

BALANCING FUTURE RESOURCES AND EXPENDITURES IN THE GOB HEALTH AND POPULATION SECTORS

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Glossary of Abbreviations

PHC	Primary Health Care
NRR	Net Replacement Rate
GOB	Government of Bangladesh
PER	Public Expenditure Review
ADP	Annual Development Plan
TFR	Total Fertility Rate
HEU	Health Economics Unit
NGO	Non-Governmental Organisation
MOHFW	Ministry of Health and Family Welfare
MCH	Maternal and Child Health
CDR	Crude Death Rate
CBR	Crude Birth Rate
IMR	Infant Mortality Rate
MMR	Maternal Mortality Rate
EPI	Expanded Programme of Immunisation
CPR	Contraceptive Prevalence Rate
GDP	Gross Domestic Product
FWC	Family Welfare Centre
PEHS	Package of Essential Health Services
ODA	Overseas Development Administration
IEC	Information, Education and Communication
AIDS	Acquired Immune Deficiency Syndrome
STD	Sexually Transmitted Disease
THC	Thana Health Complex
ARI	Acute Respiratory Infection
ORS	Oral Rehydration Solution
NGR	Net Growth Rate
DALY	Disability Adjusted Life Year
EPOCHS	Economic Package of Critical Health Services

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Executive Summary

When formulating future plans it is best to have one eye on likely future resources. To run short of money half way through the implementation of a programme may well negate its effectiveness, as well as dashing expectations. The key aim of this report, therefore, is to assess the financial viability of future GOB planned activities, particularly over the course of the 5th Population and Health Project. A shortage of resources is best identified now, in the preparatory phase of the 5th Population and Health Project, rather than later, in its implementation. The GOB, armed with forecasts of expenditure and revenues, can play a much more active role in pre-empting financial constraints than in the past.

The two principal elements of the report are the estimation of future resource availability and projection of likely expenditures. After a brief introduction, these matters are addressed in Sections B and C. The projections in Section B rely heavily on HEU's own revenue simulation model while the basis for Section C's expenditure estimates are the relevant Perspective Plans, project documentation and Budget expenditure data. (It should be noted that both sections B and C produce initial estimates which can and should be refined by further research, updated information and the latest priority setting.) The results are combined in Section D to see whether or not finances are sufficient to cover planned activities. Resource gaps are then highlighted and attributed to certain priorities or activities, where possible. The remainder of the report assesses various strategies for bridging the potential funding gap, whether by cutting expenditure or raising additional revenue. Conclusions and recommendations are set out in Section F.

A brief summary of the main findings of the report is presented below.

Balancing Resources with Expenditures

HEU's analysis reveals that there are insufficient resources under projected conditions for the GOB to carry out its planned activities in the population sector. In 1997/98 there is a resource gap of US\$ 13.7 million which broadens to US\$ 42.4 million by 2001/02 (see Table X1). Key line items which may be underfunded are *Medical* (and contraceptive) *Supplies*, *Operation and Maintenance*, and *Construction*.

Funds are unlikely to be sufficient for carrying out health activities as set out in the Perspective Plan. Using different scenarios for development activity, HEU projections show that continued high capital investment is unfeasible without substantial additional resources. Even under a reduced investment scenario, there is still a shortage of resources over the period of the 5th Population and Health Project, as shown in Table X1.

Expenditure potential lags far behind forecast need for *Medical Supplies* and *Operation and Maintenance* in the health sector. It is essential that these items receive funding, as they are integral to GOB objectives.

**Table X1: Potential Funding Gaps in the Health and Population Sectors,
1997/98-2001/02, 1994/95 US\$ million**

	1997/98	1998/99	1999/00	2000/01	2001/02
Potential Funding - Health	230 (5.9%)	242 (5.9%)	256 (5.9%)	268 (5.9%)	281 (5.9%)
Potential Funding - Population	63 (1.6%)	66 (1.6%)	69 (1.6%)	72 (1.6%)	75 (1.6%)
Funding Gap - Health	26	41	29	19	9
Funding Gap - Population	14	20	26	34	42
Required Funding - Health	256 (6.5%)	283 (6.9%)	285 (6.6%)	287 (6.3%)	290 (6.1%)
Required Funding - Population	77 (2.0%)	88 (2.1%)	95 (2.2%)	106 (2.4%)	117 (2.5%)

Source: HEU

A Package of Essential Health Services

One option for the GOB in the health and population sectors is the adoption of a Package of Essential Health Services (PEHS). Such a package would consist of highly cost-effective interventions to deal with the major threats to health. It is believed that this will help GOB prioritise when faced with competing demands and, by providing services as a package, will conserve resources.

Nevertheless, there are concerns that a PEHS may be too expensive in the short term for Bangladesh. Estimated costs may reach US\$ 12 per head, according to recent World Bank research, much higher than the US\$ 3.2 per head spent through GOB Budgets in 1994/95.

Recommendations

Planning

While plans remain incomplete expenditure forecasts can only be indicative. As planned programmes and projects are developed in more detail then it will be possible for GOB, through its Planning Units, to refine the expenditure projections contained in this report and refresh its conclusions.

Ideally, data on *optimal* running costs of facilities should be calculated and incorporated into the forecast expenditures in each plan. This will require a unit cost analysis of different facilities and perhaps even the development of production cost models.

As the priorities in each sector change from capital investment to the financing of existing infrastructure it will be vital for the GOB to meet recurrent costs. In particular, there will be extra demands on the funding of *Operation and Maintenance* and the provision of *Medical Supplies*, essential activities for the achievement of GOB objectives.

The Population Sector

HEU projections indicate that there will be a resource gap in the population sector, as shown in Table X1. A number of options for closing the gap can be derived from the HEU model by altering key assumptions:

1. If planned construction on FWCs and the Contraceptive Manufacturing Plant were delayed, the resource gap would close in 1997/98 and halve in 2001/02.
2. If GOB were to boost its allocation to the population sector from 1.6% of total Budget expenditure to 2.0% in 1997/98, rising to 2.5% in 2001/02, the resource gap would disappear.
3. The GOB may change the mode of delivery of family planning services to less intensive forms, but the *cost-effectiveness* of this approach needs to be assessed fully. The HEU is currently designing such a study.

The GOB may also examine other options such as incentives or savings schemes while making greater use of NGOs and/or the private sector under appropriate regulation.

The Health Sector

The projected resource gap in the health sector is shown clearly in Table X1. Nevertheless, under certain circumstances, potential funding can match likely future expenditures, according to the HEU model:

1. The GOB could restrict or delay some of its planned capital investment activities, especially in secondary and tertiary facilities, in order to allow sufficient funds to meet the expected costs of running an expanded health infrastructure.
2. The GOB can reallocate funds to the health sector until its share of total GOB Budget expenditure reaches 6.9% in 1998/99, up from 5.9% in 1994/95.
3. If PHC activities are given an additional 3% share of the Budget allocation for health in 1996/97 and 1997/98, there will be sufficient funds to run planned PHC activities.
4. If the GOB wishes to proceed with a PEHS, it may decide that it can only provide essential services for the poor and let other income/wealth brackets pay for themselves. Alternatively, it may design an *Economic Package of Critical Health Services (EPOCHS)* which is within its financial means. This may be broadened out to a PEHS once resources allow.

GOB may also pursue *cost saving* at the facility level through initiatives to *improve efficiency*. Research is needed in this area to estimate the potential savings and impact on the GOB Budget. Better training and guidelines for medical staff, improvements in administration and in the organisation of facilities, and manipulation of Budget incentives may all save valuable resources.

Additionally, GOB should proceed with its pilot study of the impact of *user fees* within the health sector. Helpful additional research areas would be the *potential for GOP regulation* (in relation to the operations of the private sector and NGOs) and an assessment of the viability of a *social health insurance scheme*.

Section A: Introduction

Building on the work of the Public Expenditure Review, this report seeks to assess the financial viability of future GOB planned activities. To do this, the study compares likely expenditure in the health and population sectors with estimated resource availability between 1997/98 and 2001/02. This is an essential part of the design of targets and strategies for the 5th Population and Health Project. An agreed strategy can be the most cost-effective of alternatives and appear to have a beneficial impact on society as a whole but if it is not *affordable* it will, at best, disappoint. "Shortage of operating funds is frequently the reason why projects in the social sectors fail to live up to expectations" (ODA, 1977). The same might well be said for programmes. Nevertheless, a shortage of resources is best identified now while plans for the future are still in formulation. Where this report notes a shortage of resources it also suggests various remedies, leaving policy-makers to choose as to the most appropriate course of action.

As noted one element of the study is the estimation of future resource availability. This requires an understanding of the likely development of today's macro-economic environment. Unfortunately, forecasting by its very nature is an imprecise art. Even the most complex macro-economic models, containing the fruits of years of research, are not infallible. Still, it is hoped the simulation model in this research paper yields useful results. More precise forecasts would require a rigorous macro-economic model, with the associated costs. There is no guarantee, however, that its results would be more accurate.

The other key component of the study is the projection of likely expenditures in the health and population sectors. While plans and priorities for the future have yet to be finalised, such estimates cannot be anything but indicative. Nevertheless, they are a beginning and will hopefully serve to guide GOB and its foreign development partners away from unviable actions. It is trusted that as planned programmes and projects are developed in more detail then it will be possible for GOB, through its Planning Units, to refine the expenditure projections contained in this report and refresh its conclusions.

The paper is, accordingly, divided into five sections. After an brief introduction, Section B examines the likely future resources available to the GOB. It updates and amends the provisional estimates introduced in the PER and discusses circumstances under which the estimates might change. Accordingly, a sensitivity analysis is included, comparing the most likely "conservative" scenario against a more optimistic "high-growth" scenario. Section C revisits the estimates of future expenditures in the PER. While the PER analysis was confined to extrapolation, this section deepens the analysis and refines some of its initial assumptions. Likely future activities and priorities are identified, with costs based on historical expenditure patterns, where appropriate. (Still, Section C is prevented from a rigorous identification of objectives and costing of the necessary strategies by the lack of comprehensive National Plans for health and population.) The different threads of our analysis are drawn together in Section D to highlight where resources are insufficient to meet forecast future expenditure and where there may be potential for reallocation. Section E considers the adoption of a package of essential health services as a way to bridge the gap between finances and needs. Finally conclusions and recommendations are put forward for policy makers in Section F.

Section B: The GOB resource envelope

Background

To be able to estimate future GOB revenue for the health and population sectors it is important to understand some of the likely macro-economic developments of Bangladesh. This section briefly outlines the prospects for future economic growth and suggests how this might translate into additional GOB revenue. In particular, it projects the available funds for different activities in the health and population sectors over the course of the 5th Population and Health Project, highlighting data for the financial years 1997/98 to 2001/02. Still, caution must be taken when analysing the results of HEU's simulation model. The projections are only indicative and imply no commitment from GOB to fund specific activities in the Budget. The aim of the simulations is, rather, to encourage informed debate on the future allocation of GOB resources. In particular, when combined with the expenditure requirements laid out in Section C, the simulations will show the feasibility of current plans. Necessary amendments may then become apparent.

Before proceeding with the analysis it is worth setting out briefly the mechanism by which economic growth is most likely to influence the funding of the GOB health care infrastructure. As in many other Asian low-wage countries there is enormous potential for industrial growth in Bangladesh. Labour-intensive industries, fueled by international capital, are constantly moving their location around the globe in search of low wages, easy access to final markets and a stable basis for production. Bangladesh has been a popular investment site over the last few years, particularly for the garment industry. Ideally, the result of this investment is the employment of local labour, and the use of local raw materials and infrastructure. This will generate income for the local population and, in the long run, wealth. In turn, this can be expected to boost the revenue available to GOB, through taxation, and to households, through improved income, *to be spent on health care and family planning*. With this extra income more health services can be built, maintained and demanded. This, at least, is the theory.

Macro-economic indicators in Bangladesh have pointed towards substantial growth in economic activity over the past few years. GOB has adopted a package of reforms to boost economic growth and has set ambitious plans for revenue generation. Growth estimates for the economy have settled around 5% for 1994/95 and may under the right circumstances move even higher. Recently, however, economic growth has experienced something of a stutter. Political concerns not only have affected local economic activity but may also have resulted in lost investment as international firms look to other low-wage countries in Asia. If the situation is resolved then there is no reason why Bangladesh should not continue to have extremely healthy GDP growth. If it is not then revenue generation will fall and the GOB's capacity to fund health and population activities will not improve as expected.

How can such growth prospects be translated into estimates of additional resource availability for the health and population sectors? Section B attempts to address the issue in three stages

- Isolate the different sources of revenue for GOB and forecast their future likely path
- Aggregate these revenues to form a resource envelope for GOB
- Assess the resources that will be made available to different activities in the health and population sectors

The HEU has prepared a simulation model to help identify potential future resource availability for health and population sector expenditure, first used in the Public Expenditure Review. Appendix 1 provides a brief description of the model and its underlying assumptions, to which interested readers are referred. The model recognises that the availability of GOB resources depends largely upon tax income. The amount allocated to health and population expenditure in aggregate, and different budget headings in detail, depends on historical precedent and future policy decisions. While not seeking to anticipate GOB priority setting, expenditure shares can be assumed based on recent experience and stated objectives. Combining these assumptions with the forecast results provides an indication of the likely funds available for health and population expenditures.

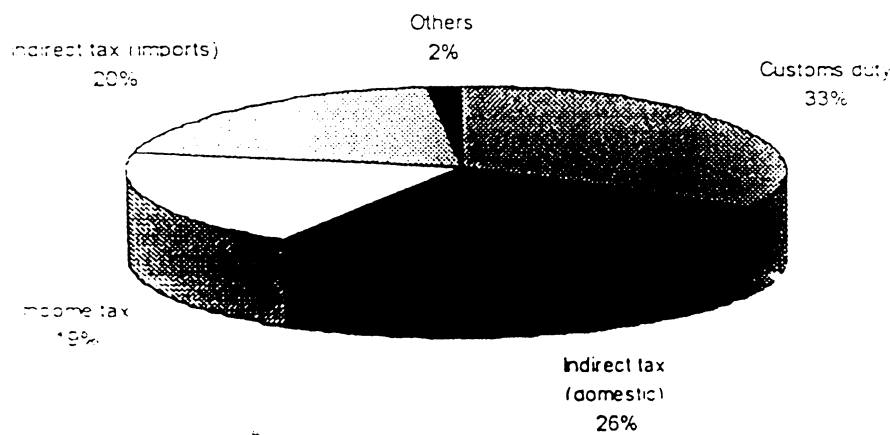
Sources of GOB revenue

1. Taxation

One of the most obvious sources of revenue for the GOB is taxation. Many high-income countries rely on this mode of financing with a wide range of taxes on income, wealth and expenditure. In contrast, the conditions prevailing in many lower income countries present difficulties for the rapid expansion of a small tax base. Income tax, for instance, often yields a relatively low return due to administrative and political considerations. Frequently, the easiest option for revenue authorities is to impose high duties and tariffs. While this may yield significant revenue in the short run it may impede future economic growth, through distorted markets, and even penalise the poor. For instance, taxing exports can both make a country less competitive in the international market and reduce income to exporters and cash crop producers. Taxing trade may, therefore, create more problems than it solves in the long run.

The 1994/95 breakdown of taxation revenue for Bangladesh is displayed in Diagram 1. Indirect taxes and customs' duties account for almost 80% of GOB taxation revenue. While GOB wishes to expand its tax base, it is also committed to a market-based economy which minimises distortions. As noted above, the pursuit of one may undermine the other in certain circumstances.

Diagram 1: Sources of taxation revenue, 1994/95



How will taxation revenue grow over the course of the 5th Health and Population Project? HEU's model assumes that one of the key determinants of future revenue is growth in GDP, as argued earlier in this section. By varying projections of future economic growth we can estimate the likely resources available for GOB. Diagram 2 displays the results of HEU's projections under three different scenarios:

- Low - GDP growth of 4% per annum
- Most likely - GDP growth of 6% per annum
- High - GDP growth of 7% per annum

At the time of development of the model it was thought that a 6% GDP growth rate was reasonable as an average for the foreseeable future. This is used as the basis for our projections throughout the study but can be changed if thought to be inappropriate. The high and low scenarios, noted above, are also included to show the reader the consequences of different growth paths on revenue generation.

The forecasts for taxation revenue were based on a partial equilibrium analysis, using various regressions and estimates of the growth in GDP. Of course, the projections are only as good as the data used and in trying to establish relationships between key variables some regressions have less than desired degrees of freedom. In particular, the static nature of the analysis has its limitations. Given the time available for the exercise, however, we believe the analysis provides useful results.

Table 1: Sensitivity analysis of taxation yields under different GDP growth scenarios, 1994/95 US\$ million, constant prices

GDP Growth	1994/95	1997/98	1998/99	1999/00	2000/01	2001/02	Average Annual Growth
4%	2.407	2.508	2.595	2.683	2.773	2.865	2.5%
6%	2.407	2.550	2.680	2.815	2.954	3.098	3.6%
7%	2.407	2.571	2.723	2.882	3.046	3.218	4.2%

Source: HEU

Diagram 2: Projections of taxation revenue, US\$ million

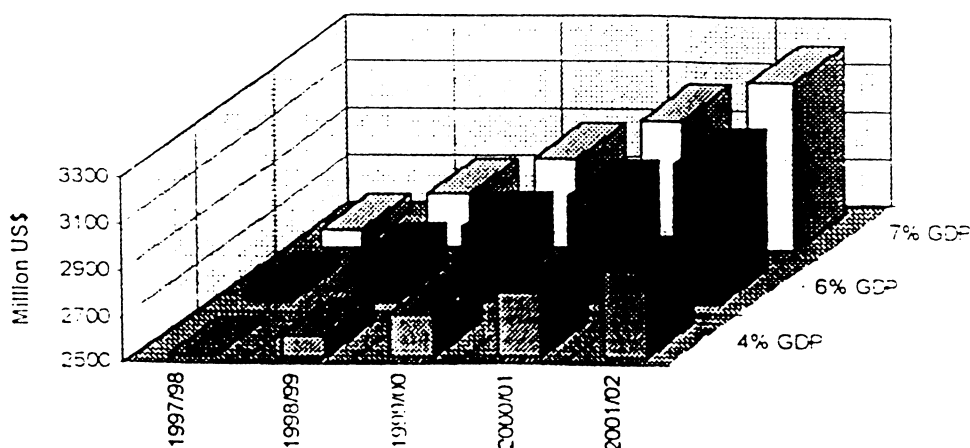


Table 1 shows the results of our forecasts under the different scenarios, over the approximate period of the 5th Population and Health Project. Starting at just over \$2.5 billion in 1997/98 revenue from taxation is assumed to rise over \$3.0 billion in 2001/02, under the 6% growth scenario. By the end of the five year period, there is a substantial difference between the different scenarios. With 7% growth, the taxation yield in 2001/02 is estimated to be over \$350 million higher than in the low growth scenario.

2. Commodity and Food Aid

In the PER, the importance of commodity aid and food aid was noted for the health and population sectors. They can impact directly through the provision of certain goods, such as medicines, or indirectly by boosting GOB resources through the proceeds of their sale. Now barring any natural disaster it is thought that this type of assistance will probably decrease its proportion of GDP over the next ten years. This source of revenue for the ADP and Revenue Budgets will become less important and forecasts of commodity aid and food aid were, therefore, made with this in mind. Nevertheless, as a modification to the PER it is thought that current World Bank statistics may underestimate the flows of such aid into Bangladesh. We revise our initial estimates upwards, therefore, by 15% in line with World Bank suggestions. Further amendments can be made when more reliable data become available.

3. Non-tax sources

Often governments in developing countries find themselves involved in a whole host of other activities, apart from taxation, which produce revenue. The scope of such activities is often very broad ranging from the profits of nationalised industries to the rent from government land. The HEU can claim no special insight into such areas of GOB activity and it is assumed, therefore, that such revenues will increase in line with the GDP growth rate. The results can be amended if this assumption is thought to be misleading.

In addition to domestic sources of non-tax revenue, we might also consider revenue from foreign aid and concessional and commercial loans. We have chosen not to include such sources in our projections of the *total* GOB resource envelope, as one of the focuses of the study is the GOB's own resource base and not the future aid policy of donors. Furthermore, some donors do not consider their aid flows to be a part of the GOB's own revenue base. For discussion of the funding potential for *line items*, however, it has been essential to take into account donor activity. To avoid controversy we assume this will remain constant, in real terms, over the projected period.

4. Cost Recovery

Technically cost-recovery is another form of non-tax revenue but we isolate it in order to assess its probable contribution to resource availability. It is likely that in the next five years official cost-recovery schemes will be introduced and expanded at different levels of the health care and family welfare infrastructure - with the focus on secondary and tertiary institutions. It is impossible to say, at this stage, exactly what the form or revenue raising potential of such initiatives may be. Still, to acknowledge the role that they will play in raising extra resources for the health and population sectors, we include a token amount of revenue in our forecasts. This amounts to 5% of estimated recurrent expenditure projections, by 2000, and 10% by 2005. This is not out of line with the World Bank's own comments on the revenue raising potential of user-fees as stated in the World Development Report (1993). Cost recovery in the

form of user fees is unlikely to make a more spectacular contribution to GOB resources given administrative and logistical constraints and the low level of per capita income in Bangladesh. (Readers who are interested in the design of the current pilot programme for user fees are referred to Research Note: No 3 of the HEU, *Draft Terms of Reference and Background Briefing Document - A Pilot Programme for Resource Mobilisation through User Fees in the MOHFW in Bangladesh.*)

The GOB resource envelope and its application to the health and population sectors

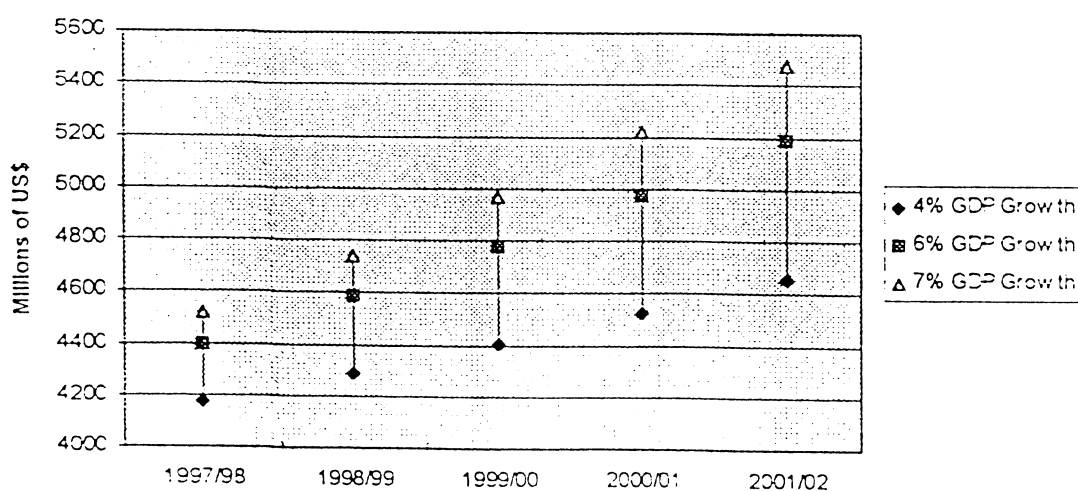
1. Total Available Resources

Aggregating all these sources of revenue for the GOB we arrive at the resource envelope for future years. This is shown in Diagram 3 and Table 2. Again we include a high and low case, along with a most-likely scenario of 6% GDP growth.

Table 2: The GOB resource envelope, US\$ million, 1994/95 prices

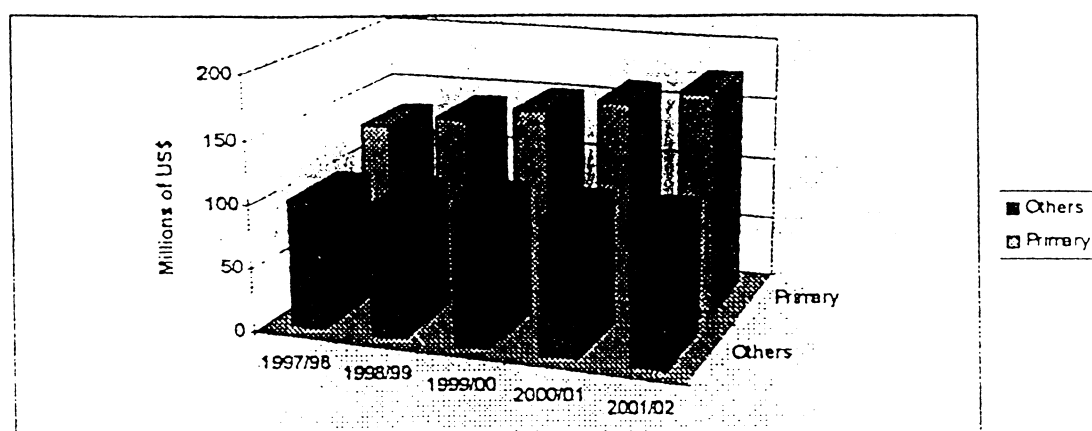
GDP Growth	1997/98	1998/99	1999/00	2000/01	2001/02
4%	4.173	4.286	4.404	4.526	4.653
6%	4.400	4.583	4.776	4.978	5.191
7%	4.516	4.737	4.970	5.217	5.478

Diagram 3: Projections of the GOB Resource Envelope under different growth scenarios



How do these aggregate projections translate into funds available for the *health* and *population* sectors? For ease of analysis we assume that the percentage growth shown in the above scenarios will be mirrored by the different allocations to activities in the health and population sectors. (We realise that this is somewhat simplistic and may ignore GOB's strategies towards the achievement of a balanced budget, for instance.) Hence, revenue growth will range from under 3% in our low-growth scenario to almost 5% in the best case. Needless to say, it would be inappropriate to specify such allocations on a budgetary basis as this would preempt the current priority setting of the MOHFW. In a similar vein it would be inappropriate to discuss the future resource availability for particular programmes or projects. Instead, we will project resource availability for the health and population sectors in aggregate, before

Diagram 4: Projected GOB Funds available for primary health care in the health sector, 1997/98-2001/02



3. Economic Classification

It would also be useful to disaggregate the available funds by economic classification. How much money will GOB have for *Medical Supplies* in the future? How much will be available for *Construction* or *Salaries*? In order to address these concerns it is necessary to divide the ADP and Revenue Budget into different expenditure categories and to forecast future values on the basis of overall revenue growth. This will allow us to consider future funding availability for each type of activity, although only at an indicative level.

After examining the likely future expenditure in Section C we can revisit our projections and examine where reallocations will be needed. For instance, it is unlikely that *Construction* will play as big a role in the future as it has in recent years. The funds previously used for this purpose may be reallocated to higher priority needs, such as *Operation and Maintenance* and *Medical Supplies*.

The results of our simulations are contained in Tables 4 and 5. Note that the projections include both GOB and donor funding, although the latter is assumed to have zero growth in real terms over the period, while the former increases in line with our resource envelope. Again we stress that these figures are only meant to guide our debate about resource allocation in Section D, where the need for *reallocations* will become apparent.

The base year for the exercise is 1994/95, with the HEU project expenditure database providing the inputs for the disaggregated line items shown. To project the funding available for different expenditure categories each line item, a certain proportion of the resource envelope is assigned to individual line items based on *historical precedent* and *GOB priorities*. (Interested readers are referred to Appendix 1 for a fuller exposition.) More specifically, it was deemed important to provide sufficient resources for some recurrent items, given the recent expansion in the GOB health care infrastructure (HEU, 1995. *An Analysis of Recurrent Costs in GOB Health and Population Facilities*). In our forecasts of projected funds we have, therefore, allowed *Medical Supplies* to the health sector to take an increasing proportion of the sector's allocation, rising by 0.5% of GOB's Budgets each year.

Table 4: Disaggregated Projection of Funds for the Health sector, 1997/98-2001/02

	1994/95	1997/98	1998/99	1999/00	2000/01	2001/02
Construction	44.3	48.1	49.4	51.0	52.3	53.7
Purchase of Equipment	22.7	24.6	25.2	26.1	26.7	27.4
Purchase of Land	1.3	1.4	1.5	1.5	1.5	1.6
Training	5.0	5.4	5.5	5.7	5.8	6.0
Technical Assistance	5.3	5.7	5.8	6.0	6.2	6.4
Medical Supplies	30.0	37.9	40.9	44.5	47.8	51.3
Operation and Maintenance	16.2	18.3	19.0	20.0	20.7	21.5
Salaries	56.3	64.2	66.9	70.5	73.3	76.2
Allowances	41.9	47.8	49.9	52.6	54.7	56.9
Others	15.9	17.9	18.5	19.4	20.1	20.8
Total	238.7	271.3	282.7	297.2	309.1	321.7

Source: HEU

Table 5: Disaggregated Projection of Funds for the Population sector, 1997/98-2001/02

	1994/95	1997/98	1998/99	1999/00	2000/01	2001/02
Construction	2.6	2.8	2.8	2.8	2.9	2.9
Purchase of Equipment	4.7	4.9	5.0	5.1	5.2	5.2
Purchase of Land	0.0	0.0	0.0	0.0	0.0	0.0
Training	8.4	8.8	9.0	9.1	9.2	9.4
Technical Assistance	1.8	1.9	2.0	2.0	2.0	2.0
Medical Supplies	45.2	47.3	47.9	48.7	49.4	50.1
Operation and Maintenance	5.9	6.2	6.3	6.4	6.5	6.7
Salaries	31.9	34.0	34.7	35.4	36.1	36.9
Allowances	25.1	26.8	27.3	27.9	28.5	29.1
Others	33.6	35.2	35.7	36.3	36.9	37.4
Total	159.3	168.0	170.7	173.8	176.7	179.8

Source: HEU

Summary

- Prospects for economic growth in Bangladesh have been extremely good over the last few years, at least until very recently. If political concerns are resolved then GDP growth may reach 6% per annum, allowing GOB room to expand its resources for the health and population sectors at a healthy rate
- The major source of revenue for the GOB is taxation, which according to HEU's revenue forecasting model will account for the majority of GOB revenue in 1997/98. Still, indirect taxes and duties on trade make up over 80% of GOB taxation revenue, and may be difficult to expand while GOB is liberalising the economy. Nevertheless, under the 6% growth scenario the GOB resource envelope will reach US\$ 4.4 billion in 1997/98 and US\$ 5.2 billion by 2001/02
- Assuming the health and population sectors take fixed proportions of the Budgets, the projected GOB funds available will increase from US\$ 236 million and US\$ 63 million in

1997/98 to US\$ 281 million and US\$ 75 million in 2001/02 for the health and population sectors respectively.

- By 1997/98 funding of PHC activities in the health sector is projected to account for 56% of all GOB allocations in the health sector, or US\$ 129 million, rising to 62%, US\$ 175 million, by the end of 2001/02.
- Indicative forecasts of funds available for disaggregated line items have been produced using the results of HEU's project expenditure database, to help stimulate debate on future allocation of resources. Funding of *Medical Supplies* has been allowed extra growth in order to reflect GOB priorities and current concerns.

Section C: Future GOB Expenditure Patterns

Methodology

Any estimation of future expenditure must take into account official GOB plans. Approved objectives, targets and cost-effective strategies would ideally provide the framework for a costing exercise. In turn, the financial feasibility of such plans can be tested by a detailed costing of activities and a comparison with available resources. Activities can then be prioritised based on their cost-effectiveness, their relationship to policy goals and available resources. This procedure is the first-best option for planning. Unfortunately, it is also very demanding on manpower, finances and information. Furthermore, comprehensive National Plans do not, as yet, exist for the health and population sectors in Bangladesh.

In their absence we have to find another methodology which is at least functional. The initial forecasting of costs in the Public Expenditure Review relied on extrapolation. While this may have been useful at that time it is not appropriate for examining disaggregated expenditure projections. A compromise is required which can give indicative results within a limited time-frame and with the available data. Two possible methodologies should be considered:

- Financial costing based on delivery of specific services
- Financial costing based on expected future individual projects and their impact on the health and family welfare infrastructure

The *first* option requires a list of approved services for delivery. Annual average costs per capita are then derived for the provision of each service, based on the funding requirements of inputs, such as manpower, natural resources and buildings and equipment. Where possible, services should be integrated to save on resources and appropriate cost savings need to be included in the projections. Note, the estimates will include both initial investment costs and the associated recurrent costs. In addition, to capture the true financial costs of each service it will be important to incorporate indirect costs of provision: MOHFW administration and manpower training may be as important to service delivery as the supply of medicines or contraceptives.

The *second* option examines the detailed project portfolio in each sector. Based on existing priorities it needs to assess which projects are likely to continue, which may close and where there is need for new initiatives. Once such questions have been answered, detailed costs can be calculated or imputed for each project and aggregated. Running costs of GOB facilities can then be calculated on the basis of the outputs of each project, on utilisation and on historical Budget data, where data allow.

Both strategies require knowledge of GOB priorities. Overall guidance on GOB strategies in both sectors has been drawn largely from draft planning documents. Until these are finalised the costing process cannot be finished. Indeed, the costs provided should be seen as a first estimate which can be developed further as particular strategies and activities are agreed. To help supplement these plans we also draw upon donor documents and briefings to gain the perspective of GOB's foreign development partners.

The two approaches, outlined above, have different merits. The costing based on *service delivery* is theoretically preferable. It allows GOB to cost various strategies in relation to each other and even, where the data allow, to compare cost-effectiveness (a theme to which we will

return in Section E). Nevertheless, this strategy requires much information. Some of this is available for the *population* sector but is notably absent for non-PHC services in the *health* sector. The costing based on *expected future projects* and *existing infrastructure* is probably more compatible with the current design of GOB's ADP and Revenue Budgets. It may, nevertheless, rely more on current than best practice. Given the available information, it is proposed that a combination of the two approaches is used to cost the *population* plans while *health* sector expenditures are derived entirely from *expected project costs along with existing running costs of facilities*.

Unfortunately, our estimates of recurrent costs rely more on historical trends than on optimal practice, which may bias the results. This is unfortunate but necessary given data availability in the sectors. It may be that if certain items were to receive more funding, utilisation would improve. In this case, current expenditure data would underestimate the financial costs of effective service provision. Yet at the same time cost savings could be made from a more efficient use of resources. Hence, it is unclear whether the reliance on current practice data will overestimate or underestimate funding needs. It is beyond the scope of this study to assess the ideal financing of running costs at different GOB facilities. Turning to GOB documentation for assistance, it is perhaps disappointing to note that neither draft *Perspective Plan* considers the recurrent cost implications of the investments it proposes. This is a serious flaw. As argued in HEU's second Research paper, *An Analysis of Recurrent Costs in GOB Health and Population Facilities*, unless these costs are fully borne, the *prima facie* cost-effectiveness of GOB's investments will be reduced. Additional research is needed, therefore, in this complex but important area.

Expenditures in the Population Sector

A significant amount of work has been done on the formulation of a plan to guide investment in the population sector. Having set objectives, the draft *Perspective Plan* analyses the method-mix of contraceptives and the various strategies that will be employed to reach such goals. The HEU appreciates this work and draws heavily upon it in the formulation of projected costs

Table 6: Key indicators for the Population Sector

	1995	2000	2005	2010
Population (million)	119.7	129.2	137.5	146.4
CBR per 1000	27.5	23.5	22.1	21.3
CDR per 1000	9.0	8.0	8.0	7.7
NGR (%)	1.85	1.50	1.31	1.36
TFR per woman	3.7	3.0	2.2	2.2
IMR per 1000 live births	82	70	50	35
NRR per woman	1.50	1.30	0.91	0.93
Life expectancy at birth				
- Male (years)	58.1	60.0	62.0	64.0
- Female (years)	57.6	57.8	59.4	61.0

Source: GOB

Sector Priorities

The basic aim of GOB, as set out in the *Perspective Plan*, is to achieve an NRR equal to one by 2005. The targets for key indicators in the sector over the next fifteen years are shown in more

detail in Table 6. The success of GOB and its foreign development partners in this sector is well documented and many of their joint strategies and activities merely need expanding or consolidating. In addition to ongoing efforts, the plan specifically identifies the need for more public awareness of the problems associated with a large and expanding population in Bangladesh. This should be achieved by a strong IEC programme. Other key strategies involve the promotion of participation at local levels, decentralisation and MCH-based family planning.

Costing

Based on the priorities and strategies set forward in the Perspective Plan, the aggregate costs for the period 1997/98 - 2001/02 are presented in Table 7 below, as indicated by major component of the Perspective Plan. These figures, along with historical expenditure data, help form the framework for the costs shown in Table 8. The Perspective Plan provides broad orders of magnitude concerning the approximate size of different programmes, while the expenditure patterns of ongoing projects are used to fill in the disaggregated expenditure estimates. Note the expenditure patterns of relevant population projects are derived from Project Proformas, the 1995 World Bank Status Report on the 4th Population and Health Project and the HEU Project Expenditure Database.

Table 7: Population Perspective Plan Estimates of Programme Costs, for 1995-2000, in Crore Taka, 1994/95 prices

Programme Service/Activities	Estimated Costs
1 Family Planning Service Delivery	1,065.0
2 Contraceptive Supplies	477.7
3 Physical Infrastructure	210.0
4 Information, Education and Motivation	48.0
5 Manpower Development	84.5
6 MCH Programme	543.2
7 Clinical Service	149.1
8 Intersectoral Population Programme	290.0
9 Private Sector and NGOs	285.0
10 Contraceptive Manufacturing Plant	130.0
11 Block Allocation	140.0
Total	3,422.5

Table 8 also sets out the disaggregated future expenditure requirements by line item. *Medical Supplies* (including contraceptives), *Salaries* and *Allowances* are the three largest line items, accounting for approximately two thirds of expenditures in the sector. *Medical Supplies* alone account for 55% of total costs over the period.

Table 8: Forecast Expenditure in the Population Sector, 1997/98-2001/02, US\$ million, 1994/95 prices

	1997/98	1998/99	1999/00	2000/01	2001/02	Total
Construction	13	14	14	15	16	73
Purchase of Equipment	6	6	7	7	7	33
Purchase of Land	1	1	1	1	1	5
Training	7	7	8	8	9	39
Technical Assistance	2	2	2	2	2	9
Medical Supplies	63	66	69	73	77	349
Operation and Maintenance	16	17	18	19	20	91
Salaries	33	34	36	38	40	180
Allowances	25	26	27	29	30	138
Others	16	17	18	19	20	91
Total	182	191	200	211	222	1,006

Source: GOB

Expenditures in the Health Sector

Priorities

According to the Perspective Plan for the health sector the basic aim of the GOB is to achieve Health for All by the year 2000. Initiatives in the sector will, therefore, concentrate on the provision of basic health services over the next five years. From 2000 there will be a special focus on urban health projects. An eventual shift toward secondary and tertiary investments and maintenance is envisaged as the burden of disease starts to change after 2007.

For the first stage of the plan, the document highlights the importance of continuing PHC activities already started during the 4th Population and Health Project, particularly MCH activities, Nutrition, EPI, Family Planning, Health Education and preventive health services. There will also need to be a strengthening of programmes for Quality Assurance, AIDS and STD prevention and control. Special emphasis needs to be placed on the provision of essential drugs and medicines and the maintenance of physical infrastructure and equipment. It is argued that each union will have its own health and family welfare centre by 2001 and that the current investment programme for the construction of THCs should be completed. The need for more efficiency in service provision and the running of facilities is also noted. This will not only improve the quality of health care but will also free resources for an expansion of PHC activities. New programmes to be started are

- Eradication of Polio and Leprosy
- Elimination of measles and neonatal tetanus
- Improvement of Nutrition
- Emergency preparedness
- School Health Programme

Many of the concerns in the Perspective Plan are also reflected by donors. In particular a recent World Bank Aide-Memoire stressed the need to strengthen and expand various initiatives in the PHC field. Specific areas of concern were child morbidity and mortality, maternal health, poverty related diseases and improved nutrition. The document stresses the importance of

sustaining and expanding vaccine supplies to meet the needs of the population. Sustainability may well require the GOB to meet an increasing share of the financial burden. Other high priorities are the expansion of ARI activities; increased ORS production; maternal health interventions; strengthening of programmes for tuberculosis, leprosy and STD/AIDS prevention and control, and for vector-borne diseases.

Costing

Given these broad areas of intervention, how can we cost likely activities in the GOB health sector? The projections of future expenditure contained in the Perspective Plan are not as detailed as for the population sector. They are only intended as an approximate planning tool to give orders of magnitude to the planned activities. As the costs contained in the Plan are only meant as an approximate guide, they do not provide a basis for detailed projections. Instead, HEU has projected costs on a project-by-project basis. Given the priorities set out above it is possible to discern which projects need to be expanded, which continued and which are not a priority over the period of the 5th Population and Health Project. This process is not meant to be definitive. Indeed, the exact timing and form of projects in future years is not something which can be determined easily without much consultation. It is important that the GOB addresses this issue and it is hoped that the work done by the HEU will facilitate this process.

Where existing programmes are continuing, costs have been derived from historical data relating to project implementation. Ideally *new and expanded* projects require fresh costing. The above discussion of priorities has highlighted some new projects. Their projected costs have been derived from some of the preparatory documents for the Perspective Plan. Such figures are, at this stage, only indicative and will remain so until the design of these projects is finalised. The investment costs of projects are then supplemented by recurrent costs, the easiest source of such data is past Budget expenditures. This is not ideal in that it relies on *actual* rather than *optimal* cost data but it will serve the purposes of our study given the time constraints. Where there is no historical precedent for a particular project or its output, rough estimates of running costs have been included. This needs to be refined and perhaps could become an important exercise for the Planning Commission in future Budget cycles.

Some projects will also naturally end over the lifetime of the 5th Population and Health Project. For these, we have adopted two scenarios in our forecasting which represent different strategies for GOB.

- *Scenario 1.* The current investment in the physical health infrastructure will slowly decline to about half its current level in 2001/02. The revenue used for this will be diverted into the running of the facilities constructed and their quality of service provision.
- *Scenario 2.* The investment in the health infrastructure will continue at its present level. Once THCs have been built other facilities will be constructed and renovated.

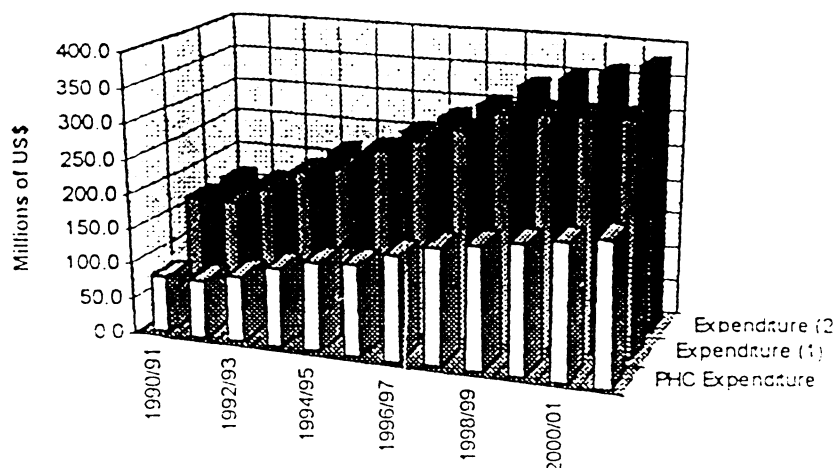
The results of our projections are shown in Diagram 5 and Table 9.

Table 9: Forecast expenditure in the GOB Health Sector, 1997/98-2001/02

	1997/98	1998/99	1999/00	2000/01	2001/02
Expenditure (1)	296.9	323.3	325.9	328.4	331.0
Expenditure (2)	305.4	337.3	350.3	364.0	378.4
PHC Expenditure	163.8	172.0	180.7	189.7	199.2

Source: HEU

Diagram 5: Past and Future Expenditure in the GOB Health Sector, 1990/91-2001/02



As might be expected under *Scenario 1* the rate of increase of expenditure slows while in *Scenario 2* there is continued high growth. Furthermore, the disaggregated expenditure projections for *Scenario 1* are contained in Table 10, showing the decline in construction. *Salaries* are the largest item in the period, with approximately \$380 million (24% of the total cost) followed by *Medical Supplies* (19%), *Allowances* (18%) and *Operation and Maintenance* (11%). The static nature of some of the line items conceals a probable decline in funding of certain development activities with an increase in recurrent cost expenditure. Such consolidation should be expected after a period of substantial investment in the health infrastructure.

Table 10: Disaggregated Cost Projections for the Health Sector

	1997/98	1998/99	1999/00	2000/01	2001/02	Total
Construction	29.4	27.0	24.9	24.9	24.9	131.1
Purchase of Equipment	23.2	23.3	23.4	23.4	23.4	116.7
Purchase of Land	1.3	1.3	1.3	1.3	1.3	6.5
Training	8.7	11.3	12.8	12.8	13.1	58.6
Technical Assistance	4.6	4.5	4.4	4.2	4.2	21.9
Medical Supplies	51.7	58.0	61.3	62.6	63.7	297.3
Operation and Maintenance	29.7	35.3	35.3	36.0	36.6	173.0
Salaries	70.7	77.0	77.0	77.2	77.4	379.3
Allowances	53.0	57.7	57.7	58.0	58.1	284.5
Others	24.1	27.7	27.7	28.0	28.2	135.8
Total	296.4	323.2	325.8	328.4	330.9	1604.8

Source: HEU

Summary

- *Any estimation of likely future expenditure must take into account official GOB plans.* While the draft Perspective Plans give overall guidance on priorities and strategies neither are they sufficient for the forecasting of development expenditures nor do they contain an adequate assessment of the likely impact of the proposed investments on recurrent costs. To supplement the Plans, HEU's forecasts have had to draw heavily on *actual* expenditure on existing projects and facilities.
- *While plans remain incomplete, expenditure forecasts can only be indicative.* Until there is complete agreement on the exact programmes and projects to be included in the health and population sectors, expenditure estimates cannot be finalised. Ideally, data on optimal running costs of facilities should also be calculated and incorporated into the forecasts.
- *Total expenditure in the GOB population sector is forecast to increase from S182 million in 1997/98 to S222 million in 2001/02.* By far the largest item of expenditure in that period will be medical and contraceptive supplies, taking up more than a third of the total cost. Salaries and allowances will also be significant items of expenditure.
- *Expenditure forecasts for health:* have been made under two different scenarios

Scenario 1: capital investment in the health infrastructure will be wound down, with construction reaching about half its current level in 2001/02. The associated costs of this scenario rise from just under S300 million in 1997/98 to approximately S330 million in 2001/02.

Scenario 2: investment in the physical health infrastructure will continue at current levels throughout the 5th Population and Health Project. As construction of primary facilities is completed the focus will turn to the strengthening of infrastructure at the secondary and tertiary levels. Under such circumstances, development expenditure rises from US\$ 305 million in 1997/98 to US\$ 380 million in 2001/02.

- *Expenditure on PHC* is forecast to rise from US\$ 160 million in 1997/98 to US\$ 200 million, reflecting the GOB's continued commitment to Health for All by the Year 2000.
- *The largest line expenditures* in the health sector over the lifetime of the 5th Population and Health Project are all recurrent. *Salaries* will account for US\$ 380 million; *Medical Supplies*, US\$ 300 million; *Operation and Maintenance*, US\$ 170 million, and *Allowances*, US\$ 280 million.

Section D: Balancing Resources with Expenditures

This section draws together the results of sections B and C to assess the financial feasibility of future plans. Where expenditures exceed resources, a closer examination is made of the particular type of activity which is causing the financial shortfall. Its priority and cost is assessed to see whether it might be phased back to allow compatibility with projected resources. If this does not bridge the gap, subsequent sections review other cost-reducing options and revenue raising strategies. Indeed, Section E assesses the efficacy of one such strategy: the introduction of a package of essential health services.

The Population Sector

Combining the likely expenditure activities for population, as set out in Section C, with the potential funding for the sector, as described in Section B, we arrive at the aggregate resource picture, shown in Diagram 6 and Table 11. As can be seen, the data suggest the resource gap would widen over the course of the Fifth Population and Health Project, if planned GOB activities were to be implemented in full: a phenomenon partly attributable to the phasing of expenditure. In an attempt to make the plan compatible with GOB Budget provisions and more realistic it was thought necessary to phase the expenditure over the plan period. This is consistent with experience as programmes often develop momentum in spending after an initial inertia.

Diagram 6: Future expenditure and potential funding in the GOB population sector, 1997/98-2001/02

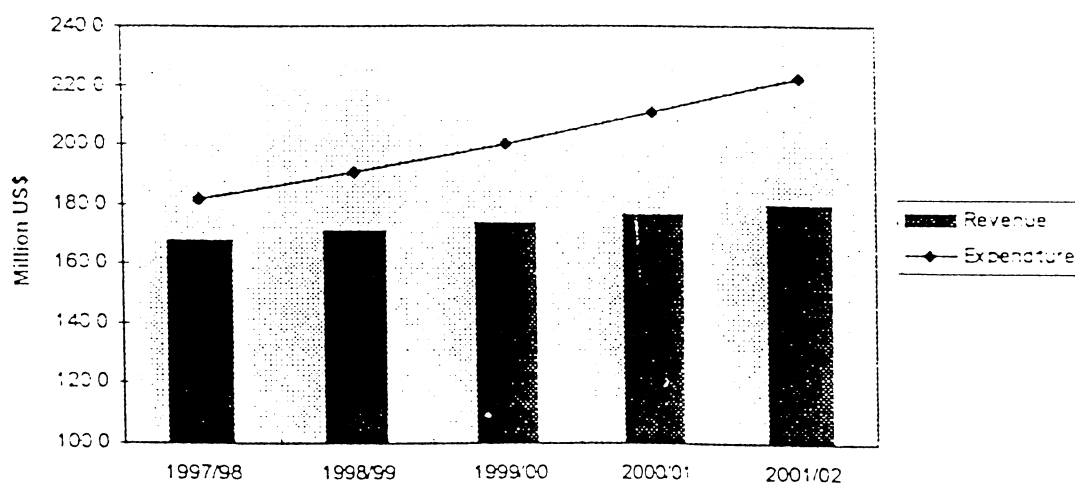


Table 18: Balancing Resources in the Population Sector: Expenditure and Potential Funding, US\$ million, 1994/95 prices

	1997/98	1998/99	1999/00	2000/01	2001/02
Potential Funding	168.0	170.7	173.8	176.7	179.8
Expenditure	181.6	190.6	199.9	211.1	222.2
Gap	13.7	19.9	26.3	34.4	42.4
Gap/Expenditure	7.5%	10.5%	13.1%	16.3%	19.1%

Source: HEU

Nevertheless, even with the phasing of forecast expenditures, there is a shortfall of resources. Although this amounts to only 7.5% of expenditures or approximately US\$ 14 million in 1997/98 it broadens to 19.1%, or over US\$ 40 million, by the end of 2001/02. How can this gap be bridged?

The first strategy to examine is whether all the expenditures are strictly *necessary* for the achievement of GOB objectives. It may help to take a closer look at the *disaggregated* expenditures implied by the Perspective Plan and compare these with the *disaggregated* revenue projections. In so doing the items which have caused a shortfall will become apparent. These itemised expenditures should be examined anyway, because their *distribution* is as important as their *total* value. Indeed, significant reallocations may well be needed within the sector for GOB to meet its future objectives. Table 12 combines the results of Table 5 in Section B and Table 8 in Section C to identify the items where a shortfall or surplus of resources is likely. A negative figure indicates there is insufficient revenue to fund the activities in the line item.

Table 12: Forecast Resource Surpluses and Shortfalls in the Population Sector.
1997/98-2001/02, 1994/95 prices

	1997/98	1998/99	1999/00	2000/01	2001/02
Construction	-10.3	-11.0	-11.6	-12.4	-13.1
Purchase of Equipment	-1.1	-1.3	-1.6	-1.9	-2.2
Purchase of Land	-0.5	-0.6	-0.6	-0.6	-0.7
Training	1.7	1.5	1.3	1.0	0.7
Technical Assistance	0.3	0.3	0.2	0.1	0.1
Medical Supplies	-15.7	-18.2	-20.7	-23.9	-27.0
Operation and Maintenance	-10.2	-10.9	-11.7	-12.6	-13.4
Salaries	1.4	0.5	-0.4	-1.6	-2.8
Allowances	1.9	1.2	0.5	-0.4	-1.3
Others	18.9	18.6	18.3	17.8	17.4
Total	-13.7	-19.9	-26.3	-34.4	-42.4

Source: HEU

Table 12 identifies the key expenditure activities causing the apparent gap. For three line items costs significantly exceed the indicative potential funding set out in Section B.

- Construction
- Medical/Contraceptive Supplies
- Operation and Maintenance

Can forecast expenditures be matched with funding by reducing and/or pushing back activities in each line item, *without* compromising GOB objectives?

1. Construction

The cost of building one FWC per union is significant over the planned period. If this is an integral part of the achievement of MOHFW's objectives then it is probably unavoidable. Indeed, international experience shows that investments in the family welfare sector often have high rates of return. (See Section E for a comparison of the cost-effectiveness of different interventions in the health and population sectors.) If the goals can be reached without this expenditure, however, it must be asked whether such building is necessary, particularly given other priorities.

2. Supplies

Supplies of contraceptives and medicines will undoubtedly need to grow to meet forecast demand and achieve the goals for Contraceptive Prevalence. The target method mix for contraceptives over the period of the 5th Five Year Plan is shown in Table 13. Expenditure on these activities may well be a prerequisite for achieving the stated goals of TFR and NRR. This may be a necessary expenditure.

Table 13: Forecast method mix of contraceptives by millions of users,
1995/96 - 1999/00

	1995/96	1996/97	1997/98	1998/99	1999/00
Oral Pill	4.00	4.26	4.86	5.34	5.8
Sterilisation	2.10	2.40	2.78	3.05	3.42
IUD	0.56	0.69	0.84	1.04	1.20
Injectables	0.99	1.23	1.33	1.52	1.72
Condom	0.78	0.91	1.04	1.27	1.45
Others	1.77	1.80	1.70	1.78	1.71
Total	10.2	11.3	12.6	14.0	15.3

Source: MOHFW

3. Operation and Maintenance

Operation and Maintenance is often an overlooked but vital activity for the smooth functioning of the infrastructure in any sector. Savings made here in one year will only rebound in the future, requiring early replacement of equipment and building, wasting investment and undermining progress toward targets. Nevertheless, cutting back on planned construction activities would help save on this item.

Perhaps the easiest strategy to bridge the gap between expenditure forecasts and potential is to delay some of the capital investment activities considered in the Perspective Plan. This might involve pushing back the construction of FWCs and the Contraceptive Manufacturing Plant (see Section C for details of costs). In addition, the expenditure included in the Perspective Plan as a reserve (the *Block Allocation* in Table 7) could be removed or pushed back, as it is not designated for any planned activity. Table 14 investigates the impact of these expenditure cuts on the resource balance.

Table 14: Forecast Resource Surpluses and Shortfalls with reduced expenditure, 1997/98-2001/02

	1997/98	1998/99	1999/00	2000/01	2001/02
Construction	1.7	1.7	1.7	1.7	1.7
Purchase of Equipment	1.1	0.9	0.8	0.6	0.5
Purchase of Land	0.0	0.0	0.0	0.0	0.0
Training	1.7	1.5	1.3	1.0	0.7
Technical Assistance	0.3	0.3	0.2	0.1	0.1
Medical Supplies	-15.7	-18.2	-20.7	-23.9	-27.0
Operation and Maintenance	-10.2	-10.9	-10.8	-10.7	-10.7
Salaries	3.6	2.8	2.0	0.9	-0.1
Allowances	1.9	1.2	0.5	-0.4	-1.3
Others	18.9	18.6	18.3	17.8	17.4
Total	3.2	-2.2	-7.7	-14.7	-21.7

Source: HEU

The delay or cancellation of the activities, as described above, allows the resource gap to close for at least 1997/98 and 1998/99, as shown by Table 14. After this the gap reopens but by a much smaller amount. Additional resources might be saved by less intensive modes of delivery of family planning services, but this might also undermine progress toward targets for the CPR and the TFR. A cost-effectiveness analysis of such issues is currently being designed by the HEU. In addition, Sections E and F of this report look to other strategies to bridge the gap.

The Health Sector

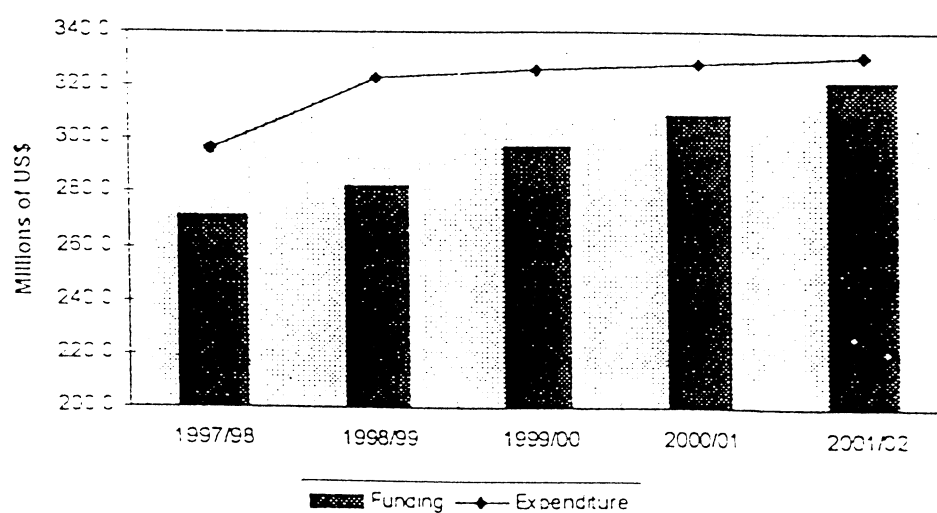
Combining the expenditure potential with the forecast expenditures we display the macro resource picture for the health sector in Table 15 and Diagram 7. Both scenarios, discussed in Section B, are included in order to assess the implications of continued high investment in the health infrastructure. Under *both* there are resource gaps. While the gap between potential and forecast expenditure drops in *Scenario 1*, to US\$ 9 million by 2001/02, it increases in *Scenario 2*, to almost US\$ 60 million. Under projected conditions *Scenario 2* would not appear to be financially feasible i.e. GOB may not have sufficient resources to develop fully its investment programme from THC and Union facilities to secondary and tertiary institutions before 2001/02. We, therefore, confine our analysis to an examination of *Scenario 1* in the remainder of this section.

Table 15: Balancing Potential and Forecast expenditure in the Health sector, 1997/98-2001/02, US\$ million

	1997/98	1998/99	1999/00	2000/01	2001/02
Expenditure (Scenario 1)	296.9	323.3	325.9	328.4	331.0
Expenditure (Scenario 2)	305.9	337.3	350.3	364.0	378.4
Potential Funding	271.3	282.4	297.2	309.1	321.7
Resource Gap (Scenario 1)	-25.6	-40.6	-28.6	-19.3	-9.3
Resource Gap (Scenario 2)	-34.6	-54.6	-53.1	-54.9	-56.7

Source: HEU

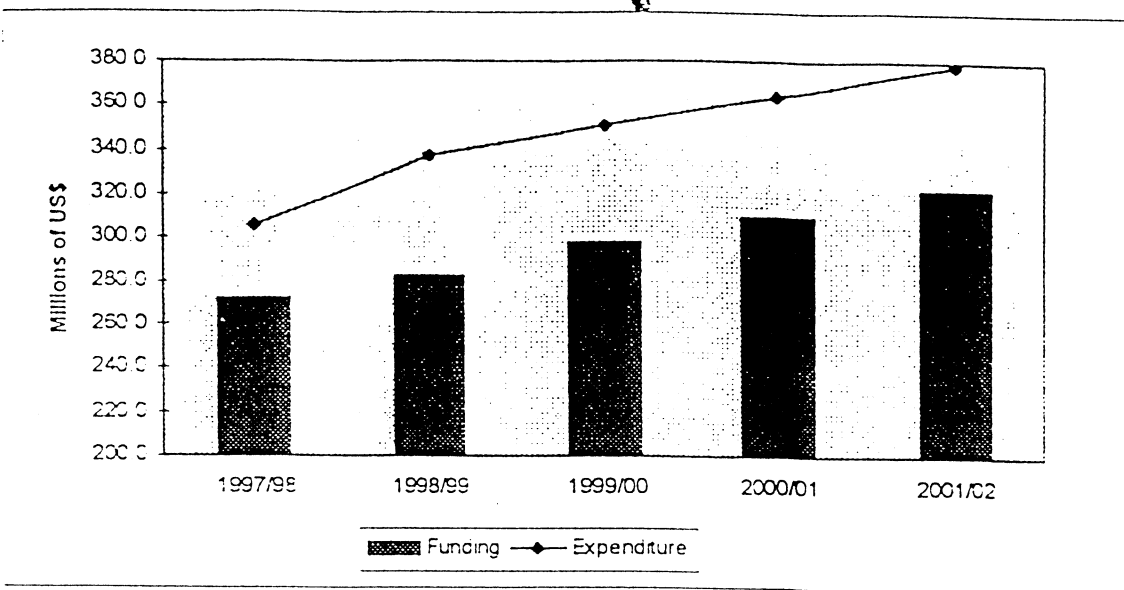
Diagram 7: Expenditure under Scenario 1 and Potential Funding in the Health sector, 1997/98-2001/02, US\$ million



According to our projections, there is still a resource gap with Scenario 1. This is particularly large in 1998/99, approximately US\$ 40 million, or 12% of the total expenditure in the sector. The size of this gap is probably caused by two factors, namely:

- Additional recurrent costs caused by the current large investment programme in the health sector feeding through into the Revenue Budget.
- The tail-end of the capital investment programme in the GOB health infrastructure. (N.B. As the physical investment programme tails off under this scenario then the resource gap begins to close.)

Diagram 8: Expenditure under Scenario 2 and Potential Funding in the Health sector, 1997/98-2001/02, US\$ million



It is important to isolate the subsectors in which the resource gaps are most prominent in Scenario 1. In Section B, where we projected potential funding, special forecasts were made for Primary Health Care activities, allowing them to take an increasing proportion of the overall Budget. Was this allocation sufficient, particularly given the apparent resource gap shown above? Diagram 9 and Table 16 display the results.

Diagram 9: Potential and Forecast PHC Expenditure, 1997/98-2001/02, US\$ million

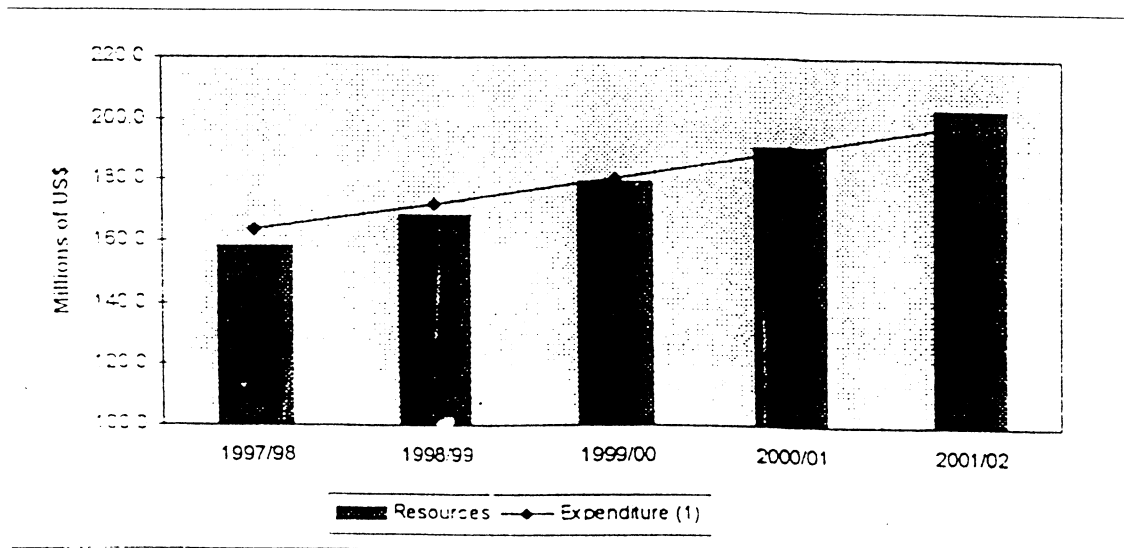


Table 16: PHC Expenditure - Potential and Forecast, 1997/98-2001/02, US\$ million

	1997/98	1998/99	1999/00	2000/01	2001/02
Potential Funding	158.0	168.3	179.9	191.4	203.7
Forecast Expenditure	163.8	172.0	180.7	189.7	199.2
Resource Gap	-5.8	-3.7	-0.8	1.7	4.5

Sources: HEU

The data suggest that although there is an initial resource shortfall, it is not large and will disappear by 2001/02, if the GOB increases its share of the Budget allocated to PHC activities by 2% per year, as was discussed in Section B. Of course, a gap still remains but, given the high priority of PHC activities for the GOB, it is probably best not to reduce planned expenditure. Further *reallocations* in the health sector may be more appropriate for raising potential expenditure and meeting the needs of the population. Indeed, our forecasting model reveals that if the PHC activities were to be given an additional 3% of the health sector budget in 1996/97 and 1997/98, on top of their current allocation, the resource gap would disappear. The above analysis suggests that the shortfalls for the sector as a whole, as implied by Scenario 1, may not apply to Primary Health Care activities if appropriate prioritisation occurs.

Still, it is important to ascertain what items are causing the shortfalls for the sector as a whole and in the original resource projections for PHC. Table 17 displays the apparent surpluses and shortfalls for different line expenditure items. It shows that the two line items with the largest funding gaps are *Medical Supplies* and *Operation and Maintenance*. Both these areas of intervention are vital for the smooth and efficient running of a country's health infrastructure. Adequate and timely supplies of medicines are a prerequisite for an effective health service. Efficient maintenance can increase the life-span of health infrastructure and thus increase the cost-effectiveness of investment programmes; a particularly important point given the rapid expansion in health sector infrastructure at Thana level and below in the last five years. Expenditure cuts are inadvisable in either.

Table 17: Forecast Resource Surpluses and Shortfalls in the Health sector, 1997/98-2001/02, US\$ million

	1997/98	1998/99	1999/00	2000/01	2001/02
Construction	18.7	22.3	26.1	27.4	28.8
Purchase of Equipment	1.4	1.9	2.7	3.3	4.0
Purchase of Land	0.1	0.1	0.2	0.2	0.3
Training	-3.3	-5.8	-7.1	-6.9	-7.1
Technical Assistance	1.1	1.3	1.7	2.0	2.1
Medical Supplies	-13.8	-17.1	-16.8	-14.8	-12.4
Operation and Maintenance	-11.4	-16.3	-15.4	-15.3	-15.1
Salaries	-6.4	-10.1	-6.6	-3.9	-1.2
Allowances	-5.2	-7.8	-5.1	-3.3	-1.2
Others	-6.3	-7.2	-8.3	-7.9	-7.4
Total	-25.1	-40.5	-28.6	-19.3	-9.2

Source: HEU

Alternatively, savings could be made elsewhere. To bolster expenditure on recurrent items, the GOB could reduce capital investment at least until the resource gap closes. To explore this option we assess the impact of cutting back *Construction* and the *Purchase of Equipment*. In this *low investment scenario* we assume that expenditure on both line items will fall to US\$ 10 million by 2001/02. The results are shown in Table 18. The gap is virtually bridged for all years except 1998/99. Indeed in 2000/01 and 2001/02 there would be sufficient resources for an increase in capital activity, if it were necessary. Nevertheless, the resource gap in 1998/99 would still need to be bridged and there might be some negative effects on the utilisation of existing services and on the quality of care if savings are made on equipment purchases.

Table 18: Reduced capital investment scenario for the health sector, 1997/98-2001/02, US\$ million

	1997/98	1998/99	1999/00	2000/01	2001/02
Construction	32.8	37.0	41.0	42.3	43.7
Purchase of Equipment	11.9	14.0	16.1	16.7	17.4
Purchase of Land	0.1	0.1	0.2	0.2	0.3
Training	-3.3	-5.8	-7.1	-6.9	-7.1
Technical Assistance	1.1	1.3	1.7	2.0	2.1
Medical Supplies	-13.8	-17.1	-16.8	-14.8	-12.4
Operation and Maintenance	-11.4	-16.3	-15.4	-15.3	-15.1
Salaries	-6.4	-10.1	-6.6	-3.9	-1.2
Allowances	-5.2	-7.8	-5.1	-3.3	-1.2
Others	-6.3	-9.2	-8.3	-7.9	-7.4
Total	-0.5	-13.8	-0.3	9.0	19.1

Source: HEU

Apart from reducing capital investment there are other means of cutting forecast expenditures. *Improved efficiency* at the facility level may well save valuable costs. Such efficiency gains may not be hard to attain. Indeed, it is hoped that some of the on-going initiatives will produce cost savings. There are many options which could be considered, and we mention only a few below, but it is hoped that further research will focus on the potential cost-savings in such areas:

- *Improved training and guidelines for medical staff* - cost savings produced as a result of improved prescription of drugs, improved diagnosis, etc.
- *Improvements in administration and organisation of facilities* - cost savings gained through computerisation of administration, better use and deployment of human resources, etc.
- *Manipulation of the incentive framework facing health facilities* - cost savings produced by changing the basis of Budgetary allocations away from number of beds occupied

Summary

The Population Sector

- HEU's analysis reveals that there are insufficient resources available under projected conditions for the GOB to carry out all of its planned activities in the population sector. In 1997/98 there is a resource gap of US\$ 13.7 million which broadens to US\$ 42.4 million by 2001/02.
- Key line items which may be underfunded in the population sector are *Medical* (and contraceptive) *Supplies*, *Operation and Maintenance*, and *Construction*. If planned construction is delayed, however, the resource gap is closed for 1997/98 and halved for 2001/02.
- The remaining resource gap in the population sector may be bridged by changing the mode of delivery of family planning services to less intensive forms, but the *cost-effectiveness* of this approach needs to be assessed fully. The HEU is currently designing a suitable study.

The Health Sector

- Resource constraints may force the GOB to *restrict its capital investment activities* in future in order to meet the expected costs of running an expanded health infrastructure. It may well be important to delay fresh investment in secondary and tertiary facilities.
- According to our data, *if PHC activities are given an additional 3% share of the Budget allocation* for health in 1996/97 and 1997/98, there will be sufficient funds to run planned activities.
- *Medical Supplies* and *Operation and Maintenance* are in danger of receiving insufficient allocations in the planned period. For both these line items expenditure potential lags far behind forecast need. It is essential that these items receive funding, however, as they are integral to GOB health sector objectives. Resources might have to be made available from other areas such as capital investment.
- It is important when faced with potential funding constraints to explore the efficiency gains which may be made at the facility level. Many of these deserve detailed consideration and research to assess the cost-savings which they could bring. For instance, better training and guidelines for medical staff, improvements in administration and organisation of facilities, and manipulation of Budget incentives may all save significant resources.

Section E: A Package of Essential Health Services

Background

In Section D we noted the resource gaps that may appear if the GOB attempts to undertake all its health and population sector activities as planned. One option that has been suggested to help the GOB close the resource gap is the adoption of a Package of Essential Health Services (PEHS). What will such a package contain? Should GOB funding of a PEHS take priority over all other expenditure in the health and population sectors? Is the application of such a package feasible in Bangladesh? Can and should the GOB provide these services to those who are not poor? In this section we examine some of these questions and consider the motivation behind the adoption of a PEHS. We take care to analyse the constraints of this approach and note the modifications that may be necessary for the specific conditions in Bangladesh. Finally we set out for policy makers the options available.

Definitions and Rationale

According to Bobadilla & Cowley, 1995, a PEHS is an

integrated collection of cost-effective interventions that address the main diseases, injuries and risk factors, plus diagnostic and health care services to satisfy the demand for common symptoms and illnesses of the population to be served.

In other words, it is a cost-effective package of services which addresses the main burdens of disease in a country. One of the main reasons for adopting a PEHS is that it helps governments focus on their priorities in the health sector. When the GOB has only limited resources it needs to know how it can maximise its effectiveness to meet the essential needs of the population. Otherwise, it will waste resources pursuing activities of secondary importance. Furthermore, the adoption of a PEHS may help the GOB concentrate on activities in the health and population sectors which it can perform best. Consequently, it can leave non-essential services to other agents, such as the private sector. All this could, however, be achieved by prioritising GOB activities in the health and population sectors. What advantage does a *package* of services have over a list of priorities?

The theoretical benefits of a PEHS approach cannot be ignored. It is argued that the package approach minimises total costs by using common inputs and reducing the cost to the patient. Bobadilla et al, 1994, cite various mechanisms by which this occurs:

- Synergism between treatment and prevention activities
- Joint production costs
- Effective screening of patients to ensure appropriate referrals
- Integration of services to reach related individuals (such as maternal and child health care)

The implication of this list is that by providing these services in a package, vital savings can be made. Integration is more cost-effective than a series of vertical programmes.

The contents of a PEHS

There are two criteria for the construction of a PEHS for any country. First, and perhaps more importantly, the services in the package must deal with the major threats to health. The World Bank suggests that this should be decided by the number of disability-adjusted life years (DALYs) lost to each disease in the country. (Readers who are interested in the concept of DALYs are referred to the World Bank's *World Development Report 1993: Investing in Health*, for a fuller exposition.) The diseases resulting in the loss of the most DALYs should be focused on. A second criterion for inclusion is that the interventions proposed in the package are *highly cost-effective*. This can be measured by comparing the cost and number of DALYs saved by the intervention. (The approach implicitly assumes that diseases which result in the most DALYs lost have cost-effective solutions. This assumption has to be tested in each country by examining the specific disease burden.)

An example of the imputed benefits and costs of a PEHS is contained in Table 19 below. This summarises World Bank data showing the cost and cost-effectiveness of a minimum package of essential services. The data were derived from Sub-Saharan Africa, Latin America and the Caribbean.

Table 19: Cost-effectiveness of health interventions in the minimum package of health services in low-income countries

Interventions	Cost per capita	Cost per DALY (\$)
<i>Public Health</i>		
- Expanded Programme of Immunisation plus (1)	0.5	12-17
- School health programme	0.3	20-25
- Tobacco and alcohol control programme	0.3	35-55
- AIDS prevention programme (2)	1.7	3-5
- Other public health interventions (3)	1.4	-
Subtotal	4.2	14
<i>Clinical Services</i>		
- Chemotherapy against tuberculosis	0.6	3-5
- Integrated management of the sick child	1.6	30-50
- Family Planning	0.9	20-30
- STD treatment	0.2	1-3
- Prenatal and delivery care	3.8	30-50
- Limited care (4)	0.7	200-300
Subtotal	7.8	-
Total	12.0	-

Sources: WHO, 1994

(1) Plus refers to vaccine against hepatitis B and vitamin A supplementation

(2) DALYs lost from AIDS include dynamic effects (probability of transmission to others) only in the first year, which understates the value of preventing cases and thus the cost-effectiveness of preventive interventions

(3) Includes information, communication, and education on selected risk factors and health behaviours, plus vector control and disease surveillance

(4) Includes treatment of infection and minor trauma; for more complicated conditions, includes diagnosis, advice and pain relief, and treatment as resources permit

Although not immediately applicable to Bangladesh, the package outlined gives a useful starting point for consideration of a PEHS. Some elements of the above package may not be particularly relevant but the emphases on prenatal and delivery care and on the treatment of tuberculosis may well be pertinent. How can this package be modified to meet the needs and resources of Bangladesh? It is noticeable that the total cost of the minimum package outlined in Table 19 is \$12 per capita. This is not cheap, even with all the benefits of integration referred to earlier. The Public Expenditure Review, prepared by the HEU for the Paris Consultative Conference, noted that 1994/95 per capita spending on health and population, through the GOB Budget, is approximately \$3.2, and this includes donor funding. This leaves a shortfall of almost \$9 per person. If these figures are applicable to Bangladesh then it would appear that the adoption of a PEHS by GOB would raise as many problems as it solves.

If the cost of \$12 per head is too high, how can the universal package be adapted to local conditions? It may be useful to take a closer look at the suggested priorities for a minimum health package in Bangladesh. This may help see whether the package costed by the World Bank is inappropriate for Bangladesh. According to the Summary Report of Working Group 1, at the 1995 Paris Consultative Conference, the contents of any such package should address, in order of priority:

- Maternal health.
- Family planning and other reproductive health.
- Child survival, through integrated service delivery and health education.
- Communicable and endemic diseases.

An *indicative* costing of the strategies to meet the above concerns for Bangladesh might include the following (derived from Table 19):

Table 20: Indicative Costing of PEHS in Bangladesh

Health Area	Intervention	Cost per capita (\$)
1. Maternal Health	<i>Prenatal and Delivery Care</i>	3.8
2. Family Planning and other Reproductive Health	<i>Family Planning</i>	0.9
	<i>AIDS prevention programme</i>	1.7
	<i>STD treatment</i>	0.2
3. Child Survival	<i>School health programme</i>	0.3
	<i>Integrated management of the sick child</i>	1.6
	<i>Expanded Programme of Immunisation plus</i>	0.5
4. Communicable and Endemic Diseases	<i>Chemotherapy against tuberculosis</i>	0.6
	<i>Limited care</i>	0.7
TOTAL		10.3

The above table implies that the costs of a basic health package are well out of reach without a substantial redistribution of resources to and within the health sector. At the very least the current spending in GOB's Revenue and Development Budgets would probably have to treble and be entirely devoted to the PEHS. Indeed, if the data in Table 20 were correct at least \$850 million extra each year would be needed to fund the PEHS! While labour costs in Bangladesh are among the lowest in the world this is unlikely to reduce the cost of the interventions by the appropriate amount.

Implementation in Other Countries

What has been the experience of other countries? How have they overcome some of the basic problems associated with a PEHS? It may be useful to examine how the packages have been implemented in other *low-income* countries. In particular, what impact have the packages had on *policy* in these countries? Indeed, applying economic principles to the PEHS approach, how cost-effective has it been? The *costs* of design have depended largely on the country in question. The minimum is around \$50,000 for a basic analysis of the burden of disease, the cost-effectiveness of different health care interventions, and their combination into an essential package. The *effectiveness* has varied substantially. According to the World Bank the package was extremely helpful in *Uganda*, where it increased spending on the poor substantially. In *Zambia*, the PEHS is the cornerstone of both donor and government activity and is at the forefront of reform. By contrast, in the East Africa region (*Tanzania, Kenya, Ethiopia* and *Eritrea*) the basic package has proved to be outside the financial reach of some countries and in *Ghana* the PEHS has been only of limited relevance, again because of insufficient resources.

Nevertheless, it is fair to say that "All the countries involved in the design of the PEHS had far fewer resources than those needed to provide universal coverage for the health interventions that decision makers in the (public) health sector consider desirable." (Bobadilla & Cowley, 1995) Indeed, many countries found it possible to design a PEHS which needed *fewer* resources than those contained in Table 19 *without compromising their basic aims*

Under these circumstances, what are the options available to GOB? There are three possible strategies for coping with the additional financial needs of a PEHS.

1. Postpone the adoption of a PEHS. In the short-term GOB might develop a package of *critical* health services which it can afford.
2. Apply the concept of a PEHS to Bangladesh. Once applied the GOB is committed to providing this package only for the *poor*, leaving the rest of the population to pay for it themselves
3. Drop the concept of a PEHS and focus on prioritisation of activities in the health and population sectors

Summary

- One option which has been suggested as a way forward for the GOB in the health and population sectors is the adoption of a **Package of Essential Health Services (PEHS)**. Such a package would consist of highly cost-effective interventions to deal with the major threats to health in Bangladesh. The rationale for the approach is that it helps GOB prioritise when faced with competing demands on precious resources. Furthermore, by providing services as a package, vital savings can be made
- Nevertheless, **there are concerns that a PEHS may be too expensive to afford in the short term for Bangladesh**. Estimated costs from the World Bank reach US\$ 12 per head, notably larger than the US\$ 3.2 per head which was spent through GOB Budgets in 1994/95.

- If the GOB wishes to proceed with a PEHS it may decide that it can only provide essential services for the poor and let other income/wealth brackets pay for themselves. Alternatively, it may design a critical package of health services which it can provide now. This may be broadened out to a PEHS once resources allow.

Section F: Conclusions and Recommendations

By identifying the resource picture for the health and population sectors over the lifetime of the 5th Population and Health Project the GOB can assess the financial viability of its plans. Furthermore, by debating different priorities and strategies now the GOB is better equipped to avoid unforeseen resource constraints. This has been a real problem in the past.

As a country with low economic profile, the Government of Bangladesh was not always able to provide adequate funds to support key programmes in the health sector even though each of the successive governments had shown their full political commitment to improve the health status of the general population, particularly the poor.
(The Perspective Plan - Health Sector, Government of the People's Republic of Bangladesh, 1995)

The future does not have to be the same. The GOB, armed with forecasts of expenditure and revenues, can play a much more active role in pre-empting problems rather than having to react at the last minute. In this section we summarise some of the main findings of the report before discussing appropriate strategies for their resolution.

Summary of Key Findings

The GOB Resource Envelope

- Prospects for economic growth in Bangladesh have been extremely good over the last few years, at least until very recently. If political concerns are resolved then GDP growth may reach 6% per annum, allowing GOB room to expand its resources for the health and population sectors at a healthy rate. Under the 6% growth scenario the GOB resource envelope will reach US\$ 4.4 billion in 1997/98 and US\$ 5.2 billion by 2001/02, according to the HEU forecasting model.
- Assuming the health and population sectors take fixed proportions of the Budgets, the GOB revenue available will increase from US\$ 230 million and US\$ 63 million in 1997/98 to US\$ 281 million and US\$ 75 million in 2001/02 for the health and population sectors respectively. By 1997/98 revenue for PHC activities in the health sector is expected to account for 56% of all GOB allocations in the health sector, or US\$ 129 million, rising to 62%, US\$ 175 million, by the end of 2001/02.

Future GOB Expenditure Patterns

- *Total expenditure* in the GOB population sector is forecast to increase from \$182 million in 1997/98 to \$222 million in 2001/02. By far the largest item of expenditure in that period will be *Medical* (and contraceptive) *Supplies*, accounting for more than a third of the total cost. *Salaries* and *Allowances* will also be significant items of expenditure.
- *Expenditure forecasts for health* have been made under two different scenarios. If capital investment is wound down, as in Scenario 1, then costs will rise from just under \$300 million in 1997/98 to approximately \$330 million in 2001/02. Alternatively, if investment continues at the same rate (Scenario 2) expenditure will rise from US\$ 305 million in 1997/98 to US\$ 380 million in 2001/02.

- *Expenditure on PHC* is forecast to rise from US\$ 160 million in 1997/98 to US\$ 200 million, reflecting the GOB's continued commitment to Health for All by the Year 2000. The *largest line expenditures* in the health sector over the lifetime of the 5th Population and Health Project are all recurrent. *Salaries* will account for US\$ 380 million, *Medical Supplies*, US\$ 300 million, *Operation and Maintenance*, US\$ 170 million, and *Allowances*, US\$ 280 million.

Balancing Resources with Expenditures

- HEU's analysis reveals that there are **insufficient resources** under projected conditions for the GOB to carry out its planned activities in the **population sector**. In 1997/98 there is a resource gap of US\$ 13.7 million which broadens to US\$ 42.4 million by 2001/02. Key line items which may be underfunded in the population sector are *Medical* (and contraceptive) *Supplies*, *Operation and Maintenance*, and *Construction*.
- Funds are unlikely to be sufficient for carrying out **health activities** as set out in the Perspective Plan. *Scenario 2* is clearly unfeasible without substantial additional resources. In *Scenario 1* there is also a shortfall but this decreases from US\$ 25.6 million in 1997/98 to US\$ 9.3 million in 2001/02.
- Expenditure potential lags far behind forecast need for *Medical Supplies* and *Operation and Maintenance*. It is essential that these items receive funding, as they are integral to GOB health sector objectives.

A Package of Essential Health Services

- One option for the GOB in the health and population sectors is the adoption of a Package of Essential Health Services (PEHS). Such a package would consist of highly cost-effective interventions to deal with the major threats to health in Bangladesh. The rationale for the approach is that it helps GOB prioritise when faced with competing demands on precious resources. Furthermore, by providing services as a package, vital savings can be made.
- Nevertheless, there are concerns that a PEHS may be too expensive in the short term for Bangladesh. Indicative costs of implementation are around US\$ 12 per head, much higher than the US\$ 3.2 per head which was spent through GOB Budgets in 1994/95. Some low-income countries, such as Ghana and Eritrea, have experienced similar financial problems with implementation.

Mobilising Additional Resources

As indicated above, much of this report has been concerned with highlighting potential resource gaps in the future. Consequently, its recommendations must deal with strategies for resource mobilisation and reallocation. While Section D examined reallocations within each sector and Section E analysed the feasibility of adopting a PEHS, it is worth briefly considering other revenue raising strategies.

Reallocating resources from other sectors

It may be possible for the GOB to reallocate resources in the Budget process to the health and population sectors. What kind of reallocations would be needed to fund the extra expenditure identified in this report? Table 21 displays the results of HEU's analysis. It highlights the resource gap for each sector commensurate with our initial projections and compares this with the potential expenditure for each sector. The required share of total expenditure is then given in bold. For the *health* sector the share of GOB's Budget expenditure should rise to 6.9% in 1998/99 and in the *population* sector it should increase to 2.5% in 2001/02.

Table 21: Budgetary Reallocations to Bridge the Forecast Gap,
1997/98-2001/02, US\$ 1994/95 million

	1997/98	1998/99	1999/00	2000/01	2001/02
Potential Funding - Health	230 (5.9%)	242 (5.9%)	256 (5.9%)	268 (5.9%)	281 (5.9%)
Potential Funding - Population	63 (1.6%)	66 (1.6%)	69 (1.6%)	72 (1.6%)	75 (1.6%)
Funding Gap - Health	26	41	29	19	9
Funding Gap - Population	14	20	26	34	42
Required Funding - Health	256 (6.5%)	283 (6.9%)	285 (6.6%)	287 (6.3%)	290 (6.1%)
Required Funding - Population	77 (2.0%)	88 (2.1%)	95 (2.2%)	106 (2.4%)	117 (2.5%)

Source: HEU

Nevertheless, reallocation cannot be pursued blindly. It is short-sighted merely to exhort the GOB to raise additional revenue by this method. The GOB has many priorities. Indeed, the health status and family planning decisions of the population are affected by many sectors of the economy, not just those under the direction of the MOHFW. In economic terms the question may be posed: "What is the opportunity cost of reallocating resources to the health and population sectors?" If such resources could educate more girls in secondary schools or provide farmers with more stable incomes, are the funds best employed in PHC activities? How does investment in a FWC compare with investment in secondary education? The answer is by no means clear. An analysis of 19th century Britain revealed that increased food production and better sanitation were arguably more important for health than medical interventions (McKeown 1979). This report merely raises such questions so that informed planning can precede reallocation decisions.

Raising revenue from Non-GOB sources

Various other options are open to GOB to bridge the gap. Some involve the direct mobilisation of resources from households. *User fees* in particular have been considered by many governments needing to raise additional resources. Received wisdom, however, indicates that its potential for revenue generation is limited, its acceptability depends on tangible qualitative gains in service, and it may have an adverse impact on the poor. This is perhaps a little too damning. *User fees* in secondary and tertiary facilities may encourage revenue generation, thus freeing government resources for primary activities. *Insurance* is also a popular option with many countries and it may be useful for the GOB to draw lessons from the experience of other South and South East Asian countries in this field.

A more controversial option for GOB is to harness the competitive forces of the *private sector* to provide various services. Where adequate *regulation* is in place such initiatives may well lower costs under the right conditions. A thorough review is needed of options for GOB in this area. *NGOs* provide an alternative delivery channel for many basic services. The harmonisation of working practices between GOB and NGOs would be an encouraging step towards efficiency in the sectors.

Recommendations

Planning

- *While plans remain incomplete expenditure forecasts can only be indicative.* This report is only one step toward the design of future health and population programmes. Until there is complete agreement on the exact programmes and projects to be included in the health and population sectors, expenditure estimates cannot be finalised.
- Ideally, data on *optimal* running costs of facilities should be calculated and incorporated into the forecast expenditures in each plan. This will require a unit cost analysis of different facilities and perhaps even the development of production cost models.
- As the priorities in each sector change from capital investment to the financing of existing infrastructure it will be vital for the GOB to meet recurrent costs. In particular, there will be extra demands on the funding of *Operation and Maintenance* and the provision of *Medical Supplies*, which must be met for the achievement of GOB objectives.

The Population Sector

Options for helping to close the forecast resource gap are set out below:

- If planned construction on FWCs and the Contraceptive Manufacturing Plant is delayed, the resource gap is closed for 1997/98 and halved for 2001/02.
- If GOB boosts its allocation to the population sector from 1.6% of total Budget expenditure to 2.0% in 1997/98, rising to 2.5% in 2001/02, the resource gap will disappear.
- The GOB may change the mode of delivery of family planning services to less intensive forms, but the *cost-effectiveness* of this approach needs to be assessed fully. The HEU is currently designing such a study.
- The GOB may examine other options such as incentives or savings schemes while also making greater use of NGOs and/or the private sector under appropriate regulation.

The Health Sector

Possible strategies to bridge the projected resource gap in the health sector are set out below:

- The GOB could *restrict or delay some of its planned capital investment activities*, especially in secondary and tertiary facilities, in order to allow sufficient funds to meet the expected costs of running an expanded health infrastructure.

- Reallocate funds to the health sector until its share of total GOB Budget expenditure reaches 6.9% in 1998/99 up from 5.9% in 1994/95.
- *If PHC activities are given an additional 3% share of the Budget allocation for health in 1996/97 and 1997/98, there will be sufficient funds to run planned PHC activities.*
- If the GOB wishes to proceed with a PEHS, it may decide that it can only provide **essential services for the poor** and let other income/wealth brackets pay for themselves. Alternatively, it may design a **critical package of health services** which is within its financial means. This may be broadened out to a PEHS once resources allow.
- GOB should proceed with its pilot study of the impact of *user fees* within the health sector. Additional research areas should be the *potential for GOB regulation* in relation to the operations of the private sector and NGOs, and an assessment of the viability of a *social health insurance scheme*.
- GOB might explore the *efficiency gains* which could be made at the facility level. For instance, better training and guidelines for medical staff, improvements in administration and organisation of facilities, and manipulation of Budget incentives may all save valuable resources.

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Appendix 1: The HEU Revenue Simulation Model

The starting point for the model is the assumption that tax revenues represent the main source of Government income and that these are dependent on tax rates, the level of economic activity and particularly the level of trade. This relationship is expressed mathematically in equation (1) below:

$$R = f(GDP, M, \tau_i, V) \quad (1)$$

where:

- R = Government tax revenue
- GDP = Gross Domestic Product
- M = the value of imports
- τ_i = the rate of tax i
- V = a vector of other variables

Specifying a functional form $f(\cdot)$ for equation (1) allows it to be estimated by ordinary least squares. This provides the basis for forecasting future tax revenues based on alternative assumptions for GDP growth and other appropriate variables. Sensitivity analysis can then be undertaken using different growth assumptions.

The next stage of the model is to simulate the Government resource envelope. This assumes for simplicity that Government expenditure in any year (E) must equal the sum of income from tax revenues (R), income from non tax revenues (NT), aid grants (A) and concessional and commercial loans (L). This can be expressed as an accounting identity as follows:

$$E = R + NT + A + L \quad (2)$$

where all the variables are defined above

Resources mobilised through cost recovery measures would by definition be included in non-tax revenue (NT). Alternative assumptions can be specified for the level and growth of each type of resource except tax revenue, which is already estimated as per equation (1).

The future share of Government expenditure going to the health and population sectors depends on future budget allocations and can be written as follows:

$$E^h = \phi^h E \quad (3)$$

$$\text{and } E^p = \phi^p E$$

where:

- E^h = expenditure on health
- ϕ^h = Government budget share devoted health expenditure
- E^p = expenditure on population and family welfare
- ϕ^p = Government budget share devoted to population and family planning expenditure

The Government budget shares for health and population, ϕ^h and ϕ^p , can be either based upon historic precedent or reflect government policy statements.

Combining equations (1), (2) and (3) gives: