system so as to reduce this conflict? To answer this, one has to turn to projections of enrollment and cost, in comparison to possible growth of GDP and budgets.

- *Projections of Enrollment and Cost*

As a starting point, one should note how much enrollment capacity is being added during the construction campaign of 2001-2005. Though the planning documents seem to disagree in small respects, the basic result is that approximately some 60,000 spaces of undergraduate enrollment capacity are being added in the ten key institutions where construction is underway.<sup>9</sup> These ten institutions possessed a capacity to accommodate some 40,000 “regular” undergraduates in the late 1990s.<sup>10</sup> The full capacity of 100,000 is assumed to be available in 2005. Thus, this is a short-run enrollment target.

To analyze the prospects for growth, a simple simulation model was constructed. See *Attachment 3* for a description of the model and some of the baseline data assumed for the simulations.

Three modeling scenarios are proposed.

First, in the most reasonable scenario, the system grows by increasing first-year intake at whatever rate is needed to take up the enrollment capacity created through the building program in the period 2001-2005, but does so in such a manner as not to “overshoot” this capacity by more than what is needed to maintain an average rate of growth of approximately 6% for the period 2003 to 2015. That is, intake is expanded so that the system settles to a level of capital spending that is as small as possible as soon as possible, but consistent with maintaining an overall rate of growth of 6% for the period. This requires expanding intake somewhat more slowly than one might otherwise think in the next few years, and then converging growth in first-year intake to whatever yields an average growth rate of approximately 6% in the entire period 2004-2015. This is because without such management, the growth in first-year intake, when combined with inertia already built into the structure of enrollment, would cause a serious overshoot in enrollment. Consequently, growth in enrollment would be very high past 2006. Note that in any case expansion continues beyond the 100,000 capacity created in 2001-2005, but continues at a smoother pace.

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<sup>9</sup> Addis Ababa University, Alemaya University, Bahir Dar University, Debu University, Jimma University, Mekelle University, Arba Minch Water Technology Institute, Gondar College of Medical Sciences, Ambo College of Agriculture, and Nazreth Technical College.

<sup>10</sup> This takes the maximum enrollment at each institution in the period 1995-2000 as a measurement of capacity. It is important to do this as enrollment in particular institutions fluctuates considerably, which means that no one particular year should be taken as representative of capacity. Note that “evening” students, who are “off budget,” are assumed to be the equivalent of a double-shift, and are thus not counted either in the base or in the expansion, for cost-driving purposes. They, as well as private enrollments, are counted in the base, and, implicitly, in the projections, for calculating the gross enrollment ratio.

Second, in a somewhat less reasonable but still manageable scenario, the system grows by increasing intake “naively” so as to absorb all of the enrollment capacity as soon as it is created, but then corrects as soon as possible by reducing first-year intake to prevent as much of the overshoot as possible, while then converging to the same long-term growth rate as in the first scenario.

Third, in the least reasonable scenario, the system grows by increasing first-year intake so as to occupy all of the enrollment capacity as soon as it is created – but then does not correct – and simply keeps expanding at the same rate as in the previous two scenarios.

The results of these scenarios are shown in Table 7, both for first-year intake and for total enrollment. The first few years are shown year by year, and then only selected years are shown thereafter. The rate of growth of total enrollment, for the whole period, in each scenario, is also shown. The projections are made for “regular” or non-evening enrollment only, as evening enrollment is assumed to be equivalent to a second shift and to continue to be largely off-budget. It is assumed that evening enrollment grows somewhat more slowly than regular enrollment, on the assumption that evening enrollment is necessitated by lack of space for regular enrollment. The assumption is that evening enrollment grows at the same rate as first-year intake grows in the “steady” scenario once the capacity created in 2001-2005 (i.e., 100,000) has been reached.

**Table 7.**

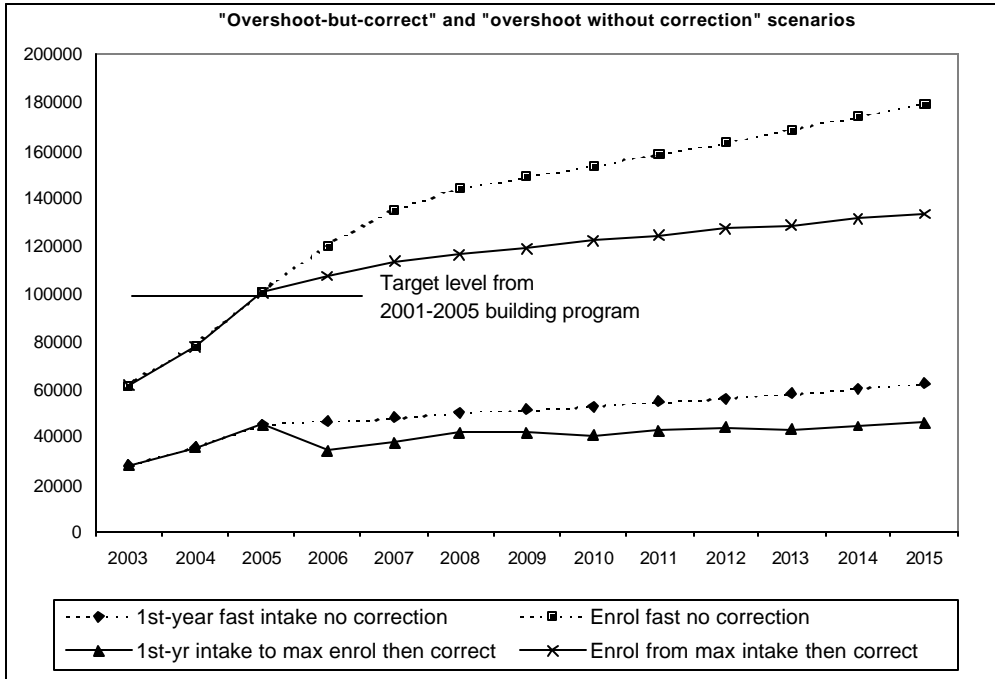
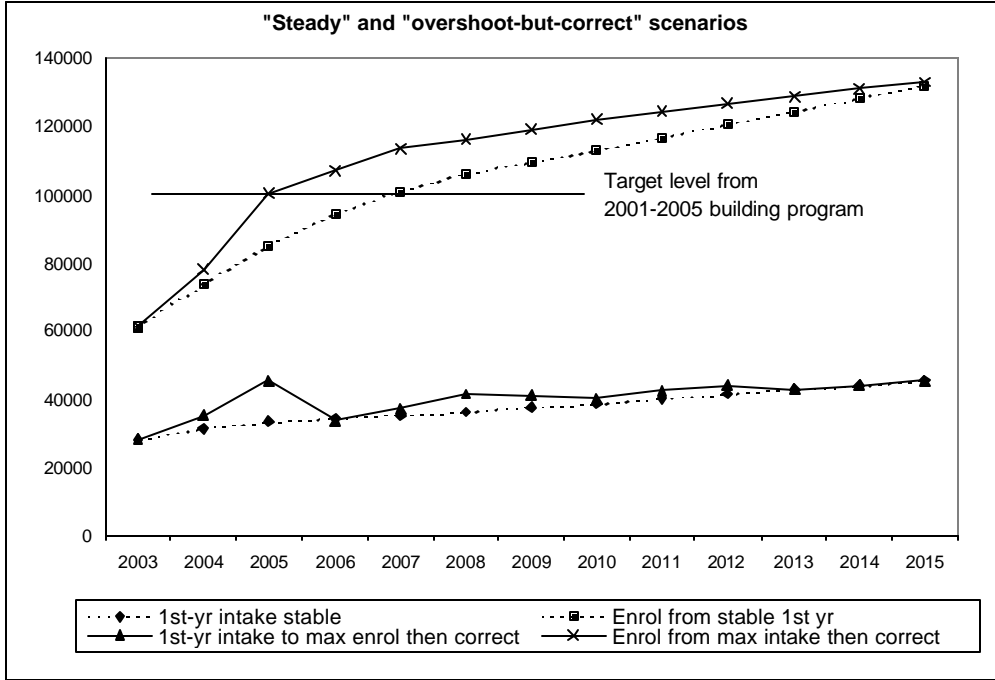
***Growth Scenarios for Ethiopian Public Higher Education “regular” (non-evening) Enrollment***

<u>Scenario</u>	<u>Variable</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2010</u>	<u>2018</u>	<u>Rate of Growth</u>
Steady growth to 6% average	First-year intake	28000	31360	33242	34305	35403	38912	50063	
	Total enrollment	61200	73604	85009	94249	100729	112850	145191	5.9%
Fast growth, overshoot-then-correct to achieve 6% average	First-year intake	28000	35560	45161	33871	37258	40072	50042	
	Total enrollment	61200	77804	100575	107142	113014	122020	145130	5.9%
Fast growth, overshoot-and-no-correction	First-year intake	28000	35560	45161	46606	48098	52864	68015	
	Total enrollment	61200	77804	100575	119878	135063	153316	197253	8.1%

Source: calculated for this report

The implication of the “overshoot-then-correct” scenario is that first-year intake needs to be sharply curtailed in the year after which total capacity is reached. This cutback is quite severe: some 26%, from approximately 45,161 to 33,871. The “steady growth” scenario implies no

cutback in first-year enrollment, and yet achieves the same ultimate total enrollment and growth rate. The “overshoot-without-correction” scenario has no cutback in first-year intake, but growth is much faster and total enrollment ends up some 36% higher by 2018. Two pair-wise comparisons between the first and second scenarios, and between the second and third, are shown in Figures 1 and 2 below.



For analyzing the fiscal feasibility, a target ratio of higher education spending to total education spending of no more than 24% is chosen. It is assumed that total education spending as a proportion of total government spending, and total government spending as a proportion of GDP, are constant. Recurrent cost per student is set at 9,122 Birr and capital cost per new student is estimated at 28,810 Birr. For recurrent costs, this is significantly below the estimated trend in per student costs, and assumes that a reduction in per student costs will be made in 2003-04 to keep higher education costs to 24% of total education cost, as a baseline. The capital costs are the annualized costs, per new student, of the 2001-2005 construction program. All projections are in constant 2003-04 Birr.

Cost projections forecast that if GDP grows at 6%, then, even without cost-sharing and without economies being made in per student cost, the following outcomes may be expected:

1. In the “more reasonable, steady growth” scenario, the 24% target is violated only in the first one or two years, is not violated by much, and then falls below this target fairly soon.
2. In the “overshoot-then-correct” scenario, the 24% target is violated to a greater degree, but expenditure quickly comes down below the target.
3. In the “overshoot-without-correction” scenario, expenditure is intolerably higher than the target, and decreases only in the most distant years of the projection.

This suggests that if GDP does manage to grow at 6%, only the least reasonable scenario is seriously unaffordable.

However, if GDP grows at 3% *and* no economies can be made *and* there is no cost-sharing, then:

1. In the “more reasonable, steady growth” scenario, the 24% target is violated seriously only in the first one or two years, is not violated by much, but then stays a bit higher than desirable.
2. In the “overshoot-then-correct” scenario, the 24% target is violated to a greater degree in the first few years, but then settles to about the same level as in the steady growth scenario.
3. In the “overshoot-without-correction” scenario, expenditure is intolerably higher than the target, and never decreases.

In assessing the mitigating strategies one could use if GDP grows slowly, we assume that 15% of recurrent cost might be sacrificed without significant loss of quality, as a consequence of efficiency-enhancing initiatives such as formula funding and tighter management controls. We further assume that the cost-sharing package being introduced in the 2003-04 academic year will work more or less as anticipated. If economies of 15% of recurrent cost can be made over seven years, and with the cost-sharing approach already in place succeeding to the degree possible (as explained below), then, even with GDP growing at only 3%, it is apparent that:

1. The target of 24% can be met comfortably except in the first year or two in the “steady growth” scenario.
2. The same target can also comfortably be met in the second, “overshoot-then-correct” scenario, again except in one or two years.

3. But in the “overshoot-without-correction” scenario, the cost-sharing and efficiency-enhancing economies are not sufficient to bring costs within target if GDP grows at only 3%, except in the very distant years of the projections.

The simulations make one point clear: the “steady growth” scenario is affordable even if there is a shortfall in GDP. The “overshoot-then-correct” scenario is affordable with 6% economic growth, but will produce significant financial strain if GDP falls to 3% and no other measures are taken. However, it becomes affordable with the introduction of cost-sharing and efficiency-enhancing economies. The “overshoot-with-no-correction” scenario, where first-year intake is increased to meet the 100,000 capacity, and then keeps on increasing at a 3% rate, is not affordable, i.e., seriously violates the 24% limit, even with cost-sharing and economy measures. These results are summarized in Table 8.

**Table 8. Results of Cost Simulation Exercises**

	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2010</u>	<u>2018</u>
<b><i>Enrollment Scenario: 6% GDP Growth, No Cost-sharing, no economies</i></b>							
Steady growth to 7% average	24.4%	26.5%	22.0%	21.8%	21.9%	20.4%	16.2%
Fast growth, overshoot-then-correct to achieve 7% average	24.4%	27.5%	24.2%	24.3%	24.0%	21.0%	16.1%
Fast growth, overshoot-and-no-correction	24.4%	27.5%	28.1%	28.3%	29.8%	28.2%	22.4%
<b><i>Enrollment Scenario: 3% GDP Growth, No Cost-sharing, no economies</i></b>							
Steady growth to 7% average	24.4%	27.2%	23.3%	23.8%	24.5%	25.0%	25.0%
Fast growth, overshoot-then-correct to achieve 7% average	24.4%	28.3%	25.6%	26.4%	26.9%	25.7%	24.8%
Fast growth, overshoot-and-no-correction	24.4%	28.3%	29.8%	30.9%	33.5%	34.4%	34.4%
<b><i>Enrollment scenario: 3% GDP Growth, Cost-sharing, 15% efficiency savings</i></b>							
Steady growth to 7% average	24.3%	26.7%	22.3%	21.9%	21.8%	19.8%	17.5%
Fast growth, overshoot-then-correct to achieve 7% average	24.3%	27.8%	24.4%	24.3%	23.7%	20.1%	17.1%
Fast growth, overshoot-and-no-correction	24.3%	27.8%	28.6%	28.5%	29.8%	27.5%	24.2%

Source: calculated for this report

**Recommendation:** First-year intake should be expanded at progressively slower rates, beginning at about 14%, then dropping to 10%, and so forth, until reaching about 3% per year, over the next few years.

### ***Aggregate Analysis***

Research conducted within the sector-wide context of the Bank's Public Expenditure Review and Country Status Report (2003) suggests that the education sector as a whole may be facing a significant financing gap if MDG and ESDP-II goals are to be achieved as planned. Government education goals for the next several years are: further expansion of primary education along with an improvement in class sizes and spending per student; a 50% expansion of secondary enrollments; a quadrupling of technical and vocational education enrollments; and a doubling of higher education enrollments. In addition, a new initiative to link secondary schools by satellite for video-teaching (*SchoolNet*) has been launched. These numerical targets, although highly ambitious, are broadly consistent with what is needed in order for Ethiopia to achieve its "Education for All" targets. *The proposed expenditure increases needed to attain these targets, however, are probably not feasible in the near term – even with substantial financial support from donor agencies.* Annual expenditure plans for the education sector (including higher education) total roughly 5 billion Birr per year, compared with current spending (2002/2003) of about 3.5 billion Birr (World Bank-PER, 2003). In other words, the projected funding gap is roughly 40%.

This produces several important implications. First, not all plans within the education sector can be paid for, and difficult choices will have to be made between competing needs within the education sector. Second, more aggressive efforts are required to find ways of reducing or sharing costs, particularly within higher education. Third, substantially more foreign assistance will be necessary. Lastly, the education sector's share of the federal budget will need to be increased, creating the associated challenge of how to reduce spending elsewhere in the budget (World Bank-PER, 2003).

## **THE PROPOSED FUNDING FORMULA**

As a key part of its higher education reform, the Ministry of Education proposes to introduce in 2004/2005 a funding formula that will provide incentives for institutional change in the pursuit of reform goals. The new funding formula is intended to lay the foundation for the introduction of block grants as the future means of funding the universities. At present, institutional funding is conducted on a negotiated line item basis, with annual increments based on inflation and revenue availability. Thus, the proposed change is a welcome and appropriate development.

The proposed new budget allocation system is intended to: (1) be based on the performance of the institutions; especially, number of students admitted, number of students graduated, the quality of education, research and community services rendered by the institution, the ratio of women and minorities, and the ability of the institution to generate additional income; (2) serve as an instrument to implement the education policy of the government; and (3) make the institutions more efficient, competitive, and innovative.

The proposed higher education formula has three sub-categories:

- Budget for regular undergraduate studies;
- Budget for graduate programs and research; and
- Budget for providing incentives and rewards.

The total budget allotted by the government for higher education is proposed to be distributed to public institutions based on a detailed allocation formula. The preliminary formula proposal is presented in *Attachment 4*.

The Ministry's proposed funding formula contains various commendable features from a government policy perspective. Certainly Goal 1 (to improve the performance of institutions) is important in the context of an expanding higher education system. Assuming the goal of expansion is to generate more high-skilled leaders for the country's growing business, government, and NGO sectors, the performance of the institutions will be critical. Similarly, the intent of Goal 3 (make the institutions more efficient, competitive, and innovative) is also essential, since these characteristics are important for the continuing expansion of the system in a way that protects quality and promotes national productivity gains. It is less clear whether Goal 2 (serve as an instrument to implement the education policy of the government) is equally as necessary, since the documentation available only describes the government's policy goals in very general terms.

The desire to "phase-in" a new formula also is appropriate, since a dramatic change from a line-item budgeting system certainly will have unintended and unanticipated negative consequences within institutions that can best be addressed through a process of gradual implementation. Currently AAU has costs that are much higher than other institutions. If this is largely due to more expensive inputs, or more favorable service ratios, rather than being due to different program offerings, then going towards formula funding too quickly would be devastating to AAU. Since AAU is the premier university in Ethiopia, this would be an unfortunate consequence.

Likewise, the formula elements that reinforce the country's needs for the greater inclusion of women and underrepresented minorities also are highly desirable and worthy of inclusion in a new financing system. So, too, is the decision to consider proximity to Addis Ababa. Too often, rural students in Africa face dramatically lower rates of educational access and attainment than urban students, as can be seen in countries with sizable higher education systems (Kenya, Nigeria, South Africa) and those with much smaller systems, such as Mozambique and Tanzania.

Unfortunately, a number of problems are also associated with the proposed funding formula. First and foremost is the complexity of the formula. In practice, the formula may be more problematic to implement than its potential benefits can justify. While it is a detailed and logically structured formula, successful implementation of it depends in large part on meeting its requirements for detailed and timely data submissions from institutions. Under present institutional conditions, this would be a demanding and laborious process. This is not to say it is unattainable over time, particularly since much of the data are simple enrollment numbers. However, unless sufficient capacities already exist in all of the public institutions (and no evidence of this has emerged in efforts to obtain data for this study) to collect data by course band, gender, ethnicity, etc., the formula will be seeking information that is not readily available. Institutions will be forced to undertake expensive and time-consuming processes to collect such

data, or might even take short-cuts to estimate the numbers, which would defeat the purpose of the formula.

The limited ability of the formula to capture critical differences in institutional capacity also is of concern. For the most part, the enrollment-based aspects of the formula simply compare the institution to all other institutions in a proportional sense. This certainly has the effect of making the institutions highly competitive in terms of the proportion of the overall recurrent budget allocated, but will do little to encourage less qualified institutions to do better. In other words, *the proposed formula seems likely to reinforce the status quo with regard to which institution currently has the greatest capacities.*

Furthermore, the formula does not appropriately weigh the different factors to emphasize the relative importance of the factors included. In its present form, for example, the formula essentially offers an equal weighting of Distance from Addis Ababa ( $a_4$ ) with the Number of Research and Post Graduate Program Students ( $a_2$ ). *Careful assessment needs to be made to ensure that the weighting reflects the allocation in direct proportion to government's priorities.* The formula takes annual changes in the various factors into account in determining the next year's funding. While annual changes are sometimes appropriate as a measurement tool, in many cases a single year can be an aberration that does not reflect a long-term trajectory of what the institution has accomplished. For example, an institution that sees a one-year decline in the number of degree graduates would be punished under the formula, even if it had increased the number of graduates consistently during recent years. The tool may be needlessly blunt since the overall goal is to create incentives to encourage more production of qualified graduates over the course of several years.

*The formula should largely compensate for costs, and should not try to create incentives of any kind.* If, for example, it is more difficult and hence costly to educate women or certain groups, perhaps because of disadvantages they have suffered earlier in life, this cost should be calculated and used. If this cost is a recurrent cost, it can be programmed into the formula. But the formula should ideally not be used as an incentive to stimulate enrolment of special groups, because there is no theoretical or empirical basis for determining what the size of the incentive should be. Instead, the formula should compensate for cost.

The issue of enrolling more students from certain groups could be handled in two ways. First, via special ear-marked grants that allow universities to develop the programs, facilities, and approaches that may be needed to better attract and serve these populations, as a one-off cost. Second, by making the funding part of a strategic planning exercise (which could involve either or both of the autonomous institutions—the one for accreditation and the one for strategy) which discusses with a university their targets for enrolments of various types, but then funds on a very simple per student basis. The formula could create certain incentives, such as rewards for speedier flow-through and completion, because a simple theoretical and empirical basis for these incentives is relatively easy to establish. (Someone that does not fail clearly costs less than someone who does, for example.)

On the other hand, one has to be careful not to create incentives for “cherry-picking” or to create incentives which disadvantage universities with no choice but to teach students who are harder to teach, because they are in poorer regions. If it does not complicate matters too much, one way to deal with this problem is to compensate for disadvantage, by assuming that youth in poorer regions are harder to educated, but also to create incentives for better flow-through by rewarding successful or on-time graduation or course completion.

*The funding formula (as opposed to other mechanisms) may not be the best vehicle to encourage internal income generation.* There are other proven ways to help steer institutions to accomplish this. In fact, using the base funding formula to do so seems a somewhat self-defeating concept, because the lack of internal income generation would reduce the base funding provided, thereby limiting the institution's capacity to generate further internal income in the future. The validity of reported income data provided might also be subject to deliberate reporting error.

### ***A Different Approach***

Moving from a line-item budgeting system towards one that offers block grants to institutions on the basis of a funding formula is a very worthwhile goal. However, such a system can be implemented without the limitations that characterize the system presently proposed in Ethiopia. One way to do this is to incorporate a series of steering mechanisms into both formula and non-formula funding to achieve the goals of performance, efficiency, innovation, etc.

“Steering mechanisms” are policy tools that encourage higher education institutions to take certain steps that are deemed essential to national economic, social, or other goals. The “mechanisms” are typically some type of funding device designed to encourage or “steer” the institutions toward meeting a specific goal or goals. These mechanisms can be included *either* as a part of the *base formula funding* that is provided to institutions, or as part of *non-base funding*.

*Base formula funding* is funding provided by the government to continue the basic operation and maintenance of higher education institutions. Base funding is typically enrollment-driven and provides operational stability. This type of funding is a blunt instrument; it can provide some level of steering, although this is often not well targeted. It has some advantages in that it is a fairly autonomous process that does not require significant administration or oversight. Using the analogy of a compass, the base funding steering mechanisms can point the funding system in the general direction of national policy goals, but they do not usually do so with much precision.

*Non-base funding* is provided in addition to the funding provided through the base formula. This type of funding is usually in the form of one or more pools of resources reserved for specific purposes. They are therefore somewhat better suited to steering. Non-base funding also offers more flexibility than base formula funding. It can be adapted more readily to address new needs and goals.

Different types of non-base funding approaches have been devised. These include earmarked funding, which is funding dedicated (or earmarked) for a specific program, mini-formulas, which use an algorithm separate from the base formula to determine how funding is allocated to institutions, and other approaches that are on top of the base formula. In the compass analogy, these non-base funding approaches can often be more precise in targeting coordinates.

From an international perspective, steering mechanisms are policy-driven funding priorities that occur both through base and non-base funding. They have been used increasingly by nations and states to achieve specific national policy objectives. Countries ranging from Australia to Japan to the United States are moving away from rigid formulaic allocations of government resources in support of higher education to more diversified and flexible approaches that employ other types of policy-driven, non-base funding. Among developing countries, World Bank financing has been used to provide non-base funding incentives (mainly in the form of innovation funds or competitive institutional grants) in Argentina, Chile, Egypt, Hungary, Indonesia, Jordan, Morocco, Mozambique, Romania, Sri Lanka, Venezuela, and Vietnam. Experience to date with non-base funding has generally been quite favorable.

Although some steering mechanisms have been implemented by threatening the loss of funding unless certain “performance” goals are met, *the most effective steering mechanisms are those that provide positive incentives for improved performance or evidence of change*. The aim is to reward institutions that perform in such a way as to carry out nationally defined policy goals.

Such steering mechanisms tend to work best when they use the baseline performance of an individual institution as the starting point for determining the amount of funding provided. In other words, the pool of resources does not reward those who are already advantaged – it rewards attainment of policy goals in relation to where that individual institution was previously. The institution *competes against itself* using its own baseline as a starting point.

In the context of Ethiopia, *the combination of a simple but targeted formula for base funding with one or more additional pools of non-base funds for policy steering is recommended as the most appropriate approach*. It is recommended that the initial structure be as simple as possible, perhaps comprised of no more than two or three variables, in order to facilitate the institutions’ transition to this new approach with minimal shocks to the existing system. Government has proposed to review its formula and revenue generation schemes after three years of implementation so this recommendation would fit nicely into that schedule. As experience is gained, the structure may be modified to incorporate additional variables.

### ***Base-funding Formula***

Ideally, the base formula funding should focus on the key operational aspects of the university. In general, these base funding components include:

- instruction;
- research;
- physical plant operations;
- general management and services;
- student support and services.

A true formula, in the sense that it is used in other countries, would need to take into account the relative importance of each of these components in terms of overall goals of the institution, and in terms of national goals. For example, instruction is usually the most significant factor in any formula, since it takes into account the salaries of teaching staff. This would therefore have a relatively high weighting coefficient in any formula.

Most funding formulas include a calculation of per-student costs – i.e., recurrent expenditures per student – that is then applied to FTE enrollment figures to determine the allocation of funds. Depending on the revenue available, adjustments can be made to the formula fairly easily by reducing the calculated amount by a fixed percentage. For example, if the formula shows that total recurrent funding required would be 600 million Birr, but the total revenue available from the Ministry of Finance and Development is only 500 million, then the amounts allocated per institution would be reduced by an average of 16 %.

*Funding formulae require estimates of unit costs that are fairly robust*. This in turn implies two other requirements. First, good data on unit costs, by field of study or department. If these data do not exist, the funding formula should start out very simply, perhaps taking all enrollments as

nearly equally costly, with variations between departments that are smaller than one knows the case to be, and *in any case phasing in the formula over time*.

At the same time, the systems should be put in place to start measuring departmental costs. The problem here is that universities will tend not to measure where there is nothing at stake in measurement. One has to create the stakes, by starting with a formula that may create slight differentials between departments, that are on target on average. As the systems to measure develop and improve, in response to the realization that measurement matters, these differentials would come to be closer to the real differentials.

Second, for the notion of an average cost to have meaning, there has to be a good number of observations. But because Ethiopia has so few universities, and because not every university offers every area of study, it may be wise to use some international benchmarking in establishing the price relativities between departments or areas of study. *Thus, starting slowly, starting very simply, with an artificially reduced variation in cost between departments or faculties, and using some international benchmarking, would all allow for a smoother implementation of a formula funding approach.*

The challenge, of course, resides in whether the universities in Ethiopia currently have sufficient capacity to collect and provide the information necessary to calculate such a formula. This seems unlikely in view of this study's rather discouraging experience in trying to obtain basic institutional information. Assuming this data capacity does not currently exist, a more simplified approach for base funding could be structured.

One way to accomplish this is to use the baseline of current funding as a guide for future base funding. In other words, funding distribution across the various public institutions would be assumed to "hold harmless" the institutions and provide some level of assurance that their current basic level of services would continue. This would encourage institutional acceptance of a new funding system even as it evolves to incorporate more steering mechanisms to achieve the goals of performance, efficiency, and innovation.

In this case, the baseline year would provide the initial coefficients for the six public universities. Let's assume, for example, that the total recurrent budget for higher education in the baseline year equals 600 million Birr, and that the institutions received the following funds in that year, with the corresponding share of the total recurrent budget:

Institution A:	240 million	40 percent
Institution B:	180 million	30 percent
Institution C:	90 million	15 percent
Institution D:	30 million	5 percent
Institution E:	30 million	5 percent
Institution F:	30 million	5 percent

This baseline percentage could be the initial coefficient that is applied to the funding calculation in subsequent years. That coefficient then could be applied to three simple enrollment factors to ensure that some rudimentary steering is included in the base funding. The first would be the number of degree program students enrolled for undergraduate studies, the second would be the number enrolled for graduate programs and research, and the third would be the number of diploma and degree program graduates from the institution.

To ensure that a “drop off the cliff” phenomenon does not result from annual fluctuations, the formula could employ a simple three-year actual rolling average. This average would be based on a mean of each of the three factors for the three years prior to the current year. For example, to calculate the number of diploma and degree program graduates for 2004, the numbers from 2002, 2001, and 2000 would be averaged. This would help to promote system stability as it continues to transition and transform.

### ***Non-base or Incentive Funding***

Beyond the base formula, it would also be important to include a pool of non-base funding for more direct steering toward the goals that have been articulated for the system. This non-base funding should probably be no more than 5 to 10 % of the total recurrent budget. Thus, in the example above, base funding could be allocated assuming 540 million Birr (90%), with the remaining 60 million (10%) used for non-base steering purposes. It would be advisable to begin initial non-base funding with no more than 5% of the total budget in order to avoid sudden distortions in spending patterns for which the institutions may not initially be prepared.

It may seem somewhat counterintuitive to use a relatively small amount of funds for such steering. However, making these funds fully available to all institutions on a competitive basis will provide significant incentives and will logically lead to innovation and efficiency. This has certainly been the case in the U.S. states that have done so, and appears to be showing some promise in South Africa (which recently implemented steering mechanisms as part of its highly technical funding formula). The leverage of these small funds derives from the fact that they come in addition to base funding. Consequently, they represent “new” funds that can marginally increase an institution’s existing budget.

Table 9 illustrates how a portion of such non-base funding might be distributed. Under this hypothetical example, many of the goals articulated in the formula proposed for Ethiopia are included. But this represents a simpler approach to such funding, and does so outside of the base funding formula, thereby reducing the likelihood of severe unintended effects.

Greater emphasis under this illustration is placed on enrollment of female students and graduation rates, reinforcing the goals of efficiency and student equity. Other weightings and priorities are possible. For each mechanism, indicators or measures of progress must be developed in order to allocate the funds to individual institutions. Clearly other factors could be taken into account in this non-base funding pool, including community services rendered by the institution, research output, or any other goals that have been agreed upon at the national level.

It should be remembered that the number of factors utilized will determine the size and complexity of the associated data gathering and reporting exercise. The capacity of institutions to collect such information still will be problematic. *For this reason, it is recommended that the government set aside funds for the establishment of up-front data collection and information management systems, and include these funds as an add-on to the block grant for base funding.* A specified time period (e.g., 35 years) could be agreed upon with the universities for the completion of such data management capacity building. These special funds could then be removed from the base funding pool, and added to the non-base funding pool to create more incentives for competition and innovation.

**Table 9.**

***Example of Non-Base Funding Distribution***

<u>PRODUCTIVITY</u> <u>(performance outcomes)</u>	<u>WEIGHTING</u> <u>(Percent)</u>	<u>Birr</u> <u>(in millions)</u>
Female Enrollments	50%	Birr 30.0
<i>Overall</i>	40%	24.0
<i>Disadvantaged students</i>	10%	6.0
Graduation rates	30%	Birr 18.0
<i>Overall</i>	20%	12.0
<i>Disadvantaged students</i>	10%	6.0
Annual Income Generated	10%	Birr 6.0
Distance from Addis Ababa	10%	Birr 6.0
TOTAL	100%	Birr 60.0

***A Possible Funding Formula for Recurrent Funding of Ethiopian Universities***

At the request of the Vice-Minister of Education, the proposed funding formula (see *Attachment 4*) was reviewed by Bank staff and comments provided as summarized above. A main concern was the high degree of complexity in the proposed formula, and in its associated data requirements. On this basis, senior Ministry advisors reworked the formula in the quest for greater simplicity and ease of implementation. Bank staff then generated the following mathematical expression of the formula elements as revised by the Ministry.

A funding formula that would meet Ethiopia’s needs could be:

$$F_{i,t} = a_t [ p_t ( c_t \text{ FTE}_{i,t} + \text{RES}_t R_{i,t} ) + (1 - p_t) F_{i,t-1} ]$$

where

$F_{i,t}$  is the funding received by university  $i$  at time  $t$

$a_t$  is a factor that adjusts the funding amounts generated by the formula if the fiscal situation does not allow government to assign each university the amount generated by the formula. This factor would transparently cut all universities by the same percentage. But the factor to the right allows universities to know what is theoretically their “entitlement” and therefore how much they are being cut. This factor could be removed from the formula for simplicity if the formula is used entirely to drive shares of funding rather than producing indicative absolute levels of funding.

$p_t$  is the phasing factor; the formula is phased in over a period of perhaps four or five years, so that, *for example*

$$\begin{aligned}
 p_1 &= 0.15 \\
 p_2 &= 0.35 \\
 p_3 &= 0.70 \\
 p_4 &= 1.00
 \end{aligned}$$

This factor gives the formula a weight of 0.15 in the first year, and the previous year’s funding a weight of 0.85 (that is,  $1 - p_1$ ). This weight can be applied either to the total funding as such, as proposed in the formula above, or it could be applied to the per student funding and then multiplied by this year’s forecast or planned enrolment. The base funding could be last year’s as here, or it could be a fixed base year. In that case an inflation factor should be used to bring the base year forward.

The speed of adjustment could be more “linear” (more initial impact to create the impression that the formula is serious, but less time to adjust) by changing the 0.15 to 0.25, the 0.35 to 0.50, etc.

$c_t$  is the unit *instructional* cost at time  $t$  of the basic or “anchor” FTE (see below) – this would have to be based on high-quality, empirical unit cost studies.

$FTE_{i,t}$  are weighted Full-Time-Equivalent enrollments at university  $i$  at time  $t$ , determined as, *for example*:

$$\begin{aligned}
 FTE_{i,t} = & W_{\text{undergrad},1} FTE_{\text{undergrad},1,i,t} + W_{\text{ma},1} FTE_{\text{ma},1,i,t} + W_{\text{phd},1} FTE_{\text{phd},1,i,t} + \\
 & W_{\text{undergrad},2} FTE_{\text{undergrad},2,i,t} + W_{\text{ma},2} FTE_{\text{ma},2,i,t} + W_{\text{phd},2} FTE_{\text{phd},2,i,t} + \\
 & W_{\text{undergrad},3} FTE_{\text{undergrad},3,i,t} + W_{\text{ma},3} FTE_{\text{ma},3,i,t} + W_{\text{phd},3} FTE_{\text{phd},3,i,t} +
 \end{aligned}$$

The  $w$  are weights that are given to each FTE depending on level (undergraduate, master’s, or doctoral) and cost group (1, 2, and 3). Note that more groups could be used, although 3 groups and 3 levels already produces 9 different levels of weights. This is probably enough to capture most of the variation that matters. One can visualize this as a grid of weights, sometimes called “prices” or “relativities,” as presented in the table below. Note that the  $w$  weights do not have a time dimension  $t$  or an institutional dimension  $i$ . These should be specified and then left fixed for some time, and they should apply to all institutions equally; that is the whole purpose of the formula.

	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>
<b>Academic Program</b>	Least expensive subjects (e.g., subjects intensive in large lectures)	Intermediate subjects (e.g., those requiring some laboratory work)	Most expensive subjects (e.g., subjects requiring clinical experience)
Undergraduate	Least expensive, usually “anchored” at 1	Intermediate	Intermediate
Master’s	Intermediate	Intermediate	Intermediate
PhD, MD, etc.	Intermediate	Intermediate	Most expensive, perhaps around 6 or 7 (relative to the 1 for the least expensive)

These relative prices or relativities are empirically estimated using departmental cost data from as many universities as possible, and for more than one point in time if feasible. One could conceivably begin with faculty level cost data, but it is much more preferable to use actual departments, because the instructional technology or approach varies by department more than by faculty. International benchmarking could also be used. The weights are normally “stylized” or “rounded” numbers (1, 2, 2.5, etc.), as there is no pretense of accuracy beyond 1 digit past the decimal point, if that—in many cases there are no digits beyond the decimal point. The prices should reflect true cost differences and not attempt to send complex “signals” beyond the price itself.

FTEs would be measured in the traditional way; e.g., a student taking, say,  $\frac{1}{2}$  the normal credit hour load would count as  $\frac{1}{2}$  of an FTE.

Furthermore, the FTEs can be either forecasts (e.g., using a moving average), or planned/agreed amounts set up for each university via a yearly strategic planning exercise, so as to prevent severe instability of funding in response to temporary variations in enrollment. The forecast can include the planned amount and a moving average of the past amounts. If not all of the planned FTEs materialize, and the shortfall is below some critical level, government could “claw back” some of the funding. Note that during the period of formula phase-in it may not be as necessary to use a moving average for the FTEs, since the phasing in would itself take care of much of the instability problem.

In some cases, e.g., if there is a desire to increase the internal efficiency of the higher education sector, it may be desirable to adjust FTEs downwards for students who fail a course, say by 20%. This can create an incentive to encourage faster student flow through the system. An alternative is to track each student’s cumulative FTE/years or credit hours, and allow students to be counted only if they have less credit hours or FTE/years than it should normatively take to graduate. Note that this may penalize universities teaching youth who are disadvantaged and thus more prone to failure, but it has the advantage of encouraging efficiency. Disadvantage can be compensated for via other means, e.g., by weighting FTEs of poor students more than other FTEs, perhaps 20% or so more.

$R_{i,t}$  is university  $i$ ’s share of a research set-aside. Government would decide on an amount to fund universities beyond that needed for pure instruction,  $RES_t$ . This amount would be divided up between the universities according to the proportion of academic staff producing research work of international standing. A committee composed of academic staff from various universities could adjudicate, based on submissions from the universities, but using *pre-announced* criteria of research excellence. If in a particular university has, say, 15% of the professors judged to meet those research standards, then  $R_{i,t}$  for that university is 0.15.

$RES_t$  is the total research set-aside at time  $t$ , this is a pure policy choice.

Aside from these formula-driven amounts, it is possible to set up other funding, either via the formula or via competitive or special grants. It would be possible to incorporate funding as an incentive to the enrolment of women, for example, or a matching grant approach to stimulating own-source revenue generation. These options do generate considerably more complexity, however, and it may be desirable to handle these issues via special grants rather than formula.

*When a formula contains too many elements, and in a country with only a dozen or so institutions of higher learning, the weights of the formula can be manipulated to produce ad-hoc results that favor one university over another. (This is related to the mathematical result that if there are  $n$  equations in  $k$  unknowns, and  $k$  is larger than  $n$ , then it is possible to produce many very different solutions to the set of equations.) The less elements in the formula, the harder it is to manipulate them to produce predetermined results.*

At the conclusion of the phasing-in period, the funding formula would be simply:

$$F_{i,t} = a_t ( c_t FTE_{i,t} + RES_t R_{i,t} )$$

### ***Recommendations***

Clearly the above described approach for formula funding would be an initial step towards the development of a more robust funding formula at a later date. While the initial funding formula is being implemented, several parallel processes should be undertaken to prepare the entire tertiary system for the eventual introduction of a true formula.

The most essential longer-term step is to develop a system for collecting data to determine costs per student across the system of higher education in Ethiopia. This is the best path to ensure that funds are distributed in a way that is appropriate to the current reality of the country. However while cost-based budget formulas have the advantage of providing an empirical, analytical basis for allocating funds, there are two disadvantages to using costs as the sole basis for a formula.

The first is that cost-driven budget formulae can end up being excessively technical and complex, and understandable only to a handful of experts who know how to manipulate them. This defeats one of the goals for a public budgeting system, which is to encourage public policy debates about broad social choices.

The second problem is that cost-based formulae can perpetuate the status quo in funding, because differences in core funding can reflect historic political advantages as much as real differences in production costs. For example, sometimes individual faculties or units within institutions will spend more on average per student than their counterparts because their programs are inherently more expensive. Laboratory-based disciplines, fine and performing arts, and clinical programs are such examples. However, programs can also be expensive because the people in them have been successful in attracting funding, and the higher funding levels have allowed them to develop expensive habits.

To reiterate, it is essential to develop a system with both formula-based funding *and* non-base funding that creates incentives for institutions to meet certain performance or outcome goals. Without this combination, the status quo will likely be perpetuated.

The following steps are recommended for both building the capacity of institutions to collect and analyze such data and to establish a true baseline for future funding decisions.

- Issue a statement on the purposes and uses of a new funding system. Any new system of funding should be accompanied by a public statement about the reason for the project, the intermediate steps that will be taken, and the plan for future collection and use of cost data. The long-term goal should be to develop a framework for consistent and comparable reporting of costs, rather than a uniform cost reporting protocol. Cost data

could be used not only for a new system of allocating government revenues to institutions, but also to support resource management and improvement at the individual institutional level, to enhance national planning and costing for higher education, to develop other higher education funding policies (such as tuition and fee policies, or scholarship programs), and for other purposes. The point is to articulate clearly and well in advance what the information will be used for, and how it can serve the needs of both government and institutions.

- Build capacity at the institutional and government levels so that uniform systems can be developed. It is essential to have a nucleus of individuals working at both the institutional and governmental levels who can provide the core of expertise to lead a new national effort to collect data, measure costs, and ultimately determine funding allocations. With proper support for their time and other costs, they should be assigned the responsibility to lead the development of a national tertiary information system. International consultant assistance, if necessary, should be limited to providing technical support and guidance. Following proper protocol, the Ministry of Education could ask for the appointment of individuals from each of the public institutions in Ethiopia. This group should be designated as the task force responsible for implementing the new system. Representatives from private institutions might also be invited to participate in the effort on a voluntary basis. However, they do not need to participate in the discussions necessary to implement the system within the public sector.
- Collect the data necessary for the intermediate system of a simplified formula and non-base incentive funding. The task force could serve as the driving force behind the creation and implementation of a robust system for collecting data needed for the above described purposes. The first step for the task force will be to determine the protocols needed for the collection of data for the simplified formula funding (using only the three enrollment factors discussed above). The next step would be to ensure that data could be collected for the intermediate non-base incentive funding components (e.g., research, female enrollments, or graduation rates, etc.).
- Build the national data “dictionary”. The next step is to build a national data dictionary of terminology, policies, and procedures needed for consistent data collection and analysis for a true formula funding system. The national team should consider the differences in mission and program mix in developing such a uniform system. To the extent possible, differences across institutions should be accommodated, to enrich the credibility of the effort and to enhance the usefulness of the data at the individual institutional level. However, consistent guides should be developed to allow the data to be assembled into nationally comparable categories of revenues and expenditures. This will be needed since one of the goals in the formula will be to use data for comparisons of expenditure patterns among public institutions. To be useful for comparative cost analysis, financial information must be collected and stored in a way that allows finances and activities to be measured using consistent definitions and common terminology. This review needs to extend as well to terminology for characterizing personnel and for accounting for expenditures. Policies and procedures (e.g., accounting codes) must be in place to ensure that all institutions record revenues and expenditures in consistent ways.

- Develop the uniform cost categories. The major headings for the cost categories could be those discussed above—instruction, research, physical plant operations, general management and services, and student support and services.<sup>11</sup> However, considerable detail will need to be added in subcategories for each main category. For example, instruction will need to take into account salary expenses for teaching staff, salary costs of support staff for faculties/departments, payments to foreign lecturers and other outside instructors, and a host of others.
- Establish a pilot phase for data collection. Once the data and definitions are clear, institutions could then begin the process of collecting the data and implementing the new system on a pilot basis. Only after such a pilot phase would it be realistic to consider the inclusion of cost data in any sort of funding formula. *That is likely to be at least five to seven years from now*, if not longer, depending on the time needed to develop data systems and implement the various protocols.

## **MANAGEMENT CAPACITIES AND EFFICIENCY**

Because it is a very poor country, Ethiopia has a particular incentive to manage its scarce resources with the greatest efficiency possible. With this need in mind, this section will look at some of the more common areas for efficiency savings, including staff/student ratios, proportion of non-academic staff, and the contracting for non-academic services. The discussion will then assess the extent to which capacities for efficient management currently exist, and what steps might be necessary in order to make them more robust in the future.

### ***Staff/Student Ratios***

Because staff salaries usually comprise the bulk of university budgets, efficiency-improving efforts often begin by looking at staff numbers and their utilization. A common indicator of efficiency in this area is the ratio of academic staff to students. In comparison to regional staff/student ratios, those in Ethiopia would suggest room for improvement, i.e., that academic staff teaching loads could be a bit higher (see Table 10). In the context of current efforts to increase enrollments, this suggests that academic staff numbers may not be the most immediate constraint on expansion. But this could change quickly as enrollments increase.

Overall staff/student ratios are gradually becoming more efficient as enrollments expand more quickly than staffing. Ratios have improved from 1:8 in 1995 to 1:12 at present. *A target ratio of 1:18 for the overall system is recommended as an appropriate goal for the near future.*

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<sup>11</sup> When determining the price ratios, it is important to note that the groupings of departments or faculties need not have any intellectual coherence; one does not group, say, the social sciences together, or the social sciences and the humanities. The groupings should be solely on the basis of similarities in cost structure.

**Table 10.**

***Comparative Staff / Student Ratios,  
2001/2002***

<u>Institution</u>	<u>Staff/student ratio</u>
Jimma University	9
Debu University	11
Alemaya University	12
Mekele University	14
Addis Ababa University	13
University of Nairobi	15
Bahir Dar University	16
University of Ghana	19
University of Ibadan	19
Makerere University	20
University of Khartoum	21
Cairo University	28

Source: Education Statistics Annual Abstracts

Staff/student ratios also vary among academic programs within the tertiary system. This is appropriate as some disciplines are more labor-intensive than others. In 2001/2002, the following ratios characterized the main academic programs within the system:

**Table 11.**

***Staff/Student Ratios by Academic Program, 2001-2002***

<u>Social Science</u>	<u>Business/ Economics</u>	<u>Education</u>	<u>Law</u>	<u>Health Science</u>	<u>Science</u>	<u>Eng/Tech</u>	<u>Agric/Vet</u>	<u>Other</u>
55	18	11	15	9	11	9	12	2

Source: Education Statistics Annual Abstracts

Several conclusions can be tentatively drawn from the above table. First, the ratio in the social sciences programs is too high for effective teaching. This may be the result of recent rapid enrollment expansion in this particular area. Second, the ratio for Education is somewhat on the low side and might be brought up to 1:18 in the interests of greater efficiency. Most striking, however, is the extremely inefficient ratio that characterizes “other programs.” This area stands out as a priority for further investigation in pursuit of efficiency gains.

### *Non-academic Staff*

The ratio of academic staff to non-academic staff can be used as another indicator of efficiency. If non-academic staff numbers are proportionately high, this suggests that perhaps too many persons have been hired to undertake non-academic tasks, and that the university may be performing a form of employment-generation role for the surrounding community. Although no clear guidelines exist on this matter, many knowledgeable observers believe that the ratio of academic staff to non-academic staff should fall between 2:1 and 3:1. On this basis, the following ratios for Ethiopian universities suggest that more careful justification of non-academic staff numbers may be in order, especially at Alemaya and Addis Ababa universities.

**Table 12.**

#### ***Non-academic Staff Ratios, 2001/2002***

<u>University</u>	Academic/ Non-academic staff <u>ratio</u>
Jimma University	2 : 1
Debu University	NA
Alemaya University	1 : 3
Mekele University	1 : 1
Addis Ababa University	1 : 2
Bahir Dar University	1 : 1

Source: Education Statistics Annual Abstracts

In addition, the very low ratio between non-academic staff and students has remained surprisingly constant throughout the recent process of enrollment expansion (see Table 13). This suggests that managers have been hiring non-academic staff as fast as student numbers increase. In the process, they overlook opportunities for cost-savings and work performance improvement.

**Table 13.**

#### ***Ratio of Non-Academic Staff to Students, 1995 – 2002***

<u>1995/96</u>	<u>1996/97</u>	<u>1997/98</u>	<u>1998/99</u>	<u>1999/00</u>	<u>2000/01</u>	<u>2001/02</u>
3	4	4	5	6	6	5

Source: Education Statistics Annual Abstracts

### ***Contracting for Non-Academic Services.***

The permanent employment of large numbers of non-academic staff is costly and inefficient for Ethiopian universities. The contracting out of the non-academic services needed by the university is increasingly common in Africa. Among the more common contracted services are the following: provision of student meals, management of residence halls, computer maintenance, campus security, university vehicle maintenance and repair, care of the grounds and gardens, and minor facilities maintenance. These arrangements facilitate university management by lessening the supervision burden for university staff, reducing the non-academic workforce with its associated personnel management responsibilities and social benefits, improving performance levels (poorly performing contracts are not renewed), and introducing greater flexibility in the application of university funds. The University of Dar es Salaam is a particularly good example of achievement in this area (Mkude, 2003).

### ***Management Skills Development***

The new Higher Education Proclamation will decentralize much of the administrative, budget, and other authority to individual universities in the interest of greater institutional autonomy, flexibility and responsiveness. In order to produce these benefits, however, decentralization will require extensive capacity building for Presidents of universities and for many senior administrators. In addition, it will also necessitate the introduction of new administrative tools for budget monitoring, control, and financial planning. This will be a major undertaking within an institutional culture characterized by a tradition of highly centralized authority and decision making within the Ministry of Education.

The Ministry of Education has requested guidance on ways to improve the leadership and management of higher education. Questions were specifically raised with regard to capacity enhancing efforts based on co-managers, advisors and training programs. These will be discussed in turn.

### ***Leadership Development***

In seeking to respond to the Ministry of Education's concern as to how best to strengthen leadership and change management capacities in its higher education sub-sector, no readily applicable solution can be offered. However, a leadership development experience carried out in South Africa and Namibia (1993-97) is relevant for shaping a response to this question. In a somewhat similar situation of higher education transformation and change, a senior mentoring program was set up for university Vice-Chancellors (i.e., Presidents in the Ethiopian context). The project was based on the use of American university Presidents as personal mentors to the South African Vice-Chancellors.

The major elements of this capacity building program evolved as follows:

- The South African university presidents (Vice Chancellors) were paired with presidents from American institutions for two years of ongoing consultations in person, by telephone, and by email.
- All of the South African university presidents were given computer training so that they became computer literate and able to handle spread sheets for budget planning (this involved individual tutorials for the presidents in their own offices).

- Opportunities were created to build a sense of mutuality between the two university presidents and to foster cooperation between their institutions.
- A two-week consultation was organized on each South African campus between the two university presidents and senior staff twice each year over a two year period. That was the equivalent of one month a year for two years – quite a commitment for sitting American university presidents.
- These consultations focused on developing a strategic and financial plan for each institution over the two-year period, including appropriate financial planning software.
- A series of workshops were provided for South African university staff on strategic planning, financial planning, academic quality reviews, fund-raising, and governance.
- Regular consultations between the American university presidents and their South African equivalents was encouraged, via telephone and email, in between these face-to-face consultations.
- Meetings were arranged among the South African universities to foster collaboration and to exchange experience and lessons learned on leadership, financial management, and institutional planning.

The process followed in organizing and implementing this program began by first identifying a small pool of American university presidents who were both willing to participate and possessed a strong record of experience, demonstrated leadership, and successes with strategic planning, financial planning, and quality enhancement. The pool was ethnically diverse and about half of its members were women. Next, the South African university presidents were given the opportunity to select their mentors based on curriculum vitas provided to them. They ranked their choices in case of duplicate first choices.

The chosen mentors then spent two weeks at their respective South African institution presenting workshops on strategic and financial planning, and working directly with the presidents, senior staff, budget and planning committees, as well as student, staff, and faculty groups when asked. The mentors continued to be in contact with their counterparts after the first visit. Roughly six months later, the mentors returned to the South African campuses for a second two-week period of consultation. This was repeated for two years.

The outcomes of this program are impressive and well documented. Thirteen of the fourteen institutions completed strategic and financial plans during that two-year period. In addition, their financial and planning systems were updated and enhanced. The university presidents (and many of their key staff) became computer literate. Most of them also became regular users of financial planning software. Institutional linkages were formed between US and South African universities. The use of peers as mentors broke down boundaries that often limit openness and progress in the development of university leaders. State-of-the-art management, budget, and planning techniques were shared between American and South African university presidents. As a result, leadership was improved and effective university autonomy and decentralization were advanced.

Other models exist. Harvard University has a very good summer program for university presidents. But it is strongly focused on policy issues in the United States, as one would expect, and may not be as useful to Ethiopian university presidents as it is to American university presidents. In addition, general leadership workshops are run by various American, British and

Canadian universities. Regional organizations, such as the Association of Commonwealth Universities, also organize periodic management training programs.

Another option would be to organize such a workshop in Ethiopia. However, experience indicates that for such workshops it is difficult to find presenters who can talk to the presidents as peers. In addition, it is very difficult to get university presidents to commit the time required on a fixed date when their last minute unavailability would be less easily noticed than in a one-to-one relationship. On the other hand, these options can be somewhat less expensive, although the Harvard workshop is costly.

Experience with the Presidential Mentoring Program in South Africa demonstrated the advantages of this kind of one-on-one specialized management and leadership training. Benefits were many times greater and more immediately applicable, including the fact that the links were more enduring, the techniques and skills fostered more substantial, the lessons given taken more seriously, and the partnerships developed ongoing and useful over a longer period of time.

### ***A Leadership Mentoring Program for Ethiopia***

A similar program could be organized for Ethiopian university leaders. It would require a relevant professional organization or knowledgeable individual to facilitate the arrangements. American (or other country) university presidents would need to be identified and vetted. Linkages, travel, and administrative arrangements would need to be made, workshops facilitated, and other assistance provided. In the case of the United States, such a mentors program could be run out of an existing office in Ethiopia (the Academy for Educational Development might be one possibility) or perhaps coordinated by a higher education membership association such as the American Council on Education or the American Association for Higher Education. The British Council in Addis Ababa might be called upon to play a similar role with British and/or other international universities. Similar types of organizations, as well as potential institutional twinning partners, also exist in the Netherlands, Australia, and Canada, as well as in newly industrializing or middle-income countries such as Korea, Malaysia, Singapore, Thailand, and South Africa.

To be effective, a number of conditions are necessary:

- Expression of interest on the part of the Ethiopian university presidents for such mentorships and an eagerness to participate in such a project.
- Commitment by the presidents to set aside sufficient blocks of time for one-on-one and group interaction during the mentor's visits.
- The written identification of specific goals and tasks for the mentorship.
- Identification of a sufficient pool of university presidents willing to make such a commitment (e.g., perhaps 15 to 20 candidates).
- Selection of the "Mentor Presidents" and providing adequate preparation and briefing for each.
- Funding to cover travel, living expenses, per diem, supplies, telephone, honoraria, and facilitation.
- Ongoing coordination, facilitation and support of the program by a competent professional.

The major cost would be travel. Although it might be possible to find presidents who would serve without asking for a consulting fee, payment of a minimal amount should be considered as a matter of principle. This enables a clear contractual arrangement with each President. Costs to be considered include: travel – 2 trips per year for two years (business class); lodging and food for mentors during their visits; honoraria for mentors; internal travel; meetings in Ethiopia for all participants (one each year); training workshop costs; and facilitation costs.

Ethiopia holds a special meaning for many Americans and Europeans, and it might not be difficult to find university presidents who would agree to serve as mentors in such a leadership development program. However, organizing such a program is a time-consuming task that requires careful facilitation.

### ***Who Should Be A University Leader/Manager?***

This is not an easy question to answer, as much depends on the talents of a particular individual. In general, however, the practice of awarding institutional management positions to recognized scholars is now largely outdated. The skills needed to become an outstanding researcher have little to do with the skills needed for good management. This distinction will become increasingly important as university management responsibilities are delegated down to academic departments and other “cost centers” under university autonomy.

As a general rule, most universities in Australia, North America and the United Kingdom today would not appoint someone to a management position if he or she did not possess some prior training and experience in university management. Most institutions have management training programs in place whereby younger academic staff with management potential are identified and provided with necessary training. When middle level management positions become open, recruiting for the replacement is undertaken within this group of “prepared” candidates. Likewise, middle level managers continue to receive training and other management development experiences (e.g., attachments, study visits) to prepare them as candidates for higher levels of management responsibility. For this reason, an aggressive and continuous higher education management skills development program is recognized to be an indispensable part of the current reform and capacity building efforts.

### ***Senior Management Teams***

When universities were small, they often functioned as close-knit academic “communities.” Faculty members were frequently acquainted with one another, support services functioned in rather informal ways, and management resided largely in a system of collegial committees comprised of scholarly peers. As universities grow in size and complexity, however, community interactions lose their face-to-face familiarity and management – if it is to be effective – gradually takes on more corporate characteristics. In the process, impeccable academic credentials alone are no longer sufficient qualification for managerial leadership, and the traditional committee system of decision-making may become time-consuming and slow to respond.

In larger and more complex institutions of higher learning, i.e., those with enrollments above 3,000 students, senior officers should ideally function as an executive management team with professional skills equal to their responsibilities. In Ethiopian universities, this “management team” is most frequently comprised by the president and the vice-presidents. Many would include the Dean of Students and Chief Financial Officer in this core group. Few, however, would include the Head Librarian. In today’s information age, this could well be a costly oversight.

*Library Management.* In countries around the globe, the university library is progressively losing its status as an ancillary service function and, aided by information technologies, is becoming a strategic component of university management. This is because knowledge is now a global resource that must be aggressively pursued and acquired on a continuous basis. University libraries are shedding their traditional functions as passive repositories of knowledge and taking on more central and dynamic roles as knowledge portals to the world and information hubs of the campus. In doing so, they become a key component of a university's capacity for quality, relevance, and community service. To play this role, they must have professionally trained managers (not simply librarians) who are members of the institution's senior management team.

In Ethiopia, head librarians are normally appointed as academic staff and they may hold teaching responsibilities as part of their job. For the country's higher education reform strategy to be fully effective, it is recommended that university libraries must also be consciously included in the reform process. This implies that, in time, they should become decentralized management units within the university, functioning as semi-autonomous cost-centers with their own work plans and budgetary allocations. It also implies that they should be staffed on a full-time basis by non-teaching professionals trained in contemporary information science (not old-fashioned library science) who are capable of managing libraries as systems of information in digital as well as paper form.

### ***Management Training***

Apart from the special leadership development needs of institutional executives, more general management training for senior and middle levels of university management should also be provided. What does management training involve?

First, a good training program develops both the leadership and management capabilities needed to effectively run an institution. Leadership skills generally include: strategic thinking, cultivation of innovation, communication, motivation of staff, teamwork, and calculated risk-taking. Management skills usually comprise: time management, resource allocation, fairness in judgment, quality control, personnel development, and effective delegation of authority. Among these, skill-building in communications is a critical capacity that is often under-emphasized in university management training.

Second, effective management training is a developmental process, not a one-off occurrence. Attitudes and behaviors change slowly. Management training must therefore comprise a *sustained program of activities over an extended period of time* in order to achieve its desired developmental impact. The management training courses recommended above should therefore be given two or three times a year for four or five years.

Third, effective management training integrates theory and practice. Ideas and innovations can point out new possibilities, but only practice will lead to mastery. As a result, short courses should ideally be interspersed with opportunities to put new ideas into practice. These opportunities might include professional attachments or secondments to other institutions via institutional linkage agreements, alternating training with implementation of action plans, and role-playing.

Finally, effective management training addresses future as well as present needs. In other words, it targets tomorrow's leaders in addition to today's managers. This approach seeks to develop a pool of talent from which future managerial leadership can be selected, while also improving institutional management at lower levels of responsibility. It implies separately designed training

programs for the core management team, deans and deputy administrators, and department heads. *In Ethiopia, such training might profitably be extended to student leadership in recognition of the fact that many of them are likely to become university staff members following graduation.* Furthermore, such training can also help to transmit democratic values and behaviors to the student body.

### ***Strategic Planning***

Although several universities have made good starts in setting out detailed strategic plans, most have not done so. The efforts of the few nevertheless create a noteworthy precedent, because effective university management begins with strategic planning. In the past, conditions have neither favored nor required much in the way of institutional planning. This has been due in part to the highly centralized structure of decision-making that left few decisions to institutions. As a result, strategic and financial planning seemed largely irrelevant for many institutions and few incentives have existed for developing those capacities.

These conditions are now changing in significant ways as a result of the institutional autonomy accorded by the Higher Education Proclamation. As the Ministry moves to decentralize authority, the capacity of the institutions to manage fully their own affairs will be severely tested. Without conscious initiative to tackle this challenge, a kind of vicious circle may emerge in which the universities have few incentives to carry out effective strategic planning on the one hand, while on the other, the Ministry may be reluctant to encourage full decentralization due to the institutions' lack the planning and financial capacities to manage autonomy. Capacity building at the institutional level will therefore be essential for successful decentralization, democratization, and transparency, as well as to the success of other reforms envisioned in the Higher Education Proclamation.

To serve as effective tools, university strategic plans will need to be carefully costed in the context of reasonable expectations about income and expenditures, as well as judgments about the financial environment in the future. Part of the process should involve a review of programs and/or costs that can be reduced in order to pay for current priority projects and goals.

Recommendation. A formal office of strategic planning could usefully be established in the Ethiopian Higher Education Strategy Institute. Among its duties might be to collect, analyze and disseminate appropriate institutional and system data on the performance of higher education system. EHESI staff could include a trained strategic and financial planner familiar with data collection and quantitative analysis of the educational data. The office would focus on both strategic and financial planning for the higher education system that links ongoing planning discussions and policy decisions to financial needs, expectations, and realities.

Recommendation. EHESI could encourage and support university strategic planning by organizing training courses and applied workshops for the tertiary institutions, including their presidents, planning officers, and institutional finance officers. The process should involve broad participation in the process within each institution to insure that the resulting vision and plan are "owned" by the various constituent groups of the institutions. Training should include provision of tools for the analysis of institutional data including enrollments, staff teaching loads, throughputs, etc.

### ***Financial Management Capabilities***

Financial management expertise will need to be strengthened at both the national and institutional levels in order to anticipate and manage effectively the implications of the recently announced shift to formula funding and block grant allocations for universities. Until now, detailed line-item budgets have been required for the system as a whole, but the capacity for financial planning and budget analysis has been little encouraged by this system. Effective institutional planning and management require careful financial analysis. This in turn necessitates the tracking of expenditures, long-term financial projections, and the ability to estimate income and expenses accurately. The existing systems and software used for university financial management, with rare exceptions, appear largely inadequate for those purposes.

The devolution of financial authority to institutions that will begin next year makes financial planning and management training especially important for institutions. This effort should tie strategic planning to financial planning and assessment in an ongoing manner so that priorities and budgets can be adjusted if significant changes occur in income or expenditure levels. These efforts would be enhanced if institutions were provided with appropriate software that can track income and expenditures as they occur and thus enable institutional leaders to make adjustments before major problems occur. Separate financial planning software developed specifically for medium term planning by universities would help institutions plan for the future. Too often budget tracking software is designed for accounting purposes after the fact and does not lend itself to planning. Presidents and other senior institutional planners need to be able to examine different possible future scenarios, and their effect on the bottom line, including those caused by fluctuations in income, inflation rates, changes in student fees, salaries, and expenditure rates. Such software is commercially available and can be acquired.

Recommendation. Financial management training could usefully be provided at both the national and institutional levels, with special emphasis on preparing individual universities for effective control of their own budgets under the impending move to formula funding and block grant allocations.

Recommendation. Financial management software that is designed for use by university planners (including presidents) as well as institutional financial officers should be identified, acquired and introduced to the universities along with the necessary training of staff.

### ***Resources for Management Training***

Within Ethiopia, valuable opportunities for training and mentorship in higher education management will be provided over the coming several years through a new program sponsored by the British Voluntary Services Organization (VSO). During that time, some 20 VSO volunteers with skills and experience in higher education management will serve as advisors to the Ministry, the new system support organizations, and university executives.

Outside Ethiopia, various university-affiliated centers exist that offer training related to higher education management and policy planning. These include the Center for Higher Education Policy Studies at the University of Twente, Netherlands;<sup>12</sup> the Center for Higher Education

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<sup>12</sup> CHEPS has provided extensive technical assistance to the higher education transformation process in South Africa over the past five years.

Research and Management at the University of Manitoba, Canada;<sup>13</sup> the Center for Higher Education Studies at Pennsylvania State University in the United States; and various programs in the United Kingdom.

Recognition of the need for more systematic efforts to develop leadership and management skills within African universities has steadily expanded in recent years. The result is a growing number of training initiatives in Sub-Saharan Africa. A new Master's program in higher education management has recently been established at the University of the Western Cape in South Africa, which seeks to become a regional training resource. The Association of African Universities runs annual week-long Senior University Management (SUMA) workshops at various locations within Africa. The South African Universities Vice-Chancellors Association (SAUVCA) has sponsored subject-specific training programs for senior university managers that will shortly be expanded to embrace the needs of middle managers as well. The Ghana National Council for Tertiary Education has produced a leadership training course, together with a training manual, for institutional officers that is attracting interest from neighboring countries. The University of Fort Hare in South Africa recently offered a course on education leadership and management development.

The responsibility for ensuring that effective management training programs are put in place and operated continually resides at two levels. At the system level, the Higher Education Strategy Institute might organize system-wide training opportunities through national workshops that address common needs faced by all institutions, e.g., strategic planning, computerized financial management. At the institutional level, each core management team, ideally guided by an institutional strategic plan, should identify its own specific management capacity shortcomings and ensure that some type of staff development or capacity strengthening plan is put in place to address these. Funding for a capacity development plan which integrated staff training with other inputs necessary to achieve greater teaching and administrative effectiveness could be supported by the proposed Innovation Fund under discussion as part of the World Bank's anticipated support to the sub-sector. The expanding capabilities of the Ethiopian Civil Service College could also be utilized when appropriate.

### ***Building a More Businesslike Culture***

The selective recruitment of private sector managers for service as university executives has generally not been adopted outside of North America and the United Kingdom. In Ethiopia, however, more limited forms of management contracting might be attempted. The financial administration or "business" side of the university is perhaps most amenable to this approach. Many universities employ chartered public accountants or MA-trained financial analysts as their chief financial officers. Some have even recruited business executives to fill posts similar to that of Vice President for Administration. In South Africa, a number of universities have recently established the position of "business development officer." Some African universities have brought in business expertise to head their income generation and consultancy units. In general, the incorporation of business expertise and experience into university administration can be a catalyst for positive change. Because it implies a change of behavior and attitudes, this can also be tension-producing and even disruptive, particularly when this expertise is brought in at the highest levels of university management.

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<sup>13</sup> CHERM has worked closely with the Association of African Universities to develop the latter's "Senior University Managers and Administrators" (SUMA) short course, which is offered annually by the Association.

Recommendation: Professional business and financial expertise from outside of the university system should be employed in a few experimental cases, preferably in one or two of the newer and smaller universities, to determine the effectiveness of this approach.

### ***Management Training Recommendations***

1. Good institutional management begins at the top. This means that the university Board must be comprised of competent persons who understand their roles and responsibilities as Board members. These roles and responsibilities have recently changed as a result of the greater institutional autonomy awarded by the Higher Education Proclamation. Given the number of universities created in recent years and the prospect of more in the near future, *a systematic program of orientation should be undertaken for all university Board members.* Such programs have been carried out with considerable success in Ghana, Namibia, and South Africa. In these countries specific training manuals for university Board members have been developed and employed to good effect.
2. Establish a locally designed leadership development program of 2 – 3 years duration for university presidents that recognizes their unique status, their special needs, and their difficulty in attending structured courses off-campus. The South African mentorship program described above could serve as a useful model for this program.
3. Organize two or three one-week management training courses in Ethiopia each year for the foreseeable future (e.g., five years) that target senior university managers, including head librarians. If each university, EHESI and QRAA sent three participants, this would make a manageable group of 30 participants. Courses might usefully address such topics as financial planning and management, institutional communications, human resource management, conflict mediation, and basic computer skills. Where high quality local training expertise does not exist, these courses should be organized by experienced international experts, or through institutional partnerships with organizations that possess the requisite experience.
4. A longer term strategy should be initiated to develop the “next generation” of university leaders and managers. This would involve identification of talented younger academic staff with demonstrated management skills who would be given opportunities to develop their potential further. This could be accomplished by sponsoring their attendance at MA programs in higher education management, such as the one offered at the University of Western Cape in South Africa, participation in short management training courses offered within the region (e.g., Ghana, South Africa) or by the Association of African Universities, and professional secondments of three to six months at well managed universities within or outside the region. In time, this pool of individuals would be expected to emerge as competitive candidates for future university management responsibilities.
5. As institutional capacities increase, thought should be given to creating an academic program in education management for Ethiopia that would offer courses and a post-graduate degree in higher education management. The elements of such a program exist at AAU. Graduates would be expected to find employment in universities, private colleges, teacher education colleges, and technical colleges. Practicing administrators from Ethiopia’s universities and the Civil Service College could be brought in to teach such a program until a permanent core group of faculty were available to support a full program.

## EDUCATIONAL QUALITY AND RELEVANCE

### *Academic Programs*

The current higher education system hosts an estimated 60 undergraduate programs and 50 diploma programs (Wondimu, 2003). In addition, some 50 graduate programs (largely at the Masters level) are offered by Addis Ababa University and Alemaya University. As noted above, the diploma programs are presently being transferred out of the higher education system in order to facilitate the expansion of degree enrollments.

The predominant form of instruction is the lecture method. When class sizes are large, lecturers are likely to use easily graded types of examinations (e.g., multiple choice, true or false). Most programs require graduating students to write senior essays or undertake similar types of projects that demonstrate a level of mastery.

In the mid-20<sup>th</sup> century, UNESCO recommended an international guideline encouraging national higher education systems to strive towards a 60:40 distribution of their enrollments between sciences/technology and arts/humanities. At present, Ethiopia's tertiary enrollments fall short of this goal (see Table 14). Some 33% of students pursue science and technology disciplines, whereas the remaining 67% are enrolled in the arts and humanities. Government policymakers and institutional leaders would be well advised to improve this balance in the interest of enhancing the country's productive capacities. The planned elevation to university status of the Gondar College of Medical Science and the Arba Minch Water Technology Institute will help in this regard.

**Table 14.**

### *Distribution of Tertiary Enrollments by Academic Program, 2001/2002*

	<u>Social Science</u>	<u>Business/ Economics</u>	<u>Educ</u>	<u>Law</u>	<u>Health</u>	<u>Science</u>	<u>Tech/ Engineer</u>	<u>Agric</u>	<u>Other</u>	<u>Total</u>
Public Degree	3,164	1,774	3,935	661	1,975	2,445	4,530	2,948	347	21,779
Public Diploma	0	2,556	3,865	88	2,065	175	906	1,691	299	11,645
Evening	976	10,846	16,088	1,024	1,779	768	4,547	1,924	1,252	39,204
Private	0	15,271	30	730	123	0	875	85	1,977	19,091
TOTAL	4,140	30,447	23,918	2,503	5,942	3,388	10,858	6,648	3,875	91,719
Percent	5	33	26	3	6	4	12	7	4	100

\* roughly half of these are studying computer technology.

Source: Education Statistics Annual Abstracts, 2001/2002

Some disciplinary specialization can be discerned among the different institutions. The main social science enrollments occur at Addis Ababa University and Mekelle University. Addis Ababa also predominates in the sciences and serves as the center for national postgraduate education. The primary sites for education students are Bahir Dar and Debub universities.

Health Science enrollments characterize Jimma University and Gondar College. Roughly half of agricultural enrollments are at Debu University. Engineering and technology students tend to concentrate at Arba Minch and Bahir Dar.

### ***Research***

Research forms part of the job description for academic staff, who are supposed to spend 25% of their time in research activities. Over the years, Ethiopian academics have produced a substantial body of research on agriculture, engineering technology, health sciences, natural sciences, social sciences, and education. However, research output and quality in recent years is not well documented. The funding of research is provided by government and donors, especially from Sweden, the Netherlands, and the United Nations. Although reliable data are not available on the role of donors in funding research, their contributions are reported to be sizeable (Wondimu, 2003).

If the current higher education expansion and reform effort is to pay the country its full dividends in contributing to national productivity growth over time, university research will need to be given more visible and explicit attention in higher education policy, institutional strategic planning, and budget allocation processes. It also means revitalizing a culture of research within the universities. To this end, staff might be held increasingly accountable for the 25% of their time presumably dedicated to research, and for associated research outputs, whether of a scientific or community-oriented nature. At a minimum, the funding and organization of graduate programs will need to include support for both student and professorial research. As opportunities permit, national awards and public recognition for research achievement could be introduced. This would also help encourage secondary students to become more interested in science and applied technology. The proposed new funding formula is expected to provide positive incentives for improved research performance, and this intention is strongly endorsed.

### ***Academic Staff and Staff Qualifications***

Universities recruit their own staff based on standard academic qualifications. Lecturers are supposed to be evaluated at the end of each semester by their peers, students, and the head of the department. Favorable assessments are required in order to continue employment. Contracts are supposed to be renewed every two years, but such reviews reportedly do not often take place. Academic salaries range from USD 400 a month for a full professor to USD 150 a month for a lecturer.

As the tertiary system has expanded, the proportion of academic staff possessing a PhD has declined, i.e., from 28% in 1995/1996 to 17% in 1999/2000. The percentage of PhD staff at Addis Ababa University has stayed fairly constant at about one-third. However, only 4% of academic staff hold PhD's at Debu and Jimma universities, and only 8% at the Gondar College of Medical Science. Mekelle and Bahir Dar universities are in somewhat better conditions with 12% of their teaching staff holding doctoral degrees.

**Recommendation:** Academic staff development, especially within the newer universities, should be designated as a high priority if educational standards are to be maintained, and a culture of research to be nourished, in the midst of rapid expansion. A steady increase in the proportion of staff with doctoral degrees also holds the key to successful attainment of the ambitious enrollment goals for graduate programs.

### ***Educational Quality***

In the absence of standardized testing of tertiary students (which very few countries carry out), it is extremely difficult to determine the current level of educational quality within Ethiopia's universities. However, three points of information combine to raise the possibility that educational quality may presently be at risk. First, it is always difficult for any nation to maintain quality standards in the midst of rapid enrollment expansion, and the Ethiopian higher education system is currently in the midst of a rapid expansion. Second, the current level of spending per student on academic expenses is quite low from both a regional and an international perspective, varying from USD 550 to USD 1,158 within the system. Third, the proportion of academic staff with PhD degrees has been declining, and will probably decline further as rapid enrollment expansion proceeds.

Anticipating the likelihood of rising concerns regarding educational quality from inside and outside the tertiary system, the government has recently established a Quality and Relevance Assurance Agency to monitor learning achievement and shore up sagging standards when they are detected. Of equal importance, government has also established a National Pedagogical Resources Center to concentrate specifically on the improvement of teaching skills, methods, and materials. These two agencies have been entrusted with guardianship of educational quality. Their future development, as service-oriented resource organizations for the higher education system, will be a critical variable in the struggle to maintain and improve quality.

In the course of enrollment expansion, the challenge of educating less well-prepared students will become more apparent. As higher education moves beyond exclusive enrollment of the best prepared 1% of the age cohort, it will confront new obstacles relating to curriculum and student readiness for campus academic life. Institutions will need to anticipate and prepare for this inevitability, even as they await quality improvement to occur at lower level of the education system. Many universities already respond to this problem through the organization of "freshman programs" that seek to address academic deficiencies. In the future, additional forms of academic support and student counseling will likely be necessary. Developing such models would seem to fall within the mandate of the new National Pedagogical Resources Center.

#### ***Will there be enough academic staff to support expanded enrollments?***

This question addresses the potential for academic staff shortages to become a major constraint on the country's higher education expansion endeavor. Perhaps the most daunting challenge to the implementation of Ethiopia's higher education reform is the sheer physical numbers of academic staff that will need to be recruited and trained over the coming years. If the system is to reach public enrollments of 130,000 students by 2007 (120,000 under-graduate plus 10,000 graduate students) and we assume a more efficient staff/student ratio of 1:20, some 3,608 new academic staff will be required. This represents a 125 % increase in just five years over the current contingent of 2,892 academic staff. If the proposed qualifications guidelines (30% PhD's, 50% Master's degrees) are applied, this would mean 1,082 new PhD holders and 1,804 new Master's degree recipients. At present, just 40 Ph.D. students are registered at Addis Ababa University.

The pure logistics of this effort would certainly require much more than the system's existing capacity in order to manage these staff recruitment, placement and relocation activities. In addition, the supply of Bachelor's degree-holders from which to recruit these numbers may not be sufficient. The public higher education system is currently producing 3,959 Bachelor's degree-

holders a year. Of these, only 250 appear to have specialized in education, and another 150 in technical education. Assuming that 2,600 new qualified secondary school teachers and 1,100 qualified technical education teachers would have to be recruited in order to reach ESDP II enrollment goals for secondary and technical education, this would mean that secondary education teacher recruitment needs would absorb 30% of all higher education graduates over the next three years. If this occurred, then roughly 35% of the remaining degree graduates would need to be recruited as higher education academic staff over the next three years in order to get them started on the necessary graduate training programs. In other words, the Ministry of Education alone would have to hire 55% of the country's total degree-holder output from public institutions during the ESDP II time period. This seems improbable.

Addis Ababa University, with 46 post-graduate programs and 1,165 post-graduate students in 2001/02, constitutes nearly 90 % of the country's capacity to provide post-graduate education. Any strategy for generating the academic staff necessary to support a doubling of undergraduate enrollments will therefore depend heavily on the AAU's capacity to produce a much larger number of successful Master's and Ph.D. degree-holders, which totaled 397 in the same year.

After averaging roughly 300 post-graduate admissions yearly for much of the past decade, the AAU has sought to respond to this challenge. It increased its post-graduate admissions to 490 in 2001/02, and to 951 in 2002/03. Nevertheless, it fell well short of its projected admissions target of 1,700 under the higher education expansion program. The shortage of qualified applicants explains much of this shortfall. Nevertheless, the admissions goal for 2003/2004 has been set at 3,000. In addition, the AAU Graduate School has reportedly not received any increase in its recurrent budget following a doubling of its post-graduate intake this year. This has placed a strain on facilities, lecturers and supplies. Next year, most of these nearly 1,000 students will begin the research projects necessary to obtain their post-graduate degrees. Because a standard research award of 10,000 Birr is reportedly awarded to such students, an additional 10,000,000 Birr will be needed to enable these students to progress towards their final degrees.

### ***Strategies for Staff Development***

Government has sought to address its academic staff shortcomings in two main ways: graduate training for Ethiopians overseas, and use of expatriate academics. Since 1994, over 550 Ethiopian students have been sent to India for first, second and third degree programs. The return rate is reportedly higher, and the cost lower, than when similar training is undertaken in Europe or North America. In 2003 some 382 expatriate academics were employed in Ethiopian universities. These included 268 Indians, 49 Cubans, 45 Nigerians, and 20 VSO volunteers from the United Kingdom. These expatriate lecturers represent roughly 10% of total academic staff.

As noted above, *the short term generation of sufficient numbers of academic staff, trained at the necessary levels, may be the single most difficult challenge currently faced by the higher education expansion and reform program.* This difficulty arises from three factors: graduate training is expensive and time-consuming; the pool of potential candidates is not large and cannot be quickly expanded; and graduate degrees hold high currency in the global labor market, thus making the risk of brain drain an ever-present possibility.

In these conditions, existing global "best practice" suggests the following key elements for a university staff development strategy in Ethiopia:

- *Sandwich Programs.* Over the past decade, "sandwich programs" have come to be recognized as the best combination of quality, relevance, and cost for staff development

in the universities of developing nations. In this model, a doctoral student completes basic coursework and a dissertation proposal (and field research, if appropriate) at a national university. She/he then conducts the literature review, data analysis, and/or laboratory research at an overseas university. Defense of the dissertation and award of the doctoral degree takes place at the national university.

- *Partnering / linkages.* Accumulating experience indicates that sandwich programs are most productively carried out within the context of partnership or institutional linkage agreements between a national and an overseas university. Instead of a random number of individual contacts via graduate students, a long term institutional partnership is explicitly put in place. This provides stability, understanding, commitment and ancillary benefits to the institutional relationship. In recognition of these benefits, various countries (e.g., Canada, the Netherlands, United Kingdom, United States) have established earmarked funding programs for their universities in support of international linkages.
- *Distance Education.* The provision of ICT-dependent graduate training is expanding rapidly in today's world. Graduate course offerings exceed the social sciences and increasingly include engineering and the natural sciences. As ICT infrastructure is put in place on Ethiopian university campuses, academic staff could be given scholarships to cover the tuition charges of graduate study at a distance (and a portion of time off to undertake the coursework). This arrangement would enable the lecturer to continue teaching on a part-time basis, and the cost of the scholarship would be less than that of residential study.
- *System-wide Staff Development Fund.* Because the need for academic staff development is urgent and short term in nature, it constitutes an excellent candidate for donor funding. This is because once an initial cohort of PhD's is produced, they will be able to staff the graduate programs necessary to generate the country's additional needs for PhD and MA/MSc graduates. During the 1980s, the University of Zimbabwe successfully established a "staff development fund" comprised of various donor contributions. Transparent scholarship award criteria were agreed with the donors, and the scholarships were distributed by a university committee in accordance with strategic priorities. A similar approach might be worth pursuing for the entire university system in Ethiopia.
- *Graduate Teaching Assistants.* In other countries, graduate students often serve as teachers for introductory level courses. In Ethiopia, such service might be considered as a prerequisite for participation in a sandwich-degree program. In the process, these students would help share the load in teaching a rapidly expanding undergraduate population.

### ***Building Ethiopian Capacities for Distance Education***

African universities, including those in Ethiopia, are increasingly using computer technology and the Internet. This use is not limited to improving access, but is also applied to strengthening teaching, research and professional networks, and to providing access to digital libraries and other sources of information. This suggests an emerging potential to incorporate distance education into the "pedagogical model" for higher education expansion. This potential has been put to good use in various developing countries. In fact, distance education enrollments represent 50% of total higher education enrollments in Thailand, 26% in Turkey, and 24% in China (Saint 2000).

The viability of distance education as a cost-effective alternative to campus-based instruction depends in large part on effective program management and the availability of trained human resources to support this new form of educational delivery. The operation and management of distance education programs, and the use of newer ICT's, require a range of technical skills that lie outside of existing education systems and, in Ethiopia, are still in very short supply.<sup>14</sup>

The lack of attention to preparatory investments in staff training and program design is the primary constraint on the use and effectiveness of distance education in African higher education, and in education systems in general all over the world. Most failures in distance education can be traced to inadequate human resource planning, provision, and training (Till, 2003). This typically results from over-emphasizing the provision of hardware and electronic networking at the cost of strategic attention to learning goals and student needs. A critical point to note in costing ICT-based distance education programs is that total costs are significantly greater than hardware costs. A rule of thumb is that hardware usually makes up 25% of total costs (Murphy et al., 2002). Similarly, experience from around the world demonstrates that annual upkeep and support costs are annually equivalent to 25% of the initial capital investment.

World experience indicates that both governments and universities tend to under-fund their distance education programs, thereby undercutting their effectiveness and heightening the risk of failure. Under-funding is most common in the provision of critical student support services, staff training, and repair /maintenance and supplies. One deterrent is that distance education requires *considerable upfront investment* to train staff, design curriculum, develop and test learning materials, and acquire selected technology (Saint, 2000). Once this sizeable hurdle is passed, the comparatively lower recurrent costs of the program can usually be covered in large part by student fees. This front-loaded investment profile suggests that tertiary distance education program development is an ideal candidate for international development assistance. Development partners can provide the investment capital and technical assistance over an initial 5 to 7 year period with reasonable assurance that the program will become progressively self-financing after that.

The test of distance education is how well it helps the learner to acquire the desired knowledge and skills. The current focus on ICT's as mechanisms for educational delivery is a potential distraction from the real objective of establishing an effective learning program. To achieve this objective, solid program management is required (Murphy et al., 2002; Till, 2003). In practice, distance education programs generally require stronger management skills than traditional tertiary programs. With scattered students, dispersed part-time tutors, far-flung logistics, unreliable communication services, time sensitive production and distribution of learning materials, and detailed student records, successful distance education programs require above-average skills in organization, logistics, and problem-solving.

In Ethiopia, where a century of highly restricted access to higher education has generated a severe scarcity of management skills, this point cannot be over-emphasized. In fact, a recent survey of distance education capacities in 22 African countries ranked Ethiopia in last place (Saint, 2000). Under such constraints, what can Ethiopia do in order to lay a stable foundation for future distance education programs at the tertiary level?

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<sup>14</sup> It is worth noting that the Alpha Distance Education Institute, a private provider, reportedly has a nationwide enrollment of 33,000 students supported by four regional offices. In October 2003, the Institute graduated 4,300 diploma students in accounting, management, and mechanics.

Africa has no ready-made success stories of technology-assisted distance education to offer Ethiopia. Internet supported education is at an early stage everywhere. Transferable experiences are in short supply. To the extent that “best practice” exists, it comes from the accumulation of global experiences in distance education. This experience suggests the following steps for Ethiopia over the next five years:

1. Organize a three-day informational seminar for higher education leaders on the methodology of distance education, including its strengths, weaknesses, benefits, and risks. The purpose would be to build understanding of how distance education might effectively complement existing higher education programs.
2. Organize several two to three week training courses (in-country) on specific skills of distance education for interested university staff. Ask institutional leaders for help in identifying motivated candidates. These courses should address: the management of distance education, curriculum and instructional design, materials production and distribution, and student support services.
3. Select 10 to 15 of the best performing participants in these training courses to undergo formal MA degree training in distance education. These studies should be undertaken *at a distance* in order to give these students personal experience with what distance education means to an individual. Various good quality MA programs of this type exist in Canada, India, South Africa, and the United Kingdom.
4. This core of MA program graduates could then be employed to staff local academic programs on distance education in Ethiopia so as to multiply national capacities to deliver tertiary education at a distance.

## **QUALITY ASSURANCE CAPACITIES, PERFORMANCE AND NEEDS**

Critical to meeting the objectives of Ethiopia’s higher education reform program is establishment of effective quality assurance capacity at the national and institutional level. This is a vital yet complex process that will require careful planning, decisions about types of standards and methods to be used, a time-table for implementation of its parts, and thoughtful consultations to insure its legitimacy. Establishing an effective national quality assurance and accreditation process will need to be carried out in stages over the next three to five years at both the national and institutional level. In the discussion below, recommendations are made about what should be done both at the national and institution levels.

In Ethiopia, quality assurance and accreditation, by law, are the responsibility of the Ministry of Education. Currently an office in the Ministry carries out a very limited form of accreditation focused on inputs such as infrastructure, class size, and credentials of teaching staff. The Ministry is aware of the need to strengthen quality assurance and has proposed a *Quality and Relevance Assurance Agency* as part of its overall reform program.

Doubling the size of undergraduate student numbers, and an even greater expansion of graduate training, runs the risk of lowering quality unless major quality assurance efforts are incorporated into the expansion process. Expansion of the higher education system without maintaining and improving quality will be counterproductive and, in the long run, destabilizing. The process should include both public and private tertiary education institutions. In the latter case, careful

quality assurance and accreditation of private tertiary institutions (both non-profit and for-profit) will allow government to take advantage of the additional access and resources they can contribute, provide incentives to private institutions that meet accreditation standards, and protect the public from the fraudulent and the questionable quality providers that have plagued many other countries.

### ***Quality Assurance and Accreditation at the National Level***

At the national level, several types of action are needed. They include: (1) Establishment of a formal mechanism to grant permission to universities and other tertiary education providers to operate and offer tertiary level degrees or programs for a limited period of time (e.g. 2-5 years) subject to accreditation. This process is sometimes called *registration*, or *certification*, or *licensure*. Actual recognition of degrees is conditional on accreditation within a specified time period. (2) Creation of a legal foundation for quality assurance, accreditation, and educational consumer protection. (3) Establishment a Quality and Relevance Assurance Agency. (4) Definition of the mission, goals, authority, and responsibilities of the Agency. (5) Definition of the requirements for accreditation and the processes and procedures for attaining it. (6) Establishing a timetable for setting up the full range of quality assurance and accreditation processes including re-accreditation of colleges and universities already approved under the current quality review system (e.g. every five to seven years).

### ***Registration or Licensure***

Government needs to provide some mechanism to register or license institutions that offer, or plan to offer, degrees at the tertiary level. When all institutions are state-supported this is often seen as unnecessary. However, with the growth of private institutions and providers, mechanisms are necessary to insure minimal quality standards, to encourage private higher education, and to protect the public from fraud.

This process provides the authorization to an institution to offer degrees or courses for a limited period of time. It is not the equivalent of accreditation or quality review and does not indicate approval of the quality of instruction, faculty, or facilities. *Registered* or *licensed* status is usually attained after an institution provides a written documentation about: its mission as a degree or certificate granting tertiary institution of higher education; its status as a public, for-profit, or not-for-profit institution; the membership of its governing board; its budget including expected sources of funding; the appropriateness of its facilities for instruction; the qualifications of its teaching staff; and other areas as may be desired. While the information provided is subject to verification, this step is normally not an extensive exercise nor does it necessarily involve a site visit. Misrepresentation in the provision of such information should be punishable as with any other fraud or misrepresentation. The system of registration or licensure could be built on the existing system of recognition within the Department of Education.

### ***A National Quality and Relevance Assurance Agency***

The Higher Education Proclamation has established a national Quality and Relevance Assurance Agency as part of its higher education reform actions. To be effective, its goals, policies, and actions must be carefully thought out and implemented so that it is not just another bureaucratic hurdle but rather focuses on the quality and outcomes of student learning in tertiary institutions. Its aims, procedures, and standards must be acceptable to the public, the academic community, and the national government.

Establishment of an effective national quality assurance process requires a wide range of decisions about the process and its implementation. Among the decisions that will be required are:

- The authority to be exercised at the national level through the Quality and Relevance Assurance Agency and that to be delegated to individual institutions. For example, will the national agency review both institutions and programs systematically, or will institutions be delegated the responsibility to carry out regular academic program reviews (self-studies)?
- The level of operational autonomy of the Quality and Relevance Assurance Agency from the Ministry of Education. While the Ministry has the ultimate responsibility for accreditation, the process will have greater legitimacy if decisions about accreditation are autonomous from control and influence by the Ministry or other government agencies.
- Conditions required of institutions in order to initiate the accreditation process. This usually includes the following types of requirements:
  - A mission statement including institutional goals as a higher education institution
  - Legal status (e.g. licensure or recognition)
  - A governance structure that includes both public and private sector/business members.
  - Faculty members with earned degrees at appropriate levels from accredited institutions.
  - A sufficient number of full and part-time teaching faculty members.
  - Degree programs enrolling students (or a timetable for that if a candidate for accreditation).
  - An externally audited financial statement demonstrating adequate funds for its educational programs.
  - A statement of course offerings that accurately describe its education programs, certificate and degree requirements.
- Discussion of the utility and practicality of doing both institutional and program accreditation. The inclusion of institutional reviews could well be inequitable for private tertiary institutions because it seems politically unlikely that any public institution would be at risk of having its accreditation withdrawn. Therefore, the initial emphasis might best be placed on program reviews in the interest of “leveling the playing field” between public and private institutions. These could be complemented by some aspects of an institutional review to ensure financial and legal integrity. If institutions carry out their own academic program reviews, that information could be made available for the process at the discretion of the institution.<sup>15</sup>
- Standards for accreditation. A number of different types of standards could be considered. Of special importance are those that measure student outcomes – what has

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<sup>15</sup> One disadvantage of using academic reviews in the course of accreditation is that it may serve as a disincentive for the institution’s reviewers to make tough recommendations about the weaknesses of curriculum, teaching, research, or staff in program reviews. To the extent academic reviews are weakened by such concerns, institutions are deprived of the full value of academic reviews including the ability to take action to upgrade quality where problems are identified. Making use of academic reviews in accreditation sit visits voluntary should help prevent that problem.

the student learned? What is their knowledge base? Their skills? The level of achievement? Attainment after graduation? Several types of accreditation standards in common usage are listed in *Attachment 5*.

- Responsibility for data collection for accreditation. Is it the responsibility of each institution, the Quality Assurance and Relevance Agency, the Ministry? In most effective systems this responsibility falls to each institution, but that will require delegation of authority and decisions in a centralized public university system such as that in place in Ethiopia.
- Frequency of reviews for re-accreditation. In most countries it ranges from five to seven years.
- Self-studies and site visits. Will each institution be required to do a self-study prior to accreditation? How will that be structured? What will be required? Or, will a visiting accreditation team carry out a review on its own? The burden is less arduous if each institution carries out its own self-study, followed by an external review. That also allows institutions to identify their own weaknesses and seek to remedy them.
- External reviewers. Who will be part of a review team? Will it be academics from other institutions, officials from the Quality Assurance and Relevance Agency, government officials, members of the community, professionals, or some mix of those? Will external reviewers (non-Ethiopian) be required in some or all cases to help assess where an institution stands regarding international expectations in a particular profession or discipline or in cases in which the department or program is the only one of its kind in Ethiopia?. Experience suggests that the majority of members of a site visit team should be peers.
- Conflicts of interest. What conditions would constitute conflict of interest for reviewers or external examiners – e.g. co-investigators on a research project, personal friendship with members of the program examined, a spouse or relative, someone from the same institution?
- Mechanisms to insure faculty and institutional input into the quality assurance and accreditation process. Will the Governing Board of the Quality and Relevance Assurance Agency include faculty and administrative representatives to ensure institutional and faculty input? Experience suggests that is important to enhancing the legitimacy of the Board.

### ***The Legal and Administrative Foundations of Quality Assurance***

Quality assurance and accreditation require a good foundation of laws, administrative rules and procedures. Part of that framework enables the process and provides the legal basis for requiring education institutions to be *licensed* or *registered* to operate in a country, sets the conditions for accreditation (e.g., with two-five years of licensure), and creates the bases for enforcement of the rules when necessary. Part of that framework should safeguard the usage of terms such as *university*, *college*, *professor*, *dean*, so that the public is protected from fraudulent and unscrupulous providers who use those names and titles to imply a status they do not have. Thus legislation and policies need to be put in place that will:

- Protect the use of higher education institutions, names, and titles;
- Define fraud and misrepresentation in the provision of tertiary education services;
- Protect the public from unscrupulous or unqualified providers;

- Provide penalties for violations;
- Delegate legal authority to the Quality and Relevance Assurance Agency to revoke accreditation, licensure, and other forms of recognition of institutions that do not comply with or meet quality assurance requirements.

### ***Private Providers and Accreditation***

Legitimate private providers, both non-profit and for-profit, will benefit from access to a comprehensive accreditation process in that they will have a mechanism to demonstrate to the public that they meet appropriate standards as degree or certificate-granting institutions. The public benefits from the knowledge that an institution is, or is not, accredited. Enforcement processes will provide mechanisms to insure “truth in advertising.” Government may want to provide incentives to accredited private institutions such as expansion of the existing “tax holiday” for the for-profit providers and extension to non-profit private institutions access to duty-free status for education supplies and equipment. While this exists in theory today, this might be the incentive to put it into actual practice. Government could make other services or access available to private accredited institutions as a way of encouraging their contributions to higher education access and training in areas of special national needs.

### ***Quality Assurance at the Institutional Level***

The key to higher education quality is the individual institutions – the effectiveness, relevance, and standards of faculty teaching, research, and service; their ability to produce effective outcomes; the nature of their facilities; and other factors. Although most colleges and universities talk about quality, few have effective mechanisms to review it on a regular basis, to seek quality improvement, and to reward effective teaching, research, and public service. As noted at the outset, institutional academic program reviews are not part of the ongoing life of colleges and universities in Ethiopia. Establishing such mechanisms is essential to effective national quality assurance and accreditation.

Effective institutional academic reviews (see *Attachment 6* on Academic Program Reviews) are more likely if they are organized and carried out by the institutions themselves on a regular basis rather than run from outside the institution. Academic reviews should be based on careful self-studies of each unit, program or faculty with a written assessment and report, a peer review of these findings, and mechanisms to insure quality improvement based on the assessment. Careful, thoughtful academic reviews will provide an impetus for quality improvement at each college and university and help the institutions prepare for periodic national accreditation reviews. The program at each institution should include a timetable that will insure that each academic program is reviewed at least once every five years initially, and once every seven years after the first review (as long as expected standards are met).

A preliminary timetable and work program for the establishment of the Quality and Relevance Assurance Agency is provided in *Attachment 7*.

## **INFORMATION AND COMMUNICATIONS TECHNOLOGY**

Continuing new developments in information and communications technologies (ICT) are leading to faster and cheaper connectivity solutions. In the process, a convergence of telecommunications, information technology, broadcast media and Internet-based information

exchange has facilitated the emergence of more accessible formal, continuing, and life-long learning opportunities.

Use of ICTs is particularly relevant to higher education systems. They hold the potential to enable these systems to enhance teaching and learning experience, improve access to educational resources and programs, expand distance learning opportunities, and reduce the costs of education in the long term. For this to happen, however, various prerequisites are required. These include supportive Government policies and an enabling regulatory environment for ICTs; robust telecommunications and information technology (IT) infrastructure; strong human resource capacity development in new technologies; clarity of educational sector objectives and the role of ICTs in facilitating achievement of those objectives; strong buy-in from students, teachers, and administrators; a sustainable funding regime; and an institutional culture that motivates and rewards collaboration, information sharing, partnership and innovation. Together, these requirements can comprise a rather daunting agenda. However, the Ethiopian government is currently engaged in high-priority initiatives to address these needs in the effort to harness the immense potential of ICT for the nation's own development needs.

### ***Infrastructure and Policy Environment***

It is generally accepted that a robust telecommunications infrastructure is the necessary condition for more effective development of markets and growth of an economy. But in Ethiopia the telecommunications network is among the least developed in the world. The Ethiopian Telecommunications Corporation (ETC) is the incumbent public telecom operator, with a monopoly over all telecom services in the country (fixed, mobile, Internet and data communications). The use of any telecommunication technology that would enable bypassing the ETC network is therefore illegal.

The national switching capacity is about 550,000 lines, of which about 340,000 are currently in use. Some 60 percent of telephones are concentrated in Addis Ababa. Ethiopia's tele-density is about 0.54 phone lines per 100 people, one of the lowest in Sub-Saharan Africa.

Use of mobile telephones in Ethiopia is still rather limited. The market is now close to its present maximum capacity of 60,000 subscribers. Costs are relatively affordable, but service quality and availability are low. ETC has recently embarked on a phased expansion of the mobile network, with an expected increase of about 500,000 new subscribers over the next two years. A dedicated digital data network provides the underlying infrastructure for ETC's Internet service and could provide other data-related services such as data transmission.

In the information technology and electronic networking segment of the sector, Ethiopia as yet has no coherent policy in place to support the growth of IT industry. Existing high import tariffs (40%) on computer and communications equipment make the widespread use of such systems rather expensive, particularly for smaller businesses and institutions, and inhibits expansion.

Until recently, the policy framework defining the direction of the sector and guiding its development was not well developed. However, in recognition of the weaknesses in the existing institutional arrangements, the government has embarked on the development of an ICT sector policy, and the creation of an ICT Development Authority that will act as the coordinating agency for the sector's future development. The new Authority will be accountable to the Ministry of Capacity Building (MoCB).

Consistent with the ongoing telecommunications development policies, ETC has begun expanding the backbone and extension of services to rural and underserved communities. The first part of the backbone extension involves an expansion of the Addis Ababa network. ETC plans to implement a network hub site which will send and receive information among 1, 200 schools, *woredas* and other sites. The hub will interconnect to the other network services and will tie the network to the Internet gateway.

ETC will then link the major institutions participating in the network (Addis Ababa University, Educational Media Agency, Government Ministries, city secondary schools, Global Development Learning Network, etc.) to one of four Points of Presence nodes through fiber optic cable connections. The national backbone will then be interconnected to an International Internet teleport. Finally, schools, *woredas* and other sites will be tied in to the backbone. This ambitious connectivity plan is currently under implementation, and is expected to be fully operational by mid-2004.

The number of Internet accounts in Ethiopia is still limited. Roughly 10,000 accounts were active in 2003. International link congestion is now quite severe for daytime connections. Despite the availability of the nationwide local call tariff for dial-up Internet users, Internet users are still strongly concentrated in the capital (94%). This is partly due to the limited availability of telecom infrastructure, and partly because of the low level of computerization outside of the capital city.

Despite the existing regulatory and infrastructure limitations, the private sector has become increasingly active in offering IT related goods and services. Recent ICT sector surveys indicate that over 200 small and medium ICT enterprises are now active in Ethiopia. Private cyber cafés are able to apply for a license from ETA for establishing telecenters.

The connectivity challenges are being addressed by ETC through creation of a national communications backbone infrastructure. This network will eventually connect over 1200 public institutions – high schools, *woredas*, government agencies, and institutions of higher education across the country. This network should enable the rapid growth of ICT-enhanced applications, particularly in the education sector.

### ***ICT Human Resources***

Considerable efforts are under way to increase the number of trained ICT professionals in Ethiopia. These include vocational training programs offered by various institutions, as well as public and private colleges. University level degree programs are being established in computer science, electronics, telecommunications, information theory, software engineering and programming, network management, and design and support of management information systems.

Since 1992, the private sector has been providing basic computer and software applications training. The growth of computer training centers in the country, despite their uneven quality, has improved the general level of computer literacy and resulted in more skilled computer usage. Most of these computer-training centers offer courses on application software, systems analysis and design, and computer maintenance.

The Government's program of decentralization and its aim of creating a network of local, regional and national Government institutions require an extensive program of ICT human resource development. Identification of training priorities, strengthening and expansion of

existing training facilities, and development of programs for training of trainers will necessitate a major multi-faceted training effort.

A particular focus must be on creating vocational streams to produce the necessary human resources in ICT area. This is particularly true for the many ICT related functions that require more hands-on, short-term technical training. Such training can be implemented either in secondary school vocational training programs, or in technical colleges, university extension programs, and distance learning centers. This could also help off-load the costs of such training from universities to less expensive vocational training centers.

### ***ICT Applications in the Education Sector***

So far, the basic education system has been virtually untouched by the computers or Internet. Of the 12,000 primary schools, only 9 had Internet access at the end of 2001. Among the secondary schools, only about 10 had access.

The tertiary education system comprises 6 national universities, 14 public colleges, and 37 private institutions with 91,719 students. Addis Ababa University (AAU) is the largest tertiary institution and is also host to the African Virtual University (AVU). The AAU has developed a campus-wide network with partial access to Internet. Other tertiary institutions have rather constricted access to computer networks and Internet. Most colleges and universities possess a limited number of stand-alone or locally networked computers, with virtually no high speed access to e-mail or Internet.

The Ethiopian Civil Service College has established a VSAT-based videoconferencing and distance learning center in Addis Ababa, as part of the Global Development Learning Network (GDLN) initiative. The two-way video conferencing facility is housed in a classroom capable of taking up to 40 students. So far, a variety of courses have been held for about 1,200 students.

The Ethiopian Government has embarked on a major initiative for use of Information and Communication Technologies (ICTs) to improve the efficiency and impact of its sector programs. The Government's ICT policy paper promotes a vision of ICT-assisted development through the use of appropriate technologies for targeted interventions to improve service delivery, access to opportunities, and human resource development.

This policy also envisions development of a national electronic network of secondary and tertiary educational institutions intended to improve the quality of teaching and learning, and to increase the coverage and reach of the education system, particularly at the post-secondary level. The network is expected to facilitate communications and information exchange, human resource development, continuing education and on-the-job-training for faculty and staff of these institutions, as well as for teachers, students, and various other target audiences in local communities.

As part of this plan, the Government is implementing a school network (SchoolNet) to connect about 500 secondary schools, and a local authority (*woreda*) network to connect the federal, regional and local governments as part of a national network of about 600 *woredas*. In addition, various technical and vocational training centers, agricultural research centers, and colleges and universities are expected to be connected to the communications backbone. This backbone will consist of about 1,200 sites that will be linked primarily via satellite, except in urban areas where fiber optic and other technologies would be used. ETC is currently constructing this backbone infrastructure.

Implementation of the *SchoolNet* and *WoredaNet* initiatives are the responsibilities of the Ministry of Education (MoE) and Ministry of Capacity Building (MoCB), respectively. These projects will provide the rural areas with connectivity to the Ethiopian national telecommunications backbone and to the Internet via very small aperture terminal (VSAT) satellite technology; introducing television broadcast-based teaching, Internet access, and computer labs in secondary schools, and deploying video conferencing, Internet access, and computer labs to the *woredas*.

MoCB has also reached agreement with the World Bank to support a government proposal to create a National Distance Learning Centers (DLC) network, consisting of 12 regional and central DLCs that will be autonomous in their operations, while affiliated with institutions of higher education and/or other entities (if applicable) based on a mutually agreed upon charter. The funding for the first five such centers will be provided under from an existing World Bank credit for a Distance Learning Project (Cr. 3501-ET). The remaining DLCs will be financed by other pending World Bank projects (e.g. ICT-Assisted Development Project).

The *SchoolNet* and *WoredaNet* initiatives, together with the regional distance learning network, are the most visible parts of the national ICT program at this point. The Government is considering broader use of these facilities for service delivery to local communities. It is also expects to introduce ICT training into secondary and technical and vocational educational training (TVET) centers.

However, major challenges still remain for use of ICTs in education. The information technology sector (computers, networks, and related services) in Ethiopia is small but growing. ICT human resources are limited due to small markets, low salaries, few on-the job incentives, and the lack of institutional infrastructure. Sector-specific ICT applications are limited in scope, and very often are implemented in a disjointed and fragmented manner so that the implemented solutions are generally under-utilized. Information availability, particularly in local languages, is restricted. Lack of ICT standards hinders wide-spread growth of applications. In practical terms, a number of regulatory, technical, and operational prerequisites must be put in place before ICTs can have a significant impact on Ethiopia's poverty reduction and socio-economic development efforts.

### ***ICT in Higher Education – Ethiopian Educational & Research Network (EthERNet)***

The Ethiopian Government has launched a major National Capacity Building Program (NCBP) to tackle the development challenges that the country is facing. One component of the NCBP is an ICT Capacity Building Program. The goal of the ICT-CBP is to open up development opportunities for Ethiopia by mainstreaming the use of ICTs in all sectors of the economy and at all levels of society. This is to be achieved through the design, development and application of ICT-assisted solutions adapted to local needs and circumstances at national, regional and community level throughout the country.

As part of the implementation of the ICT capacity building program, government is now investing in ICT education and related infrastructure developments to facilitate the delivery of quality education and to increase the student population. In light of these developments, higher education institutions would be wise to develop strategies for effective use of ICTs in order to:

- (i) strengthen inter- and intra-university administration (financial, personnel and student data bases);

- (ii) improve the quality of instruction for students; and
- (iii) facilitate faculty and student development through linkages to national and international networks of scholars and resources.

However, because the ICT development program is managed by the MoCB, while implementation of ICTs in the education sector is the responsibility of MoE, these two initiatives are not as yet well coordinated, particularly across institutions and line ministries. As a result, a lack of clarity can be discerned in terms of responsibility and accountability for effective planning, implementation and supervision of these initiatives. Without improved communication among the key actors, an *ad hoc* use of ICTs in education may result. In this case, the planned ICT initiatives in higher education institutions may not deliver the outcomes and benefits that are expected.

To increase the role of ICTs in higher education, MoCB (later in partnership with MoE) has commissioned Addis Ababa University to produce a “Connectivity Master Plan” for networking of the institutions of higher education throughout the country, and for establishment of the Ethiopian Learning and Research Network (EthERNet). AAU was selected to prepare this plan because of its successful experience in networking its own campus facilities. AAU has developed an IT interconnectivity system for its main campus with extensions to the Technology, Pharmacy and Science campuses. Inter-campus connectivity, as well as connections from the main campus to the computer center, was carried out using fiber optic cable.

The main objective of EthERNet is to provide state-of-the-art electronic communication services at the national level by connecting all of the academic and research institutions to one another, and to the global Internet. This would enable resource sharing, information exchange, and access to various common databases throughout the system.

Initially, the EthERNet will serve the higher education institutions. Over time, however, the local user and beneficiary base of the system might expand through the government’s initiatives to extend the availability of ICT infrastructure in order to deliver education and training services as well as to exchange administrative and management information (e.g. *SchoolNet*, *WoredaNet*, regional DLCs, etc.).

A survey of eleven colleges and universities carried out by AAU indicates that penetration and use of information technology in all surveyed institutions is still minimal. The survey also shows that administrative functions, such as financial management, student enrollment and academic records, personnel records, are still carried out in paper form. No significant record keeping or administrative operation using electronic means was found. From these findings, it is clear that a considerable amount of training, work process re-engineering, behavior modification, and changes in institutional culture will need to be carried out for the successful implementation of the network and its effective delivery of the expected outcomes.

AAU has submitted the “Connectivity Master Plan” for EthERNet to MoE and MoCB for their review and approval. As a part of this Master Plan, AAU has prepared a diagrammatic description of a campus connectivity plan for each campus of each university (some 16 sites). The proposed plan indicates the fiber optic cabling distance from each building to the designated computer center, the number of switches to be provided for each building, and the estimated length of cables and wires to be installed in each facility.

The proposed Higher Education Network concept is highly commendable, and in keeping with the pioneering role often played by higher education systems in the development of ICT capacities within their countries. In addition, the network might also provide an impetus for better achievement of the goals and objectives of the sector as articulated in the recent Higher Education Proclamation (No. 351/2003). Article 12 of the proclamation, for example, stipulates that:

1. *There shall be a system facilitating exchange of information between private and public, among private institutions, and among public institutions as well as among organs and units under any institution.*
2. *Any institution has the duty, upon request, to provide a worker and student who undertakes research relating to education with information or assist to have access thereto.*

The Master Plan proposes a 3-phase roll-out that will take 17 months to complete as follows:

<b>Phase</b>	<b>Task</b>	<b>Duration</b>
1	<p>Implementation of LANS</p> <ul style="list-style-type: none"> <li>• preparation, release and evaluation of bid;</li> <li>• procurement of items;</li> <li>• installation, testing and commissioning</li> </ul> <p>(connecting all buildings at each campus of each university to a central computer center at each campus, and the connection of each proximate campus of each university)</p>	8 months
2	<p>Connection of Institutional, Regional, National Centers and testing</p> <ul style="list-style-type: none"> <li>• preparation, release and evaluation of bid;</li> <li>• procurement of items;</li> <li>• installation, testing and commissioning</li> </ul> <p>(connecting universities on a regional basis – 6 regions – and the proposed Regional Network Centers and the National Network Center to one another)</p>	6 months
3	<p>Finalizing Institutional Networks</p> <p>(completing aspects of the institutional networks that were deliberately postponed in the first phase, connecting remaining campuses or buildings that need to be connected, and connecting all universities into a national system - EthERNet)</p>	3 months

The overall management strategy calls for centralized planning in conjunction with decentralized implementation and administration. The Plan proposes that the ownership and management of the institutional networks should rest with the institutions. Therefore, any infrastructure located outside the boundaries of the institutions will have to be managed by external service providers (e.g. ETC).

EthERNet is intended to be governed by a Board, consisting of members from AAU, ETC, National Computer and Information Center (NCIC), and other participating academic and research institutions as well as members appointed by the MoE and MoCB. Operational work at the national level will be the responsibility of a Managing Director to be appointed by the Board.

The organizational and management structure of the network will consist of four layers, each having its respective network centers:

- i) Campus Centers;
- ii) Institutional Centers;
- iii) Regional Centers; and a
- iv) National Center.

Administrative and technical teams will for the national, regional, institutional and campus centers will be comprised of technical experts responsible for the management and maintenance of the network at each layer. The Plan has almost exclusively focused on infrastructure development issues for the network, and has postponed discussion of applications to the future. Additional details are provided regarding the proposed structure for each of these management teams (see Connectivity Mater Plan for EthERNet, June 2003 for details).

During 2002 a large portion of the ICT equipment required for the campus-wide and institutional LANs was purchased by the Government, and reportedly has been distributed among the higher education institutions based on the recommendations of the Master Plan. MoE is now in the process of finalizing contractual agreement(s) for the installation of the LANs. This would coincide with the activities proposed under Phase 1 of the Master Plan (see table above).

As this complex and ambitious national ICT initiative moves forward, it appears that different understandings, and possibly even confusion, may have been caused by the fact that MoE and MoCB have not yet been able to communicate clearly their respective ICT development programs, and to define and agree on each institutions' roles and responsibilities in that regard.

It is worth noting that development of the Master Plan was originally commissioned by the MoCB under its broader ICT-CB program, with no significant input from the MoE. The ownership of the initiative and the responsibility for its implementation, however, were rightly transferred to MoE in early 2003. However, this transfer has created a degree of disconnect between the MoE's plans for implementation of the EthERNet Master Plan, other higher education ICT programs, and the ICT initiatives that are being implemented by MoCB (e.g. the Regional DLC network, etc.). Inadequate coordination across line ministries and programs could easily lead to fragmentation and duplicity of efforts in developing/implementing ICT initiatives, lack of proper accountability and ownership, and possible loss of opportunities in terms of project funding by external donors and partners.

### ***Alternative Approaches for Implementation of EthERNet***

In light of the above assessment, the following major steps are recommended in order to formulate a strategic development plan for ICT-enhanced higher education in Ethiopia:

1. Develop a sector strategy (ICT Development plan) for mainstreaming the use of appropriate ICTs in higher education. This could be done in parallel with the installation of institutional networks that is currently under way, and could inform the future development, expansion and use of applications and programs consistent with sector objectives and strategy.
2. Identify linkages and areas of overlap between the higher education network and other ICT-assisted secondary and post-secondary human resource development programs (e.g. *SchoolNet*, *WoredaNet*, *DLC-Net*, *TVETs*, etc.). Particular efforts

must be made to achieve very close collaboration with the ICT program team of MoCB and other relevant entities under MoCB, to ensure maximum complementarity between programs. Three areas of immediate concern can be mentioned here:

- a. *SchoolNet* infrastructure implementation and teacher/user training;
  - b. Higher Education Network installation (particularly during phase II and III), and the corresponding arrangements for staffing/ownership/financing/accountability for establishment and support of the proposed Regional Centers and the National Network Management Center.
  - c. MoE and MoCB discussion of the Regional DLC Network program of the MoCB (and its implications with respect to their autonomy, and affiliation with the institutions of higher education, its differences with potential DLCs that the institutions of higher education may wish to establish as in-house departments that are owned and operated as non-profit or for-profit operations by the newly autonomous higher education institutions, etc.). The best way to tackle these issues might be for the two key ministries (MoCB and MoE) to co-sponsor an open workshop with the institutions of higher education, with some participation by distance education specialists with international experience, to discuss the respective advantages and disadvantages of each model, and to propose a solution that would best fit all of the institutions' needs.
3. Identify very clearly the owners of each initiative and its sub-components, and establish an agreed line of accountability for implementation and delivery of each initiative (e.g. who is responsible for what, where, and to what extent for the design, development, implementation and maintenance of infrastructure, applications, training, management, etc. of each ICT initiative/activity/program). Specifically, the installation of networks at campus and institutional levels should be accompanied by adequate training of staff responsible for management, maintenance and use of the networks. In addition, special attention can profitably be paid to timely implementation of relevant applications and training of users so that the network infrastructure is utilized from the outset by the intended students and staff at a reasonable rate.
  4. Define the priority areas for application and use of ICTs with respect to higher education sector objectives (e.g. improved quality, increased enrollment, better administration and records keeping, cost recovery, new revenue streams, wider accessibility, improved teaching/learning and research, etc.). This may require additional studies and inputs from similar experiences in other universities, particularly in those that may have a similar setting compared to the relevant institutions in Ethiopia (e.g. University of Dar es Salaam, Eduardo Mondlane University in Mozambique).
  5. Prioritize (phasing, sequencing, selectivity) and develop realistic scope and implementation schedules for the roll-out of ICTs. This is particularly important with respect to programs that are initially supply-driven (e.g. EthERNet).
  6. Implement campus-wide, institutional and national higher-education network infrastructure consistent with the level of readiness of each institution (i.e., rolling out the network based on the absorption capacity of local staff for managing and

maintaining the network, rather than based on pre-defined or vendor-specified schedules).

7. Develop multi-purpose applications for use of the higher-education network infrastructure, in partnership with local regional and international partners, and in coordination with MoCB and other relevant responsible bodies.
8. Ensure that various ICT networks (such as *SchoolNet*, *WoredaNet*, regional DLCs, etc.) are integrated with the already proposed Higher Education Network and the Distance Learning Plan as proposed by other higher education institutions.

## **PHYSICAL EXPANSION AND STANDARDS**

Given the ambitious physical expansion undertaken in the current Five-Year Plan, a more limited, selective physical expansion is anticipated in the next Five-Year Plan. In this context, future proposals for additional infrastructure will need to be carefully related to overall quality improvement objectives, with attention paid to issues of appropriateness, efficiency, equity and sustainability. These issues will be discussed and suggested actions recommended.

### *Status of Current Infrastructure*

One of the starting points for developing an appropriate strategic plan for physical facilities should be an accurate assessment of the status of the current infrastructure. Base data on instructional requirements and current facilities have been collected for many of the institutions. However, little information is available on the nature, and condition, of the existing infrastructure at each campus. In the past five years, the Ministry of Education has undertaken major construction programs at all of the universities which have provided much needed new buildings and the upgrading of key existing structures. Yet many of the buildings on most campuses are old and it is expected that rehabilitation of these structures may be needed to make them fully functional. To enable the MOE to address critical facility needs at each campus, it will be necessary to have more complete information on the condition and serviceability of existing buildings and services.

**Recommendation:** It is recommended that a Facilities Condition Survey be undertaken of existing buildings at each campus as soon as possible to provide the MoE with an accurate data base on the status of the current infrastructure. The survey process could begin with a listing and basic description of each building's age, function, size, number and type of rooms, available services, and general condition. This would provide basic facilities data for each campus and would serve to identify critical, problem buildings. The next phase of the survey would involve a more detailed analysis of individual problem buildings, undertaken by professionals knowledgeable with regard to the building's specific problem areas (i.e., architectural, structural, electrical, or mechanical engineering). The product of this assessment should be a detailed, costed program of repair for each identified problem building. Given that sufficient funds may not be available to do all the identified rehabilitation work, each university should be asked to review the proposed program of repairs and arrange the list of building rehabilitation works in order of strategic priority and as part of comprehensive development programs tied to instructional outcomes.

The initial phase of the Facilities Condition Survey could be carried out by the university's own facilities staff. The second phase, involving a detailed technical assessment of selected problem buildings, might best be carried out by consulting firms such as the BDE (Building Design Enterprise) or other comparable firms.

### *Efficiency and Utilization Objectives*

As noted, the MoE has recently undertaken an extensive program of new construction at the six existing universities, as well as the four colleges proposed as future universities (see *Attachment 8* for a summary of building costs). This new infrastructure is expected to meet the majority of the institutions' facility needs for the near future. However, it is anticipated that some additional new construction may be required to address possible gaps in the institution's facility needs as well as to provide specific facilities required for new programs recently introduced.

Ministry officials have indicated that they intend to carefully evaluate future new building requests to ensure that existing facilities are being efficiently utilized and that any new construction will be required to meet specific and critical needs. Some institutions may not be making efficient use of their existing facilities, and future growth in enrollment may be accommodated through more efficient use of them rather than through additional new construction.

Issues regarding utilization of facilities that have been noted at many of the institutions, include:

- *Dedicated Faculty/Departmental Facilities:* At many of the institutions individual buildings are for the most part dedicated to specific faculties or departments, which tends to limit shared use of facilities when they are not fully utilized by these faculties or departments. Many of the institutions appear not to have any formalized policies on shared use of basic instructional facilities such as classrooms and general undergraduate laboratories, nor do they have any central administrative group responsible for scheduling classroom and general laboratory facilities. A notable exception is at Jimma University where all classrooms and laboratories, regardless of their location, are considered common facilities and are centrally scheduled by the Registrar's Office which results in much greater levels of utilization. The Registrar's Office has also begun training several staff in the use of computerized room schedule programs.
- *Theory and practicum courses organized into separate time blocks:* A number of the universities and colleges use a "block scheduling" system, which provides for delivery of theory courses in the morning session (typically 4 periods), and practicum courses in the afternoons. Even for humanities courses, which involve mostly lectures and little or no practicum time, it appears that in most cases classes are still restricted to the morning session. This approach to course scheduling results in less than 50% utilization of both classroom and practicum facilities. The main reason given for this approach is that the afternoons are too hot for teaching. However, Jimma University, which is located in a semi-tropical region, is able to schedule classroom instruction in the afternoons. While this may be the case through portions of the year, the fact remains that the technical program students still manage to undertake their practicum work under afternoon conditions. It appears that this is likely to be a practice inherited from Addis Ababa University as many of the institutions originally started out as satellite colleges of AAU, and adopted this block scheduling approach used by AAU faculties.

If limited resources are available for future building expansion, further increases in enrollment (probably in the order of 20 – 40%) could be accommodated with little additional cost at many of the universities through more efficient scheduling of existing facilities (see Box 1 below). Higher utilization can be easily achieved by staggering the theory and practicum courses and by introducing a policy of common use and scheduling of instructional facilities. Ceiling fans may need to be introduced in classrooms to ease the temperature problem and perhaps larger lecture halls should even be air conditioned in the afternoons. Certainly air conditioning should be considered for computer labs and more advanced science labs where sensitive equipment requires greater environmental control and cooler operating temperatures.

Another common scheduling practice that contributes to utilization inefficiency is the provision of a common lunch break for all programs and courses. While many institutions are operational for nine hours (e.g. 8 am to 5 pm), they only have eight available instructional hours per day as they do not schedule any instruction during the lunch break. By staggering the lunch break for different programs or years, an additional hour /day of potential classroom and laboratory use can be created without any change in overall operational time. This approach also reduces pressure on the food services and cafeteria seating as lunch is spread over two periods. Further facilities utilization efficiencies can be achieved by extending daily operational hours, say from 8 hours to 10 hours per day, as Alemaya University and Nazereth Technical Teacher College have done, to address facilities shortage problems.

- *Limited range of classroom and lab sizes:* It appears that in the past, the design of facilities was carried out based on directives and standards from the central MoE officials. Although this practice was changed in the recent Phase 3 building program to include much more university staff involvement and input, in the recently completed Facilities Data sheets, many of the institutions indicated that their major facility problem is that facilities do not match up well with the university's specific program needs. With expanding enrollment, institutions are looking to gain efficiency in teaching loads and facilities use by conducting general courses in large section sizes, requiring large classrooms or lecture rooms and larger laboratories. Even in recently completed buildings, all or most classrooms are of a standard size (usually designed for 30-40 students), whereas most universities are expressing a need for larger classrooms and lecture halls to accommodate the large enrollments in many programs. It also appears that in the few cases where larger lecture halls do exist, they are not properly equipped with audio/visual support services and equipment required for effective instruction in these larger facilities. Where institutions have introduced measures to maximize utilization and yet still experience problems with a shortage of appropriate facilities, the provision of some larger classrooms / lecture halls and laboratories may be justified and beneficial.
- *Multiple special common facilities:* It is typical for each faculty and department to feel that they have unique needs and to want to ensure easy access to special common facilities, such as libraries and computer labs. These facilities are expensive to build and equip and, perhaps more importantly, they are also difficult and costly to staff, operate and maintain. A few large, well equipped and staffed special facilities, (while less accessible,) are more sustainable and provide a better functional resource to students and staff. They also result in lower capital and operating costs relative to many smaller facilities scattered around each faculty and department.

An inventory of library and computer labs, along with information on current operating budgets, staffing and qualifications, and holdings / equipment should be prepared for each of the universities, including both existing and planned facilities under the Phase 2 and 3 development program.

**Recommendation:** An analysis of current utilization of facilities should be carried out by the MoE based on available data on existing facilities, present scheduling practices, and current and planned enrollments. This analysis will provide the MoE with base data on how well institutions are utilizing existing facilities, what specific types of additional facilities may be required, and whether there may be a mismatch between available facilities and preferred facilities in terms of section size and/or level of services and equipment provided. Future requests from institutions for additional new facilities can be evaluated against this base data on current utilization efficiencies, and the institutions should be asked to demonstrate what improvements in efficiency they have made or considered and why, despite these improvements, the proposed new facilities are still needed and justified.

*Box 1. “No Cost” Enrollment Expansion.*

Using a campus enrollment of 3500 students as “typical” and assuming that 25% of the students were freshman with 45% enrolled in majors requiring formal laboratory sessions, estimates were made of potential increases in university enrollment permitted by a more efficient use of the same physical space, or by a slight modifications of it. Merely staggering the lunch hour in two back-to-back shifts and running classes throughout the day could yield an 11% increase in enrollment within lecture-based programs. Extending instruction by one hour per day or holding classes for one-half day on Saturday, in combination with a staggered lunch hour, would yield sufficient additional classroom time for a 22% increase in lecture-class enrollments. If this strategy were combined with the addition of three large and six medium classrooms and four laboratories, enrollment increases of 60 % in lecture-based programs, and 46 % in lab-based programs could be achieved. In conclusion, *organizational changes made to expand operational hours, and modest increases in selected facilities can significantly increase enrollment capacity with minimal capital investment.* (For more details on the above options and calculations see Attachment 9).

***Standards and Anticipated Space / Furnishing Needs***

Once base data on the condition and utilization of existing facilities are available, the MoE will be able to objectively evaluate requests for additional new facilities to determine whether they are needed and justified, relative to their overall objectives, for efficient utilization and upgrading priorities.

In terms of physical facilities improvement, one issue the MoE may wish to address in the next program of development is that of “equity.” This means ensuring that all universities are brought up to a similar basic standard in terms of the quantity and quality of instructional space available. In this regard, questions regarding appropriate capital investment policy emerge. Should those universities with very low ratios of building area per student, or those with a high percentage of older buildings in poor operating condition, be given priority for capital funding? Similarly, should access to additional capital funding be used as an incentive to encourage and/or reward those institutions with policies that provide for more efficient utilization of facilities?

Once the requests for new facilities are approved, detailed improvement programs for each building should be prepared in close consultation with local university staff. To ensure that the new facilities are appropriate to the universities' needs, approval of the final facilities program should involve a sign-off by both the central MoE planning officers and by the university authorities. Equipment and furniture needs for each facility will also need to be defined, and these requirements should be prepared with direct input and approval of the university staff to ensure they are relevant to their particular programs needs and delivery methods.

Recommendation: It may be useful for the MoE to define a minimum set of criteria or standards in terms of basic facilities that will serve as a norm that all universities could be measured against to ensure equity and that they are providing appropriate environments for effective learning (the MoE already has standards for various of these items). For example:

- Functional library facilities – (minimum number of qualified staff; minimum number of volumes and subscriptions; minimum of student study spaces, ICT standards, etc.)
- Independent Learning Centers (or common-use computer facilities) – (central computer study facility, minimum number of work stations and computers, minimum services provided, i.e., Internet and audio-visual materials, etc.)
- Functional lecture rooms – (chalkboard, whiteboard, projection screen, audio-visual equipment, artificial lighting and electrical outlets, functional seating and desk for each student place).
- Functional laboratories – (furnished shared workbenches sufficient for planned section size; hot and cold water and sink; fumehood; eyewash and fire blanket equipment; stocked store, prep room).

### *Integrated Campus Planning*

Many of the current universities started as relatively small institutions in facilities and the land given to them that was often converted from other uses. The layout of most campuses is a fairly dispersed form that is often referred to as a “pavilion” style plan, where relatively small individual buildings are sited with a fair amount of open space around each one. From the universities visited during the last mission, it appears that this pattern of development is, in most cases, being continued with the large number of new facilities recently constructed.

This dispersed, “pavilion” form of site planning has a number of advantages, such as minimizing disturbance for existing building while new buildings are being built; facilitating the use of standardized building plans as there is no need to prepare customized designs that integrated the new construction with existing buildings and special site conditions; and, the large amount of open space around each building is seen as being beneficial for air circulation and acoustical privacy.

However, several important disadvantages are also associated with the dispersed “pavilion” style of campus planning:

- Inefficient use of land, compared to more compact layouts;
- Provision of a limited variety or “hierarchy” of spaces within the campus, resulting in a less interesting and less socially inviting campus environment;

- Increases in site servicing costs (sewer, water, phone, ICT – note: see the proposed ICT master plan’s proposed distances between buildings for fiber optic cable connections); and
- Increases in the problems of regular building security and maintenance.

As universities gain greater autonomy in the future, their interest in internal revenue generation will greatly increase. Land will become one of their major assets for revenue generation, whether it is used for direct production by the university, or for leasing to other commercial ventures. Many of the universities are fortunate to possess an abundance of land, and many are already using their lands for revenue generating activities. However, possessing large tracts of land can sometimes lead to a reduced awareness of the value of that land and a lack of concern for considering more efficient site development strategies. The MOE and the universities are therefore encouraged to view their land as a valuable, “limited” resource that should be planned and developed as efficiently as possible. As much land as possible should be left for revenue generation and/or future campus expansion.

But more compact, efficient approaches to campus planning should not only be considered for their revenue generating benefits. They should also be looked at for their environmental quality benefits as well. Successful campuses, like healthy and vibrant cities and towns, contain a range of open spaces and activity areas that encourage and foster healthy and creative interaction of students and faculty.

Future new building development on each campus should be planned in a more integrated fashion, with consideration for the efficient use of land, efficient servicing and maintenance, and improving the quality of the campus environment.

Recommendation: Prior to the preparation of any future building development plans, a number of site planning options for accommodating the required new buildings and for making efficient use of the overall campus lands should be prepared and reviewed by MoE planning officials and university authorities. This review will serve as a basis for reaching a consensus on the site planning approach best suited to each institution and its particular site needs. Once a decision is reached on the preferred site planning concept, detailed building plans would then be developed based on this overall planning framework and approach. As an incentive to pursue this approach, priority or preference for capital funding could be given to those plans that demonstrate more efficient and integrated campus planning approaches.

### ***Resource Requirements***

The following is a list of major resource requirements that may be needed to support the physical expansion plans for the proposed Higher Education Development Program over the next five years:

*Building Construction.* It is anticipated that a reduced program of civil works will be included in the proposed new five-year development program, with emphasis being given to critical building rehabilitation needs. Selected new buildings required for implementation of new programs, and a limited number of new buildings needed to address gaps in existing facilities or to address increased enrollment and improved utilization needs, may be required but will be funded with government resources.

Recommendation: It is recommended that the MoE consider substantially increasing the present recurrent budget allocations for “Maintenance and Repairs.” The recent major construction program represents a huge investment that needs to be carefully maintained in order to gain the maximum use of these assets for the longest possible time. Current allocations for “Maintenance

and Repair” are minimal and often are used for other purposes, resulting in very little regular maintenance work, insufficient to keep facilities in effective functional condition. Without a substantial increase in the recurrent allocations for Maintenance and Repair, the existing new and older facilities will rapidly deteriorate and a costly program of building replacement and rehabilitation will be required.

Any future allocation for “Building Construction” could perhaps include a special “Capital Renewal Fund” that might be used specifically for major building renovation works such as such as electrical and mechanical systems upgrades and replacement, roof membrane replacement or flooring repair and replacement. Such a fund, while initially financed under this development program, should in the longer term be seen as a component that could be added to the MoE’s annual capital funding program.

*Equipment and Furniture.* Equipment and furniture will be required for the new buildings, but it is anticipated that additional equipment will also be needed to address shortages or inappropriate equipment provided in the existing facilities. It is suggested that the universities be requested to prepare an initial list of these equipment and furniture needs and justify them in terms of the institution’s overall teaching and research priorities. This list could then be reviewed and edited by MoE officials, or alternatively, a specific equipment and furniture budget could be assigned to each university and they would be expected to select their priority needs relative to the funds available and in accordance with their strategic plans.

Assistance could be provided by Subject Area Specialists and Equipment Procurement Specialists for the review and editing of equipment requests and in the preparation of specifications for identified equipment. The Subject Area Specialists could perhaps be made available as a part of the institutional linkage arrangements proposed for general program support, or contracted as consultants. These specialists could also help to ensure a basic level of standardization of instructional resources across institutions / departments. Requisitions for major equipment purchases (e.g., electron microscopes, geo-physical apparatus, etc.) should be accompanied by evidence that similar equipment does not exist on campus or can not be shared, is critically important to instruction and research, and the requesters are certain of the item’s specifications and support equipment or materials. Every major purchase has not only high direct costs, but enormous opportunity costs – costs which must be weighed against overall institutional needs.

## **POLICY RECOMMENDATIONS**

Five essential conditions must be guaranteed by the national policy and regulatory frameworks in order for the currently unfolding higher education reform to produce its expected impacts. They have been discussed in detail in the preceding pages and relevant recommendations provided. These essential conditions are:

- Diversification of revenue sources. This is necessary in order to ensure adequacy of tertiary (and overall education sector) funding, to share the financing burden beyond public resources, to introduce a more business-like and efficient institutional management culture, to encourage mutually beneficial university partnerships with the surrounding community, and to avoid the risk of budget distortion.
- Formula funding. This is necessary in order to steer institutional performance progressively towards the goals of the government’s higher education reform.

- Institutional autonomy. This is necessary in order for university managers to be able to plan strategically, to implement their chosen strategies, and to possess the freedom of action needed to do what they believe needs to be done in order to improve the performance of their institution while remaining accountable for their performance.
- Block grant allocations of public subventions. This is necessary in order for institutional managers to be able to marshal their financial resources behind the priorities and goals of their strategic development plans and effectively lead their institutions.
- Quality Assurance. This is necessary in order to hold institutions ultimately accountable for their performance in teaching and to provide students with a guarantee that they will receive a certain standard of education in return for their investment of time and resources.

Worldwide experience suggests that the absence of any one of these five essential conditions is likely to place at risk the success of the entire reform undertaking. The Ministry of Education and its higher education reform implementation team are therefore urged to do all that is in their power to ensure that these essential policy and regulatory requirements are put in place and effectively implemented.

To these five elements of a national policy framework, a sixth requirement must be added: a cadre of visionary leaders and capable managers who can guide universities through the coming reforms and seize the opportunities they will create. At the end of the day, the success of higher education reform efforts often depends as much on talented leadership, particularly within those agencies with system oversight responsibilities, as it does on the right policies or careful planning.

In practice, the achievements of the government's higher education expansion and reform program will likely depend upon the quality of services to be provided by the three new support agencies to be established under the Ministry of Education. Their contributions are yet to be proven. It is absolutely critical that capable and visionary leaders be appointed to these key leadership positions. Their ideas, ability to maintain objectivity and independence, and their capacity to support university leaders and staff in their own innovative efforts will constitute the core leadership in the reform effort. Both internal and external technical support and encouragement will be required to develop these agencies into catalytic agents of change. In order for them to be successful, the Ministry of Education will need to ensure that they have both the technical and fiscal resources to carry out their mandates, and university officials will need to be forthright and proactive in identifying their shortcomings and articulating the system's needs. To achieve credibility, these organizations must be characterized by openness and a culture of independence and trust nurtured by all who are likely to benefit from their services.

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## Ethiopia Tertiary Education System

Institution	Year of Establishment	Regular Students <sup>1</sup> 2002	Full-time Teaching Staff 2002	Overall Staff/Student Ratio	Distance from Addis Ababa (kms)
Addis Ababa University	1958	12,467	879	14	0
Alemaya University	1951	3,873	162	24	507
Bahir Dar University	2000	5,196	170	31	563
Bahir Dar Polytechnic Institute	(1964)				
Bahir Dar Teachers' College	(1973)				
Debub University	2000	5,045	246	21	273
Awassa College of Agriculture	(1977)				
Wondo Genet College of Forestry	(1978)				
Dilla College of Teacher Educ. & Health Sciences	(1997)				
Jimma University	2000	5,130	293	18	335
Jimma College of Agriculture	(1953)				
Jimma Institute of Health Sciences	(1983)				
Mekelle University	2000	4,331	156	28	783
Mekelle Business College	(1992)				
Mekelle University College	(1993)				
Gondar College of Medical Science <sup>2</sup>	1947	2,201	104	21	738
Arba Minch Water Technology Institute <sup>2</sup>	1979	2,080	70	30	489
Ambo College of Agriculture	1939	1,347	45	30	125
Addis Ababa College of Commerce	1935	5,480	75	73	0
Ethiopian Civil Service College	1987	1,990	157	13	0
Nazareth Technical College	1986	1,939	110	18	100
Kotebe College of Teacher Education	1962	3,966	89	45	0
Jimma College of Teacher Education	1989	1,591	49	32	335
Awassa College of Teacher Education	1989	3,562	57	62	275
Gondar College of Teacher Education	1989	2,113	41	52	750
Abiy Addi College of Teacher Education	1989	1,073	44	24	878
Tigray Arts College		79	18	4	878
Ethiopia Mass Media Training Institute		343	22	16	0
Maichew Technical College		402	30	13	878
		64,208			

Source: Education Statistics Annual Abstract, Ministry of Education, September 2002.

<sup>1</sup> Regular students include all diploma, degree, extension (evening), and post-graduate students.

<sup>2</sup> Scheduled to become universities in 2005.

## A Simulation Model for the Ethiopian Graduate Tax

### *Introductory Remarks*

This note describes a simple tool for projecting the income that could be expected from a graduate tax and other cost-recovery mechanisms in Ethiopian higher education. The tool does not aim to provide an accurate “forecast” but simply to provide a range of possible estimates, based on certain assumptions. More importantly, the tool demonstrates how the income to be derived from a graduate tax is sensitive to different assumptions regarding factors such as types of professions to be exempt from the tax.

The tool is kept quite simple on purpose, so as to make it easy to follow. Greater complexity would likely increase the theoretical accuracy somewhat, but at the cost of considerably less ease of understanding, and at the cost of requiring data whose accuracy is dubious. The cost would therefore increase, transparency would decrease, and, while theoretical accuracy might increase, practical accuracy most likely would not, because the data needed for the more sophisticated formulation are likely to be inadequate. The tool at this point is, in our judgment, at the optimal point in a tradeoff between these various factors.

The tool applies only to the public higher education sector. This would be easy to adapt to the private higher education sector, at least in theory. But the data are likely to be harder to obtain, and it is not clear what the benefit of including the private sector would be, unless there are to be financial flows between the public and private sectors.

### *Mechanics of the Model*

The model works as follows.

Subscripts  $t$  and  $g$  refer to “real” or time period (2003, 2004, etc.) and university level of study (“grade” or “year”), respectively.<sup>16</sup> To avoid confusion we will refer to  $t$  as time periods. The base period, first year enrolment is  $E_{0,t}$ . First-year enrolment is assumed to grow at rates  $r_t$  until enrolment reaches the total created in the construction period of 2001–2005. This rate is set manually. In the “steady” or “smooth” scenario this set so that enrollment in the first year after the target of 100,000 is reached does not grow very much, so that it is not necessary to restrict intake later. In the “overshoot-but-correct” scenario, this rate is very high, so as to take up all the created space as soon as it is created. Because of the huge inertia this builds into the system, total enrollment then would keep growing very fast past the 100,000, unless intake is restricted. Thus, in the “overshoot-but-correct” scenario,  $r_t$  is brought down so that the first-year intake is actually reduced. In the “overshoot-without-correction” scenario enrollment is assumed to keep on growing, and  $r$  is simply set, the year after the target of 100,000 is reached at the same long-term level as in the first scenario. A simple year-to-year (not cumulative) transition rate of  $d$  is

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<sup>16</sup> A list of symbols is provided at the end of this note.

assumed. The system is assumed to consist of three years, but this is easy to relax to as many years as convenient. Thus, enrolment by time period and year is

$$E_{t,1} = E_{t-1,1} (1 + r_t) \text{ if } TE_{t+2,1} < 100,000, \text{ and}$$

$$E_{t,1} = E_{t-1,1} (1 + r) \text{ otherwise}$$

for the first year, and

$$E_{t,g} = E_{t-1,g-1} d$$

for subsequent years.

Total enrolment in any given time period is simply

$$TE_t = \sum_g E_{t,g}.$$

Enrolment of evening students is assumed to grow at the same long-term trend  $r$  as is used for regular enrollment once it stabilizes past the 100,000 mark. Thus the total evening enrolment would be:

$$EE_t = EE_{t-1}(1 + r)$$

A proportion of evening enrollment  $e$  is calculated as:

$$e = EE_t / TE_t$$

Yearly mortality of graduates is assumed to be  $m$  and the pay-back period (the number of years over which graduates make payments) is assumed to be  $P$ .  $P$  can be set for any number of years up to a maximum of 20, but this could be changed. Graduates naturally do not start paying until the year after they graduate. At any given point therefore there are graduates of “maturity”  $p=1$  through  $p=P$ . Note that if there are three years in the system, and the graduate tax is agreed upon in the base year, income from the tax does not start coming in until  $t=4$ . A graduation rate  $g$  is used, where  $g$  is the number of graduates over enrollment in the final year (Year 4 and Year 5). The number of graduates of maturity  $p$  at time  $t$  is then

$$G_{t,1} = (E_{t-1,3} + E_{t,4}) g (1 - m)$$

for  $p=1$  and

$$G_{t,p} = G_{t-1,p-1} (1 - m) \text{ if } p \leq P, \text{ and}$$

$$G_{t,p} = 0 \text{ otherwise.}$$

Recurrent costs per student are  $c$ , and do not vary with time. Capital costs per additional student are  $k$ , do not vary with time, and are driven by  $TE_t$ . The assumption that costs do not vary with

time is equivalent to assuming real costs, and is easy to change so that the tool works with inflated or nominal costs. Total cost is thus

$$TC_t = c TE_t + k (TE_t - TE_{t-1}).$$

There are several categories of exemptions from graduate taxes. This is captured by modeling (as a set of assumptions) the proportions of graduates graduating in the exempt areas. These are:  $w$  for women,  $h$  for teachers,  $y^*$  for those whose income is too low or who default for various other possible legitimate and illegitimate reasons, but who may not be worth the cost of tracking and enforcement, and  $l$  for those who choose to pay a “lump sum” as they study rather than paying tax later. These proportions are assumed not to change over time, but this could be changed easily. It is also assumed that evening students, who after all do pay an up-front fee, do not pay the tax. If the option of exempting women, for example, is not exercised,  $w$  is simply set to 0. It would be possible to simulate a change where evening students stop paying the fee and are then subject to the graduate tax as are regular students, and subject to the same exemptions from the tax as regular students. For now the situation is modeled on the assumption that they continue to pay the fee but are not subject to the graduate tax.

The income of graduates is assumed to be  $y$ . The graduate tax is assumed to be  $x$ . The total payment a graduate makes over the years of re-payment is therefore  $P y x$ . A discount proportion  $o$  is applied to calculate the “lump sum” that students would pay at the time they study in order to escape the tax in future, so that students choosing the current payment option pay, in effect,  $(1 - o) P y x$  in total, or  $(1 - o) P y x / 3$  per year. Assuming a social discount rate of  $i$  (a “rate of interest” as it were), one should presumably set  $o$  so that

$$o = \text{somewhat less than } 1 - \frac{1}{P} \sum_{t=1}^P \frac{1}{(1+i)^t}.$$

This is not part of the model as such, it is merely an assumption and, in related fashion, it is a recommendation, if the scheme is to be fair. If the discount is too steep, then the discount represents a subsidy relative to the cost paid by those who pay the graduate tax, but it is a discount that only those who have liquidity will be able to take advantage of. Though this is not part of the model, in the sense that it drives any of the results, it is nonetheless included in the Excel worksheet that implements the model.

The total direct revenue from the tax will then be

$$T_t = \sum_p G_{t,p} y x (1 - w) (1 - e) (1 - h) (1 - y^*) (1 - l).$$

The revenue from the lump sums paid according to the discount will then be

$$L_t = \frac{TE_t (1 - w) (1 - e) (1 - h) (1 - y^*) (1 - o) l P y x}{3}.$$

The fees per evening student are  $f$ . The revenue from fees paid by evening students is

$$F_t = f EE_t$$

The total revenue from cost-recovery efforts at time  $t$  is then

$$R_t = T_t + L_t + F_t .$$

This can be compared to total cost at time  $t$  in order to ascertain the contribution from the tax and the lump-sum. A simple ratio  $R_t/TC_t$  is created to capture the relative contribution of the total cost-recovery to total cost.

### *Possible Extensions and Caveats*

There are several directions in which the model could be improved. Whether it is worthwhile to do so merits further discussion. The presumption is that it is not worthwhile, because the data needed are not available. Thus, these issues are flagged here only as caveats.

First, it is possible that growth in a system, at the rates contemplated, may result in lower salary premia for graduates. The model tends to assume fixed salaries at today's rates. But it is possible that as more and more graduates come into the market, salaries will decrease in real terms. This means that the tax take from the tax will be even lower than is projected here. This for two reasons. First, average incomes will be lower, so the tax revenue yielded by applying a percentage tax rate will be lower. Second, the proportion of graduates  $y^*$  who fall under the minimum will be larger.

Second, the actual student reaction to the discount offered for lump-sum payment is difficult to gauge in advance. The depth of discount, and the proportion of students who take this up, are used in the model as completely separate assumptions. But clearly they are not, in reality. If the discount is too steep, then more students will take it, the tax take will be lower, and the lump-sum may not increase enough to offset the loss in tax take. This depends on the price elasticity of demand for higher education, which is unknown. On the other hand, if there is no discount, enrolment growth may be somewhat limited.

Third, if one exempts whole categories of graduates, such as teachers and women, this will tend to stimulate students to choose teaching, and/or will stimulate more women to choose to study than would otherwise be the case. The proportions of students or graduates who are women or teachers therefore may well increase from the base proportions that are observable empirically today. This will also lower the tax take.

Fourth, it is difficult to predict the dynamics between regular and evening enrollment. Evening enrolment is now presumably more expensive than regular enrolment, to the student. They attend nonetheless because, presumably, regular enrolment, being less expensive, is rationed. If regular enrolment becomes more expensive, and at the same time is allowed to expand because cost-recovery provides a financial basis for expansion, then one has two countervailing forces: the fact that regular enrolment is becoming more expensive means that interest in regular enrolment might decrease, or not increase as fast as if cost had not increased; on the other hand, if places are being expanded, existing excess demand for places might then be satisfied. How these forces balance out is not clear.

In short, in many ways the tool is relatively optimistic. The tax take may well be lower than is suggested by the tool. One way to guard against this is to use numbers, for example for the proportion of students that are women or teachers that is higher than one currently observes. How much higher these proportions should be is nearly impossible to tell in the absence of serious econometric work.

### ***Impact of Cost-sharing***

The same simulation tool that was used to project and analyze costs was also used to assess the impact of the cost-sharing policy as per the recent Council of Ministers regulation on this matter (Council of Ministers Higher Education Cost-Sharing Regulations). The following key assumptions are made: a) 10% of income is “taxed” as a cost-share, b) the “tax” period is 15 years, c) teachers pay back “in kind” rather than in cash or, in other words, are exempt from the tax-based payments, d) 10% of graduates do not pay for various other reasons including poverty or non-recoverable default of various types, d) only about 75% of last-year students actually graduate, f) only some 5% of students take advantage of the pay-as-you-go option in the regulation (because the discount for immediate payment is too shallow), and f) graduates earn approximately 9,500 Birr per year. The cost-sharing program is assumed to start only with the intake of 2003-04. It is also assumed that evening students continue to pay fees. For simulation purposes their fee payment is then added both to total revenue and to total cost. Finally, it is assumed that no efficiency savings are made; recurrent costs per student continue at today’s levels.

Under these assumptions, cost-sharing does eventually produce a reasonable amount of revenue. By 2015, some 16% of total cost (including evening student fees both in the numerator and denominator) can be recovered, and this percentage keeps increasing until it converges to about 25% by 2020 or so. Note that about 5 percentage points of this cost-recovery is simply due to the fees charged to evening students.

### ***List of symbols used, in alphabetical order***

$c$  is recurrent cost per student

$d$  year-to-year transition rate

$e$  is the proportion of students attending evening classes

$E_{t,g}$  is total enrolment in time period  $t$ , university year  $g$

$EE_{t,g}$  is the enrolment of evening students in time period  $t$ , university year  $g$

$f$  is the fee per evening student

$F$  is revenue from fees from evening students

$g$  is the “grade” subscript, refers to university “grades” or “years” 1, 2, 3

$G_{t,p}$  graduates at time  $t$  of “vintage”  $p$  (i.e., having graduated  $p$  years ago)

$h$  is the proportion of graduates exempt because they are teachers

$k$  is capital cost per student

$l$  is the proportion of graduates exempt because they chose to make a “lump sum” payment as they were studying

$L_t$  is the revenue from the lump-sum payments at time  $t$

$m$  year-on-year mortality rate of graduates

$o$  is the amount by which eventual tax payments is discounted for “lump sum” payment

$r$  is the rate of growth at which the system stabilizes after its fast-growth period

$r^*$  is the rate of growth of first-year intake

$R_t$  is the total cost-recovery revenue (tax plus lump-sum) at time  $t$

$t$  is the time subscript refers to time periods 2003, 2004, etc.

$T_t$  is the total tax revenue from the graduate tax in time period  $t$

$TC_t$  is total system cost at time period  $t$

$TE_t$  is total enrolment at time period  $t$

$w$  is the proportion of graduates exempt because they are women

$x$  is the graduate tax as a proportion of income

$y$  is the average income of graduates

$y^*$  is the proportion of graduates exempt because their income is too low

## **Description of the Simulation Model for Costs and Enrollments**

### ***Baseline Data***

For purposes of cost simulation it is important to have a set of data and definitions that are internally consistent with each other. For this purpose, we will take higher education total enrollment to be that presented in the tables published by the EMIS section. The list of institutions this applies to is presented in *Attachment 1*.

Much of the projection and cost analysis depends on establishing a “good” baseline. The notion of “good” used here is a combination of accuracy and timeliness.

For projection costs and for analyzing enrollment planning problems it is critical to have data on enrollment by university “grade” or, in Ethiopian terminology, “year.” We have attempted to use a baseline for cost discussion and projection that is as current as possible, in order to make the contribution more timely and create more value-added. Our baseline is, thus, the academic year 2003-04, which starts in the last quarter of 2003. Enrollment is therefore unknown. However, it can be estimated with reasonable certainty, since this years’ actual entry class has already been estimated informally within the Ministry of Education and is to some degree a matter of policy, and since enrollment beyond the entry class can be estimated using previous years’ known enrollments and applying transition ratios to those enrollments. It would have been possible to use reported data as a baseline, for the academic year 2002-03.

However, these enrollment data are preliminary and did not seem reliable to us, for they show enrollment in 2002-03 in university year 2 to be larger than enrollment in 2001-02 in university year 1, and so on for all years other than 5, and shows, overall, a gain in enrollment of some 50% over the year 2001-02. This is shown in Table 1. Note that the apparent transition from 1<sup>st</sup> to 2<sup>nd</sup> year and from 2<sup>nd</sup> to 3<sup>rd</sup> year suddenly increase dramatically in 2002-03 and, more interestingly, increase beyond 1.0. This cannot be merely a reallocation between diploma and degree programs, as a) the transition ratios for diploma programs (not shown) do not decrease, and b) total enrollment for diploma programs is increasing very quickly, as well. (How this trend will clash with the stated intent of moving these programs away from higher education and TVET will be an important concern in the near future.)

*Table 1.* Possible problems in preliminary reports of 2002-03 enrollment data in degree programs

	1998-99	1999-00	2000-01	2001-02	2002-03
<b>Enrollment</b>					
1st year	7199	5854	6644	9423	13409
2nd year	5499	6205	5424	4362	10312
3rd year	3686	4746	5889	3484	5745
4th year	2680	3598	4254	3596	4955
5th year	893	862	1109	1291	1628
<b>Total</b>	<b>19957</b>	<b>21265</b>	<b>23320</b>	<b>22156</b>	<b>36049</b>
<b>Growth rate</b>		7%	10%	-5%	63%
<b>Transition ratios</b>					
1st to 2 <sup>nd</sup>		0.86	0.93	0.66	1.09
2nd to 3 <sup>rd</sup>		0.86	0.95	0.64	1.32
3 <sup>rd</sup> to 4 <sup>th</sup>		0.98	0.90	0.61	1.42
4 <sup>th</sup> to 5 <sup>th</sup>		0.32	0.31	0.30	0.45

*Source:* absolute numbers from reports in *Education Statistics Annual Abstracts* for the relevant years, ratios calculated for this report.

If one takes the 2002-03 data as too preliminary for now, one would have had to use, as a baseline the year, 2001-02. But this year seems to have registered regress over the previous year, and therefore seems an uncharacteristic year. The last year that seemed fairly typical (consistent with trends both in total numbers and in internal structure) would thus have been 2000-01, but this is too distant in the past to use as a base. The judgment therefore is that a carefully analyzed and projected base that is as current as possible, but based on careful estimates rather than direct reports, is actually the best knowledge from which to start for *projection* purposes, because it provides a good combination of logical and numerical firmness, and is sufficiently up to date. The data are shown in Table 2.

*Table 2.* Estimated year-by-year enrollment in public undergraduate degree and diploma “regular” programs in 2003-04 baseline and historical transition rates between years

	Enrollment in 2003-04 <sup>17</sup>	Historical transition ratio
Year 1	28000	
Year 2	20300	86%
Year 3	7200	52%
Year 4	4200	83%
Year 5	1500	36%
<b>Total</b>	<b>61200</b>	

*Source:* calculated for this report

The drop-off between the 28,000 students in first year and the 20,300 in the second year does not represent only dropping out. Some of this difference is simply due to growth, and to the fact that growth would have to show up as an intake that is higher than the second year enrollment even if

<sup>17</sup> Numbers rounded to the nearest 100 are used as a reminder that these are only estimates.

there were no dropping out. The “net” or apparent transition rates are higher than the numbers would imply, and are shown in the second column of Table 2.

The numbers in the table above are estimated as follows. First, the transition ratios were estimated. This was done by taking enrollment by Year1, Year 2, etc., for the periods 1994-95 to 2001-02, and then calculating the average Year-structure of enrollment for that period (the percentage of students in Year 1, Year 2, etc.). This is called the “historical Year-structure” of the enrollment. The long-term growth rate of enrollment, over the whole period, is also calculated. An artificial cohort of 100 students is created, and is made to grow at this long-term growth rate. The cohort, and the larger ones resulting from applying the growth rate to the initial one of 100, are transferred to Year 2, and then Year 3, using a set of transition ratios. These transition ratios are estimated, using linear programming, so as to minimize the sum of differences between the Year-structure of the projected enrollment and the average historical Year-structure. The resulting transition ratios are thus “optimized” so as to produce the observed Year-structure, and are assumed to be the underlying parameters that determine the inertial dynamics of the system. These are also the ratios used to determine the inertia shown in Table 3 below.

The numbers in the table above, being so much higher for years 1, 2, and 3 than for, say, 2, 3, and 4, and this being due to growth in intake rather than dropouts, suggests that there is a very powerful inertia built into the enrollment pattern. If the transition ratios shown in the table are applied to the numbers already in the system, and if intake were to stay constant at 28,000, the system would grow at an average of 6% per year for four years, just on the strength of the inertia it already has. This represents a cumulative growth of 29% in four years just because of inertia. After four years the inertia gives out because a higher education degree takes four (or, for a few, five) years to complete. Note that this inertia is not due to our estimation method. It is present in the reported data as well, as can be seen in Table 3.

*Table 3.* Effect of inertia on enrollment growth

	2003-04	2004-05	2005-06	2006-07	2007-08
Year 1	28000	28000	28000	28000	28000
Year 2	20300	24185	24185	24185	24185
Year 3	7200	10620	12652	12652	12652
Year 4	4200	6005	8857	10552	10552
Year 5	1500	1515	2166	3195	3806
Total	61200	70324	75860	78583	79195
Rate of growth		15%	8%	4%	1%
Cumulative growth		29%			

Source: calculated as explained in Attachment 3

A few other data points are important in Ethiopia: the numbers of “evening” students, and the number of students in the non-governmental sector. These, again, are not known for a baseline of 2003-04. Our best estimates of what enrollment in the four key sectors and sub-sectors, based on past trends, are shown in Table 4.

Table 4. Estimated likely FTE enrollment in 2003-04 baseline, based on past trends

Government	113,300
Regular	61,200
Evening	52,100
Private	55,700
Regular	37,300
Evening	18,400
Total taking evening as ½ FTE	133,750
Minus fifth-year	1,500
Total four-year	132,250

Source: calculated as explained above

These numbers have been estimated conservatively, particularly given the uncertainty surrounding the preliminary data for 2002-03, which seemed very high. Furthermore, the growth in private education and evening enrollment has been very high. In the latter case the estimates are based on some dampening of the very fast growth in the last few years. The actual outcome of all these trends could well be higher if, say, the preliminary reported 2002-03 data turn out to be correct.

All this points to the need for extreme caution regarding these numbers in Ethiopia, given that the situation is so fluid. This is why this exercise has taken the step of attempting to produce a logically consistent and well-examined baseline for 2003-04, that can at least underpin a logical set of projections. If the baseline is wrong, at least the *trends* will have been estimated carefully. In that case, as already noted, some of the actual projections may have to be revised upwards, equally every year, because though the base may be higher, the trends will be reasonably correct.

*If one takes the enrollment data of 132,250, and noting that the target population is some 5,047,472, the enrollment ratio is some 2.6%, which is higher than the number usually given for Ethiopia.*<sup>18</sup> This is again, due to the fact that, given the fluidity of the situation, almost any statement made is out of date less than a year after it was made.

Key baseline economic parameters are as follows. Note that some of these estimates are more of a valid baseline estimated for modeling purposes than they are reported values. For example, since capital expenditures are quite variable, we took the average yearly expenditure for the construction project of 2001-2005 as more representative of a baseline for 2003/04 than the expenditure for any given year.

<sup>18</sup> This baseline target population is estimated using data from the EFA -FTI model, so that these results use as consistent as possible a set of initial assumptions as those in the EFA-FTI model. The target population is assumed to be  $(0.911^2 + 0.911^3) 3186189$  where 3186189 is the population of 15 and 16 year olds in 2003-04, and 0.911 is the ratio of population of 17 and 18 year olds to 15 and 16 year olds in 2003-04.

1. Total education expenditure in 2003/04 budget: <sup>19</sup>	3928.3 million birr
2. GDP at market prices in 2003/04: <sup>20</sup>	63139.2 million birr
3. Education expenditure as percent of GDP in 2003/04: <sup>21</sup>	6.2%
4. Recurrent higher education spending in 2003/04 on trend: <sup>22</sup>	602 million birr
6. Capital higher education spending in 2003/04: <sup>23</sup>	388 million birr
7. Total higher education spending in 2003-04: <sup>24</sup>	990 million birr
8. Higher education spending as a proportion of all education spending in 2003/04 if recurrent spending is on trend: <sup>25</sup>	25.2%
9. Percentage needed reduction from trend in per student recurrent spending to force higher education expenditure down to 24% of total education expenditure: <sup>26</sup>	7.8%

A key figure in the list above is the forecast 25.2%, which represents higher education spending as a percentage of all education spending in 2003-04. This is calculated using not reported or final expenditure for higher education in the numerator, but using per student spending in 2003-04 as predicted by the trend up to 2002-03, and the enrollment shown in Table 4 above. But it should be remembered that preliminary reported enrollment is higher than what is shown in the table. (Though the pattern of increase is not believable, in that year 3 enrollment in 2002-03 is higher than year 2 enrollment in 2001-02. This makes the preliminary 2002-2003 reports not credible, as noted elsewhere.)

If, however, enrollment turns out to be as high as preliminary figures indicate, then unless per student spending adjusts completely, it could be that the baseline budgetary pressure, as measured by this key ratio, could be higher in 2003-04 than we have estimated. If the baseline turns out to be higher than we have estimated, then all our calculations below would have to be adjusted upward. The trends would still be valid. However, all this is signal of the great pressure the fast expansion of enrollment could be putting on the system, either to increase budget or to reduce per

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<sup>1</sup> General government finance indicators database maintained by World Bank Ethiopia PREM office. Actual GDP and actual expenditure not available except for 2001/02.

<sup>20</sup> General government finance database maintained by World Bank Ethiopia PREM office. Actual GDP and actual expenditure not available except for 2001/02.

<sup>21</sup> Results from the previous two lines.

<sup>22</sup> Formal budget figures disaggregated by recurrent and capital expenditure for 2003/04 not available. Recurrent figures were projected taking the per student cost from previous years and adding 4.8%. Expenditures (in *current* terms) per student have increased by 4.8% annually on average since 1994/95. This is the trend used. However, this is probably a conservative estimate as the IMF forecasts inflation in 1993 to be well over 10%.

<sup>23</sup> Capital costs are taken as the annualized average value of the 2001-05 building program. While this may not be an exact figure for any particular year, it gives a much better sense of the base, since capital construction varies considerably by year during the construction project of 2001-05. Thus, using any one particular year, while accurate for that year, provides a poor base for comparison with projected years. Note that recurrent cost does not vary much year on year.

<sup>24</sup> Results from the previous two lines.

<sup>25</sup> Results from lines 1 and 7.

<sup>26</sup> Calculated within the model.

student costs and, presumably, quality. (Note that in this baseline exercise, a 7.8% *real* reduction from trend in per student recurrent expenditure is needed. This might be reasonably easy to achieve if inflation turns out to be as high as the IMF forecasts, simply by holding expenditure fixed in current terms. But the long-term impact on quality of this sort of practice cannot be escaped, unless the reduction in costs represents real efficiency gains.)

## Ethiopia Higher Education Funding Formula

MINISTRY OF EDUCATION PROPOSAL

### **Institutional Share of Higher Education Budget =**

$a_1$  (HETB)

[  $X_1$  (Number of Degree Program Students Under Course Band A in the Institution in a particular year / Number of Degree Program Students under Course Band A in all HEIs in a particular year )

+  $X_2$  (Number of Degree Program Students Under Course Band B in the Institution in a particular year / Number of Degree Program Students Under Course Band B in all HEIs in a particular year )

+  $X_3$  (Number of Degree Program Students Under Course Band C in the institution in a particular year / Number of Degree Program Students Under Course Band C in all HEIs in a particular year )

+  $X_4$  (Number of Degree Program Students Under Course Band D in the institution in a particular year / Number of Degree Program Students under Course Band D in all HEIs in a particular year)

+  $X_5$  (Number of Degree Program Students Under Course Band E in the Institution in a pr / Number of Degree Program Students Under Course Band A in all HEIs in a particular year ) +  $X_6$  (Number of Degree Program Students Under Course Band F in a particular year / Number of Degree Program Students under Course Band F in all HEIs in a particular year ) ]

+  $a_2$  (HETB) ( Number of Research and Post Graduate Program Students in the Institution in a particular year / Number of Research and Post Graduate Program in all HEIs in a particular year)

+  $a_3$  (Annual Internal Revenue of the Institution / Annual Internal Revenue of All HEIs)

+  $a_4$  (HETB) (Distance of the institution from Addis Ababa / Total Distance of All HEIs form Addis Ababa)

+  $a_5$  (HETB) [  $x_1$  (Number of Diploma Program Students Under Course Band A in the institution in a particular year / Number of Diploma Program Students Under Course Band A in all HEIs in a particular year ) +  $x_2$  ( Number of Diploma Program Students Under Course Band B in the institution in a particular year / Number of Diploma Program Students Under Course Band B in all HEIs in a particular year )

+  $x_3$  (Number of Diploma Program Students Under Course Band C in the Institution in a particular year / Number of Diploma Program Students Under Course Band C in all HEIs in a particular year ) +  $x_4$  (Number of Diploma Program Students Under Course Band D in the Institution in a particular year / Number of Diploma Program Students Under Course Band D in all HEIs in a particular year )

+  $x_5$  (Number of Diploma Program Students Under Course Band E in the Institution in a particular year / Number of Diploma Program Students Under Course Band E in all HEIs in a particular year ) +  $x_6$  (Number of Diploma Program Students under Course Band F in the Institute in a particular year / Number of Diploma Program Students Under Course Band F in all HEIs in a particular year )

$a_6$  (HETB) [L (Number of Degree and Diploma Graduates from the Institution in a particular year / Number of Degree and Diploma Graduates from all HEIs in a particular year)

+ M ( Number of Female Degree and Diploma Graduates from the Institution in a particular year / Number of Female Degree and Diploma Graduates from all HEIs in a particular year )

+ N (Number of “Affirmative Action” Students in Diploma and Degree Programs from the Institution in a particular year / Number of “Affirmative Action” Students in Diploma and Degree Programs from all HEIs in a particular year) ]

Under this complex formula,  $a_1, a_2, a_3, a_4, a_5, a_6$  are indices that determine the relative weights given for undergraduate and graduate studies and quality and quantity of research, and internal income generation; their value is determined by the government policy.  $a_1 + a_2 + a_3 + a_4 + a_5 + a_6 = 1$ . Note that HETB = Higher Education Total Budget.

Likewise, indices L, M, and N indicate the relative importance of each indicator in determining the size of the undergraduate budget.

Under the proposed formula, the budget allocation system would be implemented gradually, in the course of a five-year transition period.

## Standards for Accreditation

There are a number of ways in which accreditation standards are identified, each calling for different types of data and information. Examples of types of standards are listed below

### Types of standards:

#### **A. Organizational Structure:**

- “The institution has a system of governance that facilitates the successful accomplishment of its mission and purposes.”<sup>27</sup>
- Authority and responsibility among the governing board, administration, staff, and faculty are clearly spelled out.
- Governance is participatory and open.
- The governing board is responsible for quality ultimately.
- Courses are designed to ensure opportunities for reflection and analysis.<sup>28</sup>

#### **B. Resources and support:**

- Faculty qualifications, numbers, and performance are sufficient to accomplish the mission and purpose of the institution.<sup>29</sup>
- The institution provides support services that foster intellectual and personal development of students in accord with its mission and purpose.<sup>30</sup>
- The institution has a library and information resources necessary to fulfill its mission and purpose.
- The institution has “sufficient and appropriate physical resources, including laboratories, network infrastructure, material, equipment, and buildings and grounds... to serve institutional needs as defined by its mission and purpose.”<sup>31</sup>
- The institution is financially stable with resources sufficient to sustain its educational objectives.
- The institution allocates its funding with adequate consultation.
- The institution has audited financial records and its expenditures are clearly related to educational activities.

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<sup>27</sup> New England Association of Schools and Colleges, *Standards of Accreditation*, (2003), p. 3.

<sup>28</sup> Standard 4.7, NEASC, p. 6.

<sup>29</sup> Paraphrased standard 5, NEASC, p. 12.

<sup>30</sup> Standard 6, NEASC, paraphrased, p. 13.

<sup>31</sup> Standard 8, NEASC, p. 16.

### **C. Processes, procedures, and goals:**

- The existence of a mission and statement of purposes. It should be appropriate to higher education, the institution's distinctive character, addresses the needs of society, and identifies the students it seeks to serve in a realistic way.<sup>32</sup> The mission must include teaching, research, and public service.
- The institution has mechanisms for systematic planning.
- The institution evaluates the effectiveness of its teaching, research, service, and planning in an appropriate way.
- The institution shows that "each educational program for which academic credit is awarded is (a) approved by the faculty and the administration, and (b) establishes and evaluates program and learning outcomes."<sup>33</sup>
- The undergraduate degree programs are "designed to give students a substantial and coherent introduction to the broad areas of human knowledge, their theories, methods of inquiry, plus in-depth study in at least one disciplinary or interdisciplinary area."<sup>34</sup>
- Criteria for hiring, promotion, and rewards are clearly stated and followed.
- Faculty rules and regulations are printed and available to all faculty members.
- All teaching staff pursues scholarship and research.
- Instruction endeavors to improve the quality of teaching.
- The institution has an open, fair, and ethical program of admission.
- The institution identifies the learning needs of its students and makes provisions to assist them. It provides effective orientation, advising, and career development services.
- "Learning opportunities clearly identify the subject matter to be covered, the skills or knowledge to be acquired, and the learning methods used."<sup>35</sup> They are reviewed systematically on a regular basis.
- The institution has clearly accessible rules of conduct and ethical standards.
- The institution "regularly reviews its measures and instruments of assessment as part of its ongoing effort to assess and improve its performance."<sup>36</sup>
- "In presenting itself to students and other members of the interested public, the institution provides information that is complete, accurate, and clear."<sup>37</sup>
- The institution "exemplifies, and advocates high ethical standards in the management of its affairs and in all of its dealings with students, faculty, staff, external agencies and organizations, and the general public."<sup>38</sup>
- Institutions are expected "to dedicate themselves to enhancing the quality of their programs and services within the context of their missions, resources and capacities, and create an environment in which teaching, research, and learning occurs."<sup>39</sup>

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<sup>32</sup> Paraphrased from standard one of the New England Association of Schools and Colleges, *Standards of Accreditation*, p. 2.

<sup>33</sup> Southern Association of Colleges and Schools, *Standards: Programs*, p. 11.

<sup>34</sup> Standard 4.12, NEASC, p. 7.

<sup>35</sup> NCHEMS, *the Competency Standards Project: Another Approach to Accreditation Review*, CHEA Occasional Paper, August 2000, p. 14.

<sup>36</sup> American Academy for Liberal Education, *Standards and Criteria for Institutional Accreditation and Preaccreditation*, p. 9.

<sup>37</sup> Standard 10, NEASC, p. 17.

<sup>38</sup> Standard 11, NEASC, p. 19.

<sup>39</sup> Southern Association of Colleges and Schools, *Purpose and Philosophy of Accreditation*, (2003) p. 2.

#### **D. Outcomes and effectiveness:**

- “The institution identifies expected outcomes for its educational programs and its administrative and education support services; assesses whether it achieves these outcomes; and provides evidence of improvement based on analysis of those results.”<sup>40</sup>
- Students have “demonstrated attainment of necessary foundational abilities of effective reasoning – e.g. fluency in reading, writing, and oral communication, and mastery of the basic principles of logical, mathematical, and scientific reasoning during the first year of coursework or at the conclusion of the general education program.”<sup>41</sup>
- Faculty teaching quality, research, and service are evaluated for quality in a meaningful way.
- Administrative officials are held accountable and assessed on a regular basis.
- Institutional goals have been stated and achieved. There is a clear measurable “value added.”
- Example of outcomes from the Accreditation Board for Engineering and Technology (ABET), the engineering and computing accrediting agency in the US.  
“Engineering programs must demonstrate that their graduates have:
  - (a) an ability to apply knowledge of mathematics, science, and engineering
  - (b) an ability to design and conduct experiments, as well as to analyze and interpret data
  - (c) an ability to design a system, component, or process to meet desired needs
  - (d) an ability to function on multi-disciplinary teams
  - (e) an ability to identify, formulate, and solve engineering problems
  - (f) an understanding of professional and ethical responsibility
  - (g) an ability to communicate effectively
  - (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
  - (i) a recognition of the need for, and an ability to engage in life-long learning
  - (j) a knowledge of contemporary issues
  - (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.”<sup>42</sup>
- Outcomes are assessed in measurable ways. As Peter Ewell notes,<sup>43</sup> there are several kinds of outcomes worth discussing in terms of assessing the results of students’ academic experiences. These include cognitive learning, career success, satisfaction, attainment levels after graduation, and the “value added” during the time of enrollment (the latter requiring time-series data). At an institutional level, outcomes include the number of graduates, type of training of interest (e.g. public health), number of credits produced in that curriculum, participation levels in that area, and other results based on what an institution produces in this academic area.

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<sup>40</sup> *Ibid.*, p. 11.

<sup>41</sup> American Academy for Liberal Education, *Standards and Criteria for Institutional Accreditation and Pre-accreditation*, p. 2.

<sup>42</sup> Accreditation Board for Engineering and Technology, Inc. *Criteria for Accrediting Engineering Programs*, (November 15, 2002) p. 1.

<sup>43</sup> See Peter T. Ewell, *Accreditation and Student Learning Outcomes: A Proposed Point of Departure*, CHEA Occasional Paper, September 2001, pp. 5-8.

If we look at student outcomes, we can identify outcomes in several ways such as:

- Learning over time – i.e. the difference from admission to graduation.
  - in knowledge;
  - in skills;
  - in ability;
  - in attitude or disposition (e.g. ability to understand other cultures or values even if one does not accept them).
- Attainment: such as post graduate employment, nature of position, promotion, recognition.
- Development: ability to build on learning as demonstrated by measurable contributions and findings.

## Academic Program Reviews

A brief summary of information about academic reviews, and procedures that might be followed during an academic review, are set out below.

- What is an academic program review?

An academic program review provides an opportunity for an institution to:

- review an academic unit's mission and goals;
  - evaluate the quality of its academic programs, faculty, staff, and students;
  - establish priorities for the development of its curriculum;
  - determine the financial and material resources needed to support the unit's essential goals, and objectives;
  - make recommendations for Proclamationion by the unit, the administration, and others;
  - provide information that is essential to quality assessment, the development, and the enhancement of the impProclamation and reputation of the university.
  - encourage units to be self-conscious about quality and its improvement.
- The academic review process:
    - An academic review usually begins with a self-study by the unit highlighting its programs, successes, weaknesses, and needs.
    - The review is undertaken by a committee established for that purpose. The review committee is normally made up of peers in related fields, at least one person from another disciplinary area, and often an external member from another institution and/or the community. The review committee reads the self-study, meets with faculty, students, and others, and makes a report to the president, vice president, or institutional review committee.
    - The academic unit responds to the report of the review committee.
    - The institution responds to the report of the review committee.
    - The recommendations of the review committee result in some actions that improve the unit and build quality, or in extreme cases result in probation, receivership, or closure of the unit.
  - What is reviewed?
    - Curriculum quality
      - What are the goals? Are they based on disciplinary standards? International standards? World-class standards? Minimal standards?
      - Who sets the standards?

- Workforce criteria:
  - student/staff ratios
  - student FTE per laboratory
  - library requirements
  - IT expectations and requirements
- Budgetary criteria:
  - Resources per teaching staff FTE
  - Resources per student
- Input criteria
  - Quality of students admitted
  - Quality of faculty
- Output criteria
  - Expected quality of students graduated
  - Actual quality of students graduated
  - Employment data on graduates
  - Satisfaction of employers with graduates employed
- Efficiency criteria
  - Pass through rates
  - First year failure rates
  - Success rate of disadvantaged students
  - Ongoing quality review procedures
- Teaching quality and output:
  - Peer evaluation of teaching quality
  - Student evaluations of teaching quality
  - Other indications of teaching quality such as performance and success of graduates
- Research output:
  - Quality of faculty research
  - Publications by faculty members
  - Contributions of the research
  - Presentations and other external acknowledgements of the quality of research.
- Service output and contribution
  - Faculty service to the department, faculty, and university
  - Service to the country, region, or area.
  - Other recognition of service such as appointment to international committees, UNESCO service, regional service.

## **Preliminary Timetable and Work Program to Establish The Quality and Relevance Assurance Agency**

### **YEAR 1**

#### *National level*

- Set up a system of licensure or registration for higher education institutions building on the existing structure.
- Appoint a committee including representatives from universities, the Department of Education, appropriate professions, the public, and other appropriate groups to lay out the general goals, authority, and responsibilities of the Quality Assurance and Relevance Agency.
- Appoint a Governing Board for the Agency.
- Work begins to develop standards for accreditation and spell out the authority and responsibilities of the Agency.
- Work begins on rules and legislation needed to create the legal foundation for accreditation and consumer protection.
- A director is appointed and a staff is hired for the Agency

#### *Institutional level*

- The Ministry of Higher Education works with institutions to encourage them to establish mechanisms for academic quality reviews on an ongoing basis. That might include the general parameters expected of such reviews and input from planners working on the Quality Assurance and Relevance Agency.
- Each institution begins a process to set out its own plan for academic quality reviews of departments and programs, including assessment of curriculum, teaching staff, and research, drawing on peer reviews and student evaluations.

### **YEAR 2**

#### *National Level*

- Agreement is reached on accreditation standards and the responsibilities and duties of the Quality and Relevance Assurance Agency (QRAA) following consultation and discussion with institutions, relevant professions, and the public.
- Agreement is reached about whether or not accreditation will include institutional reviews only, program or subject reviews, or both.
- Requirements for accreditation, standards, and the mechanisms involved are approved, published, and distributed to institutions and the interested public.
- Consultations and workshops are organized by the QRAA to assist institutions in setting up academic program review processes. Whether or not academic reviews become part of the accreditation site visit and the accreditation process should be left up to each institution on a case by case basis. If academic reviews are seen as linked to accreditation their utility as tools for ongoing institutional quality improvement may be compromised.

- A time table is set up for re-accreditation of institutions already accredited on a rolling basis so that not all are reviewed in the same year.
- Assessment teams (peer reviewers, professionals, and others) receive training from the QRAA for accreditation site visits.
- The first institutions to be accredited or reaccredited are asked to begin to compile appropriate material needed and to begin a self study.
- Administrative rules and legislation needed for consumer protection and for accreditation are put in place.

*Institutional level*

- Most universities begin the process of academic reviews – to be staggered over the next three to five years. In general, institutions can not do more than four or five academic reviews in any year given the faculty and staff time involved.
- Institutions to be reaccredited in year 3 begin their self-studies for accreditation.
- Those tertiary institutions seeking accreditation for the first time make applications to the QRAA and if approved (this can be synonymous with *licensure*), begin their self-studies.

### **YEAR 3**

*National level*

- The first universities to be candidates for re-accreditation produce self-studies.
- Site visits are organized by the QRAA and made to these universities.
- Assessment teams submit their reports and recommendations to the QRAA Board for review and approval or requests for additional information.
- The first accreditation or re-accreditation announcements are made by the QRAA or the Minister of Education (whoever has final authority).<sup>44</sup>

*Institutional level*

- All universities are involved in the process of academic programs reviews with some on their second round. Those which have completed academic reviews receive incentive funding to be used for quality improvement in their area.
- The second group of universities to be reaccredited starts their self-studies.
- Those institutions that have been accredited follow up on suggestions (if any) from the site visit and recommendations.
- Those institutions successfully accredited receive a one-time grant to facilitate faculty and curriculum development.

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<sup>44</sup> The autonomy of the Quality and Relevance Assurance Agency is likely to be enhanced if final decisions are announced by it rather than the Ministry, but that is a decision that should be considered in setting up the QRAA as part of plans to insure that it has adequate autonomy from the Ministry and from political pressure.

## Attachment 8

## Higher Education Development Building Costs: Phases 1 – 3

University / Institution	No. of Campus	Phase 1(2000-02)		Phase 2- (01-03)		Phase 3 - (03-05)		Total - Cap.Dev.	
		Enroll. Increase	Cost* Birr (mill)	Enroll. Increase	Cost* Birr (mill)	Enroll. Increase	Cost* Birr (mill)	Enroll. Increase	Est. Cost Birr (mill)
<b>Existing Universities:</b>		(est)				(est)			
Addis Ababa Univ.	6	700	9.50		0.00	2300	128.98	3000	138.48
Alemaya University	1		0.00	3000	74.98	4720	66.31	7720	141.28
Bahir Dar University	2	1750	26.03	1150	41.88	6330	108.54	9230	176.44
Dehub University	3	1400	27.81	600	24.46	6380	120.44	8380	172.71
Jima University	2	800	26.34	600	35.79	6760	147.48	8160	209.60
Mekelle University	2	800	61.02	600	23.19	5120	112.66	6520	196.86
<b>Subtotal Existing Universities</b>		<b>5,450</b>	<b>150.69</b>	<b>5,950</b>	<b>200.29</b>	<b>36310</b>	<b>684.40</b>	<b>43010</b>	<b>1035.38</b>
<b>Proposed New Universities:</b>									
Arba Minch WT Institute			0.00	2520	47.93	3820	64.87	6340	112.79
Gonder College Med.Sc.		0	6.34	1150	43.05	6800	135.28	7950	184.68
Ambo College			0.00	400	6.619	600	0.00	1000	6.62
Nazareth Tech. Teacher College			0.00	920	21.579	3880	59.15	4800	80.72
<b>Subtotal Proposed New Univ.</b>		<b>0</b>	<b>6.34</b>	<b>4,990</b>	<b>119.18</b>	<b>14,500</b>	<b>259.29</b>	<b>20,090</b>	<b>384.81</b>
<b>Est. Added Costs Ph3-"In design"</b>								**	<b>30.00</b>
<b>Total Higher Education System</b>		<b>5,450</b>	<b>157.03</b>	<b>10,940</b>	<b>319.47</b>	<b>50810</b>	<b>943.69</b>	<b>63,100</b>	<b>1450.19</b>
<b>USD (million)</b>									<b>\$168.63</b>

Note: \* Cost figures for Phase 1 to 3 are based on actual construction contract award costs (Eng. Panel figures, Sept/03).

\*\* Several projects to be included in Phase 3 are still in design and have not yet been tendered (design cost estimates are based on unit costs of 1800 Birr/sm, while current construction unit costs are 2200 – 2400 Birr/sm).

\*\*\* Enrollment increase figures are on the number of new dormitory spaces to be provided in each phase, and assume current dormitories were provided for 100% of current enrollments.

## Options for Improved Facilities Utilization

**Institution:** Illustrative Example (based on typical data of existing institutions).  
**Programs:** Degree Programs only  
 Common Freshman Year (Degree – Soc. Sc. & Nat. Sc. programs) ;  
 Mix of Soc. Sc. and Nat. Sc. programs. (55% Soc. Sc.45% Nat. Sc.)  
 13 Depts.–majority 3 year programs (excluding Freshman Year)  
**Enrollment:** 3575 students (2001/2002).

**Existing Facilities:**

- Medium Lecture Rooms (50–65 seats) = 16 rooms (existing section hours available = 512)
- Large Lecture Rooms (85–100 seats) = 9 rooms (existing section hours available = 288)
- Medium Laboratories (30 seats) = 7 rooms (existing section hours available = 196)
- Large Laboratories (60 seats) = 1 room (existing section hours available = 28)

**Operating Schedule:** 9 hrs/day (8am-5pm): 45 hrs/week (5 d/wk).

**Instructional Schedule:** 8 hrs/day (1 hr. common lunch break): 40 hrs/wk.

**Utilization Rate:** Assume 100% utilization within current schedule/facilities/enrollments.

Option 1: Stagger Lunch Break					
Operational Data Items	Lect. Room Seat Cap.		Lab Room Seat Cap.		Notes
	50-65	85-100	30	60	
Total No. Instruct. Hr. / Wk.	45	45	45	45	
Assumed Scheduling Efficiency	80%	80%	70%	70%	
Avail. Scheduling Hr. /Wk.	36	36	32	32	
Total No. Room Section Hr. Avail.	576	324	221	32	
Add'n Section Hr. from Existing	64	36	24.5	3.5	
Add'n Section Hr. as Add'n Enroll.	196	190	41	23	at 18 L hr/s:6 P hr/s
<b>Total Estimated Additional Enrollment</b>	<b>386</b>	Lecture	<b>64</b>	Lab	45% Ex. Enroll req. lab.
<b>Percentage increase in Enrollment</b>	<b>11%</b>	Lect. Only	<b>3%</b>	% Inc. based on 45% Sc. ratio	
Option2: Extend Operational Hours (1 Hr./day or 5 Hr. on Saturday), plus Option 1					
Total No. Instruct. Hr. / Wk.	50	50	50	50	
Assumed Scheduling Efficiency	80%	80%	70%	70%	
Avail. Scheduling Hr. /Wk.	40	40	35	35	
Total No. Room Section Hr. Avail.	640	360	245	35	
Add'n Sec. Hr. from Existing	128	72	49	7	
Add'n Sec. Hr. as Add'n Enroll.	391	380	82	47	at 18 L hr/s:6 P hr/s
<b>Total Estimated Additional Enrollment</b>	<b>771</b>	Lecture	<b>128</b>	Lab	45% Ex. Enroll req. lab.
<b>Percentage increase in Enrollment</b>	<b>22%</b>	Lect. only	<b>6%</b>	% Inc. based on 45% Sc. ratio	
Option 3: Add 3 Large and 6 Medium Classrooms and 4 (60p) Labs, plus Option 2					
Existing No. of Rooms	22	12	7	5	
Total No. Instruct. Hr. / Wk.	50	50	50	50	
Assumed Scheduling Efficiency	80%	80%	70%	70%	
Avail. Scheduling Hr. /Wk.	40	40	35	35	
Total No. Room Section Hr. Avail.	880	480	245	175	
Add'n Sec. Hr. from Existing	368	192	49	147	
Add'n Sec. Hr. as Add'n Enroll.	1124	1013	82	980	at 18 L hr/s:6 P hr/s
<b>Total Estimated Additional Enrollment</b>	<b>2138</b>	Lecture	<b>1062</b>	Lab	45% Ex. Enroll req. lab.
<b>Percentage increase in Enrollment</b>	<b>60%</b>	Lect. only	<b>46%</b>	% Inc. based on 45% Sc. ratio	

