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ISLAMIC REPUBLIC OF PAKISTAN

HIGHER EDUCATION AND SCIENTIFIC RESEARCH:

STRATEGY FOR DEVELOPMENT AND REFORM

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## ABBREVIATIONS AND ACRONYMS

IOU	Allama Iqbal Open University
RD	Agricultural Research Division
DP	Gross Domestic Product
OP	Government of Pakistan
EJ	Husein Ebrahim Jamal Institute of Chemistry
QRA	Educational Levy on Imports
UPAC	International Union of Pure and Applied Chemistry
MINFAC	Ministry of Food, Agriculture and Cooperatives
MOF	Ministry of Finance
MOST	Ministry of Science and Technology
CAAV	National Council for Academic Accreditation and Validation
CAFE	Council for Academic Funding and Efficiency
CRFE	National Council for Research Funding and Evaluation
CST	The National Commission for Science & Technology
SRDB	National Scientific Research and Development Board
WFP	North West Frontier Province
ARC	Pakistan Agricultural Research Council
CAAV	Provincial Council for Academic Accreditation and Evaluation
CAFE	Provincial Council for Academic Funding and Efficiency
CST	Pakistan Council for Science and Technology
SF	Pakistan Science Foundation
IMC	Standing Inter Ministerial Committee
GC	University Grants Commission

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## ISLAMIC REPUBLIC OF PAKISTAN

HIGHER EDUCATION AND SCIENTIFIC RESEARCH:  
STRATEGY FOR DEVELOPMENT AND REFORM

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# ISLAMIC REPUBLIC OF PAKISTAN

## HIGHER EDUCATION AND SCIENTIFIC RESEARCH: STRATEGY FOR DEVELOPMENT AND REFORM

### EXECUTIVE SUMMARY

i. In the past four decades higher education has expanded much faster than primary or secondary education, which have some of the lowest participation rates in the developing world. The Government is committed, under its Social Action Program, to tackling these deficiencies, particularly in primary education. Higher education has expanded as a result of social and regional pressures and the increased rewards and opportunities that higher qualifications provide for employment and salary. Reform in the higher education system is necessary in order to free resources for developing education at lower levels, and to improve efficiency, quality and equity in higher education. Despite the phenomenal expansion of the higher education system and the weak foundations on which it rests, overwhelming evidence indicates that the escalating demand for places greatly exceeds the supply. There is also wide recognition that the development and operation of higher education is unacceptably divorced from the world of work. There are growing reservations over the capacity of the economy to absorb sensibly its output.

ii. The main theme underlying this review is that a major coherent strategy is essential in order to achieve necessary fundamental change in the system. This strategy must be developed and resolutely pursued at the highest level of government. The overall objectives of the system should be to achieve major improvements in quality and efficiency. The linchpin of the proposed strategy for quality improvement is to alter radically the prevailing incentive systems to shift the sector from a predominantly supply-driven to a much more demand-driven posture. The qualitative leap required must be set and measured by the relevance and responsiveness of the system to the real economic and social needs of Pakistan. Increased efficiency at national, provincial and institutional levels will provide the only realizable route to adequate resources and improved output.

iii. The missions to Pakistan, the numerous discussions and seminars throughout the country with providers, recipients and users of the system, and formal responses from Government, clearly established that the problems and constraints inhibiting reform are widely acknowledged and understood. This review does not, therefore, dwell on these shortcomings, but concentrates instead on the need to develop an effective strategy and, more importantly, on the means to secure its implementation. The bibliography lists numerous crucial educational policy initiatives, which have been included in most five-year plans, but have not been accomplished. The critical challenge addressed in this review is to translate policy into practice.

#### *Issues and Diagnoses*

iv. Part II of this review considers four main issues affecting the development of higher education and scientific research in Pakistan. First, the flawed institutional framework of the sector manifests four institutional deficiencies, whose resolution is a necessary, although insufficient precondition for significant improvement. Ambiguous assignment of power and governance, coordination, and oversight diffuses ultimate responsibility. This is so for universities, degree colleges and research institutions. Universities operate under a dual responsibility for management. Degree colleges and their intermediate streams operate under a different set of split responsibilities for academic mission and standards. Research institutions function under a multiplicity of disarticulated bodies and councils without coordination or coherence. At the same time, bureaucratic rigidity both within and across institutions produces a

stultifying uniformity; all institutions work to the lowest common denominator of performance. Unit managers have little if any influence over the most central aspects of their institutions. Managers have only a peripheral role in recruitment or dismissal of staff, pay scales and promotions, and establishing or changing fees, or on academic standards. Decision criteria are usually not published or are not germane to performance, that is, conducive to achievement of desired outcomes; the behavior of the various interested parties is not channelled productively. Finally, the public monopoly of the service leads to the failure to capture private funding. The students lack opportunities and incentives to study hard and make careful choices; consequently, student indiscipline emerges as a serious and pervasive problem.

v. The second issue concerns the inefficiency of Pakistan's higher education and scientific research sector, three aspects of which are striking. Its outputs—graduates and research—are generally below international calibre and are increasingly encountering substantial difficulties in being absorbed by the economy or society at large; this is a problem of external efficiency. Previously, Pakistani graduates with bachelors degrees could enter directly into masters programs overseas. Now, more and more frequently graduates must successfully complete a preliminary preparatory program before they can enroll in these masters programs. The sector is underfunded compared to spending in other countries in the region (for example, Bangladesh and India). Pakistan's institutions simply cannot perform their designated missions; this is a question of fundamental effectiveness. Universities have very little money for research and essential research support and direct support of teaching, and library holdings are severely deficient. Most seriously, the resources available to the sector are improperly deployed; this is an issue of internal efficiency.

vi. The third issue is that the higher educational experience, as delivered, is one of passing through a formal process that results in degree acquisition regardless of interest, aptitude and subject. This satisfies neither the needs of the community nor the ability and aspirations of its young people. The quality of the learning experience and, hence, the output are compromised. Weaknesses in five main areas are responsible for the poor content and delivery of higher education. The centralized imposition of inflexible, insensitive and, often, inappropriate student entry requirements encourages rote teaching and learning methods, and credit accumulation at the expense of real understanding, skill training and innovation. The absence of incentives or accountability for quality control at the institutional level means that there is no effective responsibility and accountability for the content, delivery and assessment of the curriculum. The procedures for appointing and appraising academic and support staff militate against establishing and maintaining high academic and vocational standards. The inadequate provision, maintenance and use of instructional resources—especially computers, books and materials—directly affect the quality of higher education. Finally the lack of any effective input from the world of work into the curriculum design denies the opportunity and pressure to produce creative graduates competent in the application of knowledge, with a capacity for learning that will enable them to keep abreast of modern developments in their field.

vii. Finally, the lack of productivity and success in research in Pakistan stems directly from the absence of overall planning. Without clearly stated and understood targets and priorities it is impossible to reward success and avoid waste; one clear example is the chronic dearth of research equipment and consumables in most universities. Without an overall plan for research, including coherent collaborative roles for the institutions and funding bodies, research activities are planned and executed with a limited fragmented perception of the total problem. The relationships between teaching and research, and between research and the urgent needs of the country remain confused and unresolved.

*A Strategy for Reform and Improvement*

viii. The transformation of the higher education and research sector in Pakistan into a significant contributor to development will require a long-term, multifaceted and carefully sequenced effort. Part III of this review offers a reform strategy, in the form of five logically linked objectives and sub-objectives derived from the preceding analysis. The strategy is then synthesized as a Policy Action Matrix which identifies both the means to attain each objective and the indicators of progress. Part IV gives the rationale for the proposed strategy and suggests core principles to guide its implementation. In doing so it is assumed that two indispensable preconditions for the success of any effort to improve higher education have been met.

ix. First, statesmanship is essential. No reform effort can succeed without a resolute sustained commitment from Pakistan's political and administrative leadership to correct the institutional, efficiency and service delivery weaknesses of the sector. The absence of such an elite commitment is widely considered in Pakistan to be a prime reason for past failures to bridge the implementation gap—the distance between understanding problems and identifying solutions, and putting agreed improvements into practical operation.

x. Second, the overall policy environment needs to be conducive to change in higher education and research. A democratic political system puts a premium on accountability. An outward-looking open economy, competitive both internally and externally, puts a premium on productivity and responsiveness to constantly changing conditions in domestic and international markets. This, in turn, stimulates demand for scientific and technological capacity; the demand can only be met by the higher education and research sector through its production of knowledge and of flexible graduates with employable, transferable know-how and skills. In short, a healthy political environment and macroeconomy set the parameters for improvement of higher education and research. Without an enabling political and economic environment, higher education reform will lead nowhere.

xi. The first objective of the reform strategy is to revitalize the policymaking function for higher education and research. This will require: a government statement of commitment to and support for the sector, centering around a clear exposition of its ultimate purpose and goals; the creation of an apex body responsible for macro policy formulation and oversight, including setting and revising overall targets and priorities; and the establishment of a support structure for the apex body.

xii. The second objective is to create an overall operational framework that stimulates improved quality by ensuring effective translation of agreed policies into concrete actions in individual higher education and research institutions. This will necessitate: setting up an implementation structure of second level executing agencies, concerned principally with quality and efficiency; achieving clear specialization in universities and colleges; enhancing the autonomy of individual universities, colleges and research institutions; and increasing private sector provision.

xiii. The third objective is to increase the overall envelope of resources available to the sector. This can be accomplished by: increasing charges levied on users of higher education services; tapping additional private sources of finance; generating additional revenue within the sector; and growth in public funding of the education sector as a whole.

xiv. The fourth objective is to ensure efficient use of all resources available to the sector. This can be achieved through: establishing a system of accountability for individual faculty members and

institutions; creating strong incentives for faculty performance; establishing a system to measure institutional performance and provide incentives for improvements; establishing a better balance between teaching and research; restructuring institution budgets to improve the balance between salary and non-salary expenditures, and between recurrent and capital expenditures; obtaining optimal use of available resources; and consolidating institutions and programs to reap economies of scale.

xv. The fifth objective is to improve the development and delivery of services at the institutional level, thereby attaining the ultimate goal of enhanced quality of higher education and research. This will require: translating national goals for higher education and research into action plans at the institutional level; developing methodologies for resource allocation; improving access and selection; enriching the educational experiences of students; ensuring, maintaining, and monitoring quality in programs; improving the selection and developmental procedures for academic staff; improving the efficiency and effectiveness of support services; and coordinating and invigorating research.

xvi. These five objectives are logically linked; within each objective, its sub-objectives are similarly, although more loosely, related. Piecemeal measures, which cannot take into account the interrelationships and interdependencies of objectives, are doomed to failure. Progress toward achievement of each objective contributes directly toward the achievement of the next ones. This enables a phased implementation program to be designed in which related activities can proceed concurrently.

xvii. The Policy Action Matrix outlines a coherent strategy for reform and improvement of the sector, synthesizes the main objectives and sub-objectives, and encapsulates the recommendations for change derived from this review. For each main objective the matrix specifies the responsibility for action, the action required, and the indicators to be used for monitoring implementation. In practice implementation will involve considerable flexibility and overlap between stages. Following the initial commitment and action at the highest level of government other stages can and must proceed simultaneously. Decisions on timing and phasing will depend upon the conceived urgency and must continually be directed toward the main objectives.

xviii. Part IV uses models of possible organizations and structures to facilitate understanding of the matrix and its rationale. It emphasizes the functions that must be carried out in order to realize the main objectives of the strategy. This affords a deeper appreciation of the roles and relationships involved and the nature and magnitude of the change required, without focussing too sharply on the models used.

xix. Several important principles underpin the strategy summarized in the Policy Action Matrix and justify the preferred model from Part IV incorporated into it. First, it is better to strengthen and adapt existing institutions and organizations than to create new ones unless their retention will inhibit reform or perpetuate bad practice. Second, decentralization of responsibility and accountability is the key to successful reform and improved responsiveness. Third, it is assumed that fundamental, enduring change requires careful preparation and implementation.

### *Implementation*

xx. Successful implementation will depend critically upon marshalling public, non-partisan opinion through enlightened political leadership. Consensus must be developed among students, teachers and administrators around the ultimate wisdom and feasibility of the strategy; the several groups must want the reform, to see it in their interest. The report advocates a staged approach with the advantage that, while privileging quality improvement, it builds upon existing organizations, strengths and commitments

and develops a mechanism for rapidly expanding the provision when this becomes feasible. Most importantly, however, the emphasis in the proposed approach to implementation is on closely monitoring the progress of a defined strategy in which responsibility and accountability for successful implementation clearly lies with individuals and organizations at each level and in which success is recognized and rewarded.

xxi. The report presents five principles that may ease the transition from the old to the new. First, the experience of the nation and its intelligentsia must be engaged. The aim is to rekindle optimism that improvement is feasible through wide discussion of the new mandate for higher education and the coherent strategy to implement it. Second, despite the urgency, precipitate action is undesirable. Tapered implementation would follow careful planning and would be built on good practice and the monitoring of successful developments. Realistic, concrete targets would be set for the realization of specific goals. Third, wide participation by the interested parties in planning is essential, both to develop the correct approaches and to ensure that they enjoy legitimacy. Fourth, the desired changes in the behavior of institutions and individuals should be induced through focussed incentives. The role of government is to set and enforce fair, transparent rules and norms and to ensure logically and inevitably that appropriate rewards and benefits follow the level of achievement of its targets. Finally, uniformity of response in time or in outcome is not a virtue. Equity and social justice do not require that all institutions be of equal high quality, merely that the path into the best institutions should not be closed to talented individuals.

# I. INTRODUCTION

## A. Overview and Core Themes

1. This review seeks to stimulate discussions between the International Development Association (IDA) and the Government of Pakistan (GOP) during the next phase of IDA's support for sectoral reform in higher education and scientific research. It pursues this objective by laying out a comprehensive framework for reform and improvement that recognizes the government's commitment, under its Social Action Program, to rectifying the deficiencies throughout the education sector. It supplements existing documents and recent IDA sector work and reports (see bibliography).

2. This review was initiated in early 1989. At the invitation of the Government of Pakistan, a World Bank mission visited the country from February to March and September to October, 1989 to consider the current circumstances and future development of higher education and research. During the first visit, the mission collected extensive background documentation and statistical data and sought the views of a wide range of individual participants in the sector throughout the country. During the second visit, the mission submitted its tentative analysis and conclusions to scrutiny at twelve seminars held in Islamabad and the four provincial capitals. These working sessions were attended by more than 250 people from the nation's universities, colleges, research institutes, industries, and pertinent administrative agencies. Between the two visits, the mission prepared a working paper detailing its emerging findings and circulated the paper in advance to the seminar participants. Several iterations of documents were prepared and widely circulated to support the dialogue. In August 1991 the revised analysis and conclusions were scrutinized by senior politicians and civil servants in Pakistan. In March 1992 a formal response agreeing to the report was received by the Bank. This review incorporates the results of this dialogue and the formal responses communicated to the Bank by the Government.

3. Four undercurrents recur throughout the report and drive its major findings: (i) the urgency of improving quality in the sector; (ii) the constraints on quality inherent in the current preponderantly supply-driven posture of the sector; (iii) the need for a long-term strategic approach to quality improvement through the use of incentives to shift the sector to a demand-driven posture, and (iv) the need for appropriate institutional change, resource optimization and generation.

### *1. Quality Improvement: the Priority of the Sector*

4. For at least the remainder of the century, quality improvement, not quantitative expansion, is the overwhelming priority for the sector. In every qualitative aspect--from the actual learning and knowledge generation outcomes achieved to the pertinence of those outcomes for economic development and human welfare--the performance of the sector is unsatisfactory. Expansion should occur only under conditions that guarantee and sustain high quality. Such conditions cannot be achieved in public sector institutions of higher education as they are now organized and managed.

5. With a participation rate in degree programs of less than 3 percent of the age group, higher education is not widely available in Pakistan relative to standards in countries to which Pakistan seeks to compare itself and with which it will increasingly have to compete in a rapidly changing international economic environment. Ultimately, the participation rate in higher education in Pakistan will need to grow. However, the crisis of quality must be addressed first, so that future expansion can be productive and sustainable, both economically and socially. Given national resolve and statesmanship in the implementation of efficiency measures, the quality deficit can be overcome without a contraction in the size of the system.

6. The need for a qualitative transformation of the sector, so that it becomes an important contributor to development, has long been widely acknowledged in Pakistan. The transformation has not occurred for three reasons. At the highest levels of political and administrative authority, the commitment to increasing enrollments has overshadowed any concern with quality. Policies announced on various occasions to address recognized quality problems have been piecemeal, rather than integral parts of a coherent strategy. Finally, announced policies have not been resolutely implemented.

## ***2. Sources of Poor Quality***

7. The root cause of faltering quality in the higher education and scientific research sector is its preponderantly supply-driven orientation. People are "educated and trained" and "knowledge is produced" with little consideration of the economic requirements of the agriculture, industry, and services sectors. In the face of the dynamic nature of those demands, higher education and scientific research remain unresponsive and immutable. This must change if higher education and scientific research are to contribute to development in Pakistan.

{ The supply-driven orientation in the sector, which compromises its quality, is the consequence of three logically related sets of issues: (i) its faulty organization and management; (ii) its economic inefficiency, including the wasteful consequences of insufficient resource mobilization; and (iii) the poverty of the educational and research experiences, particularly the outdated methods for design and delivery of education and research programs. To improve quality, fundamental changes will need to be agreed and then resolutely implemented in three areas: the institutional framework for the sector; the amounts, sources and uses of resources available to it; and the very nature and content of higher education and scientific research.

9. Many Pakistanis assert that violence, anarchy, coercion and more subtle forms of usurpation of the right of others to the peaceful pursuit of knowledge are widespread occurrences on Pakistani campuses. It is claimed that such "student indiscipline" is provoked by the "intrusion of politics into campus life", and that this, and nothing more complicated, is the proximate cause of the crisis of quality in higher education in Pakistan. According to this view, the necessary first step to improving quality is for the several political parties effectively to withdraw all support from student wings on campus and publicly to repudiate the intromission of partisan conflict into academic life.

10. However, an alternative view is more compelling. Although campus unrest is never to be condoned, it is probably, first and foremost, attributable to raging student frustration with the deeply unsatisfactory nature of the educational experience and with the often dubious prospects of suitable employment thereafter. The intrusion of partisan politics into academic life is only an exacerbating factor. In short, this report takes the view that campus unrest is a symptom of the underlying endemic poor quality of higher education, not its cause. Indiscipline on campus will disappear only after the complicated web of root causes of the crisis of quality is systematically destroyed. This will require vigorous and long-term implementation of far-reaching reforms in higher education.

## ***3. A Strategic Approach to Improvement—the Key Role of Incentives***

11. To achieve fundamental changes, disparate policy initiatives will not suffice; a coherent strategy is essential. Institutional deficiencies in the sector must be addressed in order to improve efficiency in resource mobilization and use. This, in turn, will induce and permit improved program design and

delivery. Attacking problems at the lower end of this logical chain without tending to difficulties higher up will not be effective. Specifically, it will ultimately do no good--and it will be very costly--to attempt to address the program design and delivery issues if the institutional and efficiency issues are left unattended. Similarly, efficiency problems will not yield to remedial action without concomitant changes in the organization and management of the sector.

12. The linchpin of the proposed strategy for quality improvement is the concept of incentives. The term "incentives" encompasses more than monetary rewards (although these are certainly important); it includes the satisfaction arising from personal commitment and professional dedication to effective performance of socially important tasks; the concept applies to institutions as well as to individuals. The need is to radically alter the incentives now prevailing to shift the sector from a predominantly supply-driven to a much more demand-driven posture. The thrust of the argument is straightforward. Neither people nor institutions change their behavior merely through direction from above, although the guidance provided by clear, consistent, and stable policies is a necessary ingredient. Behavior changes when self-interest is effectively engaged.

13. The poor performance of the sector and the pervasive despondency about its future are attributable to fundamentally perverse incentives. These motivate behavior patterns in individuals and institutions that are inconsistent with implementing the needed and agreed solutions to well-known problems. The faulty structure of incentives ensures, at best, that no actions will be taken and, at worst, that actions will be launched in precisely the wrong directions. The result is an enormous implementation gap--a huge shortfall in converting policy prescriptions into resolute action programs. A whole new set of demand-driven signals is needed to stimulate actions that positively address identified problems, thereby bridging the gap.

#### *B. Audience and Structure*

14. There are four Pakistani audiences for this review. First is the political leadership of the country, who must ultimately shoulder the responsibility for the difficult decisions required. Second are the officials of the Federal and Provincial Governments concerned with higher education and scientific research, and the executive leadership of educational and research institutions; they will be called upon to help formulate and implement the decisions. Third are the staff and students of colleges and universities, and the community of researchers in science and technology; in the first instance they will be the beneficiaries of change. Fourth are the managers of the nation's modern industrial, agricultural and service enterprises where high level manpower and knowledge must be applied to economic processes. Their current distance from the sector is at the heart of its current difficulties.

15. This review summarizes the main findings of the review missions. Part II is diagnostic. It identifies and analyses the issues confronting the Pakistani higher education and scientific research sector. Part III is illustratively prescriptive. It offers a possible strategy for qualitative improvement of higher education and scientific research in Pakistan. It is a point of departure for much needed, more profound analysis, not a ready blueprint for change. The strategy comprises an ordered series of objectives and sub-objectives, logically interrelated to effectively address the issues identified in Part II.

16. The strategy is summarized in a Policy Action Matrix at the end of Part III, in which each objective is accompanied by a list of the principal means for its attainment. The matrix is thoroughly discussed in Part IV, along with the rationale for the choices it postulates. Parts III and IV are the heart

of the report. They are meant to illustrate the scale and scope of the far-reaching changes which must take place and the type of program necessary to achieve them.

17. Since the need in Pakistan is not to discern what to do but how to do it, the concluding sections of Part IV offer for consideration a broad outline of an implementation plan. Failure to recognize the weaknesses in higher education and research and their importance to development is not at the heart of the current unsatisfactory performance of the sector. To the contrary, the problems are widely acknowledged and understood in Pakistan, and many of the reforms advanced in the paper have already been announced, sometimes more than once, in five-year plans and other policy documents (see bibliography). The challenge is to overcome the implementation gap, to translate policy into action within Pakistan's many higher education and research institutions.

### *C. Definitions*

#### *1. The Higher Education and Scientific Research Sector*

18. In this review, the term "higher education and scientific research sector"--or "the sector"--refers to the complex of educational institutions that grant academic or professional degrees at Bachelors level (B.A. and B.Sc.) or above, and to establishments dedicated primarily to the generation of basic or applied research. The term "scientific research" extends to all systematic enquiry conducted under rigorous scientific methods, without regard to its subject matter. For shorthand purposes, "basic research" is scientific enquiry that addresses questions posed by nature, and "applied research" addresses questions posed by man about the harnessing of nature for his own purposes. While for practical purposes, the focus may be on the physical and natural sciences, engineering, and technology fields, research in the social sciences and humanities is also explicitly encompassed in the analysis and recommendations.

19. Excluded from this definition of the sector, however, are: (i) the intermediate colleges (offering, at most, grades 11 and 12 of formal education) that form part of the official Pakistani definition of the higher education sector, but analytically are more appropriately dealt with in a review of secondary schooling; (ii) the polytechnics that, while formally post-secondary establishments, are more appropriately dealt with in a review of vocational education and training; (iii) the institutions, typically within enterprises, whose primary purpose is economic application of established scientific or technological principles; (iv) the institutions whose exclusive purpose is the provision of basic infrastructural services essential for industrial technology development, such as metrology, norms and standards, industrial property and patents, and quality assurance and control; and (v) the institutions operated by the Pakistan military services whose purpose is degree level higher education or scientific research and development. Note, however, that while excluded from our definition of the higher education and scientific research sector, these institutions are very often the destination of key outputs from the sector--high level manpower and new knowledge.

#### *2. The Meaning of Quality*

20. Because the focus of the review is on quality, it is important at the outset to say explicitly what is meant by that multifaceted term. Ultimately, the term refers to individuals, and what they know and are consequently able to do within various social contexts. Education of high quality imparts attributes to students that they retain over a lifetime. These attributes include: an understanding of the methods of scientific inquiry; an appreciation of the structure of mathematics and the processes of mathematical reasoning; the capacity to organize one's thoughts and to present logical, concise oral and written

arguments; an awareness of critical standards in fine arts, literature, and music; and a knowledge of the historical and cultural traditions of one's own country, as well as of the history and traditions of diverse populations. These are some of the attributes embedded in classical education. However, although they are still the basis of education of high quality, they no longer represent the complete set of attributes that high quality education is expected to impart.

21. A well-educated person also has the capacity for independent action in work, such that his knowledge and skills are productively applied in economic processes. That person is competent, as an individual, to translate theoretical understandings into solving problems in the workplace, including problems not previously encountered. That person has the capacity to realize when it is necessary to choose among alternative courses of action, to investigate actual and alternative paths in order to illuminate the decisions to be made, and to draw reasoned conclusions from that information. Quality higher education also develops the capacity for learning, so that the professional and technical worker is imaginative, innovative, and self-critical, and able to respond effectively to the changing demands of the workplace.

22. Whereas there are many settings in which higher education of recognized quality can be provided, they have certain common characteristics. Linkage to the world of economic activity imparts knowledge and skills pertinent to economic processes, provides an association with the international community of scholars, and allows a sufficient degree of flexibility to respond to dynamic changes in the nature of work.

23. Certain ingredients of provision are also essential. These include: sincere, dedicated, highly motivated faculty members who possess an education of high quality; attentive students who are committed to learning itself, not merely to acquiring the paper certifications of learning; libraries and librarians; well-stocked laboratories; and technical support staff.

24. To assert a crisis of quality in higher education and research in Pakistan is to claim that those characteristics of high quality, the relevant settings, and the essential ingredients are too often missing in Pakistan. There is a lack of capacity for independent action, problem-solving, choosing between alternate courses of action and responding to changing demands in the workplace. Dogma, prescriptiveness, passivity and conformity pervade the sector. Teachers and students alike lack the spirit of discovery and innovation. There is a complete divorce between academia and the world of work. Institutions and individuals have lost the capacity for self-examination and regeneration and are apathetic to quality and excellence. This view is widely shared by Pakistanis.

25. Of course, such an indictment of the system does not erase the fact that individual Pakistani students still manage to acquire quality higher education in the country. But these individuals, and the institutions (or parts of institutions) where they study are exceptions to the rule. One of the mission's most articulate interlocutors referred to these few success stories as "islands of quality within the ocean of mediocrity which is Pakistani higher education today." It was not always so in the history of higher education in Pakistan, which in earlier days enjoyed a worldwide reputation for top-flight performance, as evidenced by the distinguished careers in Pakistan and abroad of many of the products of the Pakistani system who graduated before the early 1970s. Finally, and importantly, the institutional exceptions to the rule of mediocrity are not only proof that quality is achievable in Pakistan, but are replete with lessons for how to achieve it--Karachi University's HEJ Institute of Chemistry, and Institute of Business Administration (IBA), Punjab University's Institute of Molecular Biology, the Pakistan Atomic Energy Commission, Peshawar University's Center of Excellence in Geology, the Aga Khan University in

Karachi, the Lahore University of Management Science, and some departments at Quaid-i-Azam University, to note only the most striking.

## **II. ISSUES IN DEVELOPMENT OF HIGHER EDUCATION AND RESEARCH**

26. Three interrelated sets of weaknesses explain the current unsatisfactory performance of the Pakistani higher education and scientific research sector. The overall institutional framework is fundamentally flawed. The resources available to the sector are insufficient and, in any event, are not used efficiently. Finally the design, development and delivery of higher education and research services are outmoded, ineffective, and often unconnected to the economic and social contexts they are meant to serve. Thus, higher education and scientific research institutions contribute too little to national welfare and development and consume a great deal of public resources. Each major weakness is treated below. Because the weaknesses are well-known and generally agreed in Pakistan, the empirical bases for conclusions are relegated to Annex 1 and the bibliography.

### ***A. Institutional Framework***

27. The higher education and scientific research sector in Pakistan manifests four institutional deficiencies. Their resolution is a necessary, although insufficient, precondition for significant and sustained improvement in the sector's performance. Ambiguous assignment of powers of governance, coordination, and oversight diffuses ultimate responsibility. It is unclear who is in charge and who should be held accountable; consequently, effective planning and management are impossible. Excessive centralization of authority and bureaucratic rigidity, both within and across institutions, produces stultifying uniformity; all institutions work to the lowest common denominator of performance. Decision criteria are usually not published or are not germane to performance, that is, conducive to achievement of desired outcomes; the behavior of the various interested parties is not channelled productively. Both direct provision of services by the private sector, and private sector participation in financing publicly provided services are notable for their almost total absence; consequently, the sector is too small and the quality of services provided is unnecessarily low.

#### ***1. Diffusion of Responsibility***

28. No single authority is in charge of universities, degree and intermediate colleges, or research institutions. Many ministries, in particular MOE and MOST, operate and establish priorities for their own research centers without significant collaboration. As a result, the higher education and scientific research sector in Pakistan is devoid of accountability. Universities operate under a system of dual responsibility for management. Degree colleges and their intermediate streams operate under a different set of split responsibilities for academic mission and for standards. Research institutions function under a multiplicity of disarticulated bodies and councils without coordination or coherence.

29. **Universities.** Financial support for universities comes overwhelmingly from the Federal Government, and is channelled to them by the University Grants Commission (UGC), an agency of the Federal Government. However, Pakistan's universities operate under legislative acts passed by the Provincial Assemblies. The Governor is by law Chancellor of the University and thus its highest

executive authority.<sup>1/</sup> The Vice Chancellors are appointed by the provincial executive, and with other senior executives and academic administrators, must answer to the political imperatives of the provinces. The Federal Government does not have significant influence over other organs of university governance.

30. The result is easy to imagine. Pressures are inexorably brought to bear on provincial legislative and executive authorities—to expand access by building new campuses and enlarging old ones, to open new courses of study, to hire more people, to increase non-salary related allowances of personnel, even to lower standards for admission of students or for award of degrees. Knowing they need not assume any responsibility for the concomitant costs, the provincial authorities instruct the university leadership to proceed forthwith in the indicated directions. Even when the Vice-Chancellors and Bursars have not perpetrated the initiative in the first place, they promptly present the bill to the Federal Government, through the UGC. The UGC has neither the political muscle nor the professional resources to serve as an effective evaluator and filter for these demands on the public purse. By the time the UGC is involved, most initiatives are not merely statements of intentions about future action; they have already been publicly announced and often are already nominally functioning on the ground in the provinces. Thus, the UGC can typically do little more than pass the financing problem upward, through the equally powerless Higher Education Wing of the Ministry of Education, to the Federal Ministries of Finance and Planning.

31. The divorce of administrative responsibility from financial responsibility means that federal, provincial, and university authorities cannot be held accountable for the overall management of the university system. It also precludes rational planning and control of the system. In an environment where tough decisions are required, nothing significant can be accomplished to improve universities until this duality of management control is ended. University leadership must be improved by bringing in full-time, appropriately qualified professionals, rather than hiring political appointees, with the attendant risks of interference and patronage.

32. **Colleges.** Both administrative and financial management of the degree colleges is the clear responsibility of the Provincial Government.<sup>2/</sup> But unlike universities, academic responsibility lies elsewhere, since colleges have no influence in setting or maintaining their own academic standards. Degree colleges do not award degrees. They merely operate degree programs whose content is established by their affiliated university, which also (for a fee charged to college students) sets and administers all degree examinations and decides on the performance criteria for passing the examinations. Since college students are awarded degrees only if they pass the university-set examinations, universities exercise virtually complete control over college curriculum. In short, neither the teachers nor the managers of degree colleges have appreciable influence over what has to be learned—the core of their business. It is not feasible to hold teachers and managers accountable for achievement against learning objectives they had no part in setting, that may not be appropriate for the circumstances of individual colleges and their students.

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<sup>1/</sup> The only exceptions are the three universities established by act of the National Assembly and operated under Federal charter (the President of Pakistan is their Chancellor), and the two new private universities which operate under independent Boards of Directors.

<sup>2/</sup> The colleges in the federally administered areas (and the very few operating under Federal charter elsewhere) come under the direct jurisdiction of the Federal Ministry of Education.

33. The degree colleges with intermediate streams (grades 11 and 12)<sup>3/</sup> are afflicted by yet another diffusion of responsibility. Functioning under the unipurpose Directorate of Colleges of the Provincial Secretariat of Education, they serve two distinct educational purposes: first degree and some post-graduate higher education, and the final two years of secondary schooling. It is well recognized that educational objectives and methods of these types of education are very different. Secondary schools are under the jurisdiction of the Directorates of Schools within the Provincial Secretariats of Education, rather than the Directorates of Colleges. They have different criteria for recruitment and payment of teaching staff. They have terminal examinations set and administered: thus the curriculum is established by a totally different process and body. The secondary school (intermediate level) courses exist side by side with degree courses in the same institution; indeed, the secondary students outnumber the tertiary level (degree) students in the degree colleges by more than two to one. The inevitable results are an encumbrance of the missions of the degree colleges, a diversion of resources meant for higher education to lower levels, and a decline in academic standards of the degree courses as the resources available to each degree student are reduced. Accountability for quality of higher education cannot be enforced in institutions whose predominant mission, in practice, is secondary education.

34. **Research.** Pakistan has no lack of institutions engaging in research and operating under the aegis of different financing and coordinating agencies and councils. Unfortunately the plethora of ministries, research and development organizations and universities undertaking research have no effective overall or institutional mechanisms to coordinate this effort to ensure reasonable efficiency. The absence of national policymaking and governance leads to an ineffective research system and colossal duplication and waste. It is impossible to reliably track the expenditures for public resources for research, let alone to develop a classification of expenditures by function or concept. Consequently, urgently needed research is not conducted while inquiry of distinctly lower priority proceeds. Research institutions fail to capitalize upon the synergy between basic and applied research and between teaching and research. They lack essential, highly sophisticated equipment; the cost can only be justified if spread among many users. There is a surplus of technical skills in some fields and levels and a dearth in others. While difficult to document empirically, the best and brightest of Pakistan's research manpower has probably chosen to locate outside the country in search of more supportive professional environments.

## ***2. Centralized Authority and Bureaucratic Rigidity***

35. To the foreign observer, higher education and scientific research in Pakistan appears to be governed by a latent principle: since not all flowers will bloom, none will be allowed to bloom. Any hint of independent initiative or responsiveness is stifled. Unit managers have little if any influence over the most central aspects of their institutions. For example, college staff are recruited centrally, with essentially no intervention by the principal. Even in universities and research institutions, the roles of department chairmen and program directors in recruitment are peripheral. In either case, the process takes forever. Managers are equally powerless to dismiss staff. Pay scales are centrally set and applied across all public employment on the basis of seniority. Remuneration based on performance, a central motivating factor in most national higher education and research systems, is an unknown concept in Pakistani higher education. Similarly, for practical purposes, promotions are based entirely on seniority,

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<sup>3/</sup> The free-standing intermediate degree colleges are excluded from the definition of higher education used in this review, of which there were 246 in 1987-88 with a total enrollment of about 62,000. These are more properly classified as (higher) secondary schools. For comparison, in the same year, 335 degree colleges had intermediate streams, with a total enrollment of 255,000 students (see bibliography).

although universities have stated minimum requirements for articles published during the requisite period before promotion can be given. In any event, promotion cannot be decided by unit managers or professional peers (again, universities are partial exceptions).

36. Finances are also determined in their entirety at the center. The Ministry of Finance decides on university budgets after considering a recommendation from the University Grants Commission. The Provincial Secretariats of Finance decide on college budgets upon recommendation of the Secretariat of Education. Neither universities nor colleges are free to establish or change fees, or to mingle proceeds accruing to them from the revenue sources they administer. The content of academic programs is standard across a given class of institution and cannot be altered by individual institutions or teachers; to change the curriculum is a process fraught with such delay, uncertainty, and frustration that for practical purposes, nobody bothers.

### ***3. Decision Criteria and Guidelines***

37. Decision criteria and guidelines for higher education, where they exist, are inconsistently applied. The result is that there is no motivation for individual performance or for institutions to move in desirable directions and no means for higher authority to hold key actors accountable. A few examples illustrate a pervasive problem.

38. Beyond the uniform pay scales, there are no effective standards for determining the UGC's recommended financial allocations to universities. The money available to a university does not meaningfully depend upon ratios of pupils to teachers, ratios of academic to non-academic staff, enrollments by discipline, space norms allocated per discipline per student, or any other readily discernible germane criterion. For colleges, expense budgets, prepared centrally in the Provincial Secretariat of Education, appear to be the simple sum of the standard personnel costs of the staff establishment plus uniform provisions for the various categories of operating expenses. The allocations do not depend in any way on specific characteristics of the college (for example, age, overall size, location, condition and intensity of use of physical plant, and distribution of enrollment by level and course).

39. The leadership of units (universities, colleges, research institutes, faculties, or departments) is remunerated without regard to the unit's size, the quantity or quality of its output, or the span of responsibility and degree of accountability of the manager. Built-in incentives for the leadership to practice and encourage good performance are totally absent.

40. Colleges are rigidly staffed according to a formula that determines the relative numbers of academic personnel at each level. All academic staff are in levels 17-19. Level 17 is the entry point for lecturers, level 18 for assistant professors, level 19 for associate professors in universities and full professors and most principals in colleges. Level 20 is reserved for university professors, some principals and the most senior administrators in the Secretariat. The staffing rule (known as "1-6-17") requires that for each full professor in a college, there are six assistant professors and seventeen lecturers. The rule is applied without regard to the differing academic requirements in colleges, the subjects taught or the performance of individual staff. One of the undesirable results of this system is that promotions have traditionally been available only by application to a vacancy at a higher level, usually in a different institution. No rational or measurable criteria are applied when assessing staff performance for promotion.

#### **4. Public Monopoly on the Control and Financing of Higher Education**

41. Except for two (newly established and still very small) private universities, a few private colleges in Karachi and Lahore, and a trace of research in a few private industrial and service establishments, higher education and scientific research in Pakistan are conducted entirely within the public sector. Although universities, colleges, and research institutions have radically different purposes, they are operated under civil service regulations designed for the management of ministries and other public administration entities. For example, personnel policies (recruitment, pay and promotion) and financial management (budgeting, accounting, and procurement) in the sector are all governed by the cumbersome rules and regulations of the public administration, despite the differing missions of institutions in the sector. The most essential characteristics of a successful national system of higher education and scientific research--flexibility and capacity to respond effectively and quickly to changing circumstances--are exactly what the structure and functioning of public administration is designed to inhibit.

42. The detrimental effect of this monopoly of public control is magnified by the near exclusivity of public sources of finance in the sector. Own-generated income from tuition, student fees, and services rendered to outside organizations germane to the fundamental purpose of a university, such as contract research or special training programs comprise less than 15 percent of the revenues; it is very much less for colleges.<sup>4/</sup> The deleterious consequences of having no private contribution to the financing of this entirely public enterprise are many, and well-known; three are particularly important.

43. The first consequence is the stark inequity of the situation. Totalling fewer than 2 percent of the age group, higher education students are already a distinctly elite group.<sup>5/</sup> Selectivity of the educational system at lower levels ensures that many students, though certainly not all, come from families that could easily afford to make significant contributions to higher education costs.<sup>6/</sup> Yet, in a country that still cannot afford to provide primary schooling to half of the age eligibles, none of them do. Thus rural primary age children, especially girls, pay for attendance in higher education of the comparatively rich urban dwellers in the form of denied opportunity for primary schooling. Elementary tenets of social equity are severely violated, in a way repugnant in a society nurturing fragile democratic institutions.

44. Second, the effective public monopoly on finance means either that there is less higher education, lower quality higher education, or both. The huge unmet demand remaining for higher education is reflected in the large numbers of applicants denied admission. Yet, given other claims on the public purse, sustainable public funding for higher education is already near its upper limit. In these circumstances, the failure to capture significant financing from private sources, either by allowing entry

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<sup>4/</sup> On the one hand, because universities often run a deficit (financed by overdrafts on their bank accounts), fee income constitutes an even smaller proportion of their actual expenditures. On the other hand, eight universities collect fees from college students taking degree examinations, and the 15 percent includes those substantial amounts from provision of a service not germane to the core purpose of a university. Data currently available do not permit calculation of the exact figure for colleges; anecdotal evidence suggests it may be 2 percent or less (see bibliography).

<sup>5/</sup> The standard figure for higher education enrollments in Pakistan is 3.1 percent of the age eligibles. But this figure includes students in free-standing intermediate colleges. In this review, intermediate colleges are excluded from the definition of higher education, since they are the equivalent of secondary schools elsewhere.

<sup>6/</sup> Higher education graduates enjoy premium incomes in the workplace. A well developed capital market for student loans could recover a meaningful portion of the costs of higher education.

of entirely private institutions, by instituting significant cost recovery in public ones, or both, inevitably leads to fewer places being built and operated, or to severe restrictions on the quantity and quality of educational inputs available to each place in the system. Not only is the public monopoly inequitable to those denied access at lower levels, it is inequitable to those denied access to and quality within higher education itself. Relaxing the effective public monopoly will thus serve in two distinctly important ways to increase equity, an effect that can be magnified by simultaneously instituting scholarship or loan schemes for students who can convincingly demonstrate their inability to pay the fees.

45. Third, the public monopoly on finance of higher education--or the fee-free provision of the service--has negative effects on efficiency. With little personal stake in the costs, student commitment to get the most from higher education is compromised; because they do not pay for their education they place little value on it. Effort dedicated to studies and constructive and productive participation in governance--seriousness of purpose--are lessened. There is little incentive to study hard, and to make choices carefully. Student indiscipline emerges as a serious and pervasive problem.

### ***B. Efficiency***

46. Three aspects of the inefficiency of Pakistan's higher education and scientific research sector are striking. Its outputs--graduates and research--are generally below international calibre and are increasingly encountering substantial difficulties being absorbed by the economy or society; this is a problem of external efficiency. The sector is so severely underfunded that its institutions simply cannot perform their designated missions; this is a question of fundamental effectiveness. Most seriously, the highly constrained resources available to the sector are improperly deployed; this is an issue of internal efficiency.

#### ***1. External Efficiency***

47. Anecdotal evidence of the imbalance between the supply of quality manpower and research and the demand in the Pakistan economy is everywhere, although detailed empirical data on the labor market are scarce. Although degree level students experience extreme difficulties finding jobs, employers complain that graduates have few utilizable skills and are ill equipped to learn on the job. The local production of qualified research personnel (M.Phil.'s and Ph.D.'s) is minuscule for a country of Pakistan's size, and Pakistani industry relies heavily on imported technology and personnel through turnkey contracts. The stories of unemployed doctors and engineers are legion, as is the response of the government to the resulting political pressures to create unneeded public sector jobs. The institutional linkages between the producing sectors of the economy and universities and colleges, which in most countries are crucial for maintaining good rates of productivity increase, are virtually non-existent (see section C). Technology transfers from universities to large-scale enterprises, and from universities through colleges to small and medium-sized firms, accepted and valued practices elsewhere, are notably absent in Pakistan.

## **2. Underfunding**

48. The resources available to universities and colleges are insufficient to allow these institutions to perform the functions they were established to provide.<sup>7</sup> Universities have very little money for research and essential research support (scientific equipment, computation equipment and supplies, programmers, technicians, research associates, and access to the international network of scholarly documentation). There is little money for direct support of teaching (computers for student use, teaching assistants to help devise problem sets and read student papers, facilities for distance learning and other types of modern communication equipment). Library holdings are severely deficient. The professional activities of faculty members, such as presenting papers at university conferences overseas and holding international conferences in Pakistan's universities, receive only meager support. These shortfalls have significant implications given the geographic isolation of Pakistan from the major world centers of scientific research. There is no money for faculty to conduct community outreach activities.

49. Colleges are afflicted by all the problems cited above, and other serious problems. In many city colleges, classrooms are extremely overcrowded. In both urban and rural areas, buildings are dilapidated, furniture is broken, plumbing and electrical supply are unreliable, libraries are poorly stocked, and laboratories lack equipment and supplies.

50. The principal cause of chronic underfunding is that colleges and universities in Pakistan rely excessively on government grants. Almost no government in the world is able to support high-grade university and college systems exclusively from its own resources. No public university in Pakistan has an endowment of significant size, and most have none at all. Colleges are forbidden by law from receiving endowments. There is no practice of annual giving by alumni to help support recurrent expenditures. Contractual income, or payments by private enterprises to university and college faculty--often shared between the faculty and their home institutions--is, practically speaking, non-existent. Student fees are minuscule and have been frozen for decades. Some universities have one significant source of outside revenue, and the faculty members and other examiners hired by universities have a significant source of salary supplementation: income from conducting examinations for private students and for students in the constituent and affiliated colleges. But this is a very time-consuming activity and distracts university personnel from performing what should be their main duties--research and teaching.

## **3. Deployment of Available Resources**

51. Distribution of government funds to universities lacks rationale. A group of the country's best academics could determine growth points in the scientific disciplines worldwide, survey present conditions in the disciplines in each Pakistani university and the potential applicability of these disciplines to Pakistan's development problems, and come to an informed consensus about which departments should be strengthened at a given time. But this kind of information does not enter the process of resource distribution at the key decision points. Those involved in the details of resource distribution do not have a broad enough scientific background to make equivalent judgments on their own initiative. Without direction or incentives each university strives to be an exact replica of all the others, without creating its own areas of excellence and advantage. There is no procedure for shifting resources from unproductive units to productive ones. The central government does not accumulate information on the quality of

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<sup>7</sup> Quantitative support for the conclusions in this and succeeding paragraphs is found in Annex 1, and in World Bank Report no. IDP51 (1989).

departments in the different universities, for example, on research produced or effectiveness of teaching. No recognition is given to universities whose graduates are especially successful in the market place; for instance, no one conducts tracer studies on graduates after they leave the university. No recognition is given to the special needs of universities catering heavily to students from rural areas, as related to the lower average standard of preparation of their entering students.

52. Instead funding is tied to staff positions. Universities request the UGC for new faculty posts on an entirely ad hoc expansionist base. The UGC carries the cases of the separate universities to the Ministry of Finance. Because UGC grants are determined annually and the size of the grants received by universities can vary significantly from one year to the next, universities are inhibited in their efforts to make long-range development plans. The UGC attempts to impose financial controls on universities by regulating the size of the grants. Universities, however, increasingly escape these controls by deficit finance--borrowing from banks. This practice increases the costs of university operation.

53. Distribution of funds from the Provincial Governments to colleges also has shortcomings. One difficulty is a great lack of flexibility. Almost all the money that goes to a college in a given year is determined by historical precedent; it is based almost entirely on the number of faculty and staff in post and on their rates of pay. Principals plead with college directorates in the provinces for additional posts, but which of those pleas is likely to be recognized, and why, is far from clear. The ratios of students to faculty vary greatly between colleges within a province; this raises doubts about the extent to which college finance is driven by enrollment.

54. Procedures for distributing revenues within universities and colleges are similarly afflicted with major problems. In universities, the chief shortcoming is the high percentage of budget devoted to staffing costs, starving productive uses of resources in research and in support of teaching. This diversion occurs after the university has received a UGC award. In colleges, the internal distribution of funds is determined by the salaries and benefits of persons previously employed. Distribution of the remaining funds after salaries is mandated by outside authority or by historical precedent.

55. Expenditure policies in universities and colleges misdirect resources. There is too little expenditure on non-salary items and much of it is spent on investments (auditoria, mosques and administrative blocks) that do little to improve standards of education and research. Within the salary budgets, there is too little expenditure on well-trained staff to support research and teaching activities and probably too much expenditure on non-academic administrative and clerical staff. Because the pay of college and university faculty is administered according to the civil service scales, with all academic staff concentrated within four salary grades, there is little distinction between the pay levels of university faculty, compared with college faculty (except at the level of full professor). The inflexibility in the pay scale means that universities cannot attract top-flight people in scarce fields to serve in Pakistan.

56. Expenditure policies in universities and colleges are almost completely devoid of accountability for performance of individuals and institutions. Excessive reliance on seniority for advancement eliminates the financial incentives for individual performance. Tenured appointments extending over an entire working life diminish incentives for individual performance and reduce the capacity of universities and colleges to respond to societal needs. (These kinds of appointments make it very difficult for university and college administrators to modify or close outmoded programs and to create or expand programs of great current development and societal relevance.) At the university level, the idea that tenured faculty are not subject to peer review processes is untenable. Major universities elsewhere regularly review senior faculty to give rewards for good performance and to penalize bad performance.

57. No systems or processes exist in Pakistan to monitor institutional performance. Neither institutional excellence nor institutional failure can be documented reliably at the present time, so obviously neither condition can be recognized for reward or punishment. Universities and colleges are almost totally independent of accountability for results.

### *C. Delivery of Educational Services: Ethos and Experience*

58. The delivery of educational services to the students in higher education in Pakistan is unsatisfactory. Beyond the contributory factors mentioned earlier, weaknesses in five main areas are responsible for this situation. These are: the centralized imposition of inflexible, insensitive and often inappropriate student entry requirements; the absence of incentives or accountability for quality control at the institutional level; the procedures for the appointment and appraisal of academic and support staff; the provision, maintenance and use of instructional resources; and the lack of any effective input from the world of work.

59. As a result of these weaknesses, whose impact is magnified by the deficiencies in institutional framework and resource allocation discussed earlier, scant attention is paid to developing an appropriate ethos for higher education. The pervading attitude in Pakistan is that higher education is the entitlement of all holders of inter level certificates, rather than a privilege earned by a few that confers very special responsibilities. The current educational experience as delivered is one of passing through a formal process that results in degree acquisition sooner or later regardless of interest, aptitude and subject. This satisfies neither the needs of the community nor the ability and aspirations of its young people. The quality of the learning experience and, hence, the output are compromised.

#### *1. Entry Requirements and Selection*

60. The centralized imposition of inflexible entry requirements based only on examination performance, frequently results in students pursuing studies for which they have no genuine interest or aptitude. It also encourages traditional rote teaching and learning methods in the secondary and tertiary systems, since only that kind of knowledge is tested in the examinations. It also encourages credit accumulation at the expense of real understanding, skill training and innovation. These negative effects need to be considered when examining the entry requirements and selection procedures so that they may be further developed during subsequent studies. The culture of exclusive reliance on candidates' scores is so entrenched that, in a recent public examination, solitary efforts to diversify the admission criteria to a premiere university were completely frustrated by opposition from faculty, students and society as a whole.

61. Students' lack of interest and aptitude for science and technology studies is one factor influencing the unsatisfactory student performance data. Entry to these programs is potentially available to less than two percent of the age cohort (less than half of the students in the final year of secondary school) who obtain the highest marks at intermediate level. Completion rates are around 30 percent. Another stark indicator is that, despite the highly selective intake, the average period to complete the study programs is 50 percent more than the prescribed normal duration of two years. This is also true for the four-year engineering program.

62. The high level of student dissatisfaction and unrest is due to the mismatch between entry criteria and study programs and to the frustration and lack of genuine interest and intellectual challenge that

results from the mismatch. The students do not accept that the numerous academic hoops they are required to jump through relate to their subsequent ability to contribute successfully to the development of their nation.

63. Beyond the narrowness of the higher education entry criteria, which fail to account for aptitude and genuine interest in a subject, other factors contributing to the mismatch are the content and level of the intermediate curriculum and the traditional content, structure and method of delivery of the first year college or university Bachelors program. The operation of a quota system, which requires that universities and colleges admit less well qualified students from under-developed regions or special groups, further serves to bring the whole admission process into disrepute. A major shift in present attitudes and procedures at all levels will be required if the mismatch issue is to be properly addressed.

## ***2. Quality Control and Assurance: Curriculum, Content, Delivery and Assessment***

64. Expansion has taken place in Pakistani higher education to meet locally or institutionally perceived needs without clear aims and objectives and without effective systems of quality control and assurance. Quality control and assurance in the academic environment comprises three main elements: institutional accreditation; academic program validation; and allocation of sufficient resources according to published criteria and documented performance indicators. The last of these has been discussed earlier in this report. Factors relating to accreditation and validation are addressed here. Severe problems are evident in both areas.

65. At the university level no mechanisms are currently in place to encourage regular review of the internal organization, committee structure, and efficiency of service delivery. As a result, some subject areas have recruited low numbers of students for years in some educational institutions, while in other institutions, student attrition through examination failure has remained unacceptably high. In some countries an institutional audit would be carried out regularly by a UGC equivalent body or a Ministry of Higher Education. In Pakistan, this does not happen at all. There is no system of institutional accreditation as understood elsewhere and no check on the performance and ethos of educational institutions.

66. Similarly, no formal or rigorous procedures exist for assuring and maintaining standards for curriculum content, delivery and assessment. Universities validate their own academic programs, without requirement for verification or calibration through incorporation of external expertise in the process. Universities also validate courses in affiliated colleges; this has two undesirable consequences. Varying standards of validation obtain across the different universities and their affiliated colleges. Colleges are able to operate only those courses for which their affiliating universities have validating expertise. For example, a college computer degree program could not be launched because the validating university had no computer studies courses.

67. At the Bachelors level, the lack of quality control and assurance is also reflected in the syllabuses. Those examined contained no statements of objectives, delivery methods, indicative reading lists, or assessment methods. Syllabus content is traditional and shows little evidence of recent knowledge or techniques. The engineering and science texts listed tended to be at least fifteen years old, or had no indication of the edition number or the year of publication. A study of selected 1988 Chemistry Bachelors exam papers showed that trivial names, rather than current International Union of Pure and Applied Chemistry (IUPAC) nomenclature, are used in the questions.

68. There is virtually no computer access or use by students in engineering or science programs. Syllabuses contain irrelevant and obsolete material, thereby confirming the absence of an effective syllabus review and updating protocol. New syllabus development procedures do not involve potential employers or require input from most college staff who will be responsible for implementation, or from the students. Students are aware of these shortcomings, particularly the gap between content and the knowledge and skill requirements of likely job opportunities. The issue of curriculum relevance to the world of work caused a student demonstration during a visit to one institution.

69. The syllabuses are not presented in ways that allow inferences on the level or depth of study actually required of the student. However, there is little evidence in the syllabuses that successful Bachelors students would have the background knowledge, sufficient experience, or practical and field experience to assess the adequacy of existing technology in their field. Nor would they be able to screen proven foreign technology for Pakistani requirements, generate new technologies and incorporate technological advances into productive processes.

70. At present the predominant method of curriculum delivery is "chalk and talk". Students laboriously copy from dictation or the blackboard. In the engineering courses, small group seminars are completely absent, few students participate in industry-related project work, and there is no encouragement of design or creativity. Laboratory work in science and engineering is predominantly subject-specific and theory-oriented with no opportunity for addressing interdisciplinary and open-ended problems.

71. Urdu, the national language of Pakistan, is the medium of instruction for education through secondary school. English remains the official language and, for practical purposes, the medium of instruction in higher education, especially in the science and engineering disciplines in universities. The result of this dual language policy is that many students entering higher education have an inadequate command of English and cannot sustain academic studies at that level, particularly in the technical disciplines where materials available in Urdu are extremely limited. In fact terminal examinations consistently show maximum student failures in English, a compulsory subject at degree and intermediate levels. The secondary level English curriculum needs substantial revision, undertaken in close collaboration with scientists and technologists in higher education, to include relevant technical English and to ensure higher levels of English language competency in the intermediate cycle.

72. No serious consideration appears to have been given to the assessment methods used in higher education or their appropriateness to the objectives and subject content of the study programs. The main method of student assessment in Pakistan, the formal written examination, is not universally appropriate for measuring student achievement of the desirable aims of the higher education system. Further, the examination system as it is administered has serious shortcomings. For example there is no limit to the number of resits allowed, as illustrated by a newspaper announcement appearing in February 1989, which advised the 1978-79 and 1979-80 cohorts of engineering Bachelors students of the arrangements for their resit examinations. This reinforces concerns about the updating and relevance of syllabuses. The early-80s graduate would have little experience with current technology, for example in the microchip industry. It also raises questions about the examination procedures and the value of current data on completion rates. Pass rates in various affiliated colleges are significantly different. The 1988 Punjab Gazette examination result data showed 9 percent of the colleges had pass rates exceeding 75 percent, whereas at the other extreme, 9 percent had pass rates of less than 10 percent. A similar pattern exists in other provinces. No central review mechanism exists to improve this performance or optimize the use of

resources. Interestingly, the highest pass rates are usually registered in the girls' colleges. Finally, no solution has been found in Pakistan to the many forms of rampant cheating.

### **3. Academic Staff**

73. Personnel management practices for academic staff militate against establishing and maintaining high academic and vocational standards. The main difficulties arise over appointment procedures, inflexibility of formal qualification requirements for specific posts, probation and tenure, promotion, salary scales, staff appraisal and professional development, and incentives.

74. Appointment procedures differ significantly between universities and colleges. Universities have their own procedures involving interviews and formal selection committees. Even here, however, there is no evidence of clear job statements and appointment criteria. Because all posts are related to the civil service pay scales, formal qualification requirements are laid down by statute for each grade. There is no possibility of these requirements being waived, however inappropriate they may be for a particular lecturing post. This practice excludes community members who may have valuable, relevant contributions to make although they do not have the requisite formal qualifications. It also precludes according extra merit-based recognition to awardees of foreign advanced degrees--particularly for lengthy coursework or research doctoral programs in the sciences in prestigious foreign universities--and thereby discourages the best trained Pakistanis from returning home after extensive periods of postgraduate study abroad to take up academic appointments in Pakistani universities.

75. Colleges vacancies are filled by the Provincial Public Service Commission. This is a lengthy procedure. Directors of Education are empowered and obliged to make interim appointments of up to one year's duration. College principals themselves are effectively excluded from participating in both appointment methods. Once appointed to a university or a college, tenure is virtually automatic after the passage of time. The fact that salaries are rigorously tied to the Federal Government pay scales precludes the use of incentives to reward excellence or to reorganize and overcome shortages in critical subject areas. The performance review procedure is patterned on civil service appraisal formats and is inappropriate for academic staff. There is also a continuing requirement for research and scholarly activity. Innovative or creative potential is firmly ignored by the present system.

76. The inflexibility over salaries and the inability to offer real incentives and rewards have clearly prevented the introduction of rational systems for staff appraisal, and professional development. Apart from encouragement to obtain Ph.D.s in universities there is no evidence of formal coherent policy of academic staff development. The emphasis on research qualifications and training appears to be at the expense of other staff development activities, which especially for colleges are arguably more important and relevant. Very few staff members have been overseas for any purpose other than discipline-based training or research. Very little attention has been given to pedagogical studies applied to higher education. Because there is no system of industrial attachments, faculty members are rarely exposed to new processes.

77. Outside Pakistan, staff development and appraisal is recognized universally as an area of considerable concern and sensitivity, particularly for academic staff and for those dedicated primarily to teaching in first degree programs. Educational change cannot effectively be evolved and implemented without the collaboration of the staff concerned. Their willingness and ability to participate depends upon providing a comprehensive, coordinated and continuing program of appropriate staff development. Pakistani higher education has virtually none at present.

#### **4. Support Services**

78. Support services, including technical and non-technical support staff, libraries, technical equipment and computers, are insufficient and inadequate. Finally, a support service which appears to be wholly lacking is a formal student counselling service providing personal assistance and guidance during the courses and advice on career opportunities.

79. The earlier comments on the selection and appraisal of academic staff apply equally--or even more--to non-academic support personnel such as laboratory technicians, library, media and secretarial staff. The selection of these groups is subject to the same shortcomings, and their appraisal and conscientious development are remarkably absent. This results in unsuitable and unqualified staff serving laboratories and a generally inflexible support system resistant to change. The pay scales reflect this and appear to foster the mood of inflexibility and unresponsiveness. Staff establishment figures in universities for science, engineering and agriculture show an underprovision of technical personnel, while non-technical support staff abound. Of the total university establishment more than 50 percent of the posts are in administrative departments; fewer than 7 percent of the posts in the teaching departments are at support staff grades.

80. On the whole, the provision of buildings is adequate in most universities but not in most colleges. Even when the buildings could clearly stand some improvement, they are rarely the limiting constraint to improved service delivery (although libraries and computer facilities may be a partial exception to this rule in a few universities). Routine repair and refurbishment is reportedly difficult, especially in colleges, where it is centrally controlled and administered. Both universities and colleges frequently lack the special facilities and organizations essential to the successful functioning of institutions of higher education. For example, there are no academic staff accommodations suitable for tutorials, where students can be seen individually. There is also a shortage of well equipped staff common room facilities, of individualized working spaces for faculty, and of activities to encourage intellectual and pedagogic interactions and the development of an appropriate ethos of commitment and learning.

81. The libraries vary in the level of provision and operation but none visited was adequate by international standards of coverage and currentness of journals and periodicals, availability of reference materials and external reference services, physical space for student study with ready access to multiple copies of texts used in courses (a reserve book system). A reserve book system is an especially important input to learning when residence halls are crowded or students live long distances from campus. Open access systems are not generally available, although books are more accessible to students in Masters programs. None of the libraries visited had self-learning, student-centered material, audio-visual aids and support.

82. Although a few institutions have some modern computer hardware, there is little evidence of computer applications being widely injected into the curricula or of the equipment and support staff necessary to provide hands-on experience for students. Perhaps more than any single factor, computer illiteracy ensures technological dependence in today's world. This is no less true in the social sciences than in the natural and life sciences and engineering.

83. The availability of basic engineering and scientific equipment in the laboratories and workshops supporting the Bachelors programs varies among institutions. Faculty members and their support staff generally lack the training necessary to develop good modern laboratory practices. The equipment needs

upgrading; the supply of spare parts, a universal problem, would be even more difficult with the introduction of modern instrumentation and techniques. Any upgrading exercise would fail to improve the quality of the students' educational experience unless it provided a major component of staff training in new laboratory methods and techniques for academic staff, and maintenance and repair of equipment and laboratory management for support staff.

### ***5. The Link to Employment***

84. At present, higher education has few formal agreements or informal links with employers and is not required to develop such links. To assess the extent to which the present provision of higher education in Pakistan is meeting the real needs of its society, visits were made to various engineering and scientific organizations representing the employers of the outputs from the system. None of the employers felt they were able to provide effective input into the design, content or delivery of educational programs or to the identification of talented and committed students. It was also significant that each organization visited ran its own training program for graduates from the Bachelors and Masters courses. The main purpose of these courses, in addition to providing in-house information, was to encourage the students to apply their knowledge to real life problems, since they did not acquire this experience during their careers in higher education.

85. All the employers confirmed that they would welcome the opportunity to contribute to making the present programs more relevant. They also offered to provide current experience and practice to both students and staff. However, no evidence was found of positive, productive collaboration between the companies visited and the institutions of higher education. Some examples were quoted by universities, mostly in Masters programs, such as pharmacy and food science, of successful and effective cooperative work between the courses and their industrial partners. From the admittedly small sample of employers visited, it was found that the scientific and technological programs of higher education are not meeting their real needs. Instead, industry imports technology, re-trains graduates to use the technology, and pays foreign experts to adapt technology for local use.

86. More appropriate and independent industries and production units, geared to local needs and facilities, will need to be developed. To achieve this, and to realize the opportunities it would afford, the higher education sector must produce graduates who can demonstrate the application of knowledge, creativity and a capacity for learning which will enable them to keep abreast of modern developments in their field. Above all they must learn to be constructively self-critical and innovative.

### ***D. The Role of Research***

#### ***1. Definition***

87. Research is systematic enquiry conducted under rigorous scientific methods. Research can offer immediate and long-term benefits to the whole community, directly by improving crops, health and infrastructures, and indirectly by raising the level of understanding of nature and society and by fostering high educational standards. Research and other scholarly activities aimed at providing fresh insight into the existing body of knowledge are also essential ingredients in maintaining intellectual, academic and vocational standards.

88. In order to properly locate research within the context of higher education, it is helpful to identify several categories of the activity. Fundamental research seeks to add to the body of existing knowledge

without necessarily being concerned with its potential use; it addresses problems posed by nature. Applied research emphasizes the application and development of new theories and techniques to practical problems posed by man. The third category, sometimes known as problem-solving, covers the use of specialized techniques for development and testing.

89. This categorization is clearly overly simplistic. Among other difficulties the categories overlap and do not adequately encompass other valuable scholarly activities such as innovative book writing, state-of-the-art consultancy and referred papers. These scholarly activities can contribute greatly to high standards of teaching and learning. Moreover it should be recognized that attitudes toward the processes of fundamental and applied research, and their interrelationship, are changing rapidly, particularly with technological innovation. This is no longer seen as a lengthy linear progression from basic to applied research and thence to new products, but as a rapid cyclical iterative process involving a complex fusion of a wide range of research knowledge and skills.

90. Each category of research has a valid role to play in higher education, but its individual value to the system and its cost varies significantly. It is necessary to recognize and if possible quantify this when setting priorities and allocating resources. Few nations can afford to pursue fundamental research across a very wide spectrum of disciplines; no nation can afford to entirely eschew fundamental research. The high costs involved in many areas of fundamental and applied research means that research is now characterized by the selection of areas of concentration and designation of centers of excellence in appropriate fields of study. Increasingly this process is carried to the point of explicitly fostering international collaboration in selected areas of research. Within the academic world, applied research and technological innovation have traditionally been given less support and status. But they are now recognized to be as intellectually demanding, as costly as fundamental research and, often, to afford significantly greater and more immediate local returns. Involvement of academic staff in applied research also increases their knowledge of current industrial developments and practice, a prime method for building mutually beneficial links between academia and industry.

91. When discussing research in an academic context, it is therefore important to distinguish the categories involved and to assess as reliably as possible the real net value of the activity in assisting the system or an individual institution to achieve its stated objectives. It is also necessary, if the research activity is to achieve its objectives and if the traditional credence and status allocated to each category is to be changed, to set attainment targets and to provide incentives.

## **2. Planning**

92. The lack of productivity and success in research in Pakistan stems directly from the absence of overall planning. Consequences of this planning vacuum have been the inability: to set clear, realistic priorities; to manage the implementation of research activities; to agree on coherent and collaborative roles and responsibilities for the separate research councils, funding bodies, universities and institutions; to allocate accountability; to monitor progress and output against targets; and to establish incentive systems (rewards and sanctions) to ensure effective use of the limited available resources.

93. The emergence of parallel systems of research institutes and funding without an overall plan has clouded the legitimate research role of universities and has created a competing demand for scarce research resources. The effect on the universities is clear. They have failed to develop strong research leadership. Indeed, only 26 percent of the university faculty possess the fundamental research credential, the doctorate (Ph.D. or equivalent). Even under the most liberal interpretation of expense categories,

less than 5 percent of the universities recurrent budgets are spent on research-related work annually; the real figure is almost certainly well under half that amount. There is a chronic dearth of equipment and consumables. This dearth is exacerbated by the escalating expenditure on salaries for teaching and non-teaching university staff. The high percentage of the total budget provided by the government removes pressure to raise additional funds by contract research. There are no incentives for staff to sustain research activity and publication after promotion to certain grades. The prescriptive nature of the degree courses inhibits development of problem-solving and innovative abilities.

94. New initiatives taken by government funded bodies, including the establishment of new research centers, have been based on a limited, fragmented perception of the total problem. New initiatives have not been accompanied by mechanisms to assess their success or criteria for continued funding. There is also a strong feeling at grass-root level that research activities do not relate to the needs of the customer, for example in industry and farming, and that opportunities for collaborative projects and staff development programs are being overlooked. In retrospect a consensus is growing among the Provinces that the 1962 decision to separate teaching and research at the Agricultural Universities has been detrimental to both teaching and research. The new agricultural university in Peshawar reflects this swing of the pendulum towards combined research and teaching.

95. Despite major investment in establishing a parallel system of research organizations and funding outside universities, there is little tangible evidence that the productivity of research and development enterprise in Pakistan has benefitted significantly, particularly in the applied industrial fields (barring a few noteworthy exceptions). This investment has also inhibited the meaningful development of research in universities by tapping into the available resources.

### ***3. Implementation***

96. Coordination of policy formulation and implementation at the national level is the responsibility of the National Commission for Science and Technology. NCST was established in 1984 to approve policies and scientific and technological development plans and to coordinate the work of the various research organizations. This apex committee, chaired by the Prime Minister, was dormant until its first, and last, meeting in March 1989. The problems of implementation and coherence are reflected in the fact that there are nine research councils reporting to and funded by three ministries and eleven funding bodies. In addition there are 26 specialized institutions undertaking some category of research.

### ***4. Roles and Responsibilities***

97. The complexity and duplication of the roles and responsibilities of research organizations, funding bodies and research institutions has resulted in unacceptably low productivity compared to national needs and an inefficient use of resources. The ambiguous role of the Pakistan Council of Science and Technology, the tensions between it, the Pakistan Science Foundation and MOST, and questionable investment by MOST in developing science and technology manpower outside universities are examples of this overlap and inefficiency. An analysis of the terms of reference for the research councils clearly demonstrates significant areas of overlap and contradiction. The resultant fragmentation of research staff and other scarce resources has undoubtedly diluted the impact that could have resulted from an integrated cohesive structure and effort. Critical mass concentrations of the highest talent and best equipment are sine qua non for research productivity.

98. For reasons noted above most university departments are not active in research. The active departments unfortunately showed little evidence of a coherent research policy, including priorities and criteria for appraisal. One engineering department did not consider Ph.D. programs to be a necessary activity. This could be an acceptable position, particularly in view of the abstract nature of some doctoral programs in engineering, but relevant applied research is an essential ingredient of Bachelors programs in science and technology. The quality of teaching in applied research areas depends upon academic staff who master the full range of modern research methods, especially since the distinctions between basic and applied inquiry are quickly disappearing; such staff need to be drawn in from outside the universities. Many of the overseas Ph.D. programs currently being followed by academic staff appear to relate more to the needs of the overseas establishments than to the needs of Pakistani staff or their institutes. In many cases the research areas being pursued in the higher education sector matched the capacities and predilections of individual staff members, rather than those of their students or their role as teachers. Such research is normally characterized by an inefficient use of resources and the absence of essential peer group critical interaction.

99. The role of the private sector in research is not easy to identify, possibly because it is so insignificant. The turnkey nature of most industries visited meant that appropriate research and development activities were undertaken by the parent company or the supplier and resulted in few demands for local provision.

### ***5. Accountability***

100. The absence of an overall plan containing associated priorities, targets and designated unambiguous responsibilities has made it impossible to clearly allocate accountability and means of measuring performance. Research in universities results more from individual commitment and initiative than from any sense of performance measured against agreed goals, and accountability. In research institutions, governmental budget allocations comprise the majority of total income. There is no acknowledged formal recognition or reward for output or for the demonstrated ability to attract other sources of income. At the individual level there is no proper appraisal of performance linked to salary or tenure (with few notable exceptions). The Pakistan Agricultural Research Council (PARC) provides a telling example of the consequences of this lack of planning and accountability. The salary bill of the technical and non-technical staff of PARC has risen so much that only 15 to 20 percent of its budget is available for research expenditures in universities and research institutions. The accountability of national research bodies is confused and hampered by the many funding mechanisms involved and the absence of clearly stated objectives and criteria that can realistically be used to measure achievement.

### ***6. Incentives***

101. Incentives at the institutional level are not characteristic of the science and technology research system in Pakistan. The funding of university research centers and other research institutions is not linked to output. There are no performance-related indicators of effectiveness and efficiency, or any incentives given to attract the external funding that would demonstrate output relevance and value. Little evidence exists of incentives at the individual level. Even the limited room for manoeuvre imposed by the government pay scales and conditions of service are rarely employed. In exceptional cases, such as HEJ Institute of Chemistry in Karachi, where such incentives (tenure and probation) were operated, material and tangible outputs were notably higher than the norm.

## **7. Resources**

102. The resources required for successful research are a critical mass of staff with the relevant knowledge and skills and the necessary equipment and access to facilities. The organization and direction of a research unit must also recognize and cater to the special nature of the activity and the motivation essential for success. A few centers of excellence on university campuses possessed these prerequisites for fundamental research. Other centers of excellence were unable to carry out their mission either because of the lack of facilities, and staff of the appropriate calibre, or the absence of clear objectives and incentives. These centers also appeared to work more in isolation.

103. The provision of physical resources for research in Pakistan is insufficient to support the nature and level of research required and aspired to. In a world of rapid advances in microelectronics, biotechnology and materials sciences with revolutionary consequences for productivity worldwide, Pakistan is being left behind. The lack of collaboration between and rationalization of research centers and activities, the absence of incentives and proper encouragement to attract external funding further exacerbates the problem. The absence of planning and coherence in the national research activity is also illustrated by the wide differences in level of provision of facilities and lack of convincing examples of common use of expensive specialist items of equipment. Of the many research institutions, some are too small to function effectively and yet make no coordinated effort to collaborate.

104. The foregoing analysis of the major issues confronting the Pakistani system of higher education and research suggests that a great deal needs to be done to elevate performance of the system. The remainder of this review is dedicated to outlining a proposed strategy for reform and improvement of the sector.

## **III. TOWARD A STRATEGY FOR REFORM AND IMPROVEMENT**

### ***A. Introduction and Caveats***

105. The transformation of the higher education and research sector in Pakistan into a significant contributor to development will require a long-term, multifaceted and carefully sequenced effort. Part III offers a reform strategy, in the form of five logically linked objectives, and synthesizes that strategy in a Policy Action Matrix which identifies both the means to the attainment of each objective and the indicators of progress. It also details the rationale for the proposed strategy and suggests core principles to guide its implementation. In doing so, the report assumes that two indispensable preconditions for the success of any effort to improve higher education have been met.

106. First, statesmanship is essential. No reform effort can succeed without resolute and sustained commitment from Pakistan's political and administrative leadership to correcting the institutional, efficiency and service delivery weaknesses of the sector. In the new political environment of Pakistan, the role of elected representatives is especially important in this respect. The absence of such a commitment is widely considered in Pakistan to be a prime reason for past failures to bridge the implementation gap—the distance between understanding problems and identifying solutions and putting agreed improvements into practical operation.

107. Second, the overall policy environment needs to be conducive to change in higher education and research. A democratic political system puts a premium on accountability. An outward-looking, internally and externally competitive, open economy puts a premium on productivity and responsiveness to changing conditions in domestic and international markets. This stimulates demand for scientific and technological capacity that can only be met by the higher education and research sector through its production of knowledge and of versatile graduates with employable and transferable know-how and skills. In short, a vibrant political environment and healthy macroeconomy set the parameters for improvement of higher education and research. Without an enabling political and economic environment, reform of higher education will lead nowhere.

108. To be fully understood, Part III of this review, *Toward a Strategy for Reform and Improvement*, must be read in conjunction with Part IV, *Rationale for Reform and Improvement*, which sets out the five main objectives of a reform program and their sub-objectives. When these objectives are considered in conjunction with the specific means to their attainment and indicators for monitoring progress, as summarized in the Policy Action Matrix found at the end of Part III, a coherent strategy emerges. Part III also includes a discussion of how the strategy could be implemented: the stages, the principles and the main issues involved. Part IV considers in much greater detail the nature and extent of change implied in the matrix and presents the rationale for the postulated changes. It analyzes the functions that must be carried out in order to realize each of the main objectives of the strategy, and presents model structures and organizations to illustrate how this could be done.

### ***B. Major Objectives***

109. Improving higher education and research along the lines suggested by Part II's diagnoses of issues entails achieving five major objectives: (i) revitalizing the top level policymaking function for higher education and research; (ii) revamping the operational framework so that policies conducive to improved quality can be implemented effectively; (iii) increasing the available resources; (iv) improving efficiency; and (v) enhancing the development and delivery of services at the institutional level. Together with their sub-objectives, the means to achieve each of them, and the indicators of progress, these five interrelated objectives constitute one possible strategy for reform. To assist the understanding of this overall strategy, the following section describes some of its key components in detail. It should be emphasized, however, that the definitive description and rationale of all the components of the proposed strategy, including their functions, membership and organizational options, are given in Part IV. The strategy is summarized below.

110. The first objective is to revitalize the policymaking function for higher education and research. This will require the following actions at the highest political and administrative levels:

(a) a government statement of commitment to and support for the sector, centering around a clear exposition of its ultimate purpose and goals;

(b) creating an apex body, for the overall framework for the sector, responsible for macro policy formulation and oversight, including: setting and revising overall targets and priorities, embodying these in major resource allocation decisions enshrined in the budget, and approving the rules and procedures under which its executing agencies will implement policy. This function could be fulfilled by a Standing Inter-Ministerial Committee (SIMC) with up to five Ministers as members and with other co-opted members, including eminent individuals from industry and commerce and the main

executing committees under the apex body. SIMC would set up think tanks and working parties to generate new, revitalizing policies and activities.

(c) establishing an essential full-time special secretariat for the apex body. The special secretariat will prepare reports and information to inform decision and policymaking by SIMC, and will monitor progress in implementation. The most appropriate operational details for the secretariat will depend upon the finally chosen format for the apex body and its sub-structure. It must, however, have high status and calibre, and the authority to act on behalf of the SIMC between meetings.

111. The second objective is to create the operational framework under the apex body to stimulate improved quality by ensuring effective translation of agreed policies into concrete actions for individual institutions of higher education and research. This will necessitate:

(a) setting up an implementation structure of second level executing agencies, concerned principally with quality and efficiency. It would be responsible for generating and applying the guidelines, rules and procedures to ensure the effective translation of policy into action at the institutional level. For higher education, this would be achieved at the federal level by modifying and expanding the charter of the UGC to strengthen its funding role and to include efficiency and performance linked parameters. An independent National Council for Academic Accreditation and Validation (NCAAV) would also be set up. Research funding and evaluation would be vested in a new National Council (NCRFE) replacing the National Scientific Research and Development Board (NSRDB), and constituted jointly by the Ministry of Education and the Ministry of Science & Technology. The NCRFE charter should embrace all research funding, whatever the source. At the same time the Pakistan Council of Science and Technology (PCST) should be given a new charter for the oversight of research and development institutions under MOST. Thus the second tier implementation structure at the federal level would comprise four councils with appropriate mechanisms, including joint committees and membership, to provide common interpretation of policy and collaboration. In each province a counterpart organization should be set up for the accreditation and funding of higher education. Other organizational options remain available.

(b) achieving clear specializations by level of universities and colleges, including removing the intermediate streams (grades 11 and 12) from the degree colleges and reestablishing these two grades in secondary schools where they properly belong; some action is already afoot, albeit haltingly, in the provinces in this direction;

(c) enhancing the autonomy of individual universities, colleges and research institutions, whereby institutions gradually develop truly independent management, starting with the strongest first; and

(d) increasing private sector provision of higher education by relaxing impediments and instigating positive incentives to open new institutions.

**112. The third objective is to increase the overall envelope of resources available to the sector. This can be accomplished by:**

**(a) increasing charges levied on users of higher education services so that within a decade between one-third and one-half of recurrent operating costs are recovered from students;**

**(b) tapping additional private sources of financing for current publicly run establishments and, especially, by encouraging more private provision of higher education;**

**(c) generating additional revenue within the sector from increased fee-for-service activity; and**

**(d) increasing public financing to the education sector as a whole so that, even though the relative share of primary and middle levels will increase, there will also be increased funding over time for higher education.**

**113. The fourth objective is to ensure efficient use of all resources available to the sector. This can be achieved through:**

**(a) establishing a system of accountability for individual faculty members and institutions;**

**(b) creating strong incentives for faculty performance by employing faculty accountability measures as key determinants of faculty advancement and pay;**

**(c) establishing a system to measure institutional performance for universities, colleges and research institutions, and subsequently using that system to provide incentives for institutional improvements by distributing government grants to institutions in accord with published measures of institutional excellence. The revitalized UGC, NCAAV, and counterpart provincial executing agencies would take the lead in doing this;**

**(d) establishing a better balance between teaching and research;**

**(e) restructuring institution budgets to improve the balance between salary and non-salary expenditures, and between recurrent and capital expenditures;**

**(f) obtaining optimal use of available resources; and**

**(g) consolidating institutions and programs to reap economies of scale.**

**114. The fifth objective is to improve the development and delivery of services at the institutional level, thereby attaining the ultimate goal of enhanced quality in higher education and research. This will require:**

**(a) translating goals for higher education and research into action plans for individual educational and research institutions;**

**(b) developing methodologies and establishing criteria for resource allocation within the institutions;**

- (c) improving access to and selection for higher education;
- (d) enriching the educational experiences of students in higher education;
- (e) ensuring, maintaining, and monitoring quality in higher education programs;
- (f) improving the selection procedures for academic staff and providing them with assistance to improve their performance;
- (g) improving the efficiency and effectiveness of support services; and
- (h) coordinating and invigorating research both in educational and research institutions.

115. The five objectives are hierarchically and logically linked and within each one its sub-objectives are similarly, although more loosely, related. An awareness of these interrelationships is a prerequisite for success in designing an action program for the improvement of higher education and research. Piecemeal measures, which cannot take into account the interrelationships and interdependencies of objectives, are doomed to failure.

116. Progress towards the first objective--revitalizing the policymaking function--must underpin and trigger action on all other fronts. Only minimal progress can be made toward meeting the third (resource mobilization) or subsequent objectives before central elements of the institutional framework are revamped. Further, very little movement toward achieving greater efficiency (the fourth objective) is possible without also making the needed organizational changes and increasing resources (the first three objectives). Sustained improvement in the ultimate delivery of services to students and researchers within individual educational and research institutions will not be feasible without rectifying key aspects of the overall policy formulation and oversight environment, beginning to reorganize the institutional framework, mobilizing additional resources, and increasing the efficiency with which all resources are used. Stated differently, progress toward achievement of each objective both puts in place the conditions for and simultaneously contributes directly toward the achievement of later ones. Failure to design actions from such a strategic perspective has remained an important element in the ineffectiveness of discrete reform initiatives in the last two decades.

### *C. Strategy for Improvement and Reform*

117. The mere stipulation of an ordered series of objectives and sub-objectives does not by itself constitute an operational strategy for reform and improvement. The concrete and actionable means to achieve each objective must also be specified, along with verifiable indicators to assess whether each step has been taken and a clear responsibility has been assigned for each one. It is also necessary, in order to direct and assist implementation, to ensure a proper understanding of the nature and extent of change required and the rationale for the chosen strategy options. An attempt to do this is contained in the Policy Action Matrix found at the end of this section.

118. The Policy Action Matrix outlines a coherent strategy for reform and improvement of the sector, synthesizes the main objectives and sub-objectives, and encapsulates the recommendations for change derived from this review. For each main objective, the matrix specifies the responsibility for action, the action required, and the indicators to be used for monitoring implementation. In practice implementation will involve considerable flexibility and overlap between objectives. Following the initial commitment

and action at the highest level of government, progress toward other objectives can, and must, proceed concurrently. Decisions on timing and phasing of specific actions will depend upon the conceived urgency. The key to success is to judge each action by its contribution to attaining the strategic objectives and to ensure that the full set of actions selected will together sustain concurrent, balanced progress toward all the objectives.

119. Part IV employs conceptual models of possible organizations and structures to facilitate understanding of the matrix and its rationale. It emphasizes the functions that must be carried out in order to realize the main objectives of the strategy. This affords a deeper appreciation of the roles and relationships involved and the nature and magnitude of the change required, without focussing too sharply on the precise organizational structures, for which there are usually alternatives.

120. Four important principles underpin the strategy summarized in the Policy Action Matrix and justify the concrete institutional and action recommendations derived in Part IV and incorporated into the matrix. First, it is better to strengthen and adapt existing institutions and organizations than to create new ones, unless their retention will inhibit reform or perpetuate bad practice. Any institutions made redundant by the establishment of new ones should cease to exist. Second, decentralization of responsibility and accountability is the key to successful reform and improved responsiveness. Third, it is assumed that fundamental, enduring change requires careful preparation and phased implementation. Fourth, that the objectives are interlinked and must ultimately be systematically addressed if discrete measures are to be viable in the long term is no reason for short-term inaction. Many significant initiatives could and should be launched within individual education and research institutions without having the full panoply of reform measures in place. Prime examples include granting more autonomy for financial management, ensuring more efficient internal allocation of resources, and expanding private higher education provision.

121. The overriding imperative of quality improvement in higher education and research drives the key measures for the changes presented in the Policy Action Matrix. The implementation of these changes would put institutions of higher education and research in Pakistan in charge of their own destinies, to flourish or to flounder. Some would excel and expand, others would fail and perhaps close their doors, but it would become possible for quality to blossom throughout the system, and for the system to grow in response to Pakistan's development needs. The current arrangements effectively preclude this.

#### *D. Toward Implementing the Strategy*

122. Reform measures of the magnitude proposed cannot be implemented overnight. Ultimately, both the nation as a whole and the several interest groups most directly involved in higher education will benefit enormously from successful implementation of the needed reform. Success will depend critically upon marshalling public, non-partisan opinion through enlightened political leadership, especially by democratically elected representatives at national and provincial levels. The prospect of radical changes in long established behavioral patterns of students, teachers, researchers, and government civil servants may initially engender uncertainty and even resistance among some elements of these groups whose accustomed behavior would be threatened by the reform. For the reform to succeed, consensus must be developed within these groups around the ultimate wisdom and feasibility of the strategy. The several groups must come to want the reform, to see it in their interest.

123. There is profound skepticism in the higher education, research and business communities in Pakistan about the commitment of the politicians and the bureaucracy to effect the necessary reforms.

To overcome the perception from below that neither the political leadership nor the bureaucracy recognizes the importance of the sector will take time, carefully accumulated and disseminated experience, and strong political leadership.

124. Implementation of the reform strategy would comprise a series of stages with considerable overlap and flexibility between them. The first stage would involve elaboration and expression of the government's commitment to and policy for the sector including goals and priorities. The establishment of an effective apex body should proceed concurrently; it would naturally play a central role in high level policy formulation. The widespread distribution of this policy document (perhaps a formal Government White Paper) would initiate the second stage, which would concentrate on the establishment of a secretariat to the apex body and the institutional substructure required for the implementation of its policies and strategies. The latter would include the reorganization of the UGC and its role, and the creation of the National Councils for Academic Awards and Validation (NCAAV) and for Research Funding and Evaluation (NCRFE). The charter and accountability of the Pakistan Council for Science and Technology (PCST) would also need to be revised at this stage and the provincial bodies established in the light of SIMC policy. The relationships between these implementation bodies, SIMC, the Ministries and the Provincial Governments would also need to be clearly defined. SIMC would simultaneously commission special studies from its think tanks and set priorities and targets for its own operation and that of its executing agencies. In all its actions, SIMC should publicly and firmly demonstrate its determination to effect change and to ensure the openness of its procedures. Most importantly it should also produce a timetable for change that would take maximum advantage of the overlap between stages, while reiterating the main objectives of reform.

125. The third stage would start as soon as the structure of executing agencies is established. They would need urgently to decide and publish their own priorities, targets and operational procedures. In particular the educational and research institutions would have to be given as much notice as possible of their new obligations and opportunities. Discussions with federal and provincial bodies would be taking place during these stages to redefine roles and to relocate responsibilities. The precise relationships between the federal level and provincial level intermediary executing agencies, with due consideration of the constitutional boundaries, would be resolved at this stage.

126. The fourth stage would be to select the first autonomous institutions. This would require the apex body (SIMC) to receive and endorse the executing agencies' proposals for methods of evaluating and monitoring quality and efficiency. It would also provide an opportunity to put them to the test. At the same time, the executing agencies would expand their drive for improvement by beginning to apply the new procedures and standards to the several types of institutions. The transitional phase would be complete when SIMC and the implementation substructure are fully operational and autonomous higher education and research institutions, working within their ambit, are the norm rather than the exception. Realistically, the transition to the new policy regime would require several years.

127. In the long term, a system in which the customers are able to choose the institutions and programs that best meet their needs and aptitudes will inherently sustain the quality of the provision. During the transition period, however, it will be necessary to provide certain safeguards. During this period the accrediting bodies will emphasize their institutional evaluation and monitoring roles. They will adopt formal quality control and assurance methodologies based on the best existing practice. The provision of personal and career counselling services for students will be equally important.

128. This staged approach has the advantage that, while privileging quality improvement, it builds upon existing organizations, strengths and commitments, and develops a mechanism that can accommodate expansion of the system when this becomes sensible. Most importantly, the emphasis in the proposed approach to implementation is on closely monitoring the progress of a defined strategy in which responsibility and accountability for successful implementation clearly lie with individuals and organizations at each level and in which success is recognized and rewarded.

### ***1. Implementation Principles***

129. Adherence to the following five principles may ease the transition from the old to the new. First, the nation's attention and the experience of its intelligentsia must be engaged. The need for radical measures to improve higher education and scientific research is widely acknowledged in Pakistan, but the failure of recent fragmented efforts to deal with parts of the problem has given rise to despondency. National dialogue and debate on higher education and scientific research should therefore be intensified; this review may be helpful in that respect. The aim is to rekindle optimism that improvement is feasible through wide discussion of the new mandate for higher education and through a coherent strategy to implement it.

130. The promulgation of an authoritative affirmation of the sector as a major factor in the successful future development of the nation, referred to above, should be the culmination of a rekindled national dialogue and debate. SIMC would not only lead and direct the national debate on the importance and development of the sector, but would provide dynamism and focus to a series of initiatives and activities designed to present its mandate and heighten its profile and status. The involvement of organizations and individuals at many levels in this exercise would also greatly increase the number of participants concerned with effecting improvement and change and would encourage a feeling of ownership toward proposed reforms.

131. Second, precipitate action is undesirable. Careful planning should precede the introduction of the necessary legislative measures and administrative regulations. Planning should be followed by a carefully staged action program of the sort noted earlier. This would ensure that the proposed change, although inevitable and eventually radical, would be achieved through a process of directed evolution, not revolution. Tapered implementation would be built on good practice and the monitoring of successful developments. Realistic, concrete targets would be set for the realization of specific goals.

132. Third, wide participation of the interested parties in the planning process is essential, both to develop correct approaches and to ensure that they enjoy legitimacy. Widespread discussion of means and ends for the sector will provide essential guidance and support for those responsible for developing and implementing policy. It will also foster the sense of ownership that engenders a commitment to successful implementation. Full involvement in the dialogue and process must be sought from public personalities from industry and commerce, from political parties, senior ranks of Federal and Provincial civil services, professional associations and—crucially—the scientific community and students in higher education. Extensive use of think tanks by SIMC (ad hoc working parties or task forces) with equally diverse membership to develop proposals on specific themes would pay large dividends in the content and legitimacy of the measures eventually to be implemented.

133. Fourth, the desired changes in the behavior of institutions and individuals should be induced through performance related incentives to be established by government, rather than by compulsory direct measures. The role of government is to set and enforce fair and transparent rules and norms including

mechanisms which logically and consistently ensure that appropriate rewards and benefits follow the level of achievement of its targets.

134. Fifth, uniformity of response in time or in outcome is not a virtue. No effort should be made to ensure that the reform affects all individuals and institutions equally on the same timetable throughout the country. The several hundred institutions of higher education and scientific research cannot all quickly and simultaneously be transformed into institutions of quality. A few excellent institutions may emerge in a few years but many institutions will not improve for many years, or not at all; some may even die entirely. Similarly institutional uniformity is not an objective of the reform. Equity and social justice do not require that all institutions be of equal high quality, merely that the path to excellence should not be closed to talented individuals or worthy institutions. In the long term more institutions should aspire to join the ranks of quality.

## ***2. Implementation Issues***

135. Notwithstanding adherence to the general principles sketched above, difficult practical issues will arise during implementation. A few of the most obvious examples are noted below with possible solutions.

136. Despite the emphasis on participation and incentives, some individuals and organizations may resist change. The first step in such cases is to recognize and respond to the real motives for clinging to preserve the status quo. These are sometimes complex and obscure, but can often be overcome once they are identified and understood. Strictures or disincentives should apply where the implementation of agreed changes is being frustrated unreasonably. These would range from budget reductions at institutional level to redeployment and redundancy for individuals. Such consequences should follow automatically and inexorably from failure to implement planned changes and to meet specified targets. It will be necessary to clarify and ensure that institutions and individuals cannot be protected from the consequences of unreasonable resistance to reform. In the same way, enhanced promotion and financial rewards should automatically follow the successful implementation of change resulting in improved performance and efficiency.

137. Where proposals for change, such as institutional and course rationalization, lead to redundancies beyond the control of the staff concerned, steps should be taken to provide retraining and redeployment opportunities. It may also prove advantageous to provide attractive severance packages for academic and support staff. These could include enhanced early pension schemes funded by the institution. Such enhancements can normally be recouped quickly from the salary savings and the increased efficiency within the institution.

138. Long established conditions of service, particularly in the public sector, are major disincentives to change. The government's determination to tackle this problem in order to achieve significant improvement and reform will demonstrate to the nation the paramount importance attached to transforming the higher and research sector into a major contributor to development.

139. Most of these examples, and indeed the whole reform program, imply increased financial outlays by the government and the institutions, particularly in the transition period before the full effect of increased efficiency can be realized. Such incremental costs of transition to the new arrangements for the sector might well be the subject of sympathetic consideration for financing by external development assistance agencies.

## E. Policy Action Matrix

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<b>1. Revitalize the policymaking environment for higher education and research</b>			
<b>(a) Government commitment to and definition of the goals of higher education and research</b>	<b>(i) Affirm authoritative and unambiguous government commitment to the improvement of the higher education and research sector with full assurance of political, legislative, administrative and financial support as a matter of policy</b>		<b>Developing political and public consensus on sectoral reform and issuing a policy statement by the Prime Minister</b>
	<b>(ii) As part of the policy commitment, establish rational and achievable goals: (a) for the whole sector to reorient itself to productivity and measurable performance; (b) for the students of higher education to develop positive values of rationality, learnability, socialization, open-mindedness, active and ongoing quest for knowledge and independence of thought and action (rather than conformity and dogmatism), within the ideology of the Pakistani nation</b>	<b>◆ National dissemination of a policy document containing firm government commitment to sectoral reform and a clear statement of sectoral goals and objectives</b>	
	<b>(iii) Disseminate the above goals widely and repeatedly among the teachers, students, and society at large</b>		
<b>(b) Create an apex body with oversight for policy formulation and implementation, and a support structure</b>	<b>(i) Constitute and designate SIMC as the highest policy organ for higher education and scientific research in Pakistan and require that it review and approve each year a consolidated revenue and expenditure budget for the sector that determines the size of Federal Government block grants for universities, and research and development institutions and includes the distribution of research and development funds between universities and research institutes</b>	<b>◆ Regular 2 to 3 monthly meetings of SIMC, including the annual budget approval meeting</b> <b>◆ Regular meetings of the standing committees of SIMC to formulate proposals on policy questions and monitor implementation</b>	<b>Notification of a new charter for SIMC</b>
	<b>(ii) The apex body would establish appropriate standing committees to establish criteria and guidelines for quality assurances and control, resource allocation and monitoring</b>		

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
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(iii) SIMC would establish think tanks mandated to produce proposals on specific matters related to the policy formulation role of the apex body

**2. Create an institutional framework conducive to improved quality.**

**(a) Strengthen policy implementation, coordination and oversight bodies**

(i) Establish a special secretariat to support the apex body (SIMC). The special secretariat would formulate proposals for consideration and approval by the apex body on overall policy, performance monitoring, and other oversight functions for the higher education and scientific research sector to include: (a) annual preparation of the budget proposal for block grants for the universities and scientific research and development institutions; and (b) approval of the criteria and standards to be used by the second level executing agencies

(ii) Empower four intermediary executing agencies with policy implementation roles for: (a) quality assurance for higher education institutions—a National Council for Academic Accreditation and Validation (NCAAV); (b) resourcing and efficiency for higher education institutions—a revision of the role of UGC; (c) serving both functions for all research institutions, a National Council for Research Funding and Evaluation (NCRFE); and (d) a revised liaison and oversight role for PCST

(iii) Empower the NCRFE to exercise overall coordination of the nation's scientific research effort by requiring it to develop and implement criteria and procedures for allocating all federal funds from a block grant received annually from the SIMC secretariat for support of public sector institutions

- ◆ Setting up the special secretariat with senior staff seconded from the ministries and committees. The secretariat would be led by a small nucleus of permanent professional staff, and headed by a suitably eminent individual from the private sector or civil service.

- ◆ Notification of performance criteria for organizations and prescribed efficiency standards

- ◆ Create intermediary executing agencies—the new UGC, NCAAV, NCRFE, and PCST by initial charter or by reorganization of the existing UGC and modification of its charter

- ◆ Notification of the charter of the NCRFE

- ◆ Clear statement of criteria for allocation of public funds for research

- ◆ Mechanisms for monitoring, evaluating, and rewarding performance of individual organizations

Administrative reorganization

Federal legislation

Federal legislation

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<b>(b) Achieve clear specialization by level of universities and colleges, including delinking intermediate streams (grades 11 and 12) from degree colleges</b>	<b>(iv) Establish in each province a Provincial Council for Academic Funding and Efficiency (PCAFE) and require it: (a) to allocate all funds from the provincial budgets for college education among individual colleges on the basis of previously developed and announced efficiency standards and performance criteria; (b) abolish the Provincial Directorates of College Education and their Regional and Divisional Directorates, where they exist, transferring only their standard setting and performance monitoring functions to Provincial Councils for Accreditation and Validation (PCAA), taking account of the work of NCAAV in this area</b>	<ul style="list-style-type: none"> <li>◆ Establish charters of PCALE and PCAA</li> <li>◆ Indicators of performance criteria and efficiency standards for colleges</li> <li>◆ New budget formats</li> <li>◆ Enhanced autonomy of individual colleges</li> </ul>	<b>Provincial legislation</b>
	<b>(v) Ensure necessary coordination between UGC and NCFRE on funding of scientific research by reciprocal representation on governing boards</b>	<ul style="list-style-type: none"> <li>◆ Ensure reciprocal representation in UGC and NCFRE</li> </ul>	<b>Federal legislation</b>
	<b>(vi) Reinforce the professional and technical capacities of UGC, and NCFRE and provide such capabilities to PCALEs to develop input standards and performance criteria, and to apply the same in budget allocations</b>	<ul style="list-style-type: none"> <li>◆ Appoint professional staff to UGC, NCFRE and PCALEs</li> </ul>	
	<b>(i) Remove two-year BA degree level constituent colleges from university control and establish them under independent Boards of Governors</b>	<ul style="list-style-type: none"> <li>◆ Autonomous charter of constituent colleges</li> </ul>	<b>Provincial legislation</b>
	<b>(ii) Absorb the postgraduate (MA and MSc) programs in constituent colleges into the appropriate university faculties or establish them in new faculties</b>	<ul style="list-style-type: none"> <li>◆ Concentration of all Masters' level courses in science and selected humanities courses in universities</li> </ul>	
	<b>(iii) Plan for the eventual transfer of postgraduate (MA and MSc) programs in affiliated colleges to the appropriate university faculties or establish them in new faculties</b>	<ul style="list-style-type: none"> <li>◆ do</li> <li>◆ Moratorium on the establishment of new post-graduate colleges</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<b>(c) Enhance autonomy of individual universities, degree colleges and research institutions</b>	<b>(iv) Phased plan to sever the connection between the affiliated degree colleges and the general universities by requiring the PCAAV in each province: (a) to prescribe curricula, set and administer examinations, and award degrees for non-autonomous state-run colleges; and (b) to accredit autonomous colleges and their programs</b>	<ul style="list-style-type: none"> <li>◆ Greater diversity among courses and programs across colleges</li> <li>◆ Increased number of quality institutions and gradual demise of unproductive institutions and courses</li> <li>◆ Non-uniform and job relevant curricula</li> <li>◆ Improved student success rates</li> <li>◆ Reduced student indiscipline</li> </ul>	Provincial legislation
	<b>(v) Phase out all two-year degree programs at universities, thereby restricting first degree programs at universities to more rigorous three-year honors programs in carefully selected high priority disciplines (especially newly created disciplines)</b>	<ul style="list-style-type: none"> <li>◆ Enriched Bachelors' programs in universities</li> <li>◆ Emergence of new disciplines</li> </ul>	
	<b>(vi) Impose a complete embargo on establishment of additional intermediate colleges</b>	<ul style="list-style-type: none"> <li>◆ Gradual disappearance of intermediate colleges as institutions</li> </ul>	Policy stipulation
	<b>(vii) Vigorously implement current policy to introduce Grades 11 and 12 in selected secondary schools, and equipping these schools with adequate staff and physical resources</b>	<ul style="list-style-type: none"> <li>◆ Complete integration and social acceptance of inter stream into the secondary school culture</li> </ul>	do
	<b>(viii) Introduce Grades 9 and 10 in the free-standing low enrollment intermediate colleges in rural areas with little or no potential for growth—converting them into secondary schools—and transfer them to the Provincial Directorates of Schools</b>		do
	<b>(ix) Phase out intermediate streams in existing degree colleges by providing incentives to the colleges to shed secondary level instruction and by simultaneously expanding the physical infrastructure of nearby secondary schools so they can absorb Grades 11 and 12</b>	<ul style="list-style-type: none"> <li>◆ Complete integration and social acceptance of inter stream into the secondary school culture</li> </ul>	
	<b>(i) The apex body would stipulate a policy for enhancing autonomy in the higher education and research institutions</b>	<ul style="list-style-type: none"> <li>◆ General policy statement</li> </ul>	Policy stipulation

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
	<p>(ii) Remove the universities from direct provincial and federal control: (a) by restructuring the universities as public non-profit institutions under independent self-perpetuating Boards of Trustees or Governors with a majority of members from industry and commerce and a minority of members from relevant government agencies, (b) by explicitly requiring that university financing be diversified beyond public budgetary support; (c) by according universities unfettered powers to set all terms and conditions of employment and to hire, promote, remunerate, and fire personnel according to their own standards and procedures; and (d) by providing for their independent pursuit of self-prescribed goals</p>	<ul style="list-style-type: none"> <li>◆ Appointment of full-time chancellors or presidents of universities</li> <li>◆ Reconstituted senate, syndicate, and committee structures with strong representation from professionals and vastly reduced representation from pressure groups (teachers, students, etc.)</li> <li>◆ Majority representation from private sector on Governing bodies or Boards of Trustees</li> <li>◆ Gradually increasing income from enhanced user charges and other non-public sources</li> <li>◆ Faculty salaries independent of national pay scales</li> <li>◆ Performance-based hiring, firing, and promotion of faculty</li> <li>◆ Statements of individualized goals and objectives for each university</li> </ul>	
	<p>(iii) Establish full operational autonomy of the best and longest established degree colleges in each province by establishing them as public non-profit institutions under independent self-perpetuating Boards of Trustees or Governors with minority of members from government; (b) by granting them authority to set their own entry requirements, select their own students, develop their own curricula and, once accredited by the PCAAV, to award their own (undergraduate, BA) degrees; and (c) by according them full authority to set all terms and conditions of employment to hire, promote, remunerate, and fire personnel according to their own standards and procedures</p>	<ul style="list-style-type: none"> <li>◆ Selected colleges placed under autonomous Boards of Governors with a majority of members from the private sectors</li> <li>◆ Non-uniform courses, curricula, and student entry requirements</li> <li>◆ Charter to grant degrees</li> <li>◆ Accreditation with PCAAV</li> <li>◆ De-caderized and non-transferable faculty and performance-based hiring, firing, and promotion procedures</li> <li>◆ Faculty salaries independent of national pay scales</li> <li>◆ Increased income from student fees</li> </ul>	<p>Provincial administrative action</p>

<b>Objectives and Sub-objectives</b>	<b>Means</b>	<b>Indicator</b>	<b>Action by Government</b>
	(iv) For degree colleges remaining within the state sector, enhance the management authority of the Principal, operating under established rules, including provision for a management committee of senior staff: (a) to determine the overall size of the student body and to select students from among those declared eligible for admission on the basis of aptitude and potential; (b) to administer personnel policies (staffing mix, hiring, firing, and promoting); (c) to administer budgets (including procurement); and (d) to mobilize additional resources through fees or other revenue generating activities	<ul style="list-style-type: none"> <li>◆ Semi-autonomous College Management Councils composed of the Principal and senior faculty and operated under established procedures</li> <li>◆ Increasing revenue from enhanced student fees and other activities</li> <li>◆ College-based promoting and firing of faculty</li> <li>◆ Course accreditation secured from PCAAV</li> <li>◆ College-based student entry requirements and enforcement</li> </ul>	Provincial administrative action
(d) Increase private sector provision of higher education	<p>(i) Entrust management of selected, highly reputable nationalized degree programs under policy guidelines similar to those for independently-run, public, non-profit colleges to Boards of Governors appointed by their former owners</p> <p>(ii) Remove most legislative and administrative restrictions on establishment and operation of private institutions of higher education, leaving in place the minimal regulatory framework (including mandatory publication of a detailed annual report on educational results and finances) needed to prevent exploitation of students and their families</p> <p>(iii) Increase the incentives for individual and institutional investors from the private sector to establish degree colleges by such measures as opening special lines of credit from the nationalized banks and using public powers of eminent domain to acquire land for long-term lease to privately run institutions of higher education</p>	<ul style="list-style-type: none"> <li>◆ Increased number of denationalized colleges with appointed Boards of Governors</li> <li>◆ Pursuit of self-prescribed courses and curricula with PCAAV accreditation</li> <li>◆ Voluntary accreditation leading to a charter to award degrees</li> <li>◆ Self-prescribed student fee schedule</li> <li>◆ No financial support from public funds, except periodic grants-in-aid, if necessary</li> <li>◆ Increased private sector investment in establishing new colleges</li> <li>◆ Eased availability of loans from nationalized commercial banks for investors interested in setting up colleges</li> <li>◆ Easy access for investors to public land in urban and suburban areas</li> </ul>	<p>Administrative action provincial governments</p> <p>Legislation and administrative action</p> <p>Federal and provincial administrative action</p>

<b>Objectives and Sub-objectives</b>	<b>Means</b>	<b>Indicator</b>	<b>Action by Government</b>
	(iv) Eliminate the limit on deductions from taxable income of philanthropic donations by individuals and institutions for support of the capital costs of higher education	♦ Change in income tax laws	Federal legislation
<b>3. Mobilize sufficient resources</b>			
<b>(a) Enhance User Charges</b>	<b>(i) Remove all subsidies to students' residential accommodation and services to recoup actual unit costs from users with released funds to be used for additional residential accommodation</b>	♦ Increased recovery of hostel fees and service charges from students to offset the investment and operating costs ♦ Better maintenance of hostel facilities ♦ Expanded residential accommodation for students	Administrative action
	<b>(ii) Increase tuition fees in public institutions over ten years to 35 percent of recurrent expenditures on general higher education and 45 percent on professional higher education in annual increments of at least 5 percent</b>	♦ Three-fold increase in student fees in university and colleges initially and 20 percent additional annual increase thereafter throughout the decade	do
	<b>(iii) Allow universities and colleges to retain student fees for institutional use</b>	♦ Availability of supplementary resources in colleges and universities	Regulatory changes
	<b>(iv) Implement means tested scholarship and fellowship schemes, administered by local bodies or individual educational establishments to assure that qualified low-income students are able to attend colleges and universities</b>	♦ A fool-proof means testing mechanism in place ♦ Availability of adequate funds from public, local bodies, Zakat and other sources to support indigent but meritorious students	Administrative action
	<b>(v) Expand student loan schemes</b>	♦ Expanded loan opportunities from Banks and other sources	do
	<b>(vi) Permit colleges and universities to establish an institution-wide or departmental Development Fund to receive funds from the students for investments in quality</b>	♦ Analogy of Sindh's Colleges Development Fund replicated in other provinces	do
	<b>(vii) Impose prohibitive penal charges on ex-students unauthorizably occupying university and college hostels and enforce recoveries</b>	♦ Gradual elimination of unauthorized hostel occupants	do

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<b>(b) Tap additional non-public sources for finance</b>	<b>(i) Establish explicit authority for universities and colleges to seek endowment income from alumni, affluent organizations, individuals, and philanthropists, and raise income-tax exemption levels to facilitate generous endowment donations</b>	<ul style="list-style-type: none"> <li>◆ Establishment of Endowment Funds and endowment seeking mechanisms</li> <li>◆ Increased revenue from non-public sources</li> <li>◆ Gradual thawing of "givers" and building up of a tradition of giving</li> </ul>	do
	<b>(ii) Repeal the statute that denies colleges the right to raise endowment income</b>		Federal and provincial legislation
	<b>(iii) Provide partial tax offsets for the industrial and commercial sectors to sponsor students who have acquired admission into higher education institutions</b>	◆ Growing sponsorships of admitted students by the private sector	do
	<b>(iv) Implement major long-term arrangements with the private sector to establish new higher education institutions or operating components of existing ones so that specific private sector requirements are met by an increase in productivity</b>	<ul style="list-style-type: none"> <li>◆ Innovative cost-sharing arrangements between public and private sectors</li> <li>◆ Universities and colleges administering tailor-made courses for the private sector on a fee-for-service basis</li> </ul>	do
	<b>(v) Implement "sandwich programs"--alternating periods for study and relevant work and training--in higher education</b>	◆ Functional sandwich programs in engineering, technical and commercial institutions	do
	<b>(vi) Permit universities and colleges to seek donations of equipment and materials from industry</b>	◆ Growing availability of donated equipment and materials in educational institutions	Administrative action
	<b>(vii) De-nationalize selected colleges that were nationalized in 1972</b>	<ul style="list-style-type: none"> <li>◆ Increasing number of denationalized colleges</li> <li>◆ Budgetary relief on recurrent public costs of college education</li> </ul>	do

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<p>(c) Generate additional revenue in institutions of higher education and research</p> <p>(d) Establish incentives for universities and colleges to raise resources through (b), (c), and (d) above</p>	<p>(i) Provide incentives in universities and selected colleges to encourage contract research and carry out technical, social, and economic feasibility studies and other problem-solving assignments associated with ongoing and new development projects, by measures such as allocation of additional junior staff positions and reservation of some income returned by the universities from the contract to improve the research infrastructure in the departments</p> <p>(ii) Empower universities to generate additional income from their immovable assets (real estate, testing laboratories, etc.)</p> <p>(i) Condition some portion of the grant of public funds to universities and colleges on their demonstrated success in raising funds from other sources</p>	<ul style="list-style-type: none"> <li>◆ Growing university income from fee-for-service assignments</li> <li>◆ Growing involvement of universities and colleges in development and problem-solving assignments</li> <li>◆ Additional non-salary income for faculty</li> <li>◆ Improved research infrastructure</li> </ul> <ul style="list-style-type: none"> <li>◆ Increased university income from entrepreneurial activities</li> <li>◆ Availability of incentive grants to match own-generated revenue by universities and colleges</li> </ul>	<p>Entering into contractual arrangements with universities and colleges for development related studies and assignments</p> <p>Administrative action</p> <p>Administrative action</p>
<p><b>4. Ensure efficient use of resources</b></p> <p>(a) Establish a system of accountability for individual faculty members</p>	<p>(i) initiate a program of internal and external peer review of faculty publications</p> <p>(ii) Implement a system of student evaluation of each faculty member's performance in teaching courses</p> <p>(iii) Record the amount of revenue generated by each faculty member each year from contract research, industrial problem-solving and other income-earning scholarly activities</p>	<ul style="list-style-type: none"> <li>◆ Restructured faculty performance formats</li> <li>◆ Vastly improved quality and relevance of faculty publications</li> <li>◆ Growing use of diverse teaching and learning methods</li> <li>◆ Enhanced job satisfaction among faculty and less faculty turnover</li> <li>◆ Increased non-public university revenue</li> <li>◆ Sustained involvement of faculty in research and problem-solving assignments</li> <li>◆ Longer on-campus hours spent by faculty</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<p><b>(b) Create strong incentives for faculty performance by using faculty accountability measures to regulate faculty advancement</b></p>	<p><b>(i) Develop acceptable norms for faculty performance in different academic fields and different types of institutions</b></p> <p><b>(ii) Establish high grade review bodies to evaluate each faculty member's performance in research, teaching and service activities, every five years for senior faculty and every three years for junior faculty</b></p> <p><b>(iii) Regulate faculty promotions by, and relate pay levels to, results of review</b></p>	<ul style="list-style-type: none"> <li>◆ Improved faculty performance</li> <li>◆ Heightened faculty job satisfaction and morale</li> <li>◆ Faculty salaries delinked from national pay scales</li> </ul>	
<p><b>(c) Establish an accountability system to measure institutional performance of universities and colleges</b></p>	<p><b>(i) Require that NCAAV and PCAAV conduct and publish the results of formal institutional performance evaluations every three years</b></p> <p><b>(ii) Collect and disseminate annual information on each post-secondary institution under such headings as: (a) student wastage; (b) examination passes and failures by subject area; (c) workplace success of graduates (tracer studies); (d) student assessment of teaching; (e) student faculty ratios by academic field; (f) original research publications; (g) endowment income; and (i) contract income</b></p>	<ul style="list-style-type: none"> <li>◆ Enhanced efficiency of resource use and reduce wastage</li> <li>◆ Comparative performance data on universities and colleges available</li> <li>◆ Rationalized allocation of resources including performance incentives</li> <li>◆ Balanced student teacher ratios</li> <li>◆ Improved relevance of curricula and courses through feedback from graduates</li> <li>◆ Growing diversity among course offerings</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<p><b>(d) Create incentives for institutional improvements by distributing government grants to institutions in accord with measures of institutional excellence</b></p>	<p><b>(i) Set targets for improvements in each institution</b></p> <p><b>(ii) After three years grace period, increase grants for institutions that are meeting a defined proportion of targets and reduce those that are not meeting targets</b></p>	<ul style="list-style-type: none"> <li>◆ Differentiated grant programs</li> <li>◆ Differentiated institutional growth patterns</li> </ul>	
<p><b>(e) Improve the balance between teaching and research</b></p>	<p><b>(i) Relieve universities of the responsibility for indirectly overseeing affiliated colleges</b></p> <p><b>(ii) Convert the constituent colleges of the universities into free-standing degree colleges or fully integrated university faculties of departments with the full range of relevant activities</b></p> <p><b>(iii) Increase the capacity of universities to bid successfully for research grants and contracts</b></p> <p><b>(iv) Provide incentives for contract research, studies, surveys and problem-solving assignments and share the revenue between faculty and universities</b></p> <p><b>(v) Approve higher credit for active student research compared with desk dissertations as pre-requisite for awarding M.Phil. and Ph.D. degrees</b></p>	<ul style="list-style-type: none"> <li>◆ Greater in-house development of universities' own faculty and research programs</li> <li>◆ Increased number of autonomous degree-awarding colleges</li> <li>◆ Expanded and strengthened university faculties and departments</li> <li>◆ Expanding research activities in the universities</li> <li>◆ Increased revenue from non-public sources</li> <li>◆ Greater job satisfaction among faculty and their increased income</li> <li>◆ Enhanced student involvement in research work</li> <li>◆ Improved quality of student output</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<b>(f) Improve the balance between salary and non-salary expenditures in favor of the latter in universities and colleges</b>	<p><b>(i) Fix realistic norms to finance research, consumable materials, library acquisitions and other development work out of the recurrent budgets and make these norm-based allocations non-fungible with salaries</b></p> <p><b>(ii) Issue and enforce norms for determining faculty strength</b></p> <p><b>(iii) Gradually reduce expenditure on salaries of non-essential non-teaching staff</b></p>	<ul style="list-style-type: none"> <li>◆ Steadily increasing budget allocations to non-salary items</li> <li>◆ Equitable teacher-student ratios across faculties, departments, subject areas, and educational levels</li> <li>◆ Restricted growth of senior positions for Professors and Associate Professors in universities</li> <li>◆ Sustained reduction in the numbers of non-teaching and non-technical support staff</li> </ul>	
<b>(g) Improve the balance between capital and recurrent expenditures in universities</b>	<b>(i) Develop and enforce reasonable space norms for academic, administrative, residential and communal facilities in universities to limit massive capital investments</b>	<ul style="list-style-type: none"> <li>◆ Sustained reduction in unit areas in non-academic buildings</li> <li>◆ Shared use of teaching and learning spaces across faculties and departments</li> </ul>	
<b>(h) Facilitate optimal use of available resources</b>	<p><b>(i) Institute program budgeting</b></p> <p><b>(ii) Delegate full procurement powers to institutions</b></p> <p><b>(iii) Empower universities and colleges to reappropriate budget allocations within and among programs to effect efficiency savings</b></p>	<ul style="list-style-type: none"> <li>◆ Easy comparability of program unit costs</li> <li>◆ Balanced budgetary provisions within and across various programs</li> <li>◆ Enhanced fungibility of allocations</li> <li>◆ Diminished incidence of lapse of funds</li> <li>◆ Timely and efficient utilization of procurement allocations</li> <li>◆ Balanced and fully utilized budgets</li> </ul>	<p><b>Administrative action</b></p> <p><b>do</b></p> <p><b>Administrative action</b></p>

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
	(iv) Streamline quarterly releases of budgeted amounts to ensure timely expenditures	♦ Uniform spread of expenditures in each financial year with minimal lapse of funds	do
	(v) Continuously monitor space use and improve space utilization through efficient time-tabling and inter-departmental and inter-faculty sharing of teaching and learning spaces	♦ Reduced incidence of over-crowding or under-used or empty teaching-learning spaces at any given time during a working day	
	(vi) Extend the on-campus hours dedicated to academic pursuits of teaching staff in universities and colleges to a minimum of 35 hours weekly	♦ Adoption of secretariat working hours in colleges and universities ♦ Full-time, on-campus presence of all faculty members	
	(vii) Extend the hours of utilization of available physical plant, including second shifts and evening courses, when feasible and necessary	♦ Tailor-made short courses for working population ♦ Community gatherings and cultural meetings in the evenings	
	(viii) Introduce summer courses during the long vacation	♦ Reduced overall course durations	
	(ix) Declare all university and college faculty to be non-vacation staff	♦ Full-time, on-campus presence of all faculty members during long summer vacation	Administrative action
	(x) Introduce inter-disciplinary courses and programs	♦ Joint administration of courses and programs by various faculties, for example, bio-engineering	
	(xi) Derive comparative unit costs of various educational programs and explore areas of efficiency savings through use of alternative educational modes and methods	♦ Variable student groups in classes and seminars ♦ Individual and group tutorials ♦ Distance education programs ♦ Individual self-study ♦ Reduced unit costs of courses and programs	

<b>Objectives and Sub-objectives</b>	<b>Means</b>	<b>Indicator</b>	<b>Action by Government</b>
<b>(i) Promote economies of scale</b>	<p><b>(i) Prohibit establishment of small new degree colleges, convert uneconomic small degree colleges into higher secondary schools for grades 9 to 12 and expand residential capacity of centrally located colleges having growth and improvement potential to accommodate students from rural areas</b></p> <p><b>(ii) Raise enrollments in newer and smaller universities rather than setting up additional universities or campuses in the public sector</b></p> <p><b>(iii) Concentrate disciplines with overall low enrollments in selected institutions with cognate disciplines rather than dispersing them among many institutions</b></p> <p><b>(iv) Gradually phase out under-enrolled, under-productive disciplines and departments from general universities</b></p> <p><b>(v) Restrict the multiplicity of subjects offered in degree colleges to avoid uneconomically small class sizes in general subjects</b></p> <p><b>(vi) Expand the mandate of general colleges to encompass professional courses and encourage amalgamation of small professional colleges into general colleges and vice versa</b></p>	<ul style="list-style-type: none"> <li>◆ Growth in the number of well-endowed urban area colleges with 4,000 to 6,000 enrollment</li> <li>◆ Gradual demise of small rural degree colleges</li> <li>◆ Vastly expanded hostel facilities in urban mega-colleges</li> <li>◆ Enrollments of 8,000 to 15,000 in average universities</li> <li>◆ Complete embargo on establishing new universities</li> <li>◆ Increasing specialization in universities</li> <li>◆ Growing cross-country mobility of students</li> <li>◆ Marked reduction in course options in individual universities</li> <li>◆ Reduced course options and improved quality of courses and programs</li> <li>◆ Growth in the number of multi-disciplinary colleges</li> </ul>	
<b>5. Improve the development and delivery of services</b>	<p><b>(a) Translate the goals into action strategies</b></p> <p><b>(i) From the agreed goals derive working level objectives of institutions and organizations engaged in the sector, including those that undergo reorganization, the new Special Secretariat and establish clear terms of reference for them</b></p>	<ul style="list-style-type: none"> <li>◆ Marked reduction in student failure rates</li> <li>◆ Improved employability of products of higher education</li> <li>◆ Increased research output (publications, doctoral degrees, new processes and materials)</li> <li>◆ Universities securing expanded number of problem-solving contracts</li> </ul>	

<b>Objectives and Sub-objectives</b>	<b>Means</b>	<b>Indicator</b>	<b>Action by Government</b>
	<p>(ii) Within agreed goals and objectives, establish priorities and targets of action to foster a shift toward a demand-led system and institutional autonomy</p> <p>(iii) Prepare long-term and medium-term plans of change and development including implementation strategies</p> <p>(iv) Implement action plans</p>	<ul style="list-style-type: none"> <li>◆ Increased number of industrial products and pilot plants</li> <li>◆ Improved varieties of high yield agricultural seeds</li> <li>◆ Growing diversity of programs and courses within and across universities and colleges</li> <li>◆ Reduced duplication of research effort and wastage</li> </ul>	
<b>(b) Develop a methodology of resource allocation</b>	<p>(i) Evolve the data base required to support and monitor the sector performance</p> <p>(ii) Delineate criteria and norms of resource allocation to institutions and programs</p> <p>(iii) Monitor performance and make adjustments where necessary</p>	<ul style="list-style-type: none"> <li>◆ Differentiated distribution of public resources between good and bad institutions</li> <li>◆ Improved rates of return on public investments</li> <li>◆ Transparent criteria of resource allocations</li> </ul>	
<b>(c) Improve access to tertiary education</b>	<p>(i) Rationalize the distribution of inter level work in secondary schools and inter colleges</p> <p>(iii) Review higher education entry requirements to include motivation and potential in addition to examination performance at inter level</p> <p>(iv) Review first-year Bachelors programs for appropriateness of content and level taking account of the inter level of knowledge</p> <p>(v) Monitor cohort progression over the years to refine instruments and approaches for student selection</p>	<ul style="list-style-type: none"> <li>◆ Full integration of inter colleges into the secondary stream</li> <li>◆ Growing use of aptitude tests and attitude inventories</li> <li>◆ Improved student retention and pass rates</li> </ul>	

<b>Objectives and Sub-objectives</b>	<b>Means</b>	<b>Indicator</b>	<b>Action by Government</b>
<p><b>(d) Enrich the educational experience of students of higher education</b></p>	<p><b>(i) Add one-year Honors Program at the B.A. and B.Sc. level in universities for those students who wish to pursue further studies</b></p>	<ul style="list-style-type: none"> <li>◆ Steady expansion in Honors courses</li> <li>◆ Improved student preparedness for Masters and Post-Masters programs and lesser attrition at the Masters' level</li> <li>◆ Increased Ph.D. enrollment</li> </ul>	
	<p><b>(ii) Introduce project work in laboratories and workshops as part of the general learning process</b></p>	<ul style="list-style-type: none"> <li>◆ Substantive departures from stereotyped and highly structured "experiments"</li> </ul>	
	<p><b>(iii) Promote inter-disciplinary courses of study</b></p>	<ul style="list-style-type: none"> <li>◆ Availability of courses like Bio-technology</li> </ul>	
	<p><b>(iv) Strengthen the statistical and mathematical underpinnings of courses in science and technology</b></p>	<ul style="list-style-type: none"> <li>◆ Introduction of Mathematics and Statistics as integral components of science and technology courses including biological sciences</li> </ul>	
	<p><b>(v) Broaden the learning process by emphasizing self-learning responsibilities of students</b></p>	<ul style="list-style-type: none"> <li>◆ Increased number of self-study and library search assignments for students</li> </ul>	
	<p><b>(vi) Systematically build extended use of library services into the teaching-learning process</b></p>	<p>do</p>	
	<p><b>(vii) Provide incentives for teachers to use diverse teaching methods</b></p>	<ul style="list-style-type: none"> <li>◆ Faculty assistance programs in the use of educational methods, materials and media</li> <li>◆ Recognition of improved teacher performance in periodic appraisals and concomitant rewards</li> </ul>	
	<p><b>(viii) Improve resources (equipment, technical staff and training) for the extended use of computers in colleges and universities in the teaching-learning process</b></p>	<ul style="list-style-type: none"> <li>◆ Widespread use of computer-aided instruction and learning across faculties</li> </ul>	
	<p><b>(ix) Integrate regular internal assessment of students into the teaching-learning process</b></p>	<ul style="list-style-type: none"> <li>◆ Assignment of 40 percent credit to internal assessment of students in their final transcripts</li> </ul>	
	<p><b>(x) Encourage faculty to minimize use of "chalk and talk" and substitute the Socratic methods, use of case studies, seminars, etc.</b></p>	<ul style="list-style-type: none"> <li>◆ Accumulation of case studies</li> <li>◆ Growing use of group tutorials</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<p><b>(e) Monitor, maintain and ensure quality in higher education program</b></p>	<p><b>(i) Establish loosely-linked Provincial Councils covering Accreditation and Validation (PAAV) for all autonomous and private non-autonomous colleges and provide them with clear terms of reference linked to the NCAAV, and significant representation from output users</b></p> <p><b>(ii) Improve national and provincial curriculum design and development practices through energizing existing mechanisms and developing new ones with representation from output users, professional bodies, curriculum bureaus and higher education and research institutions</b></p> <p><b>(iii) Provide to the university and college faculty and curriculum design bodies specific training on methodology including needs assessment, curriculum objectives, syllabus design, teaching-learning and assessment methods and progress monitoring and review</b></p> <p><b>(iv) Institutionalize periodic reviews and updating of the curricula</b></p> <p><b>(v) Establish national standards for examination procedures and moderation including safeguards for quality, equity, and comparability</b></p>	<ul style="list-style-type: none"> <li>◆ Growing diversity among programs and institutions</li> <li>◆ Improved physical facilities</li> <li>◆ Faculty build-up</li> <li>◆ Closures of unproductive and uneconomical programs and institutions</li> <li>◆ Transparent criteria of accreditation and their unbiased application</li> <li>◆ Holding of periodic curriculum reviews</li> <li>◆ Improved balance between curricula breadth and depth in various courses and subjects</li> <li>◆ Greater specificity of curricular objectives</li> <li>◆ Greater involvement of IERS and Curricula Bureaus in pedagogical assistance to faculties and departments</li> <li>◆ Continued reference to industry and employment market for needs assessment</li> <li>◆ Close proximity of curricula to educational and employment needs</li> <li>◆ Widespread use of objective test items</li> <li>◆ Improved curriculum design and evaluation skills among faculty</li> <li>◆ Introduction of normal curve grading</li> <li>◆ A stream-lined public examination system with minimal malpractices</li> </ul>	<p><b>Provincial legislation</b></p>

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
	(vi) Shift toward demand-led provisions by funding institutions at norm levels for validated courses with incentives for improved efficiency and performance	<ul style="list-style-type: none"> <li>◆ Differentiated funding mechanisms for accredited programs and institutions with transparent criteria of funding for norms and incentives</li> <li>◆ Individualized growth and development among different institutions</li> </ul>	Administrative action
(f) Improve the selection procedure of academic staff and provide them with planned assistance in improving their performance	(i) Review procedural constraints on academic staff appointments and remuneration and produce new conditions of service and tenure	<ul style="list-style-type: none"> <li>◆ Localized recruitment of faculty</li> <li>◆ Decaderization of college faculty</li> <li>◆ Delinkage of faculty selection from the purview of Federal and Provincial Public Service Commissions</li> </ul>	Regulatory changes
	(ii) Involve the employing institutions substantively in academic staff selection	<ul style="list-style-type: none"> <li>◆ Removal of pressure group representation from faculty selection bodies and growing representation of employers</li> </ul>	
	(iii) Institute staff development as an ongoing activity to include research experience, pedagogy, subject updating and industrial experience	<ul style="list-style-type: none"> <li>◆ Discrete recurrent funding provision for faculty development in annual budgets</li> <li>◆ Diversified needs-based staff development programs</li> <li>◆ Industrial attachments of faculty</li> </ul>	Administrative action
	(iv) Specify proportions of institutional budgets for staff development and incentives for satisfactory completion of staff development programs and activities	<ul style="list-style-type: none"> <li>◆ Growing provision for faculty development abroad</li> <li>◆ At least 50 percent provision reserved for university and college faculty in federal programs of high level staff development abroad</li> </ul>	
	(v) Reinforce the National Academy of Higher Education, existing Institutes of Education and Research and establish new centers, where necessary, for providing pedagogical support to academic staff as one of their functions	<ul style="list-style-type: none"> <li>◆ Expanded facilities and faculty in National Academy of Higher Education and IERs</li> </ul>	
	(vi) Use distance learning resources of AIOU to support the pedagogical development of university and college teachers	<ul style="list-style-type: none"> <li>◆ Growing involvement of AIOU in higher education faculty development</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<b>(g) Improve the efficiency and effectiveness of support services in higher education</b>	<b>(vii) Institute performance-based appraisal of academic staff through alternate modalities such as peer appraisal and some form of students' appraisal</b>	<ul style="list-style-type: none"> <li>◆ Restructured appraisal instruments</li> <li>◆ Growing self-development effort by faculty</li> <li>◆ Improved faculty performance</li> </ul>	
	<b>(viii) Base staff career development decisions on a performance-based appraisal system and make corresponding changes in service rules</b>	<ul style="list-style-type: none"> <li>◆ Restructured probation and tenure system</li> <li>◆ Enhanced job satisfaction among faculty</li> </ul>	
	<b>(i) Expand institutional libraries so that they become central resource centers</b>	<ul style="list-style-type: none"> <li>◆ Increased recurrent library budgets</li> <li>◆ Augmented and modernized library content including journals and magazines</li> </ul>	
	<b>(ii) Introduce a major program of micro-computer availability in universities and colleges along with associated staff development</b>	<ul style="list-style-type: none"> <li>◆ Increased availability and use of computers</li> </ul>	
	<b>(iii) Review technical support staff deployment practices, identify and make up deficiencies and initiate ongoing training and development of support staff in priority areas</b>	<ul style="list-style-type: none"> <li>◆ Balanced provision of qualified technical staff</li> <li>◆ Discrete budget for technical support staff development</li> </ul>	
	<b>(iv) Establish a full-time student counseling service in each institution to provide personal and career services</b>	<ul style="list-style-type: none"> <li>◆ Informed selection of courses by students and lesser incidence of over-enrolled and under-enrolled courses</li> <li>◆ Improved student placement in training and jobs</li> <li>◆ Reduced student indiscipline</li> </ul>	
	<b>(v) Ensure adequate availability of recurrent funds for consumable materials and operation and maintenance requirements of physical plant and services</b>	<ul style="list-style-type: none"> <li>◆ Well-provided laboratories</li> <li>◆ Efficient campus maintenance</li> </ul>	
	<b>(vi) Assist in improving the communal life of faculty and students</b>	<ul style="list-style-type: none"> <li>◆ Proliferation of students, professional and cultural groups</li> <li>◆ Faculty club</li> <li>◆ On-campus community events</li> </ul>	

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
<p><b>(h) Coordinate and invigorate research in all educational and non-educational institutions and establishments</b></p>	<p><b>(i) Establish and disseminate clear terms of reference for the apex body for coordinating all non-military research</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Balanced distribution of research and development work in universities and research and development organizations</b></li> <li>◆ <b>Reduced duplication of effort</b></li> </ul>	
	<p><b>(ii) Prepare and issue a national research policy statement, with aims, strategies and priorities</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Updated research and development policy document</b></li> <li>◆ <b>Macro and micro plans of action</b></li> </ul>	<p><b>Administrative action</b></p>
	<p><b>(iii) Enhance the resources for and coordination between the NCAAV and NCRFE to reinforce their support of the research and development effort</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Increased public allocations to universities and research and development organizations</b></li> <li>◆ <b>Increased fee-for-service activity along with public-financed incentives</b></li> </ul>	<p><b>do</b></p>
	<p><b>(iv) Review existing and designate new centers of research concentration and excellence in universities according to agreed performance criteria</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Gradual phasing out of non-productive centers</b></li> <li>◆ <b>Selective growth of productive centers</b></li> <li>◆ <b>Non-geographic location of new centers</b></li> </ul>	
	<p><b>(v) Derive and notify criteria and targets for monitoring and assessing the output and performance of all research institutions</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Transparent criteria of resource allocation</b></li> <li>◆ <b>Individualized and targeted plans of action</b></li> <li>◆ <b>A self-regulating system of performance monitoring</b></li> </ul>	<p><b>Administrative action</b></p>

<i>Objectives and Sub-objectives</i>	<i>Means</i>	<i>Indicator</i>	<i>Action by Government</i>
	(vi) Develop a methodology for core funding of research institutions and incentive funding based on performance	<ul style="list-style-type: none"> <li>◆ Sustained core budgets over a period of time</li> <li>◆ Differentiated incentive allocations</li> <li>◆ Increased competitiveness among research and development organizations</li> </ul>	
	(vii) Catalyze productive collaboration with research institutions	<ul style="list-style-type: none"> <li>◆ Twinning arrangements with industry and research and development organizations</li> <li>◆ Reciprocal representation on policy management bodies</li> <li>◆ Growing development of indigenous technology</li> <li>◆ Reduced reliance on imported turn-key technology</li> </ul>	Tax incentives to industry and protectionist measures for indigenous industry

## **IV. RATIONALE AND MODELS FOR REFORM AND IMPROVEMENT**

140. This chapter provides a three stage commentary on the matrix to facilitate its understanding and present its rationale. The five main objectives of the proposed strategy for reform are first explained by the functions that must be performed at various levels. This expository approach affords a deeper appreciation of roles and relationships and avoids focussing prematurely on the organizational implications of potential solutions. Finally, the recommended model in the Policy Action Matrix is derived by applying three general principles. First, it is better to strengthen and adapt current institutions and organizations--redefining their legal status, mandates, and membership--than to create new ones from scratch. The establishment of brand new agencies and structures is suggested only where no other alternatives are available. Second, the decentralization of operational responsibility, with accountability, is the key to success. An improved institutional framework facilitates downward delegation of managerial authority to and within institutions. It reserves for the higher levels only policy formulation and oversight, the latter to be accomplished by evaluating against defined criteria and targets. Third, it is accepted that radical and lasting change cannot be achieved precipitously and ubiquitously; careful preparation and tapered introduction are paramount.

### ***A. Revitalizing the Policymaking Function***

141. Successful policymaking arrangements for higher education and research usually exhibit common characteristics: a firm and manifestly credible commitment by government to higher education and applicable research; a small apex body to generate macro policy for the sector; and the use of this apex body, with continuing high level government participation, to oversee the operation of appropriate substructures at national and sub-national levels. These substructures are responsible and accountable to the apex body for the quality and efficiency of all higher education and research institutions.

#### ***1. Government Commitment and Goals***

142. The government's unequivocal commitment to the reform of higher education and research needs to be signalled by a statement of intent and support for the sector. This policy statement should address national needs and priorities, but must clearly indicate the general nature and extent of necessary changes. It should patently carry the full authority and support of both executive and legislative branches of government and should be concise, unambiguous and specific in order to avoid misinterpretation and delay. In this statement, government needs to elucidate, with equal authority: (i) how it intends to sustain its commitment and ensure that its macro policies and priorities are converted into realizable programs; and (ii) how these programs will continue to be developed, promulgated, implemented, monitored and reviewed at the appropriate levels, both federally and provincially. The statement should also cover aspects such as: the place of technology development in the nation's overall economic growth strategy; the role of higher education and research institutions, including their links with industry, in technology development; socio-economic constraints; the imperatives of quality and of efficiency and the operational meaning of those concepts.

143. Such a statement of overall policy, including goals, priorities and targets, is essential to provide drive, focus and direction to detailed strategy development and decision making, which must take place for and within the sector. Its widespread distribution and discussion will provide necessary guidance to those responsible for developing and implementing change. It is important that this statement resists the

temptation to compromise, generalize or platitudinize. It will provide a framework for restructuring, integrating and improving the institutions and activities involved, and for controlling the undue proliferation of institutions and courses.

## **2. *The Apex Body***

144. It is not the role of government at the highest level to produce detailed blueprints for change or to directly manage change. Rather the responsibilities of government at the highest levels are to: (i) specify and publish overall goals and priorities; (ii) formulate macro policy to achieve them, including policies to allocate scarce public resources and provide the proper incentives for use of private resources; (iii) ensure through careful monitoring that the policies are reliably translated into realistic action programs at national, sub-national, and institutional level; (iv) reformulate goals, priorities, and policies in response to changing external factors and implementation experience; and (v) maintain the pressure for improvement, by being apprised of progress and problems with implementation.

145. One way to discharge these responsibilities, without adding greatly to the bureaucracy and inertia of the system, is to establish a small special purpose council at the apex of government. Typically an apex body is at or above ministerial level, but is not an executive organ. It delegates, but does not abrogate, some of its authority by operating through an appropriate subcommittee structure responsible directly to it. As considered in more detail below, the apex body needs a permanent secretariat to formulate proposals, to monitor progress, to provide background information and data to inform its policymaking, and to coordinate and support the work of the subcommittee structure. In this connection, the apex body would regularly receive for approval and endorsement: policy recommendations, proposed action programs, recommended procedures, and progress reports submitted by its subcommittees. Its role is to ensure that these submissions comply with the formulated macro policy and the strategy for its implementation. Endorsing and authorizing strategy and implementation at the top level is essential in order to maintain the impetus for change, to ensure that the members of the body are aware of progress, and to enable them to revise and redirect the program as necessary.

146. The most important enabling instrument of the apex body is its annual review and approval of a consolidated revenues and expenditures program for the sector as a whole, accompanied by a coherent statement of sector policies and program priorities to be served by this consolidated budget. The size of the overall Federal Government block grants to the resourcing agencies for higher education and for research would be stipulated in this program budget, but not the distribution of resources by individual institution; this would be decided only by the resourcing agencies on the basis of criteria approved and published by the apex body, following development by the executive organs themselves and vetting by the apex body subcommittees. Many of these criteria should be performance or output-related, rather than input-related. This consolidated budget for the sector would, for the first time, provide a comprehensive overview of sources and uses of resources for higher education and research in Pakistan.

147. Subcommittees of the apex body could be of two kinds. A few standing committees could be established for key functions, such as consolidated budget review, and oversight of resource allocation rules or of quality assurance and control rules and procedures. Although chaired by an apex body member, the standing committees would also include experts who do not sit on the apex body, drawn from the agriculture, industry, and service sectors, and from higher education and research institutions. More frequently, the apex body could also set up ad hoc blue ribbon task groups—think tanks—to nourish its policy formulating role. A think tank would not be a standing committee, but would comprise a small team of experts (no more than ten people, and not necessarily all Pakistani) with a mandate to produce

information and proposals on specified concerns of the apex body. Think tanks would be disbanded on completion of their task. These fixed-term working groups of experts would be selected according to the task at hand and would typically include specialists from the sector and its customers; there is no need for such groups to be chaired by a member of the apex body. When appropriate the think tanks could also obtain short, intensive input from recognized international experts and thus take advantage of the best current practice outside Pakistan, for example on institutional funding and accreditation methods and the evaluation of research quality.

148. The apex body must provide the legitimacy, motivation and energy to effect change. It must remove obstacles to change and generate the environment in which successful change can occur. Therefore it must not: be distracted into considerations of detailed rules and their implementation; become involved in the daily operations of its subcommittees, the intermediary executive agencies, or the educational and research institutions; in any way obscure the presentation or understanding of its policies and the procedures by which they are developed or otherwise compromise the transparency of its operations; be too large to allow effective debate and decision making; or allow its method of operation to discourage top level politicians and practitioners from becoming members or being directly involved in the work of its subcommittees. Since it is not an executive organ it need not meet frequently once the initial major work program is complete, perhaps four times a year. If it is to fulfill its main role of policy formulation and oversight, its meetings must be well briefed and documented.

149. **Organizational Options for the Apex Body.** The National Commission for Science and Technology (NCST) was established in 1984 as a forum for science and technology decision making at the highest level. NCST, chaired by the Prime Minister, is comprised of twenty-eight of the highest political and research appointees from various parts of government with special interest in the sector. Of the members, eleven are ministers, and eleven are executive heads of science and technology institutions; no one is from outside the public sector. An Executive Committee of NCST was recently announced; its membership is comprised of the non-ministerial members of NCST, the agency heads. The NCST, which has met only once, has not yet emerged as an active body and it is not clear whether its terms of reference, which do not currently include higher education, or its membership will enable it to fulfill the role of the envisaged apex body. As presently constituted it is too large and has too many vested interests for effective debate and decision making.

150. The preferred option is to establish a Standing Inter Ministerial Committee (SIMC) with up to five ministers as members and with the Ministers of Education and of Science and Technology as rotating chairman. A few eminent individuals from industry and commerce would be co-opted with the chairmen of the main executing committees under the apex body. Terms of reference would be drawn up to reflect the responsibilities reflected above. Initially SIMC would need to meet frequently, every two to three months, to formulate policies and targets, to define its sub-structure implementation, and to agree on roles and relationships. As the structure and its operation were finalized and implemented, the monitoring and evaluation could be devolved to its secretariat to require regular and formal reports on their activities and progress. SIMC would also set up think tanks and working parties to assist it in generating new, revitalizing policies and activities.

### ***3. The Secretariat***

151. The apex body must have a secretariat to operate properly as the highest policymaking organ for the sector. Its principal functions would be to coordinate and support the subcommittees, to conduct technical work needed to generate and substantiate policy proposals, to monitor implementation of

adopted policies, and to ensure that members of the apex body are well briefed and effective in their macro policy formulation and decision making roles. This includes the timely provision of basic, up-to-date, reliable, and consistent data on the sector and its activities. In conjunction with the subcommittees, the secretariat staff would participate in the development of proposals for consideration by the apex body, but would not be part of the apex body's decision making process. Nor would the secretariat actually directly manage or implement programs for the sector or develop detailed rules and regulations for policy implementation. As discussed below, these are the responsibilities of the intermediary executing agencies and the higher education and research institutions.

152. As the Federal Government is now constituted, there is no single organization with an undisputed mandate to serve in such a secretariat capacity. The Ministry of Science and Technology looks after some research and operates programs of postgraduate education abroad, but has no special role in higher education, the crucial training of researchers, and the conduct of research at Pakistani universities. The Ministry of Education looks after education at all levels (except for the largest programs of postgraduate training abroad in science and engineering), and in that capacity supports some research in higher education establishments, but has no particular role in the nation's research institutions. Consequently, production and utilization of higher level scientific and technological manpower are for the most part divorced. Neither ministry considers what is perhaps the single most important issue--the synergy between higher education and research training, and the actual shape and conduct of the nation's scientific research enterprise. A third Ministry, Food, Agriculture and Cooperatives, has a significant involvement in agricultural research funding but no formal interaction with the other two Ministries.

153. **Organizational Options for the Secretariat.** One approach to providing staff support for SIMC would be to create a new special purpose secretariat. The service staff could be drawn from the appropriate ministries and seconded to the secretariat for a few years. Selected staff would need to have sufficient status and experience to guarantee the unhesitating provision of reliable information from pertinent government sources; they would also need to command the professional respect of both the apex body and subcommittee members. A senior Secretary to the Federal Government should be placed at its head.

154. The preferred option would be to select a small team of permanent staff, headed by an eminent industrialist or top level civil servant. They would be supported by staff seconded from appropriate ministries and organizations within the structure, for example the MOE, MOST, NCRFE, UGC or NCAAV. This arrangement would not only provide the essential level and status of support, policy formulation and performance monitoring for the apex body, but would demonstrate the importance of SIMC and accelerate the dissemination of its purpose and methodologies. Staff service on the secretariat should carry high prestige and be recognized by special provisions for compensation above the normal government scales.

155. Neither of the above proposals resolve the question of divesting the MOE of its responsibility for higher education in order to leave it with an undiluted mandate to deal with the manifold deficiencies of education at lower levels. These are certainly severe enough to deserve the undivided attention of a cabinet department. Particularly challenging areas for increased MOE attention include: the division of responsibilities between Federal and Provincial Governments for primary education finance; structural reform of secondary general education so that it fully incorporates the current intermediate streams; primary and secondary education curriculum development; the place of vocational and technical education at pre-tertiary levels; the role of non-formal education; sports and welfare; Islamic education; international cooperation for education below the tertiary level; and improvement of educational

establishments in federally administered areas. Transferring the responsibility for higher education to MOST would not only enable these problems to be addressed but would provide a third model for the secretariat for the apex body. It could be drawn predominantly, but not exclusively, from MOST.

### ***B. Creating the Operational Framework Conducive to Improving Quality***

156. The academic and professional standards of the leadership and staff in the institutions of higher education and research are central to the drive for improved quality. The role of government, having demonstrated commitment and purpose to set goals and policies, is to provide an operational framework within which these individuals and institutions are accorded necessary freedom and support and are held accountable for results. This framework is a complex mixture of structures, procedures and interrelationships.

157. So that national goals set by the apex body are realized through implementation of policies it sets, very substantial changes are required in the current operational framework of the higher education and research sector. These include: constitution of an implementation substructure of intermediary executing agencies responsible to the apex body (not to any specific ministry) for policy guidance, priorities and budget formation; interrelationships between components of the operation framework; clarifying the roles of various institutions according to their comparative advantage; enhancing the autonomy of individual establishments of higher education and research; and increasing private sector provision of higher education.

#### ***1. Intermediary Executing Agencies***

158. The implementation substructure reporting to the apex body needs to address two principal aspects of sector operations: quality assurance and efficiency. Quality assurance is achieved through mechanisms for accrediting institutions and validating courses. Efficiency is achieved through resource allocation mechanisms. Within those two areas of concern, the major functions of the implementation structure under the apex body are to: translate the policies presented by the apex body into practical action programs; implement these programs; monitor progress and report back. The specialist agencies charged with these tasks may also be required to undertake other work related to national policy for higher education and research as specified by the apex body, from which they derive their authority and to which, in certain respects, they are directly accountable.

159. Beyond their exclusive concern with quality assurance and the efficient distribution of resources, the key principles guiding constitution of these specialist executing agencies are that: (i) they must be responsible for all higher education and research in order to avoid duplication and waste and to make the most effective use of the limited resources available; (ii) they should be run by decision making committees or councils with active, knowledgeable members from the sector and its customers, not from the bureaucracy; and (iii) they should be small enough to facilitate their executive roles.

160. The executing agencies would be required to develop procedures and standards against which performance of institutions of higher education and research can be judged. Each would, within its area of specialization, develop performance criteria and efficiency standards for the institutions receiving public funds. For example, full-time equivalent students, with weighing factors by discipline and level, could appropriately be used by a resource distribution agency to determine the global core budget for universities and colleges. Similarly a quality assurance agency would develop methods for measuring and quantifying research performance. These procedures would be updated periodically on the basis of

experience and would be announced publicly. These, and more complex performance indicators such as student staff ratios and the analysis of student pass rates would be developed progressively in consultation with the staff and institutions concerned.

161. The implementation structure of executing agencies must not impose additional bureaucracy on an already overburdened system, attempt to manage the institutions, or conceal from the public its methods and procedures. Instead, it must reduce inertia and increase flexibility and responsiveness, achieve the decentralization of management and the transfer of authority and accountability to the institutions, and operate transparently by widely promulgating the processes, criteria and indicators by which the sector, its institutions and staff, will be assessed.

162. While in theory it may be possible to combine, within a single intermediary agency, the dual roles of resourcing and quality assurance, in practice it is probably not wise to do so when dealing with a large system of educational institutions. The nature and magnitude of the tasks, the experience required, the procedures to be adopted and the timescales involved are in many respects incompatible. It is therefore necessary, to separate these functions into two councils (UGC, NCAAV), while ensuring close liaison and collaboration between them.

163. It would not be sensible for the groups concerned with quality and efficiency in education also to cover the research institutions. Few research institutions in Pakistan undertake significant amounts of teaching and many teaching institutions (especially colleges) do no research. The criteria and procedures for credibly measuring research performance and costs are different from those applied to teaching. Other differentiating factors are priorities, commercial pressures and timescales. However the size, number, coherence, work and organization of the research institutions indicate that it would be possible and advantageous to have one group responsible for both quality assurance and resource allocation for all research activities (NCRFE). Collaboration between MOE and MOST could be strengthened through the revised charter of PCST and its oversight of MOST research and development institutions. This would also encourage and enable closer links between research activities in the institutions and in higher education.

164. It is essential to ensure close liaison and collaboration between all the executing agencies within the implementation structure. This could be achieved in various complementary, not mutually exclusive, ways. The first is limited commonality of membership on the councils to disseminate information and practice. The second is an overlap of support staff to ensure that practices are common and that appropriate information and papers are circulated between councils. The third would be to accord the chairpersons of all the intermediary agencies observer status or even non-voting membership in the apex body, thereby providing closer liaison between the apex body and other components within its substructure. Finally it would be possible to establish joint standing committees or working parties between some of the executing agencies. The committees should not increase the bureaucracy; their work would be to ensure that apex body policy is being effectively and uniformly applied and that good practices were being disseminated.

165. In summary, the most effective, efficient and practical implementation substructure at the federal level would comprise four main executing agencies or councils:

- (i) a National Council for Academic Accreditation and Validation (NCAAV) for quality assurance for institutions of higher education;

(ii) a revitalized **University Grants Commission (UGC)** with a revised charter to enable it to expand its remit to cover resourcing and efficiency of higher education institutions;

(iii) a **National Council for Research Funding and Evaluation (NCRFE)** to serve both functions for all the research institutions; and

(iv) a **Pakistan Council for Science and Technology (PCST)** with a revised charter and responsibility for oversight and liaison of MOST research and development institutions and activities.

Because college education is administered by the provinces, both national level educational agencies (which would deal directly with universities) would need to have branches or affiliates in the four provinces; these provincial agencies are treated later.

166. The main functions of these four key intermediary executing bodies in the implementation structure, and how they will accredit, validate and resource the institutions are discussed below. Their effect at the institutional level and what they will require of the institutions and their staff, are considered later when discussing the recommendations for ensuring efficiency in the use of resources and improving the development and delivery of services at the institutional level.

167. **Accreditation.** The NCAAV (National Council on Academic Accreditation and Validation) would accredit universities and colleges which could satisfactorily demonstrate their ability and commitment to achieve and maintain acceptable academic standards in all their areas of work. It would also validate programs within institutions that have not received accreditation. NCAAV would operate through a system of specialist institutional and subject subcommittees requiring a wide range of expertise. The accreditation and validation processes would involve visits to the institutions by NCAAV or the specialist subcommittees commissioned by it, following a formal submission from the institution. Before the visits, each member of the visiting party would be given detailed information, usually within a prescribed format, on the purpose of the visit, the itinerary, the format for meetings with staff and background information on the submission and the institution. They will also be given relevant information from previous visits by NCAAV and UGC.

168. Institutional accreditation could only be granted after at least one visit in which the institution's internal procedures for the quality assurance of its courses were subject to rigorous scrutiny and debate. The NCAAV would establish and promulgate detailed procedures through which accredited status would be granted, the criteria and evaluation methods to be adopted and the standards required. The type of information required in order to make a valid and reliable accreditation assessment would include: how the institution is managed and operated; how it formulates its academic plan in relation to national needs; its academic performance; its internal procedures for course development, quality control and assurance; and its staff development programs. The accreditation process would study the institution's procedures for curriculum development and approval rather than detailed syllabus content. In this regard the NCAAV would ensure that the institution's procedures formally injected the necessary external input to the curriculum development and review process and critically assessed quality, relevance and methods of delivery.

169. Following accreditation institutions would not be required to justify their curricula, only to satisfy the NCAAV that their internal procedures for review and updating remained effective. The accreditation

of an institution would require the endorsement of the apex body upon recommendation of the NCAAV, and would afford increased status and (especially for colleges) a reduction in bureaucratic control.

170. Subject to apex body policy, most universities and some of the better established, larger colleges would probably be fully accredited within the first few years of reform program implementation and would provide exemplars and standards for others to follow. If confidence in the institution were particularly strong, the period of approval could be five years. Other institutions might be accorded limited conditional accreditation subject to audit, or for a shorter period, for example mandating that a review take place within two years. Institutions that fail to meet accreditation standards must be apprised of the reasons and advised how and when they may reapply. Accreditation would not be transferrable.

171. In order to demonstrate the consistency and credibility of the system--there will inevitably be much criticism levelled by those who have most to lose or hide--the NCAAV must publish and otherwise disseminate the detailed accreditation criteria and procedures, as it has developed them and the apex body has approved them. It must also ensure that all individuals associated with its work carry the respect of the sector and the community they serve. As with the other intermediary executing agencies, NCAAV must be and be seen to be a professional body operating transparently under reasonably objective methods, free of political and any other pressure. Quality improvement of the sector will be impossible without this.

172. **Validation.** For course validations, NCAAV would also evaluate institutional curriculum development and review procedures including input from the world of work. It would, however, study in detail the curriculum content and the delivery, assessment, and examination methods proposed for the course. The NCAAV would also need to be assured that the institution and department offering the course have sufficient resources and staff to operate it properly at the necessary level. Course validation would be offered to institutions that lacked the experience and breadth of work to justify accreditation, but had strength in particular areas of study and were being encouraged to move toward accredited status. The validation process would include a submission to NCAAV of the curriculum content, rationale and delivery methods followed, initially at least, by a visit to the department.

173. **Resourcing and Efficiency.** The expanding function of the UGC, and the revision of its charter by Government Act, would enable and require it to develop practical and equitable methods of resource allocation among institutions, reflecting: the national priorities set by the apex body; the work load of the institution; its performance; views on its quality received from the NCAAV; and an annual submission from the institution detailing its internal development plans and supporting expenditure proposals.

174. The first need is for an accurate and detailed data base on the institutions and their work. Basic information will be required on: actual student numbers; staffing levels and indicators of staff quality; recurrent and capital expenditure; resources; and support services. These data must be consistent in form and sufficiently detailed to ensure and demonstrate the equity and credibility of the UGC and its methodology. (The skeleton of such a data base is included in Annex 1.) The data would then be used to calculate and publish institutional parameters as a basis for deriving core funding. For example, subject areas, levels and modes of study could each be weighted to reflect national priorities and costs in order to produce an equivalent student load. Unit costs derived from the block grant for the sector approved by the apex body, would then be used, with the student load factors, to calculate the core funding for each institution. As experience of the system increases, the procedures can be refined and fine-tuned. An important advantage of a logical systematic approach to resourcing is that it provides a proper understanding of the size and nature of the sector and its activities.

175. Another important function for UGC would be to develop, promulgate and apply a set of appropriate performance indicators by which the economic efficiency of the institutions can be evaluated. These will be extracted from the common data base and their calculation and presentation must be consistent and uniform. Setting the value for each indicator against national, or even international, norms will make it possible to reliably, objectively assess the performance of the sector and its institutions. The results of this crucial exercise should be tied to a system of automatic rewards and penalties designed to improve overall efficiency, recognize good practice and assist in the achievement of the national goals for the sector. It will also direct and afford the opportunity for some rationalization and redistribution of resources to the development of priority areas. Among the most important efficiency indicators which UGC will need to develop (often desegregated by faculty and department) are: staff student ratios; unit costs; space utilization; the extent of resource mobilization from the students and the surrounding community; promotion and graduation rates; and tangible evidence of collaboration with industry.

176. **Research.** The function of NCRFE (National Council for Research Funding and Evaluation) would be to develop and oversee the implementation of the necessary quality evaluation and resourcing procedures. These procedures would be, as described above for the NCAAV and UGC, modified in accordance with the special characteristics of research activity. The assessment of research quality should include: peer review; the number and quality of refereed papers; the number of staff of international and national status; successful collaboration with industry, quantified in terms of external funding; and patents issued. Procedures for allocating funding should not be designed to perpetuate existing distributions but should directly reflect quality and performance, with a view to phasing in a radical transfer of resources to the centers of proven scientific excellence and developmental impact.

177. Most scientific research in Pakistan is directly funded either through the budget of a parent ministry (as is the case for the MOST research institutes and a few others) or through the provision for universities in the budget of the Ministry of Education. For the reasons given earlier, this arrangement is neither effective nor efficient. All funding for research needs to be brought within the purview of the apex body.

178. One basis for channelling funding through the apex body is to distinguish between core funding for research infrastructure and project funding for research activities that address national priorities and respond to national initiatives. Building research teams and their basic operational capacity would remain the responsibility of the parent ministry, funding mechanisms and quality evaluation would be the responsibility of the apex body through its executing agency NCFRE. Under the reform program, PCST would retain responsibility for core funding for research institutes that are currently dependent upon MOST. The expanded UGC would supply core funding for research infrastructure to universities, as appropriate, to maximize the linkage between research and advanced teaching. Research conducted under the auspices of other ministries would continue to receive core capacity building support from them.

179. Specifically, NCRFE would operate a system of competitive research project funding, using decision criteria, procedures, and mechanisms approved and widely publicized by the apex body, for which researchers anywhere would be eligible to apply. In managing this major pool of resources for project support, NCRFE would assure that the research institutions are effectively working on problems of national importance, in a coordinated way, to the highest possible standards of excellence and with maximum efficiency.

**180. Organizational Options for the Executing Agencies.** The best way to bring into being the first line resourcing and efficiency council is to reorganize, strengthen, and recharter the University Grants Commission (UGC). It could be required to develop the necessary formulae and rules to distribute the public funds for higher education allocated by the apex body. Membership on the council would be changed to cover the colleges and their work, to reflect strongly the importance of industrial links with the system, and to safeguard against the influence of vested interests. Unlike the current UGC, the revised council would not be concerned with accreditation or validation.

**181.** The intermediary body for quality assurance, the National Council on Academic Accreditation and Validation (NCAAV), would need to be created; no institution in Pakistan provides a reasonable starting point. Its members should be drawn from across the sector and from employers; the chairperson should be an eminent industrialist. NCAAV, working closely with the UGC, should take note of the limited evaluation experience currently undertaken by universities in order to develop the more rigorous and universal accreditation and validation procedures it will need to employ.

**182.** The body for the funding and evaluation of research (NCRFE) could best be developed from the National Scientific Research and Development Board. It would report to the apex body, SIMC. Its membership would be drawn from industry, national research councils, the UGC, the Pakistan Science Foundation and universities.

**183.** The four agencies would operate under published and disseminated terms of reference, rules and procedures approved by the apex body. These would be designed specifically to translate policy statements from the highest levels into concrete actions within individual higher education and research institutions. To do so effectively, the four councils would need significantly more independence and autonomy than the existing UGC. The proposed operational and administrative structure must provide a framework within which the councils and their staff will be afforded much greater freedom of action.

**184.** The councils should have a full-time chairperson, a representative group of no more than 12 part-time members, and a professional staff. Members of the councils would be nominated by pertinent non-governmental organizations such as the Committee of Vice-Chancellors, the Chamber of Industry and Commerce, professional associations, and the Committee of Research Institute Directors. Members would be selected and appointed by the apex body to give wide and eminent representation. They should be appointed for their expertise and should act on a personal basis; they should not be mandated by their nominees. The inclusion of practitioners from key sectors, such as agriculture, industry and commerce, would be an important feature of the councils' membership. Council members would be appointed for fixed terms of three years, with the possibility of limited reappointment.

**185. Provincial Intermediary Agencies.** Clearly, the intermediary higher education agencies discussed above should, ultimately, encompass all institutions within the sector, whether federal or provincial. It is less clear how the proposed federal structure could operate in parallel with a provincial structure without imposing unacceptable overheads. Early in its tenure, the apex body would need to address this issue. The two most important features of the provincial structure are that it properly relates to and reflects the federal structure and that it is serviced professionally and adequately resourced.

**186.** The optimal solutions need not necessarily be exactly the same for the quality assurance and resourcing functions. Specifically, NCAAV might appropriately depend on provincial branches (PCAAV) of the overall council. Uniform criteria and procedures for institutional accreditation and course validation should quickly be extended throughout the country. The provincial colleges would be funded

through a new agency, the Provincial Council for Academic Funding and Efficiency (PCAFE) which would relate closely to the UGC. Both agencies would develop common procedures, norms and indicators. Resource allocation and monitoring of economic efficiency may reasonably have to reflect for somewhat longer the current sources of public funding for higher education: the Federal Government for universities and the Provincial Government for colleges.

187. However, for some selected colleges granted full autonomy (see below), the apex body may wish to consider a new arrangement whereby some (or all) of their funding would come directly from the Federal UGC rather than exclusively from the provincial affiliate. The advantage would be to break the mould of existing provision and to present a credible and valuable vocational alternative to the universities. The colleges likely to be given autonomy would be those with recognized academic standards, effective industrial links and with emphasis on vocational teaching rather than research. This would be a further tangible affirmation by government of the synonymy of quality and relevance. The danger is that these institutions would immediately press to become universities although, with political and academic will, this could be safeguarded against. The position of the professional colleges would need to be considered in this context.

188. For these fully autonomous colleges (and possibly for universities as well), an attractive "mixed" solution may also be possible. The federal level structures (UGC with input from NCAAV) would work together to allocate core resources to the institutions, so that their basic missions can be accomplished. The level of work involved and the expenditure on research would need to be reflected in the resourcing methodology. The provincial level resourcing agencies would be free to provide additional funding to support local priorities. Such a system should not be too difficult or cumbersome once the standards and procedures underlying the core allocations are made known. In academic terms the procedures developed for quality assurance and control in universities and colleges are likely to be more universally acceptable and applicable. If these accreditation and validation processes are practical, equitable and publicly credible there will be considerable status and advantage accruing to institutions seen to embrace them.

189. The coordination and oversight of college level education at the provincial level should be organized so that the Provincial Secretariats of Education are freed to concentrate on the public provision of primary and secondary education. The current Directorates of College Education and their regional and divisional offices should be abolished. In their place, two agencies could be established in each province to operate in collaboration with the NCAAV and UGC. Whether the provincial agencies are branches or affiliates, they would be semi-autonomous, with members appointed by the Provincial Governments but nominated in their majority by non-government organizations with special interests in higher education. The agencies should be closely linked provincially and should liaise with the corresponding federal bodies. The Provincial Councils for Academic Funding and Efficiency (PCAFE) would be responsible for funding colleges (either all of them, or those which had not been granted full autonomy), using procedures and norms compatible with those developed by the UGC. The provincial agencies for quality control (PCAA) would be responsible for adapting the quality assurance and control methods developed by NCAAV to colleges remaining in the state administered sector. It would be necessary to adapt these methods to fit the different missions of the colleges and the circumstances of the provinces. Private colleges would be required to seek accreditation under the PCAA system and private universities through NCAAV.

## ***2. Achieving Proper Specialization of Educational Institutions***

190. The second area for reform of the operational framework is to achieve a clear specialization of universities and colleges by level so that each can efficiently concentrate the proper resources on its primary mission. The appropriate physical facilities, staff, curriculum and organization are very different for grades 11 and 12 (intermediate streams, which are really secondary level), grades 13 and 14 (in Pakistan the first degree level), grades 15 and 16 (M.A. and M.Sc. in Pakistan), and training at the M.Phil. and Ph.D. levels. To attempt to offer all of these levels in a single institution is a prescription for getting none of them right.

191. Central to the institutional specialization proposal is the transformation of the existing degree colleges first and foremost into effective higher education teaching establishments. They should become the preeminent institutions for the award of Bachelors degrees in higher education. Colleges should cease offering the final two years of secondary education (the intermediate stream) and second degrees (M.A. and M.Sc.). They could, however, be called upon to offer specialized extension services to their surrounding communities centered around exploitation of their particular comparative advantage, teaching, through the development of certificate and other adult and continuing education courses. In exceptional circumstances some M.A. work may be retained by the Bachelors college when there is no accessible alternative and the college has appropriate staff and facilities.

192. Similarly, universities should become the preeminent locales for what, in most other countries, would be called true higher education: awarding honors and three or four-year first degrees, training talented manpower at the Masters and Ph.D. levels, and conducting research. At the pinnacle of the education system, universities should set the standard of quality by example. Their primary mission should not be diluted by encumbering them with the direct management of constituent colleges or with the administration of examinations for affiliated colleges. Above all, universities must concentrate on their own comparative advantage: extracting the most from the synergy between high level teaching and conducting scientific research. The crucial functions of highest level scientific and professional training of staff for colleges and universities, for research institutions, and for elite professional and technical leadership roles within the economic sectors cannot readily be delegated to other institutions, but success depends on bridging the current gap between teaching and research.

193. The desirability of these changes has long been recognized in Pakistan. To accomplish them and still offer quality programs, the current network of colleges must be consolidated so that institutions are large enough to benefit from economies of scale. The bibliography indicates that cost savings associated with increased college size are substantial, particularly for the small colleges. For example, increasing enrollment from 400 to 1,200 could entail a one-third reduction in the recurrent unit cost of the small college. Some specialization in colleges by discipline and of disciplines within specific universities will be appropriate. Many colleges must be converted to secondary schools particularly at the intermediate level. Creating an institutional framework conducive to quality in higher education also has important implications for the secondary school system.

## ***3. Increasing Institutional Autonomy***

194. The third area for action is to enhance the autonomy of universities, degree colleges and research institutions. An autonomous institution, with an overall framework, guidelines and a structure of effective accountability has the freedom to manage its own affairs. Three dimensions of autonomy need to be addressed: managerial (or administrative), financial, and quality assurance. The measures outlined above

at national and provincial level for policymaking, oversight of quality assurance and resource allocation, and the specialization of institution by mission are all prerequisites for institutional autonomy. They simultaneously go some distance toward achieving greater autonomy. These developments to improve quality, which stem directly from the central theme of this review, must also be reflected in the internal structure and organization of the institutions.

195. Autonomous institutions would be managed by a Boards of Governors or Trustees responsible and accountable for all aspects of the institution's existence. The legal status of the institution, as described in its Instrument and Articles of Government, would vary across institutions, but would in every case safeguard independence and specify liability and accountability. The structures within an autonomous institution would include senior groups with executive authority responsible for policy formulation, resourcing, and quality assurance and control. In designing such systems, good management principles--responsibility, authority and accountability--must be clearly defined and located; be devolved as far as reasonably possible; and be mutually supportive. Openness with procedures and decision making is a further requirement for successful, enduring improvement.

196. Within the guidelines established by the apex body, the Boards of Governors or Trustees would develop policy and priorities for the institution. They would also agree on a structure, an organization and a method of operation designed to satisfy the institution's objectives and their own responsibilities. Their responsibilities would include all fiscal matters and the appointment, promotion and dismissal of staff without interference from federal or provincial bodies. Without this authority and a worthwhile, clearly defined role to play in determining the conduct and direction of the institution, it is impossible to attract members with the necessary calibre and commitment. The membership of the Board should bring together groups with the strongest interest in the quality of the institution's provision. It should also bring to the institution a wide range of experience and expertise and the active support of the local community. At least half the Governors or Trustees should represent business, industrial, professional and other user interests. Federal and provincial representation should be limited to one-sixth of the membership in order to demonstrate the independence of the Board. Institutional members would include the principal and representatives from the teaching and non-teaching staff elected from and by the main internal management committees. This group should also not exceed one-sixth of the board. The board membership should rarely exceed 25 in order to allow the board to fulfill its executive role. Often half that number will be sufficient, and boards with more than a dozen members will have to establish a subcommittee structure for its members to function effectively. The terms of reference of the Boards of Trustees or Governors would require the formal approval of NCAAV or NCRFE and UGC for universities and research institutes, and approval of the appropriate agencies for colleges. Once established, the board should be self-perpetuating (the members themselves selecting others to serve when terms expire), but the membership will be reviewed as part of the normal NCAAV and UGC procedures for accreditation and efficiency.

197. The executive head (Vice-Chancellor, Principal, Director) of an autonomous educational or research institution would be selected by the Board of Governors or Trustees and be responsible to the board for the institution's daily operation, internal management and staff discipline. The emphasis on quality and efficiency is likely to require the establishment of senior staff posts at deputy level for chairing internal committees in these areas. The main features of this structure in universities and colleges are: the Academic Board or Senate which is responsible for the planning, coordination, development and oversight of all academic work and research within the institution; a policy and strategy committee; a resourcing and administration committee. In an autonomous institution, these committees must operate so that the crucial decisions are made with input from those who will eventually be held

accountable. In order to devolve decision making to the appropriate level, this structure should be repeated at the lower levels within the institution, for example at division or department level. The membership of these committees will reflect their roles and importance. They are decision making groups that, through the Academic Board and Board of Governors or Trustees, will have a major effect on the present and future work of the institution. In research institutions the parallel system would be a management committee responsible for the daily operation of the institution, with a subcommittee structure covering planning, resources and efficiency, and quality assurance. The Principal would chair the management committee, and senior staff the three subcommittees; these senior staff would be members of the management committee.

198. Financial autonomy of publicly supported institutions refers to the authority for internal allocation of resources and for seeking additional resources from non-public sources. Education and research institutions would distribute their core budgets and all other income in order to best meet their agreed goals and to satisfy the performance indicators used by UGC or NCRFE. They would be held accountable only to the extent to which they meet the agreed resourcing and efficiency goals and targets. They would be free to diversify sources of finance beyond the sums received from federal or provincial budgets by establishing fees, tuition and charges for services rendered to students (catering and lodging) and to the community (research, consultancy, and special non-degree courses). The resourcing committee would be responsible for developing rules and procedures for the internal distribution of income. It may chose to do this using the methodology adopted by the UGC, or more likely, to modify these allocations in the light of the institution's internal priorities and policies, subject to satisfying the performance criteria used by UGC.

199. Academic autonomy means more than the unfettered freedom to teach and research; it involves taking responsibility for adequate internal quality assurance. In short an autonomous educational institution would have freedom to offer its own courses, subject only to maintaining its accredited or validated status through the NCAAV. This would require the institution to demonstrate that the internal quality assurance and control procedures were effective and that the student output reached the required standard. The role of the internal quality control committee would be to set up and operate, through the Academic Board, the necessary in-house systems. In a research institution, the work of the quality assurance subcommittee would be to ensure that all projects were judged against criteria and procedures that recognized those developed by the NCRFE. Internal management and review systems that responded quickly to external need and enabled good quality to be strengthened and poor quality to be curtailed would be mandatory.

200. **Organizational Options for Provincial Executing Agencies.** In universities, neither proposal mooted in Pakistan for resolving the problem of autonomy and divided responsibility was compelling. The first proposal involved fully federalizing all universities, and the second fully provincializing them. Neither proposal would accord the institutions the managerial or financial autonomy described above. The first proposal is unlikely to be politically acceptable in a climate of democratization and decentralization; provinces would not willingly give up all control of their public universities. The second proposal is similarly impractical until and unless the revenue raising powers of the provinces or, at least, the revenues automatically accruing to the provinces are radically enhanced. Even then, the risk of provincial authorities overspending on higher education relative to lower levels, especially primary schooling which is critically deficient, would be substantial given the influence of the educated elite in the Provincial Governments.

201. The best solution may be to remove universities that exhibit self-sufficiency and quality from the direct control of both levels of government as quickly as possible. They would be established as non-profit autonomous institutions under independent, self-perpetuating Boards of Governors or Trustees. These universities would remain public in the sense that some governors or trustees would be drawn from and would represent the Provincial and perhaps Federal Governments. Much of their funding would be received from the public budget through block grants from UGC. In all other respects, however, universities would become autonomous as quickly as possible.

202. For colleges, the movement toward greater autonomy should take two different directions. Some colleges should be given full operational autonomy, analogous to that proposed for the approved universities. The most viable colleges would be selected through performance criteria and efficiency standards (examination results, student cohort progression, faculty qualifications, student and staff ratios, effective industrial and community related activities, and overall size). Presumably most constituent colleges within universities would qualify on this basis, as would the strongest affiliated colleges.

203. Many existing colleges clearly would not be viable institutions if established under independent boards. These colleges must remain within their federal or provincial administered sector, with their principals appointed by and responsible to the Secretariats of Education, and their resources channelled through the PCAFE. For these colleges, greater autonomy would be achieved by granting their principals significant authority to manage their institutions. The principals would be empowered to make many decisions and perform many functions currently handled by the Directorates of Colleges, their divisional offices, and by civil service commissions. For example, with a management structure and operating procedures acceptable to PCAFE and PCAAV, college principals would be given powers to: determine the size of the student body; select students from those declared eligible according to the program of study; select, promote and dismiss staff; administer the college budget including all procurement of goods and services; and mobilize additional resources. These colleges would not conduct their own examinations or award their own degrees; these functions would initially be assumed by the provincial agencies within the central framework developed by the NCAAV. These institutions would, however, offer validated courses and be encouraged to move gradually toward accredited status.

204. The progressive sanctioning of autonomy to selected educational institutions--thus freeing them from the present duality of control and externally imposed constraints on flexibility and responsiveness--will effect a major shift toward a demand-driven system. In the long term, a system in which the customers are able to choose the institutions and programs that best meet their needs and aptitudes will inherently sustain the quality of the provision. Increased institutional autonomy will directly assist those responsible for implementing change. If institutions and their management are willing and able to accept the increased responsibility and accountability, then they must be given the authority to handle their affairs, particularly their staff and budgets. It will also be necessary to demonstrate unequivocally that they are being allocated rational, equitable resources and that the methodology for the allocation is understood and accepted. The role of the apex body and its intermediary implementing agencies in establishing standards and norms for the resourcing levels, and collecting and disseminating data on resourcing levels and performance is crucial in this respect.

#### ***4. Private Sector Provision***

205. The final arena for action in creating an institutional framework conducive to quality is to increase the private sector provision of higher education. The limited recent experience with the two private universities in Pakistan, as with private higher education elsewhere in the world, suggests that quality can

be very high, and the private sector can make an important contribution toward the expansion of access to higher educational opportunity.

206. A few of the highly reputable degree colleges, nationalized in 1972, might be returned to their former non-profit institutional owners (typically religious organizations). Impediments to establishment of new colleges should be removed and positive incentives offered, such as removal of the limitation on deductions of taxable income from philanthropic donations. Unlike the independent public colleges and those in the state sector, private institutions of higher education would be expected to be financially self-supporting, at least for their recurrent or operating budgets, with income derived from student fees and funding mobilized from the business and industrial communities, and wealthy individuals. Because increased private industrial, commercial and other non-governmental provision will inevitably be central to any effort to expand access to higher education, and crucially important in the strategy to improve quality, a more detailed rationale of increased private provision and a discussion of the way forward are offered in the bibliography.

### *C. Mobilizing Sufficient Resources*

207. The grave deficiencies in post-secondary education and scientific research call for the injection of additional resources. They also require the establishment of mechanisms to raise the standards of efficiency in colleges, universities, and scientific research institutions. Adding resources without raising standards of efficiency and providing additional resources are actions destined to fail. Moreover, the mechanisms under which new resources are provided can be designed to improve efficiency. Although these two objectives are inextricably linked in practice, they are discussed separately in this section and in the Policy Action Matrix in order to facilitate and focus debate.

208. New resources should be made available from other providers, not only from government. Indeed, incremental resources from government should be conditional upon resource mobilization from other sources. Post-secondary research institutions should themselves assume responsibility for acquiring a meaningful share of the necessary increase in revenue. Their success in raising funds should be viewed as one rewardable institutional performance indicator.

209. **Diversified Public Sources.** An important step in mobilizing sufficient resources is to dedicate the entire proceeds of the IQRA surcharge on the import duty to education and maintain the proportion of the overall education budget destined for universities and colleges (almost 20 percent in recent years). The IQRA surcharge was established as an education levy, but has not yet been added specifically to the education budget. The annual yield is approximately 300 crores of rupees. Adding the entire proceeds of IQRA to education would increase the recurrent budget in education by approximately 40 percent and bring educational expenditure overall to a less unsatisfactory level. Higher education should likewise benefit from equitable shares of Zakat, Usher Revenue, the Special Employment Promotion Fund, and the Workers Children Education Fund. Local bodies should be directed to levy an educational cess and assign a fair share of the yields to higher education institutions. Local bodies should also provide a fair share of their ordinary revenues to such institutions. By these means and by redirecting the revenues of the central government, public support for education should be raised from the present 2.4 percent to at least 4 percent of GDP over ten years.

210. **Cost Recovery and Enhanced Fees.** In colleges and universities, the current fees paid by students should be gradually increased over ten years to cover 35 percent of the recurrent expenditure on general higher education and 45 percent of professional higher education at first and second degree

levels.<sup>8/</sup> Concomitantly, a means tested student support scheme should be established to ensure that no student is denied access to post secondary education simply because he or she comes from a low income family.<sup>9/</sup> In the early years of fee increases, the revenue generated would mostly be needed for student support. Toward the end of the transitional period, however, as fees approach the 35 and 45 percent targets, substantial sums above student support needs will become available. They should be retained by the institutions for expenditures on quality improvements that are high visible to students. These quality improvements could include library holdings (multiple copies of basic textbooks), laboratory equipment and supplies, audio-visual equipment, teaching materials, and maintenance of physical plant. The performance of colleges and universities in establishing and collecting fees (or collecting more than a centrally established minimum fee) should be among the criteria used by the UGC to allocate funds; the stronger the effort by the institution, the greater the reward from the funding body from budgetary resources provided.

**211. Establishing Development Funds.** In addition to substantial increases in fees, two further cost recovery measures are urgent. First, colleges and universities should be encouraged to establish Development Funds. Upon acceptance to a course of study, students should be required to make a contribution; the amount should vary according to the income status of the family. Contributions should also be sought from business enterprises and wealthy individuals. Contributions to Development Funds should be tax deductible to families and corporations--that is, deducted from the income upon which taxes are paid. The annual receipts from these sources to the Development Funds should be matched by government at the start of the subsequent year. Two-thirds of the combined receipts should be used annually for capital expenditures, including expansion of student accommodation. The remaining third should be retained in an income earning endowment account from which only the interest could be used. Second, all subsidies for student housing and catering should be removed and the fees charged for student housing should be set at a level sufficient to recover a portion of the costs of expanding student accommodation. Severe penalties should be assessed on and recovered from former students who continue to occupy university and college housing without authority.

**212.** These cost recovery measures will enhance equity and promote efficiency. Presently, most university and college students come from families who could well afford to pay costs of this magnitude.<sup>10/</sup> Most parents of successful intermediate students who gain admission to degree courses

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<sup>8/</sup> Cost recovery targets at the M.Phil. and Ph.D. levels probably need to be separately established.

<sup>9/</sup> Student support typically takes two forms. Scholarships can be provided to subsidize students' living costs (at home or in residence halls) while they are enrolled; in effect this is compensation for the indirect (opportunity) costs of higher education incurred by a student who cannot work because he is enrolled. Fellowships can be provided to assist the student to pay the fees levied by the institution, and to offset instruction costs. Several options for the administrative organization of a student support scheme merit urgent exploration, with the central decision being whether it would be centrally administered by government (Federal or Provincial) or by the institutions themselves, or some mixture of both according to the type of institution. Student loan schemes should also be considered; a good first step would be to expand the existing scheme operated by the Pakistan Banking Council.

<sup>10/</sup> If tuition fees covering 35 and 45 percent, respectively, of the per student recurrent costs of general and professional higher education had been charged in academic year 1986-1987, the approximate amounts involved would have been Rs.6,900 for general and Rs.9,600 for professional courses in universities. Depending upon the province, the corresponding figures for college education would have ranged from Rs.770 to Rs.1,340. While substantial, these sums must be seen in the context of an overall per capita GDP of Rs.6,000 and a system of higher education which enrolls only 2 percent of the age group, an economically elite group.

have paid as much as Rs.1,500 per month for private tuition for the intermediate examination. At the same time, some intellectually qualified, impoverished persons cannot attend higher education institutions because they cannot afford even the incidental private costs. The revenues generated by the increase in tuition fees will make possible a scholarship program to address the plight of the academically worthy poor. Extra income would also be generated for quality improvements to benefit all students. Cost recovery also enhances efficiency by encouraging students to be more careful in their use of time, to refrain from disruptive behavior, to choose a program of study that will provide a return on their cash investments in higher education, and to study harder. Well-defined cost recovery schemes also give students a sense of ownership or involvement in the welfare of the institution they attend and gives their parents a greater interest in their investment. There is no good argument against cost recovery schemes, except that they take both political courage to instigate and administrative capacity to run.

**213. Private Sources.** Universities and colleges should also tap private sources of revenue. Universities should establish a development office to seek contributions to their Development Funds; consortia of colleges should establish the same. Government should make endowments and contributions to institutions of higher education tax deductible without limit. The present rule that colleges cannot receive endowments should be lifted. Under beneficial arrangements, colleges and universities should seek donations of funds from industry for current operations, as well as donations of equipment, supplies and money for the Development Funds mentioned above.

**214.** For example, universities and colleges might pledge to reserve a certain number of places for children of a given firm's employees, to be selected by the college admission process from among those company children who can demonstrate academic qualifications comparable to other candidates in the admissions pool. Universities might pledge to provide customized training for a firm's professional employees. Universities might seek cost-sharing arrangements under which they would build a new institute or open a new program specializing in the technology of a given industry. Colleges might design and implement sandwich programs in collaboration with local firms.

**215. Contract Research.** Universities and colleges should also expand their activities in contract research, seeking clients in the private and public sectors. Not only is contract research a good source of income, but putting pressure on faculty to engage in contract research also encourages them to keep up-to-date in their fields. Faculty who are successful in contract research tend to be better teachers, because they are able to show students the relevance of academic disciplines. University faculty who are unsuccessful in contract research should be required to renegotiate their conditions of services. Universities could also become entrepreneurial, but cautiously, with the management of their assets, such as real estate, endowment funds, etc. For example, the creation of research parks, technoparks or industrial estates near campuses should be explored with access to specialist facilities. Research and technoparks nurture new firms that are spun off from faculty research of commercial value.

**216. Privatization of Higher Education<sup>111</sup>.** Shifting some post-secondary education into the private sector offers financial benefits and efficiency gains. Private institutions operate at, or near, full cost recovery, relieving the burden on the public purse. Private institutions must be relatively efficient or they cannot survive. As mentioned above, a series of measures needs to be taken to encourage the

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<sup>111</sup> The term privatization refers to increased provision of services by private providers. This can be accomplished by creating new private establishments and by converting some public establishments to private ones. Privatization includes encouraging new investments.

establishment of private colleges and universities (see bibliography). These measures include: providing individuals with access to bank loans to establish new universities and colleges; providing those persons establishing new private colleges or universities with access to subsidized real estate; providing persons who wish to run a private college with turn-key facilities under a lease-purchase arrangement.

#### ***D. Ensuring the Efficient Use of Resources***

217. There are two main aspects of the drive toward achieving the fourth objective, improving the efficiency of the sector. The first aspect is to devolve responsibility and accountability close to the service delivery site, and the second is to change the incentive structures. Opportunities for improved performance through specified priorities and targets are best grasped at institutional and individual levels. Opportunities must be accompanied by the right to decide and the power to act. New incentive structures at both the individual and institutional levels require that local decision making is directed toward the enhancement of efficiency. This will require fundamental changes in existing procedures and attitudes. The approach described below is a combination of decentralization and freedom of regulation including the following: defining performance standards for individuals and institutions; setting performance norms and criteria; creating units responsible for monitoring performance; and relating individual and institutional rewards and sanctions to measured performance.

##### ***1. Performance Standards and Accountability***

218. Post-secondary education is labor intensive, and the performance level of an individual faculty member is the single most significant determinant of efficiency in the sector. Thus the first step in ensuring efficiency in the use of resources is to establish a system of accountability and performance standards for college and university faculty. The second step is to improve efficiency at the institutional level; this is a prime responsibility of the UGC.

219. Methods for judging the performance of faculty members are available in Pakistan. There are three elements of performance to be assessed: research, teaching and counselling, and professional activity. Research, more pertinent for universities than for colleges, is best assessed by peer review. The peer review teams assigned to assess each faculty member's research output should include academic or scientific persons from inside and outside the member's own institution. Often it will be appropriate to include academics from outside Pakistan in this review process, especially when the more senior faculty are being reviewed. Teaching can be assessed through observations by students, senior colleagues and faculty peer groups. Students can be asked to rate a professor's course on a confidential form at the final meeting; this is a widespread practice in various parts of the world. Counselling can be judged by the rate of progress of a faculty member's students toward their degrees and by their success in examinations. Professional activity can be rated by contract income, by awards, by editorships, by holding office in professional associations, and by reading scholarly papers at meetings of professional associations.

220. The performance standards for university faculty members should emphasize research and professional activity, although teaching and counselling must not be ignored. For college faculty, teaching would be the predominant activity to be assessed. Standards for research and professional activity may also vary from one academic field to another. For example, in some fields, contract income may be readily available to competent faculty and in other fields it may not. Once standards have been developed and the performance data on faculty members have been accumulated, review bodies should be set up at each institution to prepare a suitable summary statement on the work of each professional

employee. The work of senior faculty might be reviewed every five years, and junior faculty might be reviewed every three years.

**221. Faculty Performance, Recognition and Incentives.** Measurements of faculty performance should be incorporated into a system of faculty rewards. The results of faculty reviews should be used to regulate faculty advancements. To allow greater flexibility in determining remuneration, faculty salaries should be delinked from Federal pay scales. Completely removing the civil service status of university and college faculty members, and allowing independent institutional Boards of Governors or Trustees to fix conditions of service are the logical ways to accomplish this. Less extreme measures could also be effective during transition. For example, the civil service pay scales could be interpreted as a minimum or base pay, and performance related supplements could be decided by the institution.

**222. Institutional Performance, Recognition and Incentives.** Incentives at the institutional level should be created to inculcate a greater concern for efficiency. The most important measure is the assessment of institutional progress, prepared by the NCAAV, and used by the UGC to calculate government grants to universities and colleges. The NCAAV and the UGC should set timed targets for specified improvements in each institution. The targets should be directed at correcting obvious deficiencies, and should be informed by judgments about which new developments should take priority. In research institutions, the NCRFE would directly relate some part of its allocation, above the core provided by the parent ministry or UGC, to its assessment of quality and output. It would be equally important to generate and demonstrate disincentives to inefficiency in the both higher education and research institutions. Thus sanctions, including financial penalties, would be applied if institutions failed to meet stipulated targets. As an additional incentive, financial awards could be made to recognize work carried out in excess of agreed norms, for example, the student throughput per staff member. It would be the institution's responsibility to distribute the financial awards to the responsible individuals.

## ***2. The Balance Between Teaching and Research***

**223.** In universities the balance between teaching and appropriate research should be shifted in favor of research. A true university has, in addition to its community outreach role, two essential functions: to conduct research and to prepare a new generation of scholars and scientists. These functions do not represent the complete list of university activities, but research and postgraduate education are responsibilities that cannot easily be delegated to any other institutions. University budgets should be reconstructed to favor quality postgraduate teaching and support for relevant research programs. Postgraduate students must be admitted for their research potential and, once admitted, introduced swiftly to research processes. As quickly as possible, postgraduate students, working under faculty direction, should be given direct responsibility for research. To protect their time, university faculty should be released from the obligation to oversee examinations in constituent and affiliated colleges.

## ***3. Restructuring the Budgets***

**224.** In all institutions, especially universities, the proportion of the budget devoted to faculty salaries must decline. Expansion of quality research, teaching and professional activities demands this. To this end, realistic norms for faculty staffing should be established in universities and colleges based on realistic student numbers. Initially UGC for universities, PCAFE for colleges, and NCRFE for research institutions would also specify the maximum percentage of the total institution budget to be spent on staff salaries. Tied non-vireable expenditure to support research should also be clearly spelled out for all institutions. The balance between capital and recurrent expenditures should also be changed in favor of

the latter. In the educational institutions, capital investments should be based on established norms for academic, administrative, residential, and communal facilities. Their application to university and college development should allow a reduction in massive capital investments. In research institutions all capital costs including buildings and equipment must be calculated by NCRFE when assessing the institutional efficiency.

**225. Optimization of Resources.** Delegation and the use of incentives should facilitate the optimal use of resources. A summary of actions required at the institutional level would include: (i) adopting program budgeting for colleges and universities; (ii) delegating full procurement powers to institutions; (iii) empowering universities and colleges to re-appropriate budget allocations among programs if re-appropriation enhances efficiency; (iv) streamlining quarterly releases of budgeted items to assist timely expenditures; (v) monitoring and improving space use through imaginative timetables and inter-departmental and inter-faculty sharing of teaching and learning spaces; (vi) extending the working day in universities and colleges to or beyond the normal length in government and industry; (vii) promoting second shifts and evening courses and introducing summer sessions; (viii) converting all university and college faculty appointments to non-vacation appointments; (ix) promoting the development of inter-disciplinary courses and programs; and (x) deriving comparative unit costs of educational programs and exploring efficiency savings through the use of alternative educational methods, such as distance learning.

**226. Economies of Scale.** The bibliography suggests that there is substantial room for exploitation of economies of scale, especially in colleges. The numerical expansion of small rural degree colleges should be curbed. Rural students should be accommodated in centrally located colleges with potential for growth and improvement. Residential facilities should be provided for this purpose. Enrollments in newer and smaller universities should be raised in lieu of setting up additional universities or additional campuses of existing universities. Selected disciplines should be introduced or concentrated exclusively in certain universities and efforts should be made to improve their quality. Under-enrolled and unproductive departments and disciplines should be phased out. The multiplicity of subject combinations in degree colleges should be restricted to avoid uneconomic class sizes. Some general degree colleges should be encouraged and assisted to become multi-disciplinary by offering professional courses in education, public health, or commerce at the degree level.

#### ***E. Improving the Development and Delivery of Service at the Institutional Level***

**227.** Strengthening the policymaking function for the sector, establishing the necessary enabling institutional environment, mobilizing the needed resources, and ensuring efficiency in the use of available resources are all necessary measures. But their real purpose is to make possible a quantum improvement in the development and delivery of education and research services at the institutional level. The main themes underpinning proposals in this area are, first, an emphasis on coordinated formal methods of ensuring quality, and, second, a shift to a demand-driven system. This approach represents the most effective means for achieving the necessary magnitude and nature of change. It has the additional merit of not being overly prescriptive. By clearly defining aims, targets and priorities, and by specifying the local mechanisms required, it provides the means and direction for detailed decision making and action at the institutional level. The specific activities required at the institutional level include: improving access; upgrading support services; coordinating research activities; translating national goals into action plans; developing internal resource allocation procedures; enriching the educational experience; putting quality assurance mechanisms into practice; and improving staff appointment and development procedures.

### ***1. Institutional Action Plans***

228. Within the policy and organizational framework established by the apex body and its intermediary executing agencies, teaching and research institutions must elaborate medium and long-term plans, specify goals and propose changes needed to meet the goals. These plans should include a review of existing internal management structures, mechanisms for quality control, staff development, resourcing, and internal and external constraints on development. Institution plans and goals would also include priorities and targets, policies for seeking autonomy, and critical self-appraisal of performance, strengths and weaknesses. The institution will also need to indicate how it will respond to the procedures promulgated by the apex body and its implementation structure. Universities and colleges will be guided by their monitoring bodies (NCAAV and UGC) on the content and format of their action plans. Similarly, the research institutions would submit plans along with specific bids for the development of research projects in accordance with NCRFE procedures.

229. **Resource Allocation.** All institutions, autonomous and otherwise, will be required to develop internal procedures for distributing the resources from government and other sources. As discussed earlier, these methods are likely to be adapted from those applied by the apex body and its substructure. For example, an educational institution may decide to modify the weighing used by UGC for a particular subject area to calculate the allocation to a specific department. This could be justified by the institution's recognized priorities. At the institutional level the results of the collaboration between UGC and NCAAV will be manifested, since the core allocation will depend upon an assessment of efficiency and quality. Research institutions will develop procedures for allocating their core financial allocations. The freedom to redistribute funds provided by NCRFE for given lines of research would be restricted; such allocations would normally be project based.

230. **Access.** At present there is a mismatch between entry requirements and selection methods, and course content in higher education. Three aspects of this mismatch need to be addressed: the content of the intermediate courses; the entry requirements into higher education; and the content of the first year higher education programs. A review of the intermediate programs should consider their suitability for preparing students for higher level studies and the extent to which students are advised or encouraged toward the opportunities available. This issue should be addressed by the NCAAV in collaboration with the organization responsible for secondary level curricula and assessment. Fluency in English and mathematics should be prerequisites of intermediate programs purporting to prepare students for higher education studies in science and technology.

231. The entry requirements into higher education should be revised so that they are not wholly based on performance in the intermediate examinations, but attempt to measure other factors such as aptitude and genuine interest in the chosen subject. The apex body could commission a study by a think tank of suitable experts and, if necessary, overseas advisers to consider the current selection methods and to propose improvements or alternatives.

232. Finally the content of first year higher education programs will need to be reconsidered to include compensating modules, reorientation studies, new teaching and learning methods and more challenging open-ended project work. This should be part of the overall thrust to improve quality by reviewing the total higher education course content and the extent to which it prepares students for subsequent employment.

233. Specific points warrant further consideration on access: the expansion of scholarship schemes for able and motivated students. Such awards should be based on personal interviews, and should require proof of motivation and aptitude in addition to formal academic achievement in the appropriate subjects. Alternative modes of study could also be considered in order to attract a limited number of mature able students.

234. It will also be necessary to monitor carefully the results of the proposed changes. The collection and analysis of cohort and institution based data on student performance and progression is vital and must be available to the validating and resourcing bodies. These data would be an important element for deciding on the distribution of basic resources and incentives. They could also be made available for research and for staff development symposia on academic methods and policy.

235. **Enriching Students' Educational Experience.** The work of the NCAAV would be the key to improving the quality of the students' educational experience. The formal program of institutional accreditation and course validation visits, with supporting information and action plans, would concentrate on quality and performance and would eventually have a significant effect on the students' educational experience. At the meeting between the institution and the visiting party, the major items on the agenda would be curriculum design and delivery, the student experience, and outcomes of course objectives. NCAAV would also identify and publish information on the best and worst practices. Measures of quality and performance at the classroom and the institutional level would be quantified by such parameters as pass rates, examiners' reports, cohort progression and employability. Institutions and their staff would be accountable for their methods and performances.

236. Institutional quality assurance and control processes should encompass subject content and learning methods. There must be a move away from "chalk and talk". The student's educational experience should include case studies, seminars, discussion sessions, project work and open-ended exercises in laboratories and workshops. All study programs should be designed to encourage the extended use of libraries and other self-learning materials. They should attempt to develop creativity and problem-solving abilities in the student. Interdisciplinary studies and appropriate subsidiary subjects, such as statistics, languages and communication, should be included in all curricula. The language of instruction in science and technology should be English.

237. Work experience periods should be of sufficient duration and properly planned and monitored to ensure a worthwhile learning experience. In areas where students would normally expect to use their subject of study in employment, placements should enable them to spend their training period working in some aspect of their subject area.

238. Radical changes in teaching and learning methods will also necessitate different types of student assessment. Their implementation will require relevant staff development and responsible behavior by both students and faculty members. Accreditation should take account of the institution's capability to provide the environment and resources needed to deliver the curriculum and its learning and examination methods.

239. A review of courses and their rationale would identify programs that meet neither the needs of students nor their prospective employers. For example, the two-year minimum period of study required to obtain the first higher education qualification, the Bachelors degree, is too short to give the student sufficient breadth and depth of knowledge. The three-year honors program, already introduced in some

universities, should be phased in to become the major first degree qualification. Masters programs should require two years study following a first degree at honors level.

240. To achieve such fundamental changes in emphasis and method, significant staff development programs will need to be initiated to involve staff continually in their own development. It will also be necessary for NCAAV to introduce methods to monitor between visits whether staff development is happening in practice.

## ***2. Quality Assurance and Control***

241. Two major innovations in the proposals for change will affect academic and vocational standards within the institutions. The first innovation is the formal rigorous approach of the apex body and its substructure of intermediary executing agencies; the second is the move toward institutional autonomy. The present, somewhat ad hoc, and variable course validating procedures will be replaced by a universal, more consistent approach based upon the best current practice. This will also maintain the developmental focus on the priorities and strategies in the overall policy for higher education and will preclude the indiscriminate introduction of new educational programs in accredited institutions. The autonomy proposed for the institutions will carry with it far greater responsibility and accountability for academic and vocational standards.

242. The institutions would be required to formalize and demonstrate to NCAAV their internal mechanisms for developing policy, establishing priorities, allocating resources, quality control and staff development. Staff should be directly involved in this exercise to ensure that their aims and strategies are clearly understood and that good practice is widely disseminated. In universities and colleges, internal course validating procedures would be an important element for institutional accreditation and would involve continuous updating and review; they would also be expected to include a formal input from potential employers and students. In research institutions, the formal procedure for the assessment of quality and performance would be subject to discussion and approval by NCRFE.

243. All curricula should be subject to continual review and revision. Institutions' internal course validations should be required to include and justify: a statement of aims and objectives related to national policy; content and structure; methods of delivery and assessment; and the resources required, including staff. Data on previous student cohort progression should also be included when curricula are subject to review and revision. In evaluating the curriculum and its delivery, the criteria of acceptability used within the institution and by NCAAV should shift toward a student-centered approach that emphasizes work related goals, more interactive teaching, student involvement and the development of personal durable skills.

244. The intermediary executing agencies could also identify and confirm institutional priorities and initiate new study programs or areas of research into higher education. They could also play a major role in encouraging employers to participate and collaborate in improving the quality of provision.

## ***3. Academic Staff Selection and Development***

245. There is an urgent need to reconsider the national constraints imposed upon academic staff appointments and salary scales. Sufficient staff of the necessary calibre and experience must be attracted and retained by the higher education and sector. The present system, particularly in colleges, discourages institutions from introducing proper appointment, appraisal and development procedures. It also inhibits

flexibility and prevents the introduction of incentives based on performance or the need to pay competitive salaries in areas of short supply. Faculty salary scales should be delinked from government pay scales and conditions of service. Autonomy must provide greater flexibility and freedom at the institution level to introduce realistic schemes for probation, appraisal, tenure, development, and incentives including performance related pay. Formal promotion requirements should be made more flexible and should include not only the possession of paper qualifications, but group appraisal. This may require amendments to existing service rules.

246. Autonomy will include delegation of responsibility for appointments. Institutions will therefore need to develop and implement formal procedures for staff appointments to safeguard standards. These should include clear job specifications, conditions of service and methods of selection.

247. An urgent concerted approach to staff development will be necessary if significant improvement is to be achieved in the performance of the sector. In addition to subject matter updating, staff development should include training in: management, especially in the new autonomous institutions; curriculum development and delivery; research methodology; and pedagogy (new teaching and learning methods).

248. The possession of Ph.D.s, often without serious regard to relevance and subject development, is currently emphasized as a criteria for promotion in universities. This should be balanced by the need to introduce current practice into teaching, with faculty being encouraged to gain industrial experience, staff development and training programs. Such experience should be recognized as a factor for promotion. Probationary periods, the granting of tenure and other recognition should be used as incentives to encourage technical and pedagogical updating and performance. The NCAAV should consider funding specified areas of staff development, such as curriculum design and delivery, and new teaching and learning methods. The apex body might commission a specific think tank to encourage greater collaboration between industry and the science and technology faculties (the successful teaching company scheme in the U.K. affords a possible model) and to encourage staff to acquire current relevant industrial experience.

249. In order to demonstrate the importance attached to academic staff development, the NCAAV could work with UGC to design and fund centers of excellence in selected universities for subject based pedagogical studies in higher education. These units should also offer research and staff development programs covering the latest methods and techniques. The fees from such programs should provide extra income for the institutions concerned. The National Academy of Higher Education should strengthen its activities in this area; Allama Iqbal Open University networks could also become involved.

250. As part of their accreditation reviews, NCAAV and NCRFE will require institutions to prepare staff development plans and to allocate funds according to their achievement. In universities and colleges, priority should be given to: the introduction of the latest curriculum development and delivery methods; the importance of relating higher education to real socio-economic needs; and current, relevant industrial and commercial experience. The traditional emphasis on the acquisition of higher degrees in universities should only be acceptable if it pursues scholarship at the highest level and clearly meets all or some of these main priorities. In research institutions, the staff development emphasis should be on research methods, identifying and managing goal-related research, and collaboration with industry and commerce. Since incentives are the best aid to innovation, the institutional staff development plans should also include a system of recognition and reward for tangible proof of achievement.

#### **4. Improving the Effectiveness of Support Services and Resources**

251. In order to improve the effectiveness of support services and resources, actions are required by: the apex body and its intermediary executive agencies; other organizations with responsibility for higher education and research institutions; and the institutions themselves. The accreditation and the course validation procedures will include an appraisal of the institution's support services and resources, as will the work of the NCRFE. These will cover: resourcing levels; plans for technical and non-technical support staff development; sources of non-government funding; and proposed changes to match planned reorganization and development. With the increase in institutional autonomy, present and future building usage, repair and refurbishment will become the responsibility of all the higher education and research institutions.

252. NCAAV and UGC will need to promulgate norms for support services and resourcing levels as approved by the apex body, these should include space, equipment, library facilities, number and types of support staff, building usage and maintenance. These data could be faculty or discipline based. UGC and NCRFE, as appropriate, should also commission an urgent study into space utilization norms based on student numbers and disciplines. This will provide essential data on existing levels of provision and will direct a rationalization and redistribution to developing and priority areas.

253. The proposed financial autonomy of the institutions will require them to set up and demonstrate procedures for support staff appointments and employment, compatible with those for academic and professional staff. The freedom to vire between budget headings within the global allocation will also necessitate a careful consideration of priorities but could lead to an increased budget for equipment and related staff development.

254. Two areas of support staff development warrant special attention in all institutions: first, training programs for technicians in laborator, equipment maintenance and use; and second, computer familiarization for several groups, including administrative, library and technician staff. It may initially be necessary to allocate funds above the global budget norms to support these activities and purchase selected items of modern equipment.

255. There is an urgent need to introduce computing equipment into all areas of the work of the institutions. This will require a specific allocation of funding for microcomputing equipment and a major training program to instruct staff in its maintenance and use. First, priority should be given to generating a critical mass of expertise in each institution to encourage and assist an exponential expansion of new technology.

256. The provision of a student counselling services prior to entering a Bachelors program will foster the shift toward a demand-driven system. Students will be given personal guidance and advice on careers and additional education opportunities. Advice in the schools would help identify aptitudes and preferences and would encourage progress into career oriented further education. Counselling services, revisions in fee structures, scholarship and grant systems, and changes in institution funding levels and mechanisms would further encourage a demand-driven thrust toward responsiveness and employability.

## **5. Research Activity**

257. The apex body should endeavor to coordinate all research.<sup>12/</sup> The terms of reference of the National Council for Research Funding and Efficiency (NCRFE) should be widely disseminated to ministries and organizations with an interest in research and its outcomes. NCRFE should prepare and issue a policy statement relating all research activities to national policy and needs, specifying aims, strategies and priority areas. NCRFE should also designate a few appropriate centers of excellence (relevance) from among existing research and educational establishments.

258. All designated research institutions should be given as much autonomy as possible but should be accountable for performance and should be funded by results. Research institutions should be empowered and encouraged to attract additional external funding and be free to spend net income from such sources. The criteria by which research performance will be monitored and assessed should be derived and promulgated by the apex body and NCRFE. Future government core funding and incentive funding will be allocated according to this assessment of research quality and performance.

259. Within the framework set by the apex body, all research and higher education institutions should be required to define their research policy and strategy and provide appropriate efficiency and performance data. These data would include tangible evidence of output, industrial and other collaboration, external sponsorship and staff development. The criteria adopted to assess performance would weight such factors and should be used to direct and foster research in priority areas, support success and identify waste.

260. The apex body and NCRFE should promote formal links between institutions to make the most effective use of expertise and specialized equipment. University and college staff should be encouraged to concentrate research in the designated priority areas and to seek collaboration with the research institutions to enrich their staff development and teaching programs. Greater emphasis should be given to research applied to solving the real problems of society and to injecting this activity into academic staff development and higher education programs. Training programs based on the designated centers of strength should provide training in research methodology and techniques, and the management and operation of applied research.

261. Dissemination of research activities and results should be required, and all researchers should submit their programs and progress to critical appraisal by their colleagues. An apex body think tank could be commissioned to investigate ways to encourage and promote interdisciplinary research and collaboration, particularly in relevant applied research areas. Incentives should be offered to encourage developing industries to collaborate with research institutions in applying modern production and scientific methods. Several individual and project based models exist for achieving this at relatively low cost and requiring gradually increasing contributions from the industrial partner as the program develops successfully.

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<sup>12/</sup> Military research would be subject to arms length oversight by the apex body. Military research conducted in non-military establishments would be treated like all other research in Pakistan.

## **THE COSTS AND FINANCE OF HIGHER EDUCATION IN PAKISTAN**

### ***A. Introduction***

1. This annex<sup>1/</sup> addresses the following questions: (a) What does it cost to provide higher education in Pakistani universities and colleges? (b) What are the components of this cost? (c) What institutional features explain the cost differences among universities and degree colleges? (d) How efficient are the institutions? (e) What are the sources of finance for higher education and what is the level of student subsidy? (f) How do these vary across the different institutions?

### ***B. Unit Costs of Higher Education***

2. Given the data available, we use recurrent expenditure per student to estimate the unit costs of providing higher education in Pakistan. This measure excludes capital expenditures and student fees, such as personal expenses for transportation, lodging, books, etc.

3. Unit Costs. Table 1 displays recurrent average expenditure per student for the college sample. According to this measure, unit costs in degree colleges averaged a low Rs.2,853 (US\$1,64)<sup>2/</sup>, ranging from Rs.727 (US\$50) in the Sindh College of Commerce to Rs.9,457 (US\$544) in the Government College of Physical Education in Karachi. In addition to this broad range of unit costs, costs also differ by province and by type of college. Colleges in the NWFP and in Balochistan spend on average 40 percent and 85 percent more per student than colleges in the other provinces. College costs in the Punjab, in the Federal Colleges in Islamabad, and in the Sindh are lowest, averaging Rs.2,600 to 2,700. Professional colleges spend 35 percent more per student than general colleges.

*Table 1: Average Per Student Costs in Degree Colleges  
(in 1987 constant Rs.)*

	<i>Mean</i>		
	<i>Number of colleges</i>	<i>Per student recurrent cost</i>	<i>Standard deviation</i>
General	154	2,799	1418
Professional	11	3,790	1349
Male	120	2,848	1625
Female	45	2,863	1349
Sindh	102	2,576	1661
Punjab	16	2,604	1097
NWFP	32	3,600	892
Balochistan	10	4,801	2340
Islamabad	5	2,734	812

<sup>1/</sup> For a more detailed version of this Annex, please see Annex 5, Report No. 8231-PAK, February 1990.

<sup>2/</sup> The exchange rate used here is 17.399 rupees per U.S. dollar as reported for 1987 by the International Monetary Fund in the rf series.

4. Universities cost six to seven times more per student than colleges. Unit costs among universities averaged Rs.17,407 (US\$1,000) in 1985-86 and Rs.20,960 (US\$1,205) in 1986-87, ranging from a low of Rs.7,015 (US\$403) in Shah Abdul Latif University to a high of Rs.49,579 (US\$2,850) in Islamic International. The unit cost at AIOU, however, appears remarkably low (Rs.700), only one-tenth of the cost at Shah Abdul Latif.

5. Table 2 shows the unit costs and their distribution by type of university and field of study<sup>3/</sup>. Relative to general universities, professional agricultural universities spend about 25 percent more and professional engineering schools spend about 30 percent less per student. Statistically, however, these differences are not significantly different from zero. Across faculties, general universities spend about the same for an Arts major as they do for a Science major (Rs.16,500 in 1985 and Rs.20,000 in 1986). They too, however, spend a slightly higher amount on their agricultural students, though only two general universities offer an Agricultural specialization.

6. This similarity between unit expenditure among arts and science faculties can be explained by the distribution of university resources. Science faculties would have higher unit costs than arts faculties if universities committed a greater share of their resources to necessary laboratory equipment and materials for teaching and research. Only minimal resources are allocated to these items rendering the difference in costs across faculties negligible.<sup>4/</sup>

*Table 2: Average Per Student Costs in Universities  
(in 1987 constant Rs.)*

	N	Average per student expenditure			
		All faculties	Arts	Sciences	Agriculture
<b>All Universities in 1985-86</b>	<b>19</b>	<b>17,407</b>	<b>16,537</b>	<b>16,627</b>	<b>25,900</b>
General	12	17,871	16,537	18,190	31,300
Prof. Agricultural	3	22,318	--	--	22,318
Prof. Engineering	4	12,331	--	12,331	--
<b>All Universities in 1986-87</b>	<b>19</b>	<b>20,960</b>	<b>19,905</b>	<b>19,551</b>	<b>25,520</b>
General	19	21,115	19,904	20,884	23,150
Prof. Agricultural	3	27,111	--	--	27,111
Prof. Engineering	4	15,883	--	15,883	--

*Note:* Arts includes the faculties of Art, Law, Commerce, and Education. Faculties of Science, Pharmacy, and Engineering comprise Sciences. Agriculture includes only Agricultural faculties. Differences in unit expenditure between the two years included in the review are to some degree attributable to poor accounting.

<sup>3/</sup> We were unable to compute unit costs separately for each faculty (for example, education, law, commerce, and pharmacy). The absence of disaggregated expenditure data made it necessary to group all faculties under the three headings: arts, sciences, and agriculture.

<sup>4/</sup> In some universities (for example, Quaid-I-Azam) unit expenditure for Arts is greater than for Sciences.

7. International Comparisons. How do these unit costs compare with the costs of higher education in other countries? Although international comparisons of unit costs may be misleading because of data incompatibilities and different input prices, they nonetheless provide a basis for comparison. Pakistan's higher education average unit cost for 1985-86 is US\$332 is less than India's average of US\$599 and Bangladesh's of US\$453.<sup>§</sup> It is, of course, considerably less than was spent by universities in developed countries. For example, American and British public universities spend ten (US\$10,500 per student in 1982) and eight (US\$8,000 per student in 1980) times as much per student as their Pakistani counterparts.<sup>§</sup>

8. The Structure of Unit Costs: Personnel and Non-Personnel Expenditures. Colleges and universities differ not only in how much they spend per student but in how their resources are allocated. Relative to universities, colleges allocate a significantly larger proportion of their budgets to salaries and allowances. Table 3 shows that, on average, colleges allocate about 93 percent of their budgets to salaries and allowances, leaving trivial sums to cover all other instructional and operational costs. Universities allocate a considerably smaller share of their budgets to faculty salaries and a correspondingly larger share to non-personnel items. On average, salaries and allowances comprise 65 percent of university budgets. However, the true proportion is probably between 65 percent and 80 percent since, in some cases, a large share of non-personnel expenditure is pension payments. According to university accounting practices, these payments are generally reported as miscellaneous expenditure under non-personnel headings.

9. Expenditures on Teaching and Non-Teaching Staff. Colleges and universities spend such large shares of their resources on personnel, in part, because they are widely considered and used as places of employment for many unskilled Pakistanis. Consequently, an unreasonably high percentage of personnel expenditures cover the salaries and benefits of low-level non-teaching staff.

10. For most degree colleges, salaries and allowances of teaching staff account for only 60 percent of the total salary bill (see table 3), whereas in universities, only about 50 percent of all personnel expenditure is faculty compensation. The remaining 40 percent and 50 percent of personnel expenditure in colleges and universities is compensation for a large cadre of support staff and administrators.

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<sup>§</sup> The average unit cost is estimated from enrollment and expenditure figures as reported in World Bank report no. IDP51 (1989). More recent disaggregated data are not available.

<sup>§</sup> Digest of Education Statistics 1985-86. 1986. Office of Educational Research and Improvement, U.S. Department of Education Center for Statistics, Washington, D.C.; Shattock, Michael and Gwynneth Rigby, ed. 1983. Resource Allocation in British Universities. London: The Society of Research into Higher Education.

*Table 3: Distribution of College and University Budgets*

	<i>Colleges</i>			<i>Universities<sup>a</sup></i>			
	<i>All</i>	<i>General</i>	<i>Professional</i>	<i>All</i>	<i>General</i>	<i>Agricultural</i>	<i>Engineering</i>
Unit Cost (Rs.)	2,853	2,799	3,790	19,183	19,492	24,715	14,107
<i>Percent of budget allocated to:</i>							
All Personnel <sup>b</sup>	92.6	92.5	93.6	65.0	65.2	68.8	61.6
Faculty	54.8	55.0	50.3	30.3	30.0	35.0	27.1
Non-Faculty	37.8	37.5	43.3	34.7	35.2	33.8	34.0
Non-Personnel <sup>c</sup>	7.4-9.2	7.5-9.4	6.4-6.7	35.0	34.8	31.2	38.4
Library and research		9.5-3.6	.98-1.3	3.8	4.0	2.4	4.2
Non-Faculty Personnel				34.7	35.7	33.8	34.0
Non-teaching	--	--	--	29.4	29.5	29.1	29.2
Administration	--	--	--	5.3	5.7	4.7	4.8

a. The figures are averages over the two academic years 1985-86 and 1986-87.

b. Faculty and non-faculty expenditures were estimated, first, by assigning to faculty the midpoint salary in their scale. The sum of all faculty salaries was subtracted from total expenditures on personnel. The remainder is estimated to be non-teaching personnel expenditures. This method was used because expenditures reported as "Basic Pay of Officers" relate to teaching faculty, and because the "Basic Pay of Other Staff" reflecting total salary payments to non-teaching staff were unreasonable in the light of total staff in each category.

c. Colleges, library and research includes expenditure for library books, periodicals, magazines, chemicals and glassware, and for scientific equipment. A range is given because, in addition to budgetary allocations, colleges are given grants for these items, which do not always appear in the budget statements. For universities, expenditures on research studies is also included with these items.

11. Excessive numbers of support staff and administrators are employed in universities; support and administrative staff outnumber teaching staff by an average of 4 to 1. Stated differently, from 75 percent to 90 percent of all personnel employed in universities are in non-teaching positions. In degree colleges, there is on average one such staff member per professor, although this ratio ranges from 0.4 to 2.8. Hiring practices disproportionately favor the unskilled; almost 90 percent of the non-teaching staff in colleges and universities are drivers, gardeners, watchmen, messengers, tea servers, etc. in the lowest grades (1 to 7) of the civil service pay scale (see table 4).

12. The staffing pattern is repeated within the university teaching departments (compared with the sections considered administrative).<sup>2/</sup> Most support staff in teaching departments are unskilled labor, particularly in the general universities. Like the colleges, staffing patterns in the teaching departments disproportionately favor the unskilled. On average, 76 percent of non-teaching staff in the teaching departments are in the lowest grades in the civil service pay scale, i.e. grades 1-7 (see table 4). They outnumber technical and administrative support staff (grades 8-16) by three to one. Fortunately, engineering universities have the lowest proportion of these staff (62 percent) and a higher proportion of technical staff.

<sup>2/</sup> Teaching and administrative sections are categories in university budgets. Teaching sections refer to academic departments; administrative sections refer to the registrar, admissions, etc.

**Table 4: Non-Teaching Staff by Civil Service Grade in Colleges and University Teaching Departments (in percent)**

	<i>Civil Service Grade<sup>a</sup></i>			<i>Total</i>
	<i>1 to 7</i>	<i>8 to 11</i>	<i>12 to 16</i>	
<b>Colleges</b>	<b>82.9</b>	<b>12.7</b>	<b>4.4</b>	<b>100</b>
General	82.7	12.7	4.6	100
Professional	86.4	12.1	1.5	100
<b>Universities</b>	<b>75.7</b>	<b>11.8</b>	<b>12.5</b>	<b>100</b>
General	81.2	7.2	11.6	100
Agricultural	82.2	9.7	8.1	100
Engineering	62.0	21.1	16.9	100

*Note:* Figures are averages for 1985-86 and 1986-87. Refer to green cover sector review, volume II, appendix table C.6 for each academic year.

a. Grades 1-7 include drivers, gardeners, watchmen, messengers, etc. Grades 8-11 include technical assistants, laboratory assistants, library workers, and lower level clerical staff. Grades 12-16 include high level technical staff and their supervisors.

13. **Non-Personnel Expenditure.** Non-personnel expenditure comprises the remaining 7 percent to 9 percent of college budgets and 35 percent of university budgets (see table 3). Of this expenditure, a very small share is allocated to research, library books, periodicals and magazines, scientific equipment, chemicals and glassware. Incomplete data from college budgets show that an average of 1 percent of college budgets, or Rs.26 (US\$1.50) per student, is allocated to these items, about the same amount spent per African primary school student on teaching and learning materials.

14. Added to these allocations, colleges also receive targeted grants from Provincial Governments for library materials, and scientific hardware and software. From the data provided, we cannot determine if the targeted grants are reflected in the budgets. If we include the targeted grants, total non-personnel expenditure rises to an average of 9 percent, and funds for libraries, and scientific hardware and software increase to an average of 3.5 percent of total expenditure. Nonetheless, colleges still spend on average only Rs.100 (US\$5.75) per student for these materials.

15. University students fare somewhat better than their college counterparts in the amount spent per student on library and research materials (Rs.730 or US\$42). Students fare better because universities spend more per student generally, not because universities allocate a larger share of their budgets to teaching and learning materials. Among universities, an average of only 3 percent to 4 percent of the budget is allocated to research, libraries, equipment, and other learning support materials. The other 30 percent covers expenditure on numerous small budget items—electricity, transportation, rent, office supplies, building maintenance, etc. In some cases, a large share of the other expenditure covers pension

payments.<sup>8/</sup> The distribution of budgetary allocations among colleges and universities suggests that, after covering salaries, nearly all funds remaining are allocated to overhead. There is little left to pay for these inputs. In comparison, U.S and British public universities allocate from 15 to 25 percent of their resources, or US\$1,200 to 2,500 per student, to research and libraries.<sup>9/</sup>

### ***C. Institutional Characteristics and Unit Costs***

16. **Framework.** The variations in unit costs among colleges and universities discussed in Section I may reflect differences in: (a) scale economies and their corresponding efficiency in resource use; (b) the mix of programs offered; and (c) the quality of instruction. To test if these factors are related to cost differences between institutions, we adopt the traditional economic average cost framework from the theory of the firm.<sup>10/</sup> We assume that managers of degree colleges and universities seek to minimize average unit costs subject to the realization of a desired level of instructional quality per pupil. Within an institution, unit costs may be high because, although enrollment may be low at the beginning, a certain number of staff and facilities must be provided in order to offer a minimum number of courses at a certain level of quality.

17. Given the minimum number of courses and quality of instruction, an institution may increase its enrollment and lower its average costs simply by increasing the use of existing resources, that is, by raising student-personnel ratios, by increasing the number of hours professors teach, or increasing the use of facilities. In the long run, the decline in average costs should either taper off or begin to increase if the variety of courses and specializations offered are broadened, more staff are hired, and student-staff ratios fall, or if quality is maintained as enrollment increases.

18. **College Characteristics.** Table 5 displays the relationship between enrollment and unit costs among degree colleges. There is some evidence of economies of scale. Unit costs decline quite rapidly as college size increases from below 400 to about 1,300 to 1,600 students (see column 1). The cost associated with small student enrollment appears substantial. Colleges with enrollments of 400 or less spend two and one-half times more per student than colleges three times larger. The increased cost of small colleges cannot be explained by a wider variety of course offerings or by a larger number of science courses offered; small colleges offer fewer of both (see columns 7 and 8).

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<sup>8/</sup> Since pension payments are technically "personnel related" expenditures, the share of overhead expenses in the budget may be overstated for universities that include pension payments in overhead expenses.

<sup>9/</sup> Digest of Education Statistics 1985-86. 1986. Office of Educational Research and Improvement, U.S. Department of Education Center for Statistics, Washington, D.C.; Shattock, Michael and Gwynneth Rigby, ed. 1983. Resource Allocation in British Universities. London: The Society of Research into Higher Education.

<sup>10/</sup> Although institutions of higher education, particularly universities, are more accurately multi-product firms that conduct teaching and research, sparse data on research output and the fact that little research is carried out in Pakistani colleges and universities make this an inappropriate framework for this analysis.

Table 5: Average Unit Costs and Other Indicators for Colleges, by Size

Enrollment	N	Per student cost (1)	Ratio of students to faculty (2)	Ratio of students to non-teaching staff <sup>a</sup> (3)	Percent of budget allocated to non-teaching staff (4)	Percent of faculty in Grade 18 and above (5)	Percent of budget allocated to non-personnel expenditure (6)	Number of subjects (7)	Percent of subjects in science (8)
<= 399	26	5422	15	18	39.5	18.8	10.1	12	28.6
700-999	31	2582	32	36	40.1	24.0	7.9	14	37.2
1000-1299	31	2431	35	59	39.6	24.2	7.2	16	34.4
1300-1599	21	2023	38	65	35.9	28.7	5.6	18	34.0
1600-1899	17	2373	37	40	38.4	32.0	5.4	17	43.6
1900-2199	12	2348	32	55	35.3	30.1	6.9	18	36.2
> 2200	23	1726	47	80	32.7	30.7	5.0	20	27.2
All	204	2853	32	46	37.8	25.5	7.4	15	33.2

a. Data on non-teaching staff pertain to a sub-sample of 110 colleges.

19. The lower unit costs in larger colleges can be attributed to higher ratios of students to faculty and non-teaching staff (see columns 2 and 3). The number of students per faculty member increases from 15 in the smallest colleges with enrollments of less than 400 students to an average of 47 in colleges with enrollments of more than 2,200. Overall, however, student to faculty ratios are astonishingly high in all but the smallest colleges. Similarly, student to non-teaching staff ratios are high, from an average of 18 in the smallest colleges to 80 in larger ones. Correspondingly, larger colleges spend a smaller share of their resources on non-teaching staff (see column 4).

20. The lower per student costs and higher student faculty ratios among the larger colleges may signal that a lower quality of education is offered in these institutions relative to smaller colleges. Without reasonable measures of instructional quality, such as test scores or pass rates on examinations<sup>11/</sup>, we use the percent of faculty in civil service grades 18 and above and the proportion of the budget allocated to non-personnel items as proxies for instructional quality. Larger colleges have a higher proportion of more experienced, more highly educated faculty (see column 5). It appears that the larger proportion of relatively more qualified faculty in larger colleges leaves a smaller share (only 5 percent) for overhead and other essential inputs (see column 6).

21. University Characteristics. Universities show similar unit cost patterns. Larger universities have lower unit costs; this is strongly related to increased use of teaching and non-teaching staff (see table 6). A large drop in unit costs is evident for universities that enroll 1,400 students or more. The four smaller universities that enroll under 1,400 students--Islamic International, NWFP Agriculture, A.J.K., and Q.I.A.--spend on average 2.5 times more per student than their larger counterparts.

22. Relative to larger universities, small universities also have substantially lower student-faculty and student to non-teaching staff ratios. On average, small universities have five students per professor and two students per non-teaching staff; larger universities have sixteen students per professor and five per

<sup>11/</sup> Exam results were obtained only for a subset of colleges. An analysis of the results is presented in Section IV.

non-teaching staff. These lower student to staff ratios are associated with substantially higher costs. On average, institutions with student-faculty ratios lower than 8 to 1 have unit costs 2.5 times higher than those with ratios of 8 to 1 or more; and, where student to non-teaching staff ratios are 3 to 1 or less, unit costs are 86 percent higher. This suggests that raising enrollment at given staff levels, particularly non-faculty staff levels, may substantially lower unit costs in small universities.<sup>12'</sup>

23. Increasing enrollment, however, is reasonable only when university space permits (and if there is sufficient demand). Table 6 shows that, overall, Pakistani universities do not appear to be overcrowded. With the exceptions of A.J.K., NWFP Agriculture, NED Engineering, and the University of Punjab, teaching space is ample, averaging 13.5 square feet per student.<sup>13'</sup> Quaid-I-Azam, Sindh Agriculture and Islamia Bahawalpur appear to have excessive classroom space relative to enrollments. Although the number of students per square feet may be a crude measure of space availability, the figures suggest that in most universities existing teaching space could be used more efficiently. In most cases, however, increasing student enrollment at current faculty levels may raise student to faculty ratios beyond acceptable levels.

24. In larger universities, the unit costs do not appear to be lower at the expense of overcrowding. Nor do larger universities appear to sacrifice the quality of faculty for lower costs. Similar to larger colleges, the larger universities employ a greater proportion of more experienced and highly qualified faculty than smaller schools. For example, among the ten largest universities, 31 percent of faculty are in grades 18 and above compared to an average of 25 percent in other colleges and universities, and they allocate a correspondingly smaller share of their budgets to overhead.

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<sup>12'</sup> Shah Abdul Latif University enrolled less than 1,300 students in 1985-86, but had a student-faculty ratio of 21 to 1, and one of the lowest unit costs (7,592 Rs.).

<sup>13'</sup> This compares favorably to the international standard of 12.7 square feet per student.

Table 6: Average Unit Costs and Other Indicators by Size, Universities 1985/86-1986/87

University	Total enrollment	Unit cost	Students per			Salaries and allowances			Area per student (square feet)	
			Faculty	Non-teaching staff	Percent of faculty in grade 18 or above	Non-personnel	Faculty	Non-teaching staff		
Islamic International	461	39,423	5	1	23.1	15.1	52.7	29.3	79.5	19.45
NWFP Agriculture	727	33,563	4	2	32.1	37.4	32.5	52.8	40.2	8.22
Azad Jammu and Kashmir	836	31,677	5	2	17.2	20.7	31.0	38.8	37.1	2.72
Quaid-i-Azam Univ.	1,142	35,805	5	2	29.6	81.2	31.9	43.1	32.1	32.40
NWFP Engineering	1,430	19,271	13	3	37.6	0.0	43.7	25.2	29.5	14.71
Shah Abdul Latif	1,469	7,592	21	6	12.9	29.6	22.3	34.9	45.0	.
Sindh Agriculture	1,837	23,451	8	2	34.6	14.6	30.9	36.2	39.2	29.15
Islamia U. Bahawalpur	1,852	14,745	12	3	19.6	70.6	33.7	33.8	44.3	18.07
B.Z. Multan	1,869	17,453	17	3	14.0	45.7	44.6	19.1	35.4	16.28
Gomal University	2,438	13,435	10	2	18.6	23.2	24.7	40.0	54.0	6.66
Univ. of Balochistan	2,744	14,468	12	4	18.7	49.2	25.0	35.7	36.7	12.25
Mehran Engineering	3,396	14,427	15	4	28.0	6.2	36.7	32.2	36.8	12.44
NED Engineering	4,085	9,194	32	7	32.9	8.5	43.3	26.8	38.5	4.34
University of Sindh	4,621	24,828	12	3	31.1	34.7	42.2	26.1	28.1	11.27
Agriculture Faisalabad	4,922	17,131	10	3	35.9	24.5	30.2	35.4	38.8	11.10
Engineering Lahore	5,296	13,536	17	4	47.1	4.8	30.1	31.8	37.8	14.71
University of Karachi	8,387	11,431	20	7	34.5	45.4	41.9	33.5	28.9	13.27
University of Punjab	9,245	13,968	18	3	34.1	44.7	40.5	23.5	37.4	4.37
University of Peshawar	9,355	9,092	17	6	32.7	16.6	27.6	39.8	30.6	11.50
All	66,112	19,183	13	3	28.1	30.1	35.0	33.6	39.5	13.49
General	44,419	19,493	13	3	23.8	39.7	34.8	33.1	40.8	13.47
Agricultural	7,486	24,715	7	2	34.2	25.5	31.2	41.5	39.4	16.16
Engineering	14,207	14,107	19	5	36.4	4.9	38.4	29.0	35.6	11.55

Note: The figures in this table are averages for 1985-86 and 1986-87.

#### D. Efficiency

25. The low consumable expenditure per student and minimal learning, teaching, and research support resources in Pakistan's colleges suggest that little is probably taught and learned in these institutions. The low pass rates of students taking the intermediate and undergraduate exams offer support for this conclusion.

26. Pass Rates. Table 7 shows the percent of exam takers who passed the 1988 F.A., F.Sc., B.A. and B.Sc. exams in a sample of colleges. On these exams, a final score of 33 correct is the minimum required to pass. To obtain a passing score, many parents pay their children's teachers for tutoring sessions after school; students also resort to cheating during the exams. For example, 10 percent of all

students who sat for the 1988 exams administered by the University of Peshawar were disqualified for cheating.<sup>14/</sup>

27. Notwithstanding the low proportion of correct responses required to pass, and the aids of tutoring and cheating, an astonishingly small proportion of students pass the exams. Table 7 shows that, on average, only 40 percent of intermediate and 33 percent of undergraduate students passed in 1988. Students attending women's colleges, however, scored consistently better than students attending men's colleges.<sup>15/</sup> On the F.A. and F.Sc. exams only 33 percent of the men passed compared to 55 percent of the women; on the B.A. and B.Sc. exams only 25 percent of the men passed compared to 50 percent of the women. Students attending college in the Sindh also perform better than those in other provinces. These low pass rates, especially among men, suggests that colleges do not adequately teach students what they are required to know.

*Table 7: Percent Passing the F.A., F.Sc., B.A. and B.Sc. Exams, 1988  
(number of colleges)*

	<i>Intermediate</i>		<i>Undergraduate</i>	
	<i>Arts</i>	<i>Science</i>	<i>Arts</i>	<i>Science</i>
Sindh	58 (24)	57 (22)	-- --	-- --
Punjab	36 (55)	45 (54)	34 (49)	33 (32)
NWFP	41 (31)	14 (31)	30 (15)	31 (26)
Balochistan	-	-	-	-
Islamabad	-	-	50 (4)	30 (4)
Male Colleges	33 (71)	35 (82)	26 (46)	24 (45)
Female Colleges	59 (39)	49 (25)	49 (22)	52 (17)
All Colleges	42 (110)	36 (107)	34 (68)	32 (62)

-- Not available.

<sup>14/</sup> Another example comes from the University of Punjab which had one affiliated college in which all students cheated in 1989. Cheating is reportedly common; it is not, however, always reported.

<sup>15/</sup> Most colleges are segregated by sex. There are a few co-ed colleges, but only a few women attend.

28. One might then ask if there are certain college characteristics associated with higher or lower levels of achievement. Can these low pass rates be explained, for example, by the low level of resources on which colleges operate? By the breadth (or narrowness) of their course offerings? By the minimal amount spent on teaching and learning materials? By the quality of the professors? Or, by their high student faculty ratios?

29. The following sections present the results of an exploratory regression analysis that examines the relationship between exam pass rates and these college characteristics. The testable hypotheses are both limited and driven by the explanatory variables available in the college data set. We do not, for example, have data on the students' background or ability, nor on numerous other variables, such as the time students spend on homework, or in science labs, that may influence performance. Moreover, multicollinearity among some of the variables further reduced the number of usable explanatory variables.

30. With these limitations in mind, in this analysis, we test the relationship between: (a) the breadth of course offerings; (b) instructional and learning inputs; and (c) class size. Specifically, we test the null hypotheses of no relationship between college level pass rates and: (a) the degree to which the college specializes in teaching arts or sciences; (b) the breadth of the curriculum offered; (c) the availability of libraries, and scientific hardware and software; (d) the quality of the faculty; and (e) the size of classes, while holding constant the number of students who took the exam. The latter is introduced to control for selection since the spread of ability is likely to be wider when the pool of students sitting for the exam is larger. Failure to control for this distorts the performance ranking of colleges.

31. It was found that students enrolled in colleges specializing in the arts perform worse than those enrolled in the more general colleges (that is, those colleges offering a more even mix of arts and sciences). Among all colleges, male and female, the higher the concentration of arts students the lower the pass rate. Students in specialized science colleges, however, perform better than their peers in the more general colleges. This is, in part, because specialized science colleges offer a broader range of science courses, and this broader curriculum better prepares students for the exams.<sup>19</sup> Holding the degree of specialization in the arts or sciences constant, colleges that offer more science subjects, and male colleges that offer a broader range of arts subjects, have higher pass rates.

32. The hypothesis of no relationship between student to faculty ratios and pass rates is rejected for male arts colleges where high student to faculty ratios have a deleterious effect on learning. In female colleges and specialized science colleges, however, student to faculty ratios are not associated with pass rates.

33. Female colleges outperform male colleges in both the arts and sciences. For females, however, the characteristics of the college are not significant predictors of their success. Because the data show few differences among male and female colleges, women's higher exam pass rates are probably explained by a higher degree of selection and individual characteristics, such as better study habits.

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<sup>19</sup> A high degree of collinearity between the percent of students in the field and the number of courses offered in science programs makes the degree of specialization proxy insignificant in the model for intermediate science exam pass rates. Earlier specifications and the raw correlation revealed a significant and positive relationship between the percent of students in science programs and science exam pass rates.

34. Finally, students in the Sindh still perform better than those in other provinces even after controlling for the college characteristics included in the model. The higher pass rates among males on the F.A. exam and of all students on the F.Sc. exam suggest that the Sindh has either, or both, higher quality colleges and better students, or that the education standards there are lower or the exams easier.

35. Bachelors. Only two variables are associated with college pass rates in relation to the B.A and B.Sc. exams: (a) the student faculty ratio in the B.A. regressions, and (b) female colleges in both the B.A. and B.Sc. regressions. Students attending colleges with higher student to faculty ratios perform worse than other students. The exam results of female students explains nearly all the variation in pass rates on the B.A. and B.Sc. exams. Holding differences among colleges in course offerings, instructional inputs and class size constant, the pass rates of women are 16.2 and 24.9 percentage points higher than those for males on the B.A. and B.Sc. exams.

36. The absence of a relationship between pass rates and the area specialization of the college, the breadth of courses offered, the "quality" of the faculty, and expenditures on instructional materials may indicate two things. First, the variables may inadequately measure aspects of college quality. Second, and more likely, the results suggest that achievement among undergraduates is purely random. In other words, if students pass, they do so as a result of their own effort, not as a result of the quality of their education.

#### *E. Revenues and Cost Recovery*

37. In the previous section, we defined unit cost as total recurrent expenditure per student. We assumed that the amount spent by universities per student reflects the costs they incur to provide a year of education at a certain desired level of quality. The regression analysis confirmed our assumptions about the factors that explain variations in unit cost among colleges and universities, namely economies of scale and a more intense, but not necessarily more achievement-efficient, use of resources.

38. The intensity of input use or the market prices of inputs are not the only determinants of expenditure per student in Pakistan's colleges and universities. Since most college and university funds are provided by the government, expenditure per student and the quality of education provided are also determined by government funding decisions and the processes that govern grant requests and approvals. These, combined with low cost recovery, have historically left colleges and universities under-funded, and have not encouraged them to design, plan and undertake quality improvements.

39. University Revenue. On average, federal grants constitute 87 percent of university income. Ten universities depend on government for over 90 percent of their income; only two depend on government for less than 70 percent of their income (see appendix C, table 12<sup>17/</sup>). This is in comparison to a 62 percent average in India (1980), a 65 percent average in the United Kingdom (1980), and a 58 percent average in the United States (1986).<sup>18/</sup>

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<sup>17/</sup> For all references in this annex to appendix C, please refer to the PAKISTAN: Higher Education and Scientific Research green cover sector review, volume II.

<sup>18/</sup> Shattock, Michael and Gwynneth Rigby, ed. 1983. Resource Allocation in British Universities. London: The Society of Research into Higher Education; The Condition of Education: Post Secondary Education 1988. 1988. Office of Educational Research and Improvement, U.S. Department of Education, Washington, D.C.; Tilak, Jandhyala. 1989. Trends in Public and Private Finances for Education in India. The World Bank, Washington, D.C.

40. Since 1979, when the Federal Government increased its involvement in higher education, universities have consistently received from the government less than what they assess is necessary to provide a university education. During each of the eight years between 1979 and 1987, universities received an average of 30 percent less than the amount they requested. In response to these suboptimal allocations, universities have lowered actual expenditures, but actual expenditures are as low as the government grant. In other words, universities run deficits. Between 1979 and 1987, eleven universities, for which data were available, ran an average deficit each of Rs.2.6 million each year (see appendix C, table 10). In 1985 and 1986 university deficits averaged 3 percent of university expenditure.

41. University Grant Process. Under-funding is not the only outcome of the sector's dependence on federal grants as its principal and nearly sole source of income. The grant allocation process is, at best, neutral or, at worst, discourages university planning, realizing higher standards of achievement, and management and finance improvements.

42. In the first step of the grant-awarding process, the university submits its estimated budget (which although very detailed, often does not add up), for a federal grant to the University Grants Commission (UGC). The UGC prepares a recommendation on the size of the grant for final action by the Ministry of Finance (MOF). In determining and explaining the recommendation, the UGC reduces the university's detailed budget to a two or three-page brief in which only the university's total income and expenditure are discussed, and only in terms of how they compare to the previous year or two. Generally, the UGC recommends a lower grant than that requested by the university and suggests that the university raise more of its own income (see appendix C, table 12). The MOF then decides on each university's grant based on the UGC brief, the available pool of funds for higher education and discussions. Typically, the MOF cuts the size of the grant. These repeated cuts and the simplistic grant allocation process preclude responsiveness to the changing needs of universities and creates circumstances where planning for higher quality education could only bring despair.

43. Cost Recovery in Universities. The low level of cost recovery in universities compounds the counterproductive effects of the grant process and over-dependence on government grants. Universities raise an average 17 to 20 percent of their income (see appendix C, table 10). Fifty-five percent of this income is paid by college students in exam fees (see appendix C, tables 10 and 15).<sup>19/</sup> Data on income from universities own resources are perhaps the most unreliable of all university data. Because of inconsistencies in these data (see appendix C, tables 10 and 15), we estimated the level of cost recovery in universities. Taking the reported fee schedules of universities and discounting the number of scholarships, we estimate that student fees (excluding exam and hostel fees) cover only about 3 percent of unit costs. This is a low level of cost recovery in absolute terms and it is lower than that found in other countries in South and East Asia (see table 8). At this low rate, university students receive a public subsidy of about Rs.18,400 (about US\$1,000), about three times per capita income (in 1987) in Pakistan.

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<sup>19/</sup> Universities with a number of affiliated colleges, such as the Universities of Karachi, the Punjab, Peshawar and Sindh, earn a substantial proportion of this fee income from the exams they administer.

*Table 8: User Fees as Percentage of Unit Public Cost*

<i>Country</i>	
Indonesia	13.0
Korea	23.4
Malaysia	5.8
Philippines	3.7
Thailand	6.9
Turkey	15.0

*Source:* World Bank, Financing Education in Developing Countries, Washington, D.C.: 1986.

44. The low level of cost recovery elicits other behavior that damages the efficiency and effectiveness of universities. Since students do not pay for their education, they have no incentives to complete their course of study on time, which many of them do not. Since students do not pay, they have less leverage in effecting change. Universities are unlikely to be very responsive to demands for better education when those demands come from the students who invest little in their own education. But the other key player, the government, demands no standards. Thus, universities are not held accountable for the quality of education.

45. College Revenues and Cost Recovery. Colleges receive most of their revenue from the Provincial Government. Allocations to individual colleges in each province are based on the number of staff in the college. In addition, a lump sum grant for all non-personnel costs and a lump sum grant targeted for library books and periodicals, chemicals, glassware, and scientific equipment are disbursed to each division for distribution among their colleges. The amounts awarded vary from year to year depending on the availability of provincial resources. They also vary slightly among colleges, although in many cases the divisional grant is simply divided equally among colleges. In other words, there is no rational formula for the distribution of funds.

46. Within this financing setting, colleges depend somewhat less on government funding than universities; they raise a larger proportion of their income from tuition and other fees. Data on income from 99 colleges (44 in the Sindh and 55 in the Punjab) show that provincial grants comprise 90 percent of college revenue. Income from fees comprises the remaining 10 percent of revenue (12 percent in the Sindh and 9 percent in the Punjab). The fee income converts into an average annual fee of Rs.300 and Rs.200 and to an average annual subsidy of Rs.2,600 and Rs.2,400 in the sample of Sindh and Punjab colleges.

47. Because only a subset of colleges reported fee income, we estimated it for all colleges in the Sindh and NWFP. Since college fees are uniform within a province, we used the posted fee schedules, the reported enrollment by academic year and faculty, and discounted the total by the number and value of scholarships awarded. Tuition and other fees in the Sindh range from Rs.275 per year for an intermediate arts student to Rs.450 for a M.S. student. In NWFP, they range from Rs.270 per year for an intermediate arts and to Rs.365 per year for a M.S. student. In the Sindh, about 13 percent of all

students receive scholarships of an average rate of Rs.525. In the NWFP, students in the Malakand, Sohat, Dir and Chitral Districts pay no fees and about 12 percent of the remaining students in the province receive scholarships of an average rate of Rs.335. Using this information and the enrollment data, we arrived at estimates of fee income similar to those reported in the subset of colleges above. We estimate that, on average, college students in the Sindh pay Rs.330 per year, and students in NWFP pay Rs.200 a year. The public subsidy to college students is then an estimated Rs.2,200 and Rs.3,400 in the Sindh and NWFP, or between 40 percent and 60 percent of per capita income.

48. There are at least four ways to alleviate the negative effects of the existing finance structure and to engage students and faculty in supporting the improvement of higher education. First, the overall level of resources in the sector could be increased. Second, additional resources could be mobilized from fees, especially from university students, and from other sources (for example, endowments). There is some evidence that parents are willing to pay more if their children learn. Many parents, for example, already pay professors to tutor their children after school (para. 26). Third, government can direct institutional behavior in more positive directions by linking government grants to performance criteria. Finally, government can encourage rational planning by eliminating the two-tiered university grant cutting process and instituting one review process. The review process would require detailed, carefully considered institutional plans and in-depth and direct discussions with the institutions about their budgets.

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